



RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

March 2021 Board Packet

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Agenda

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Regular Board Meeting Agenda

Wednesday, March 3, 2021

6:30 PM

Due to the COVID19 pandemic, this month's board meeting will be held via the video conferencing platform Zoom. Board members, staff, consultants, and general public will be able to join in via video and/or phone. The public that wish to will be able to listen to meeting but not participate with the exception of the visitor comments portion of the agenda. If you have comments you may speak on the Zoom meeting during the visitor comments agenda item. Instructions for joining in on the Zoom meeting can be found after the agenda.

1. Call to Order – 6:30 PM
2. **Approval of Agenda (pg. 3)**
3. Recognition of Outgoing Board Member – Marj Ebensteiner (pg. 6)
4. New Board Member Introduction – Val Eisele
5. **Ramsey-Washington Metro Watershed District Board Manager Oath of Office (pg. 7)**
6. **Consent Agenda: To all be approved with one motion unless removed from consent agenda for discussion.**
 - A. Approval of Regular Meeting Minutes February 3, 2021 (pg. 13)
 - B. Treasurer's Report and Bill List (pg. 23)
 - C. Permit Program
 - i. 21-03 Phalen Parking Lot Improvement, Phase 2 – St. Paul (pg. 34)
 - D. Stewardship Grant Program
 - i. 21-05 CS Cherokee Hills 2, Phase 2 – rain garden (pg. 39)
 - E. Keller Channel Weir & Phalen Outlet Modifications – Change Order No. 2 (pg. 41)
7. Visitor Comments (limited to 4 minutes each)
8. Permit Program
 - A. Applications – see consent agenda
 - B. Enforcement Action Report (pg. 46)
9. Stewardship Grant Program
 - A. Applications – see consent agenda
 - B. Budget Status Update (pg. 49)
10. Report of Managers
 - A. Summary of Closed Meeting held February 10, 2021 at 6:00 PM.

- B. Board Issues, Policies and Operation (for discussion at meeting)
 - i. Meeting Minutes
 - ii. Visitor Presentations
- 11. Presentations and/or Action Items
 - A. **Ryan Drive and Keller Parkway Conveyance Upgrades Accept Plans and Solicit Bids (pg. 51)**
 - B. **North St. Paul Target Accept Bids and Order Project (pg. 85)**
 - C. New Project Scope Summaries
 - i. Emergency Response Plans (pg. 87)
 - ii. **Shallow Lake Aeration Study (pg. 92)**
- 12. Administrator's Report (pg. 96)
 - A. Meetings Attended
 - B. Upcoming Meetings and Dates
 - C. WaterFest Update
 - D. **CAC Update and Membership**
- 13. Attorney Report
- 14. Project and Program Status Reports (pg. 101)
 - A. Ongoing Project and Program Updates
 - i. Response to Accuracy of LIDAR and XP-SWMM Question
 - ii. Response to Request for more Public Facing Technical Materials
 - iii. Interim Emergency Response Planning
 - iv. FEMA Flood Mapping Updates
 - v. Kohlman Creek Flood Risk Reduction Feasibility Study
 - vi. Ames Lake Area Flood Risk Reduction Feasibility Study
 - vii. Special Project BMP Monitoring
 - viii. Shallow Lake Aeration Study
 - ix. Tanner Lake Alum Facility Monitoring
 - x. Automated Lake Monitoring Systems
 - xi. North St. Paul Store Stormwater Retrofit Project
 - xii. Targeted Retrofit Projects
 - xiii. Aldrich Area Project
 - xiv. Wakefield Park/Frost Avenue Project
 - xv. Keller Channel Weir and Phalen Outlet Resiliency Modifications
 - xvi. Ryan Drive and Keller Parkway Conveyance Project
 - xvii. Beltline/Battle Creek Tunnel Five-Year Inspection
 - xviii. Natural Resources Program Update
 - xix. Education Program Update
 - xx. Communications Program Update
 - B. Lakeline Article: Strategic Aquatic Plant Harvesting as a Multi-faceted In-Lake Management Tool (pg. 113)

15. Adjourn

Items in **bold signify that an action needs to be taken by the Board.*



RAMSEY-WASHINGTON

METRO WATERSHED DISTRICT

NOTICE OF BOARD MEETING

Wednesday, March 3, 2021

6:30 PM

Via Web Conference and In Lieu of an In-Person Meeting

Per Minnesota Statute 13D.021, President Lawrence Swope has determined that an in-person meeting of the RWMWD Board of Managers is not practical or prudent given the COVID-19 pandemic. In compliance with Center for Disease Control and Minnesota Department of Health guidance on minimizing potential for spread of the virus, RWMWD will conduct its regular Wednesday, March 3, 2021, meeting at 6:30 p.m. CDT, by web conference and conference call. Members of the public wishing to participate in the meeting may do so by accessing the web-based conference, or by phone.

To access the meeting via webcast, please use this link: <https://us02web.zoom.us/j/88270528800?pwd=SFR2STF1SkFQQVJ1TndGWGNHVVpoZz09>

The meeting room will open at 6:20 pm with the meeting starting at 6:30 pm. To connect to audio you may choose to use your computer audio options or you may use your mobile device to call. The phone access number is **(312) 626-6799**. The Meeting ID is **882 7052 8800**. The meeting password is **919036**. If you have any questions, please contact Tina Carstens at tina.carstens@rwmwd.org.

Certificate of Appreciation

Presented to

Marj Ebensteiner

in recognition and grateful appreciation for
eight years of dedication, leadership, and service
to the Ramsey-Washington Metro Watershed District.



RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

March 3, 2021

Larry Swope, President

Cliff Aichinger, Vice President

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT
RAMSEY AND WASHINGTON COUNTIES, MINNESOTA

STATE OF MINNESOTA)
) ss.
COUNTY OF WASHINGTON)

OATH OF OFFICE

I, **CLIFTON AICHINGER**, do solemnly swear that I support the Constitution of the United States, the Constitution of the State of Minnesota, and that I will faithfully, justly, and impartially discharge the duties of the office of Manager of the Ramsey-Washington Metro Watershed District, Ramsey and Washington Counties, Minnesota, to the best of my judgment and ability.

Dated: _____

Clifton Aichinger

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT
RAMSEY AND WASHINGTON COUNTIES, MINNESOTA

STATE OF MINNESOTA)
) ss.
COUNTY OF WASHINGTON)

OATH OF OFFICE

I, **VAL EISELE**, do solemnly swear that I support the Constitution of the United States, the Constitution of the State of Minnesota, and that I will faithfully, justly, and impartially discharge the duties of the office of Manager of the Ramsey-Washington Metro Watershed District, Ramsey and Washington Counties, Minnesota, to the best of my judgment and ability.

Dated: _____

Val Eisele

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT
RAMSEY AND WASHINGTON COUNTIES, MINNESOTA

STATE OF MINNESOTA)
) ss.
COUNTY OF WASHINGTON)

OATH OF OFFICE

I, **DR. PAMELA SKINNER**, do solemnly swear that I support the Constitution of the United States, the Constitution of the State of Minnesota, and that I will faithfully, justly, and impartially discharge the duties of the office of Manager of the Ramsey-Washington Metro Watershed District, Ramsey and Washington Counties, Minnesota, to the best of my judgment and ability.

Dated: _____

Dr. Pamela Skinner

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT
RAMSEY AND WASHINGTON COUNTIES, MINNESOTA

STATE OF MINNESOTA)
) ss.
COUNTY OF WASHINGTON)

OATH OF OFFICE

I, **LAWRENCE SWOPE**, do solemnly swear that I support the Constitution of the United States, the Constitution of the State of Minnesota, and that I will faithfully, justly, and impartially discharge the duties of the office of Manager of the Ramsey-Washington Metro Watershed District, Ramsey and Washington Counties, Minnesota, to the best of my judgment and ability.

Dated: _____

Lawrence Swope

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Consent Agenda

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**Ramsey-Washington Metro Watershed District
Minutes of Regular Board Meeting
February 3, 2021**

The Regular Meeting of February 3, 2021, was held at the District Office Board Room, 2665 Noel Drive, Little Canada, Minnesota, at 6:30 p.m.

PRESENT:

Marj Ebensteiner, President
Cliff Aichinger, Vice President
Lawrence Swope, Treasurer
Dianne Ward, Secretary
Dr. Pam Skinner, Manager

ABSENT:

ALSO PRESENT:

Tina Carstens, District Administrator
Tracey Galowitz, Attorney for District
Nicole Soderholm, Permit Inspector
Simba Blood, Natural Resources Specialist
Brian Field, Representing Mead Metals

Paige Ahlborg, Project Manager
Brad Lindaman, Barr Engineering
Dave Vlasin, Project Coordinator
Sam Wagner, Lower Phalen Creek Project
Jacob Dobias, Representing Mead Metals

1. CALL TO ORDER

The meeting was called to order by President Ebensteiner at 6:30 p.m.

2. APPROVAL OF AGENDA

A Manager requested to remove Items C and E from the Consent Agenda. Tina Carstens noted that Item C will be moved to the Permit Program and Item E will be moved to Action Items.

Motion: Manager Swope moved, Manager Ward seconded, to approve the agenda as amended.

A roll call vote was performed:

Manager Swope	aye
Manager Ward	aye
Manager Aichinger	aye
Manager Skinner	aye
President Ebensteiner	aye

Motion carried unanimously.

3. CONSENT AGENDA

- A. Approval of Minutes from January 6, 2021
- B. Treasurer's Report and Bill List
- C. ~~Permit Program~~

~~i. #21-02 Mead Metals Addition, Shoreview~~

D. Keller Channel Weir & Phalen Outlet Modifications – Change Order No. 1

E. Joint Powers Agreement for the Establishment of Metro INET

Motion: Manager Aichinger moved, Manager Swope seconded, to approve the consent agenda as amended.

A roll call vote was performed:

Manager Swope	aye
Manager Ward	aye
Manager Aichinger	aye
Manager Skinner	aye
President Ebensteiner	aye

Motion carried unanimously.

4. VISITOR PRESENTATIONS

There were none.

5. PERMIT PROGRAM

A. Applications – See Consent Agenda

Permit #21-02 Mead Metals Addition, Shoreview

A Manager commented that there are a lot of trees and vegetation that will be removed on the site as a part of this project. The question was asked as to whether the District reviews options to replace that vegetation with applicants, similar to rain garden ideas. Nicole Soderholm commented that most of the tree clearing is to make room for a building and impervious parking area. The Manager commented that the application process would be an opportunity to discuss things that could be available to improve the property overall. Tina Carstens asked if the Manager is suggesting a cost-share program. She explained that the cost-share program would need to be above and beyond the District and all other permit requirements. The Manager commented that it would be a good idea to use this opportunity to discuss restoration opportunities. Nicole Soderholm commented that she does bring it up when she notices opportunities and noted that she can look more into habitat restoration opportunities in addition to water quality.

A Manager commented that they are sad when mature wooded areas are removed for development because 100-year-old trees cannot just be replaced. They stated that it would be great if there are things that could be done to preserve these areas, such as alternative water treatment options that may allow a wooded area to remain.

Nicole Soderholm stated that the applicant is present and could provide additional input. Brian Field, representing the applicant, stated that due to the nature of the expansion and additional parking lots there is very little room to save trees and unfortunately the topography of the site works against that concept. He stated that they did look into the concept, but the site space is very tight.

Nicole Soderholm commented that this site also has poor soils but noted that she can keep that idea in mind for sites with better soils and more space. She noted that the District does not have authority over tree removal. She stated that the member cities have tree replacement and preservation ordinances that govern that activity. A Manager commented that it is simply a contact opportunity that could take advantage of bringing that concept forward.

Another Manager commented that the District is proactive with schools and churches and this would simply be another opportunity to be proactive and discuss the cost-share program. Nicole Soderholm stated that she typically focuses on public sites and site with better soils but will continue to discuss opportunities with applicants.

Motion: Manager Swope moved, Manager Ward seconded, to approve Permit #21-02.

A roll call vote was performed:

Manager Swope aye
Manager Ward aye
Manager Aichinger aye
Manager Skinner aye
President Ebensteiner aye

Motion carried unanimously.

B. Monthly Enforcement Report

During January, zero notices were sent.

6. STEWARDSHIP GRANT PROGRAM

A. Applications

Permit #22-01 CS: Lower Phalen Creek Study

Paige Ahlborg commented that this is a unique opportunity to work with the Lower Phalen Creek project and do further investigation for daylighting within the portion of the creek that travels through the District. A Manager commented that the daylighting is a great idea.

Sam Wagner, Environmental Stewardship Program Manager for the Lower Phalen Creek Project, commented that this has been a longstanding project not just for the organization but for residents on the east side. He stated that this would provide a different water resource in an urban environment that could set incredible precedent. He also displayed a brochure that has been developed for the project and reviewed additional background information. He noted that this study will be the first step and the second step would go further into daylighting the creek and the associated restoration work around the creek area.

A Manager commented that they had worked on this issue for 30 years and the issue of daylighting the creek has been mentioned since the 1980's. They recognized how difficult it would be to do. They asked where the water would come from and asked whether the existing outlet would be used or whether a new outlet would be created from Lake Phalen. Mr. Wagner replied that he could not answer that with full confidence as he has been working more on public engagement for the project and working with engineers. The Manager commented that in the summer months the level of Lake Phalen drops below the outlet and therefore water would not flow into the creek. The comment was made that at times the creek could then be dry during times of the year unless water is pumped into the creek. Mr. Wagner commented that they are still narrowing the scope of work for engineering services and applying for grants. Mr. Wagner noted that different options will continue to be reviewed and they will also consider flood risk for reaches seven and eight.

A Manager referenced the Stewardship Grant Program and asked if this type of application is allowed under the current program guidelines. Paige Ahlborg stated that staff is looking for that direction and provided other unique projects that have used this program. Tina Carstens explained that staff proposed the Stewardship Grant Program because they would be partner in this special request for grant funds to assist with the project. She agreed that this is a special request. The Manager commented that they do not have an issue with using the program but believes the motion should be clear that this is a special request.

A Manager asked if this would then set precedent for additional study requests to come forward. Tina Carstens noted that this would be a planning grant and could set a precedent for the future. Another Manager commented that the motion should make clear that this project is for a major community asset, restoration, etc. that make this

project unique. The Manager stated that this idea has been a concept for many years and this study will finally determine whether it would be viable through multiple partners.

A Manager commented that they were comfortable placing this in the Stewardship Grant Program but if funds become tight at the end of the year, this should be funded in another manner as this would be more of a miscellaneous item.

Motion: Manager Aichinger moved, Manager Skinner seconded, to approve Stewardship Grant #20-01 CS in the amount of \$10,000 as a special request for the feasibility planning of a historic community water resource restoration of Phalen Creek.

A roll call vote was performed:

Manager Swope	aye
Manager Ward	aye
Manager Aichinger	aye
Manager Skinner	aye
President Ebensteiner	aye

Motion carried unanimously.

Mr. Wagner thanked the Board and staff noting that this is a great step for the project, noting that this is a great opportunity to bring this together. He noted that he would print copies of the brochure and provide them to the District and Managers. He confirmed that he would love to come back to the District to provide updates as often as the Board would like.

B. Budget Status Update

No comments.

7. PRESENTATIONS AND/OR ACTION ITEMS

A. North St. Paul Target Store BMP Retrofit Accept Plans and Solicit Bids

Tina Carstens stated that the plans have been developed and staff is asking to go out for bid for the project.

Brad Lindaman identified the Target store location, noting the large amount of impervious surface for the site. He stated that the area drains into a system that flows to PCU Pond, which discharges into Kohlman Creek, and eventually to Kohlman Lake. He stated that about 45 percent of the site could drain to larger BMP tree trenches and rain gardens, similar to those constructed on the East Saint Paul Target site. He stated that the plans are about 95 plus percent complete, with a few tweaks necessary for completion. He estimated a total cost including contingency of \$1,390,000.

Paige Ahlborg stated that staff ran this project through the prioritization tool, and it ranked number seven out of over 60 projects. She noted that the projects that rank higher are larger flood reduction projects with much higher costs.

A Manager commented that it appears the tree trench concepts from Maplewood Mall were proposed and asked if staff discussed the issue of plowing with the Target maintenance staff. Paige Ahlborg confirmed that staff spoke with Target Corporation prior to the East Saint Paul site.

A Manager appreciated staff mentioning the ranking on the prioritization list and asked staff to share the ranking list. The comment was made that the Manager would like to see that information in the staff report. Tina Carstens agreed that could be included in the staff reports moving forward. She noted that the tool will continue to be used

as staff identifies potential projects. The Manager commented that it would be helpful for the Board to continue to see how that new tool is used.

A Manager stated that this action is to authorize the final design and asked if this would come back before the Board if completion of the design changes the project and estimated budget. The question was also asked as to what would happen if the bids can in very high and where the threshold would be. Brad Lindaman stated that staff attempts to develop the plans to a place where they can feel confident in the cost estimate before bringing it to the Board. He commented that if the estimate changed significantly, it would come back to the Board. Tina Carstens noted that the bids come back before the Board and the Board has the opportunity as to whether to accept or reject the bids.

Motion: Manager Aichinger moved, Manager Swope seconded, to approve the preliminary design, and proposed project schedule, and direct staff to finalize the design and bidding documents and solicit bid proposals.

A roll call vote was performed:

Manager Swope	aye
Manager Ward	aye
Manager Aichinger	aye
Manager Skinner	aye
President Ebensteiner	aye

Motion carried unanimously.

B. Board of Managers Annual Meeting

Tina Carstens noted that the current officer listing was included in the packet. She noted that a motion would be necessary to elect the Officers for 2021.

A Manager noted that they have been on the Board for several years and each Manager brings skills and attributes. They suggested that the positions be rotated.

Motion: Manager Ward moved, Manager Swope seconded, to elect Larry Swope as President.

Further discussion: Manager Swope commented that he was associated with the Board prior to his time serving on the Board. He commented that it is nice for groups to change the slate of officers in order to bring in different points of view. A Manager commented that they like the way the meetings have been run and hoped that someone would not need to be President in order to bring their perspective to the discussions. Another Manager asked for clarification on whether votes would be taken on both nominees. Tracey Galowitz confirmed that process.

Motion: President Ebensteiner moved, Manager Skinner seconded, to elect Marj Ebensteiner as President.

Motion: Manager Swope moved to elect Cliff Aichinger as President, Manager Ward seconded.

Further discussion: Manager Aichinger commented that he was the Administrator when Roger Lake held the position of President for 20 years. He commented that everyone has a voice and therefore as long as open discussion occurs and the meeting is well run, there is often not a need to change that position. A Manager commented that they would like to see people hold different roles. Another Manager stated that they would be happy to continue to not hold an Officer position.

Tracey Galowitz stated that there are three nominations for the position of President and therefore the roll call vote should specify the nominee each Manager would vote to elect.

A roll call vote was performed:

Manager Swope	Aichinger
Manager Ward	Swope
Manager Aichinger	Swope
Manager Skinner	Ebensteiner
President Ebensteiner	Ebensteiner

Motion tied with two votes for Swope and two votes for Ebensteiner, therefore a second vote was needed between the two choices.

A roll call vote was performed:

Manager Swope	Swope
Manager Ward	Swope
Manager Aichinger	Swope
Manager Skinner	Ebensteiner
President Ebensteiner	Ebensteiner

Manager Swope was elected as President for 2021 with a vote of 3-2.

Motion: Manager Ebensteiner moved, Manager Skinner seconded, to elect Cliff Aichinger as Vice-President.

A roll call vote was performed:

Manager Swope	aye
Manager Ward	aye
Manager Aichinger	aye
Manager Skinner	aye
President Ebensteiner	aye

Motion carried unanimously.

Motion: Manager Skinner moved, Manager Swope seconded, to elect Marj Ebensteiner as Treasurer for 2021.

A roll call vote was performed:

Manager Swope	aye
Manager Ward	aye
Manager Aichinger	aye
Manager Skinner	aye
President Ebensteiner	aye

Motion carried unanimously.

Motion: Manager Skinner moved, Manager Ebensteiner seconded, to elect Dianne Ward as Secretary for 2021.

Manager Ward declined.

Motion: Manager Aichinger moved, Manager Ebensteiner seconded, to elect Pam Skinner as Secretary for 2021.

A roll call vote was performed:

Manager Swope aye
Manager Ward aye
Manager Aichinger aye
Manager Skinner aye
President Ebensteiner aye

Motion carried unanimously.

Tina Carstens noted that the slate of Officers for 2021 will become effective for the next meeting.

Motion: Manager Aichinger moved, Manager Skinner seconded, to appoint Barr Engineering, Galowitz Olson, and Redpath and Company to continue as the consultant for 2021.

A roll call vote was performed:

Manager Swope aye
Manager Ward aye
Manager Aichinger aye
Manager Skinner aye
President Ebensteiner aye

Motion carried unanimously.

Tracey Galowitz stated that there is a gap in the newspaper coverage area because one of the newspapers went out of business. She stated that the base of the District is broad and provided details on the requirements for coverage. She stated that she would recommend using the *Pioneer Press* because of the coverage areas that have been lost. She noted that the publication options would also provide more flexibility in providing the necessary notices for the District.

Tina Carstens asked what would happen if there were difficulties having the notices published. Tracey Galowitz commented in the past the issue was not in having the notice published but in getting the affidavit that it was published. She stated that the *Pioneer Press* is published daily and therefore provides much more flexible. She stated that she would recommend trying the publication again.

A Manager asked the number of public notices that are done each year. Tracey Galowitz estimated a handful of publications. The Manager commented that the budget implications would not seem to be that large and supported using the *Pioneer Press*. Another Manager commented that it would seem that newspapers are becoming outdated and it would be nice to see that requirement changed so that electronic notice could be provided and suggested that perhaps this be brought up for the next MAWD Annual Meeting.

Motion: Manager Skinner moved, Manager Ebensteiner seconded, to approve the Official Bank of Deposit and designate *Pioneer Press* as the official newspaper.

A roll call vote was performed:

Manager Swope aye

Manager Ward aye
Manager Aichinger aye
Manager Skinner aye
President Ebensteiner aye

Motion carried unanimously.

A Manager commented that it would seem the timing of the elections seems to be early, as appointments to the Board by the county are done following this meeting. It was noted that two Managers are up for reappointment this year.

It was suggested that the Board change the timing for the Annual Meeting activities to occur at the March meeting each year, in order to allow the appointments for the year to occur prior to that time. Tracey Galowitz suggested that item appear on an upcoming agenda in order to discuss and take formal action, which would also allow staff to determine if there would be any other implications.

C. Joint Powers Agreement for the Establishment of Metro-INET

A Manager commented that the previous year the Board agreed to participate in the creation of the Joint Powers Agreement that had not yet been drafted. They stated that the JPA has now been developed and asked the projection for what it could look like next year and whether it would be a good deal for the District. Tina Carstens stated that the District has committed for what has been budgeted for 2021, but the future budget for 2022 has not been developed past that point.

The Manager asked the number of votes the District receives. Tina Carstens replied that the District is two percent of the use and therefore has two votes out of 120. The Manager asked whom the delegates are. Tina Carstens replied that she would be the delegate and has not yet delegated her staff backup. The Manager commented that the language is very comprehensive and wondered where it was going. Tina Carstens commented that once all the JPAs come in, the first item of business would be to determine what would be needed to bring this into its own entity. She noted that she would compare that to other entities that provide similar work/service.

A Manager commented that the decision was made to join Metro-Inet many years ago was when there were under 20 organizations. They commented that the participation has increased because other organizations realized that they were able to obtain much better service and cost than they could gain on their own. They commented that the service provided by Metro-INET has been great and responsive and in order to gain that level of service from an outside service would have a much higher cost.

A Manager commented that the cost will most likely increase to a certain degree because the organization has grown but did not think that increase would be substantial. They commented that the level of service has been great when issues arise that need assistance. Tina Carstens agreed that Metro-INET has been very responsive when issues arise, even with employees working from home.

Motion: Manager Aichinger moved, Manager Swope seconded, to approve the Joint Powers Agreement for the Establishment of Metro-INET.

A roll call vote was performed:

Manager Swope aye
Manager Ward aye
Manager Aichinger aye
Manager Skinner aye
President Ebensteiner aye

Motion carried unanimously.

8. ADMINISTRATOR'S REPORT

A. Meetings Attended

No comments.

B. Upcoming Meetings and Dates

A Manager asked what would be anticipated for WaterFest 2021. Tina Carstens replied that with the current outdoor gathering requirements they would not be able to hold the event. She stated that the consultant has sent a survey to the vendors and partners in order to determine whom would want to participate if the event was able to be held or if there are suggestions for a virtual format. She noted that staff will meet in the following week to review the survey results.

A Manager asked for an update on the funding request to BWSR. Tina Carstens provided an update on the different phases, noting that BWSR would like feedback on what the third phase of the program should look like.

A Manager asked how much money the District receives. Tina Carstens noted in the last round the amount was about \$94,000. She commented that this process has been a bit frustrating for those within the metro area as they do not fall under the 1 Watershed 1 Plan (1W1P) process. She commented that most organizations in the metro agree that they would prefer a more streamlined process.

C. MAWA and MAWD Activity

Tina Carstens provided an update on the MAWD issues and activity between MAWA and MAWD, noting that there will be a joint discussion session between the MAWA Executive Committee and MAWD Board.

9. PROJECT AND PROGRAM STATUS REPORTS

A. Ongoing Project and Program Updates

- i. Owasso Basin Flood Risk Reduction Feasibility Study
- ii. Willow/Kohlman Creek Flood Risk Reduction Feasibility Study
- iii. Ames Lake Area Flood Risk Reduction Feasibility Study
- iv. FEMA Flood Mapping Updates
- v. Targeted Retrofit Projects
- vi. Keller Channel Weir and Phalen Outlet Resiliency Modifications
- vii. Twin Lake Outlet Construction
- viii. CIP Maintenance and Repair 2021 Project
- ix. Beltline/Battle Creek Tunnel Inspection
- x. Ryan Drive and Keller Parkway Conveyance
- xi. Automated Lake Monitoring Systems
- xii. Special Project BMP Monitoring
- xiii. Natural Resources Program Update
- xiv. Education Program Update
- xv. Communications Program Update

A Manager commented that they would like to see a Hillcrest update once available.

Tina Carstens provided an example of information that can now be found the lake pages of the District website that includes water levels.

A Manager thanked Tina Carstens for her participation with MAWA. The Manager commented that they would like to know more about how the feedback was used and whether it was helpful for the Owasso Basin Flood Risk Reduction. They also requested updates continue to be given as it moves forward. Brad Lindaman stated that staff is attempting to address the different comments and will then summarize that information.

A Manager asked if there is a known reason on the length of time it requires to receive approval from Ramsey County Parks for their access agreements. Tina Carstens stated that the process is to require County Board approval for every access agreement, which is where the pinch point occurs in the process. She recognized that it is a consuming process that she continues to bring forward to Ramsey County Parks staff to seek a better solution.

A Manager commented that she participated in the Tree Identification Zoom presentation the previous night and there were good things that could be used for restoration work.

Brad Lindaman stated that the Phalen/Keller project is in full force and noted that staff has been taking photos of the progress. He shared that progress with the Board of the Phalen Outlet Modifications. He also shared a photo showing the start of the Gervais Creek cleaning.

A Manager asked where the ads and articles were posted attempting to recruit CAC members. Tina Carstens noted that the articles were included in the emailed newsletter and then targeted ads were done on social media. She stated that ten applications were received thus far.

10. REPORTS OF MANAGERS

President Ebensteiner stated that she is more than happy to pass the torch to Manager Swope as President.

The Board expressed appreciation to President Ebensteiner for her service as President.

11. ADJOURN

The meeting adjourned at 8:33 p.m.

RWMWD BUDGET STATUS REPORT
 Administrative & Program Budget
 Fiscal Year 2021
 2/28/2021

Budget Category	Budget Item	Account Number	Original Budget	Budget Transfers	Current Month Expenses	Year-to-Date Expenses	Current Budget Balance	Percent of Budget
Manager	Per diems	4355	\$8,500.00	-	-	-	\$8,500.00	0.00%
	Manager expenses	4360	3,500.00	-	-	-	3,500.00	0.00%
Committees	Committee/Bd Mtg. Exp.	4365	3,500.00	-	515.00	774.00	2,726.00	22.11%
	Sub-Total: Managers/Committees:		\$15,500.00	\$0.00	\$515.00	\$774.00	\$14,726.00	4.99%
Employees	Staff salary/taxes/benefits	4010	1,520,000.00	-	107,058.03	232,949.08	1,287,050.92	15.33%
	Employee expenses	4020	15,000.00	-	132.02	227.54	14,772.46	1.52%
	District training & education	4350	75,000.00	-	-	378.00	74,622.00	0.50%
	Sub-Total: Employees:		\$1,610,000.00	\$0.00	\$107,190.05	\$233,554.62	\$1,376,445.38	14.51%
Administration/Office	GIS system maint. & equip.	4170	10,000.00	-	-	987.02	9,012.98	9.87%
	Data Base/GIS Maintenance	4171	40,000.00	-	-	-	40,000.00	0.00%
	Equipment maintenance	4305	3,000.00	-	-	-	3,000.00	0.00%
	Telephone	4310	8,000.00	-	57.48	114.96	7,885.04	1.44%
	Office supplies	4320	7,000.00	-	100.00	151.20	6,848.80	2.16%
	IT/Internet/Web Site/Software Lic.	4325	70,000.00	-	6,139.76	11,849.04	58,150.96	16.93%
	Postage	4330	3,000.00	-	-	-	3,000.00	0.00%
	Printing/copying	4335	8,000.00	-	294.00	588.00	7,412.00	7.35%
	Dues & publications	4338	11,000.00	-	-	7,500.00	3,500.00	68.18%
	Janitorial/Trash Service	4341	15,000.00	-	704.42	1,254.42	13,745.58	8.36%
	Utilities/Bldg.Contracts	4342	30,000.00	-	1,094.06	3,291.59	26,708.41	10.97%
	Bldg/Site Maintenance	4343	150,000.00	-	833.74	1,985.97	148,014.03	1.32%
	Miscellaneous	4390	5,000.00	-	-	-	5,000.00	0.00%
	Insurance	4480	50,000.00	-	-	-	50,000.00	0.00%
	Office equipment	4703	150,000.00	-	1,023.00	7,686.00	142,314.00	5.12%
	Vehicle lease, maintenance	4810-40	43,000.00	-	-	-	43,000.00	0.00%
	Sub-Total: Administration/Office:		\$603,000.00	\$0.00	\$10,246.46	\$35,408.20	\$567,591.80	5.87%
Consultants/Outside Services	Auditor/Accounting	4110	65,000.00	-	3,707.91	4,032.61	60,967.39	6.20%
	Engineering-administration	4121	93,000.00	-	6,231.00	11,031.00	81,969.00	11.86%
	Engineering-permit I&E	4122	10,000.00	-	-	-	10,000.00	0.00%
	Engineering-eng. review	4123	55,000.00	-	4,850.50	8,347.50	46,652.50	15.18%
	Engineering-permit review	4124	55,000.00	-	2,760.00	3,546.00	51,454.00	6.45%
	Project Feasibility Studies	4129	440,000.00	-	10,839.50	14,766.00	425,234.00	3.36%
	Attorney-permits	4130	10,000.00	-	-	-	10,000.00	0.00%
	Attorney-general	4131	40,000.00	-	4,372.25	7,285.25	32,714.75	18.21%
	Outside Consulting Services	4160	20,000.00	-	-	-	20,000.00	0.00%
	Sub-Total: Consultants/Outside Services:		\$788,000.00	\$0.00	\$32,761.16	\$49,008.36	\$738,991.64	6.22%
Programs	Educational programming	4370	60,000.00	-	-	-	60,000.00	0.00%
	Communications & Marketing	4371	25,000.00	-	877.50	877.50	24,122.50	3.51%
	Events	4372	50,000.00	-	-	57.32	49,942.68	0.11%
	Water QM-Engineering	4520-30	180,000.00	-	3,950.11	4,827.08	175,172.92	2.68%
	Project operations	4650	200,000.00	-	908.07	1,642.29	198,357.71	0.82%
	SLMP/TMDL Studies	4661	103,000.00	-	-	-	103,000.00	0.00%
	Natural Resources/Keller Creek	4670-72	140,000.00	-	465.85	465.85	139,534.15	0.33%
	Outside Prog.Support/Weed Mgmt.	4683-84	127,000.00	-	13,000.00	13,000.00	114,000.00	10.24%
	Research Projects	4695	95,000.00	-	3,334.00	3,334.00	91,666.00	3.51%
	Health and Safety Program	4697	3,000.00	-	-	-	3,000.00	0.00%
	Sub-Total: Programs:		\$983,000.00	\$0.00	\$22,535.53	\$24,204.04	\$958,795.96	2.46%
GENERAL FUND TOTAL			\$3,999,500.00	\$0.00	\$173,248.20	\$342,949.22	\$3,656,550.78	8.57%
CIP's	CIP Project Repair & Maintenance	516	1,325,000.00	-	153,380.83	293,034.87	1,031,965.13	22.12%
	Targeted Retrofit Projects	518	2,810,000.00	-	20,117.00	35,678.00	2,774,322.00	1.27%
	Flood Risk Reduction Fund	520	4,200,000.00	-	53,547.98	80,374.74	4,119,625.26	1.91%
	Debt Services-96-97 Beltline/MM/Battle Creek	526	394,901.00	-	0.00	282,532.15	112,368.85	71.55%
	Stewardship Grant Program Fund	529	1,000,000.00	-	1,699.00	4,844.50	995,155.50	0.48%
	Wetland Restoration Projects	540	500,000.00	-	-	-	500,000.00	0.00%
	Wakefield Park Project	553	-	-	3,265.00	3,420.00	(3,420.00)	---
	District Office Bond Payment	585	194,885.00	-	-	-	194,885.00	0.00%
CIP BUDGET TOTAL			\$10,424,786.00	\$0.00	\$232,009.81	\$699,884.26	\$9,724,901.74	6.71%
TOTAL BUDGET			\$14,424,286.00	\$0.00	\$405,258.01	\$1,042,833.48	\$13,381,452.52	7.23%

Current Fund Balances:

Fund:	Unaudited Beginning Fund Balance @ 12/31/20	Fund Transfers	Year to date Revenue	Current Month Expenses	Year to Date Expense	Unaudited Fund Balance @ 02/28/21
101 - General Fund	\$4,263,108.52	-	657.09	173,248.20	342,949.22	3,920,816.39
516 - CIP Project Repair & Maintenance	397,361.82	-	8,344.54	153,380.83	293,034.87	112,671.49
518 - Targeted Retrofit Projects	1,037,852.35	-	78.54	20,117.00	35,678.00	1,002,252.89
520 - Flood Damage Reduction Fund	3,537,301.65	-	-	53,547.98	80,374.74	3,456,926.91
526 - Debt Services-96-97 Beltline/MM/Beltline-Battle Creek Tunnel Repair	946,126.60	-	-	-	282,532.15	663,594.45
529 - Stewardship Grant Program Fund	622,020.57	-	-	1,699.00	4,844.50	617,176.07
540 - Wetland Restoration Projects	-	-	-	-	-	0.00
553 - Wakefield Park Project	4,172.20	-	-	3,265.00	3,420.00	752.20
580 - Contingency Fund	891,682.00	-	-	-	-	891,682.00
585 - Certificates of Participation	204,313.98	-	-	-	-	204,313.98
Total District Fund Balance	\$11,903,939.69	\$0.00	\$ 9,080.17	\$ 405,258.01	\$1,042,833.48	\$10,870,186.38

RWMWD BUDGET STATUS REPORT
 Administrative & Program Budget
 Fiscal Year 2020
 12/31/2020 - Updated 2/25/21

Budget Category	Budget Item	Account Number	Original Budget	Budget Transfers	Current Month Expenses	Year-to-Date Expenses	Current Budget Balance	Percent of Budget
Manager	Per diems	4355	\$8,500.00	-	-	6,325.00	\$2,175.00	74.41%
	Manager expenses	4360	3,500.00	-	-	3,500.00	0.00	100.00%
Committees	Committee/Bd Mtg. Exp.	4365	3,500.00	-	-	2,824.97	675.03	80.71%
	Sub-Total: Managers/Committees:		\$15,500.00	\$0.00	\$0.00	\$12,649.97	\$2,850.03	81.61%
Employees	Staff salary/taxes/benefits	4010	1,450,000.00	-	-	1,489,654.98	(39,654.98)	102.73%
	Employee expenses	4020	10,000.00	-	-	26,650.16	(16,650.16)	266.50%
	District training & education	4350	25,000.00	-	-	7,241.19	17,758.81	28.96%
	Sub-Total: Employees:		\$1,485,000.00	\$0.00	\$0.00	\$1,523,546.33	(\$38,546.33)	102.60%
Administration/Office	GIS system maint. & equip.	4170	15,000.00	-	-	2,729.02	12,270.98	18.19%
	Data Base/GIS Maintenance	4171	5,000.00	-	-	2,600.00	2,400.00	52.00%
	Equipment maintenance	4305	3,000.00	-	-	-	3,000.00	0.00%
	Telephone	4310	8,000.00	-	-	916.92	7,083.08	11.46%
	Office supplies	4320	5,000.00	-	-	5,977.92	(977.92)	119.56%
	IT/Internet/Web Site/Software Lic.	4325	55,000.00	-	-	56,580.45	(1,580.45)	102.87%
	Postage	4330	5,000.00	-	-	574.20	4,425.80	11.48%
	Printing/copying	4335	8,000.00	-	-	5,013.55	2,986.45	62.67%
	Dues & publications	4338	11,000.00	-	-	9,904.88	1,095.12	90.04%
	Janitorial/Trash Service	4341	15,000.00	-	-	9,163.96	5,836.04	61.09%
	Utilities/Bldg.Contracts	4342	20,000.00	-	-	13,677.82	6,322.18	68.39%
	Bldg/Site Maintenance	4343	200,000.00	-	-	19,681.28	180,318.72	9.84%
	Miscellaneous	4390	5,000.00	-	-	377.00	4,623.00	7.54%
	Insurance	4480	40,000.00	-	-	41,477.44	(1,477.44)	103.69%
	Office equipment	4703	150,000.00	-	-	143,197.61	6,802.39	95.47%
	Vehicle lease, maintenance	4810-40	43,000.00	-	-	33,874.35	9,125.65	78.78%
	Sub-Total: Administration/Office:		\$588,000.00	\$0.00	\$0.00	\$345,746.40	\$242,253.60	58.80%
Consultants/Outside Services	Auditor/Accounting	4110	60,000.00	-	-	57,007.35	2,992.65	95.01%
	Engineering-administration	4121	93,000.00	-	-	66,786.40	26,213.60	71.81%
	Engineering-permit I&E	4122	10,000.00	-	-	2,715.75	7,284.25	27.16%
	Engineering-eng. review	4123	55,000.00	-	-	47,265.00	7,735.00	85.94%
	Engineering-permit review	4124	55,000.00	-	-	43,466.50	11,533.50	79.03%
	Project Feasibility Studies	4129	570,000.00	-	-	346,260.58	223,739.42	60.75%
	Attorney-permits	4130	10,000.00	-	-	-	10,000.00	0.00%
	Attorney-general	4131	40,000.00	-	-	25,892.77	14,107.23	64.73%
	Outside Consulting Services	4160	40,000.00	-	-	-	40,000.00	0.00%
	Sub-Total: Consultants/Outside Services:		\$933,000.00	\$0.00	\$0.00	\$589,394.35	\$343,605.65	63.17%
Programs	Educational programming	4370	60,000.00	-	-	14,799.97	45,200.03	24.67%
	Communications & Marketing	4371	25,000.00	-	-	14,684.80	10,315.20	58.74%
	Events	4372	50,000.00	-	-	25,011.92	24,988.08	50.02%
	Water QM-Engineering	4520-30	185,000.00	-	-	256,825.53	(71,825.53)	138.82%
	Project operations	4650	160,000.00	-	-	68,935.24	91,064.76	43.08%
	SLMP/TMDL Studies	4661	173,000.00	-	-	78,024.59	94,975.41	45.10%
	Natural Resources/Keller Creek	4670-72	140,000.00	-	-	106,322.38	33,677.62	75.94%
	Outside Prog.Support/Weed Mgmt.	4683-84	67,000.00	-	-	47,092.33	19,907.67	70.29%
	Research Projects	4695	95,000.00	-	-	113,414.77	(18,414.77)	119.38%
	Health and Safety Program	4697	3,000.00	-	-	2,773.57	226.43	92.45%
	NPDES Phase II	4698	10,000.00	-	-	-	10,000.00	0.00%
	Sub-Total: Programs:		\$968,000.00	\$0.00	\$0.00	\$727,885.10	\$240,114.90	75.19%
GENERAL FUND TOTAL			\$3,989,500.00	\$0.00	\$0.00	\$3,199,222.15	\$790,277.85	80.19%
CIP's	CIP Project Repair & Maintenance	516	1,115,000.00	-	-	1,584,909.37	(469,909.37)	142.14%
	Targeted Retrofit Projects	518	1,012,000.00	-	-	1,500,300.50	(488,300.50)	148.25%
	Flood Risk Reduction Fund	520	4,000,000.00	-	-	529,423.65	3,470,576.35	13.24%
	Debt Services-96-97 Beltline/MM/Battle Creek	526	400,074.00	-	-	398,353.26	1,720.74	99.57%
	Stewardship Grant Program Fund	528-529	1,000,000.00	-	-	885,536.47	114,463.53	88.55%
	Impervious Surface Volume Reduction Opportunity	531	1,600,000.00	-	-	-	1,600,000.00	0.00%
	Wakefield Park Project	553	100,000.00	-	-	264,176.80	(164,176.80)	264.18%
	District Office Bond Payment	585	194,885.00	-	-	120,358.21	74,526.79	61.76%
CIP BUDGET TOTAL			\$9,421,959.00	-	\$0.00	\$5,283,058.26	\$4,138,900.74	56.07%
TOTAL BUDGET			\$13,411,459.00	\$0.00	\$0.00	\$8,482,280.41	\$4,929,178.59	63.25%

Current Fund Balances:

Fund:	Beginning Fund Balance @ 12/31/19	Fund Transfers	Year to date Revenue	Current Month Expenses	Year to Date Expense	Unaudited Fund Balance @ 12/31/20
101 - General Fund	\$4,633,167.33	-	2,829,163.34	-	3,199,222.15	4,263,108.52
516 - CIP Project Repair & Maintenance	1,160,359.00	-	821,912.19	-	1,584,909.37	397,361.82
518 - Targeted Retrofit Projects	(52,309.00)	1,583,697.62	1,006,764.23	-	1,500,300.50	1,037,852.35
520 - Flood Damage Reduction Fund	2,565,820.00	-	1,500,905.30	-	529,423.65	3,537,301.65
526 - Debt Services-96-97 Beltline/MM/Beltline-Battle Creek Tunnel Repair	1,252,348.00	-	92,131.86	-	398,353.26	946,126.60
528/529 - Stewardship Grant Program Fund	711,696.00	-	795,861.04	-	885,536.47	622,020.57
531 - Impervious Surface Volume Reduction Opportunity	1,484,215.00	(1,583,697.62)	99,482.62	-	-	-
553 - Wakefield Park Project	268,349.00	-	-	-	264,176.80	4,172.20
580 - Contingency Fund	891,682.00	-	-	-	-	891,682.00
585 - Certificates of Participation	130,460.00	-	194,212.19	-	120,358.21	204,313.98
Total District Fund Balance	\$13,045,787.33	\$0.00	\$ 7,340,432.77	\$ -	\$8,482,280.41	\$11,903,939.69

Ramsey Washington Metro Watershed Dist.
Check Register
For the Period From Feb 1, 2021 to Feb 28, 2021

Check #	Date	Payee ID	Invoice #	Payee	Cash Account	Amount
EFT	02/10/21	hea002	Mar 2021	HealthPartners	Employee Benefits	\$2,358.00
EFT	02/10/21	met008	Mar 2021	MetLife-Group Benefits	Employee Benefits	1,978.97
72075	02/15/21	ada002	3240750	Adam's Pest Control, Inc.	Utilities/Bldg. Contracts	79.00
72076	02/15/21	aws001	S1335957-020121	AWS Service Center	Janitorial/Trash Service	234.42
72077	02/15/21	blo001	Dec 2020	Simba Blood	Employee Reimbursement	151.56
72078	02/15/21	cit001	007734-001/000	City of Little Canada	Utilities/Bldg. Contracts	96.92
72079	02/15/21	ecs001	312563	ECSI System Integrators	Utilities/Bldg. Contracts	360.00
72080	02/15/21	gil001	201080	Gilbert Mechanical Contractors, Inc.	Bldg./Site Maintenance	668.28
72081	02/15/21	gru001	01-1304	Gruber's Power Equipment	Natural Resources Project	465.85
72082	02/15/21	han008	1369	Hanna Enterprises, Inc.	Janitorial/Trash Service	470.00
72083	02/15/21	nsp001	717083261	Xcel Energy	Project Operations	95.52
72084	02/15/21	pre003	317971399	Premium Waters, Inc.	Utilities/Bldg. Contracts	26.00
72085	02/15/21	shi001	B 12968225	SHI International Corp.	Office Equipment	948.00
72086	02/15/21	tes001	S327950-IN	The Tessman Company	Construction Imp.-Maint. & Rep.	144.00
72087	02/15/21	tim002	M26087	Timesaver Off-Site Secretarial, Inc.	Committee/Board/Meeting Exp.	290.00
72088	02/15/21	usb005	434942017	US Bank Equipment Finance	Printing Expense	294.00
72089	02/23/21	ahl001	Feb 2021	Paige Ahlborg	Employee Reimbursement	131.83
72090	02/23/21	bar001	1/16-2/12/21	Barr Engineering	January/February Engineering	124,355.76
72091	02/23/21	bar004	Feb 2021	Deborah Barnes	Employee Reimbursement	40.00
72092	02/23/21	cad001	17348000	Allstream	Water QM Staff	69.90
72093	02/23/21	car003	2020	Tina Carstens	Employee Reimbursement	643.05
72094	02/23/21	cit011	229857	City of Roseville	IT/Website/Software	6,043.78
72095	02/23/21	com004	Feb 2021	Comcast	Utilities/Bldg. Contracts	79.06
72096	02/23/21	don001	Jan/Feb 2021	Matthew Doneux	Employee Reimbursement	80.00
72097	02/23/21	fit002	Jan/Feb 2021	Mary Fitzgerald	Employee Reimbursement	279.46
72098	02/23/21	fre001	1164	Freshwater Society	Outside Program Support	3,000.00
72099	02/23/21	gal001	Feb 2021	Galowitz Olson, PLLC	February Legal Expense	4,372.25
72100	02/23/21	ham002	2021 Membership	Hamline University	Outside Program Support	10,000.00
72101	02/23/21	haz001	Feb 2021	Lauren Hazenson	Employee Reimbursement	40.00
72102	02/23/21	int001	W210102513	Office of MN, IT Services	Telephone Expense	57.48
72103	02/23/21	kub001	Feb 2021	Kyle W. Kubitza	Employee Reimbursement	33.04
72104	02/23/21	mel001	Feb 2021	Michelle L. Melser	Employee Reimbursement	98.98
72105	02/23/21	was002	5107	Washington Conservation District	Stewardship Grant Fund	1,373.00
72106	02/23/21	mel001	Feb 2021	Michelle L. Melser	Employee Reimbursement	166.88
72107	02/23/21	min008	27177	Minnesota Native Landscapes, Inc.	Construction Imp.-Maint. & Rep.	120.00
72108	02/23/21	ncp001	Feb 2021	NCPERS Group Life Ins.	Employee Benefits	16.00
72109	02/23/21	pac001	2112025658	Pace Analytical Services, Inc.	Water QM Staff	189.00
72110	02/23/21	pas002	Jan/Feb 2021	Sage Passi	Employee Reimbursement	80.00
72111	02/23/21	pem002	Progress Pay #2	Pember Companies	Construction Imp.-Maint. & Rep.	139,469.03
72112	02/23/21	qwe001	Feb 2021	CenturyLink	Project Operations	246.57
72113	02/23/21	red002	150458440	Redpath & Company	Jnauary Accounting Services	3,707.91
72114	02/23/21	shi001	B12990013	SHI International Corp.	Office Equipment	75.00
72115	02/23/21	sod001	Feb 2021	Nicole Soderholm	Employee Reimbursement	40.00
72116	02/23/21	tim002	M26235	Timesaver Off-Site Secretarial, Inc.	Committee/Board/Meeting Exp.	225.00
72117	02/23/21	usb002	Feb 2021	U.S. Bank	February Credit Card Expense	1,537.01
72118	02/23/21	van001	76491-3/1/21	Vanguard Cleaning Systems of Minnesota	Utilities/Bldg. Contracts	550.00
72119	02/23/21	was002	5107	Washington Conservation District	Water QM Staff	114.75
72120	02/23/21	win002	6359	Windmill Strategy	Communications & Marketing	577.50
Total						<u>\$306,472.76</u>
EFT	01/08/21	myp001	01/08/21	January 8th Payroll Fees	4110-101-000	253.10
EFT	01/22/21	myp001	01/22/21	January 22nd Payroll Fees	4110-101-000	71.60
Dir.Dep.	02/05/21	---	Payroll Expense-Net	February 5th Payroll	4010-101-000	29,590.67
EFT	02/05/21	int002	Internal Rev.Serv.	February 5th Federal Withholding	2001-101-000	10,030.59
EFT	02/05/21	mnd001	MN Revenue	February 5th State Withholding	2003-101-000	1,833.85
EFT	02/05/21	per001	PERA	February 5th PERA	2011-101-000	6,374.84
EFT	02/05/21	emp002	Empower Retirement	Employee Def.Comp. Contributions	2016-101-000	2,570.00
EFT	02/05/21	emp002	Empower Retirement	Employee IRA Contributions	2018-101-000	450.00
Dir.Dep.	02/19/21	---	Payroll Expense-Net	February 19th Payroll	4010-101-000	27,993.02
EFT	02/19/21	int002	Internal Rev.Serv.	February 19th Federal Withholding	2001-101-000	9,539.29
EFT	02/19/21	mnd001	MN Revenue	February 19th State Withholding	2003-101-000	1,754.14
EFT	02/19/21	per001	PERA	February 19th PERA	2011-101-000	6,074.68
EFT	02/19/21	emp002	Empower Retirement	Employee Def.Comp. Contributions	2016-101-000	2,570.00
EFT	02/19/21	emp002	Empower Retirement	Employee IRA Contributions	2018-101-000	450.00
				Payroll/Benefits		<u>\$99,555.78</u>
Total				Accounts Payable/Payroll/Benefit		<u>\$406,028.54</u>

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From February 1, 2021 - February 28, 2021

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
02/10/21	EFT	hea002	HealthPartners	4040-101-000	Employee Benefits-General	\$2,358.00	
02/10/21	EFT	met008	MetLife-Group Benefits	4040-101-000	Employee Benefits-General	1,978.97	
02/15/21	72075	ada002	Adam's Pest Control	4342-101-000	Utilities/Bldg. Contracts	79.00	
02/15/21	72076	aws001	AWS Service Center	4341-101-000	Janitorial/Trash Service	234.42	
02/15/21	72077	blo001	Simba Blood			151.56	
				4670-101-000	Natural Resources Project-General		92.46
				4040-101-000	Employee Benefits-General		59.10
02/15/21	72078	cit001	City of Little Canada	4342-101-000	Utilities/Bldg. Contracts	96.92	
02/15/21	72079	ecs001	ECSI System Integrators	4343-101-000	Building/Site Maintenance	360.00	
02/15/21	72080	gil001	Gilbert Mechanical Contractors, Inc.	4343-101-000	Building/Site Maintenance	668.28	
02/15/21	72081	gru001	Gruber's Power Equipment	4670-101-000	Natural Resources Project-General	465.85	
02/15/21	72082	han008	Hanna Enterprises, Inc.	4341-101-000	Janitorial/Trash Service	470.00	
02/15/21	72083	nsp001	Xcel Enegy	4650-520-000	Project Operations-General	95.52	
02/15/21	72084	pre003	Premium Waters, Inc.	4342-101-000	Utilities/Bldg. Contracts	26.00	
02/15/21	72085	shi001	SHI International Corp.	4703-101-000	Office Equipment-General	948.00	
02/15/21	72086	tes001	The Tessman Company	4630-516-000	Construction Imp.-Maint. & Repair	144.00	
02/15/21	72087	tim002	Timesaver Off-Site Secretarial	4365-101-000	Committee/Board Meeting Expense	290.00	
02/15/21	72088	usb005	US Bank Equipment Finance	4335-101-000	Printing-General	294.00	
02/23/21	72089	ahl001	Paige Ahlborg	4040-101-000	Employee Benefits-General	131.83	
02/23/21	72090	bar001	Barr Engineering			124,355.76	
				4121-101-000	Engineering Admin-General Fund		6,231.00
				4129-101-000	Project Feasability-General		306.00
				4123-101-000	Engineering-Review		4,850.50
				4129-101-000	Project Feasability-General		2,320.00
				4129-101-000	Project Feasability-General		5,535.00
				4129-101-000	Project Feasability-General		90.00
				4129-101-000	Project Feasability-General		1,042.00
				4129-101-000	Project Feasability-General		1,546.50
				4520-101-000	Water QM-Engineering		3,498.00
				4124-101-000	Engineering-Permit Review		2,760.00
				4695-101-000	Research Projects-General		2,314.00
				4695-101-000	Research Projects-General		1,020.00
				4650-101-000	Engineering-Project Operations		661.50
				4128-518-000	Engineering-School/Commer Retrofit		14,481.50
				4128-518-000	Engineering-School/Commer Retrofit		3,072.50
				4128-518-000	Engineering-School/Commer Retrofit		1,507.00
				4682-529-000	Stewardship Grant Fund		1,699.00
				4128-518-000	Engineering-School/Commer Retrofit		1,056.00
				4128-553-000	Engineering-Wakefiled Park Project		3,265.00
				4128-520-000	Engineering-Flood Damage		9,635.44
				4128-520-000	Engineering-Flood Damage		43,685.02

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From February 1, 2021 - February 28, 2021

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
				4128-520-000	Engineering-Flood Damage		132.00
				4128-516-000	Engineering-Maint. & Repair		4,955.00
				4128-516-000	Engineering-Maint. & Repair		425.00
				4128-516-000	Engineering-Maint. & Repair		8,267.80
02/23/21	72091	bar004	Deborah Barnes	4040-101-000	Employee Expenses-General	40.00	
02/23/21	72092	cad001	Allstream	4530-101-000	Water QM Staff-General	69.90	
02/23/21	72093	car003	Tina Carstens	4040-101-000	Employee Benefits-General	643.05	
02/23/21	72094	cit011	City of Roseville	4325-101-000	IT/Website/Software	6,043.78	
02/23/21	72095	com004	Comcast	4342-101-000	Utilities/Bldg. Contracts	79.06	
02/23/21	72096	don001	Matthew Doneux	4040-101-000	Employee Benefits-General	80.00	
02/23/21	72097	fit002	Mary Fitzgerald	4040-101-000	Employee Benefits-General	279.46	
02/23/21	72098	fre001	Freshwater Society	4683-101-000	Outside Program Support	3,000.00	
02/23/21	72099	gal001	Galawitz Olson, PLLC	4131-101-000	Attorney General-General	4,372.25	
02/23/21	72100	ham002	Hamline University	4683-101-000	Outside Program Support	10,000.00	
02/23/21	72101	haz001	Lauren Hazenson	4040-101-000	Employee Benefits-General	40.00	
02/23/21	72102	int001	Office of MN, IT Services	4310-101-000	Telephone-General	57.48	
02/23/21	72103	kub001	Kyle W. Kubitz	4020-101-000	Employee Expenses-General	33.04	
02/23/21	72104	mel001	Michelle L. Melser	4020-101-000	Employee Expenses-General	98.98	
02/23/21	72105	was002	Washington Conservation District	4682-529-000	Stewardship Grant Fund	1,373.00	2020
02/23/21	72106	me1001	Michelle L. Melser	4040-101-000	Employee Benefits-General	166.88	
02/23/21	72107	min008	Minnesota Native Landscapes, Inc.	4630-516-000	Construction Imp.-Maint. & Repair	120.00	
02/23/21	72108	ncp001	NCPERS Group Life Ins.	4040-101-000	Employee Benefits-General	16.00	
02/23/21	72109	pac001	Pace Analytical Services, Inc.	4530-101-000	Water QM Staff-General	189.00	
02/23/21	72110	pas002	Sage Passi	4040-101-000	Employee Benefits-General	80.00	
02/23/21	72111	pem002	Pember Companies	4630-516-000	Construction Imp.-Maint. & Repair	139,469.03	
02/23/21	72112	qwe001	CenturyLink	4650-101-000	Project Operations-General	246.57	
02/23/21	72113	red002	Redpath & Company, Ltd.	4110-101-000	Auditor/Accounting	3,707.91	
02/23/21	72114	shi001	SHI International Corp.	4703-101-000	Office Equipment-General	75.00	
02/23/21	72115	sod001	Nicole Soderholm	4040-101-000	Employee Benefits-General	40.00	
02/23/21	72116	tim002	Timesaver Off-Site Secretarial, Inc.	4365-101-000	Committee/Board Meeting Expense	225.00	
02/23/21	72117	usb002	U.S. Bank			1,537.01	
				4325-101-000	TI/Website/Software		95.98
				4343-101-000	Bldg./Site Maintenance		70.33
				4040-101-000	Employee Benefits-General		55.90
				4530-101-000	Water QM Staff-General		78.46
				4040-101-000	Employee Benefits-General		106.95
				4040-101-000	Employee Benefits-General		634.26
				4371-101-000	Communications & Marketing		300.00
				4320-101-000	Office Supplies-General		100.00
				4343-101-000	Bldg./Site Maintenance		73.26
				4343-101-000	Bldg./Site Maintenance		21.87
02/23/21	72118	van001	Vanguard Cleaning Systems of Minnesota	4342-101-000	Utilities/Bldg. Contracts	550.00	
02/23/21	72119	was002	Washington Conservation District	4530-101-000	Water QM Staff-General	114.75	
02/23/21	72120	win002	Windmill Strategy	4371-101-000	Communications & Marketing	577.50	
Accounts Payable Total:						\$306,472.76	

Ramsey Washington Metro Watershed Dist.
Cash Disbursements Journal
For the Period From February 1, 2021 - February 28, 2021

Date	Check #	Vendor ID	Name	Account ID	Account Description	Amount	Check Detail
EFT	01/08/21	myp001	Payroll Fees	4110-101-000	January 8th Payroll Fees	253.10	
EFT	01/22/21	myp001	Payroll Fees	4110-101-000	January 22nd Payroll Fees	71.60	
Dir.Dep.	02/05/21	---	Payroll Expense-Net	4010-101-000	February 5th Payroll	29,590.67	
EFT	02/05/21	int002	Internal Rev.Serv.	2001-101-000	February 5th Federal Withholding	10,030.59	
EFT	02/05/21	mnd001	MN Revenue	2003-101-000	February 5th State Withholding	1,833.85	
EFT	02/05/21	per001	PERA	2011-101-000	February 5th PERA	6,374.84	
EFT	02/05/21	emp002	Empower Retirement	2016-101-000	Employee Def.Comp. Contributions	2,570.00	
EFT	02/05/21	emp002	Empower Retirement	2018-101-000	Employee IRA Contributions	450.00	
Dir.Dep.	02/19/21	---	Payroll Expense-Net	4010-101-000	February 19th Payroll	27,993.02	
EFT	02/19/21	int002	Internal Rev.Serv.	2001-101-000	February 19th Federal Withholding	9,539.29	
EFT	02/19/21	mnd001	MN Revenue	2003-101-000	February 19th State Withholding	1,754.14	
EFT	02/19/21	per001	PERA	2011-101-000	February 19th PERA	6,074.68	
EFT	02/19/21	emp002	Empower Retirement	2016-101-000	Employee Def.Comp. Contributions	2,570.00	
EFT	02/19/21	emp002	Empower Retirement	2018-101-000	Employee IRA Contributions	450.00	
						\$99,555.78	
Payroll/Benefits							
TOTAL:						\$406,028.54	



**Summary of Professional Engineering Services During the Period
January 16, 2021 through February 12, 2021**

	Total Engineering Budget (2021)	Total Fees to Date (2021)	Budget Balance (2021)	Fees During Period	District Accounting Code	Plan Implementation Task Number
Engineering Administration						
General Engineering Administration	\$76,000.00	\$11,031.00	\$64,969.00	\$6,231.00	4121-101	DW-13
RWMWD Health and Safety/ERTK Program	\$2,000.00	\$0.00	\$2,000.00		4697-101	DW-13
Educational Program/Educational Forum Assistance	\$20,000.00	\$306.00	\$19,694.00	\$306.00	4129-101	DW-11
Engineering Review						
Engineering Review	\$55,000.00	\$8,347.50	\$46,652.50	\$4,850.50	4123-101	DW-13
Project Feasibility Studies						
Interim emergency response plan funds for top priority District flooding areas	\$60,000.00	\$2,320.00	\$57,680.00	\$2,320.00	4129-101	DW-19
Groundwater/Surface Water Next Steps	\$50,000.00	\$0.00	\$50,000.00		4129-101	DW-16
FEMA Flood Mapping Update (2020)	\$109,720.00	\$80,427.00	\$29,293.00	\$5,535.00	4129-101	DW-9
Hillcrest Golf Course (multi-use)	\$20,000.00	\$90.00	\$19,910.00	\$90.00	4129-101	DW-6
Gold BRT planning	\$20,000.00	\$0.00	\$20,000.00		4129-101	DW-6
Kohlman Creek flood damage reduction feasibility study	\$75,000.00	\$1,042.00	\$73,958.00	\$1,042.00	4129-101	DW-9, BELT-3
Ames Lake Technical Assistance and Project Planning with St. Paul	\$25,000.00	\$1,940.50	\$23,059.50	\$1,546.50	4129-101	DW-9, BELT-3
Battle Creek PFAS (monitoring, source ID, meetings, communications)	\$25,000.00	\$0.00	\$25,000.00		4129-101	DW-10
694/494/94 WQ treatment feasibility study	\$30,000.00	\$0.00	\$30,000.00		4129-101	BCL-3
Subwatershed feasibility studies for At-Risk creeks (Fish Creek and Gervais Creek)	\$35,000.00	\$0.00	\$35,000.00		4129-101	DW-1, DW-2, DW-6
Wetland Restoration Workshop, Education, and Planning	\$25,000.00	\$0.00	\$25,000.00		4129-101	DW-8
Contingency*	\$50,000.00	\$0.00	\$50,000.00		4129-101	
GIS Maintenance						
GIS Maintenance	\$5,000.00	\$0.00	\$5,000.00		4170-101	DW-13
Monitoring Water Quality/Project Monitoring						
Lake Water Quality Monitoring (Misc QA/QC)	\$10,000.00	\$0.00	\$10,000.00		4520-101	DW-2
Annual WQ Report Assistance	\$10,000.00	\$0.00	\$10,000.00		4520-101	DW-2
Special Project BMP Monitoring	\$25,000.00	\$3,571.50	\$21,428.50	\$3,498.00	4520-101	DW-12
Permit Processing, Inspection and Enforcement						
Permit Application Inspection and Enforcement	\$10,000.00	\$0.00	\$10,000.00		4122-101	DW-7
Permit Application Review	\$55,000.00	\$3,546.00	\$51,454.00	\$2,760.00	4124-101	DW-7
Lake Studies/WRPPs/TMDL Reports						
2020 Grant Applications	\$40,000.00	\$0.00	\$40,000.00		4661-101	DW-13
Tanners Flood Response Tool Model Update	\$3,000.00	\$0.00	\$3,000.00		4661-101	TaL-1
WMP Updates - Including Implementation Plan Updates	\$20,000.00	\$0.00	\$20,000.00		4661-101	DW-13
Prioritization of water quality projects from subwatershed feasibility studies	\$15,000.00	\$0.00	\$15,000.00		4661-101	DW-13
Contingency for Lake Studies	\$25,000.00	\$0.00	\$25,000.00		4661-101	
Research Projects						
New Technology Mini Case Studies (average 6 per year)	\$12,000.00	\$2,314.00	\$9,686.00	\$2,314.00	4695-101	DW-12
Kohlman Permeable Weir Test System - Implement Monitoring Plan	\$15,000.00	\$0.00	\$15,000.00		4695-101	DW-12
Phalen Chain of Lakes Changes in Water Quality	\$10,000.00	\$1,020.00	\$8,980.00	\$1,020.00	4695-101	DW-2, DW-12
Project Operations						
2020 Tanners Alum Facility Monitoring	\$15,000.00	\$661.50	\$14,338.50	\$661.50	4650-101	TaL-3
Beltline Outlet and Keller Channel Operations Plans	\$30,000.00	\$0.00	\$30,000.00		4650-101	DW-9, BELT-3
Capital Improvements						
Target	\$150,000.00	\$24,961.00	\$125,039.00	\$14,481.50	4128-518	DW-6
Motel 6	\$60,000.00	\$3,072.50	\$56,927.50	\$3,072.50	4128-518	DW-6
Cemstone	\$60,000.00	\$0.00	\$60,000.00		4128-518	DW-6
Commercial Sites Retrofit Projects 2021 (Targeted Retrofits)	\$45,000.00	\$0.00	\$45,000.00		4128-518	DW-6
School Sites Retrofit Projects 2021 (Targeted Retrofits)	\$45,000.00	\$0.00	\$45,000.00		4128-518	DW-6
Church Sites Retrofit Projects 2021 (Targeted Retrofit)	\$45,000.00	\$4,006.00	\$40,994.00	\$1,507.00	4128-518	DW-6
BMP Incentive Fund: Gen'l BMP Design Assistance and Review (cases where Dist is approached by landowner, or landowner is not commercial, school, church).	\$75,000.00	\$4,844.50	\$70,155.50	\$1,699.00	4682-529	DW-6
Willow Lake Area Detention (from feas. Study)	\$150,000.00	\$0.00	\$150,000.00		4128-520	DW-9, BELT-3
Kohlman Creek Storage and Detention (from feas. Study)	\$200,000.00	\$0.00	\$200,000.00		4128-520	KC-2
Aldrich Arena (soils and plantings)	\$25,000.00	\$21,804.39	\$3,195.61	\$1,056.00	4128-518	DW-6, WL-1
Wakefield Park/Frost Avenue Stormwater Project	\$17,500.00	\$22,151.27	-\$4,651.27	\$3,265.00	4128-553	DW-6, WL-1
Wetland Restoration (Cottage Place or other)	\$100,000.00	\$0.00	\$100,000.00		4128-529	DW-1, DW-8
Keller Channel Weir & Phalen Outlet Resiliency Modifications	\$250,000.00	\$183,071.01	\$66,928.99	\$9,635.44	4128-520	DW-9, BELT-3
Address Internal Load in TMDL lakes	\$60,000.00	\$0.00	\$60,000.00		4661-101	KL-2, GC-2, WL-3, BL-3
Ryan Drive-Keller Parkway Conveyance	\$168,850.00	\$64,779.52	\$104,070.48	\$43,685.02	4128-520	DW-9, BELT-3, GC-3
Twin Lake Outlet Easement Acquisition, Permitting, Construction Plans (2020)	\$90,000.00	\$71,141.87	\$18,858.13	\$132.00	4128-520	DW-9
Place holder for feas. study (other) recommendations	\$25,000.00	\$0.00	\$25,000.00		4128-520	
CIP Project Repair & Maintenance						
Routine CIP Inspection and Unplanned Maintenance Identification	\$75,000.00	\$8,637.00	\$66,363.00	\$4,955.00	4128-516	DW-5
Beltline 5-year Inspection	\$70,000.00	\$612.50	\$69,387.50	\$425.00	4128-516	BELT-2
2021 CIP Maintenance and Repairs	\$150,000.00	\$79,284.07	\$70,715.93	\$8,267.80	4128-516	DW-5
2022 CIP Maintenance and Repairs (planning, bidding, and project setup)	\$30,000.00	\$0.00	\$30,000.00		4128-516	DW-5

TOTAL PAYABLE FOR PERIOD 1/16/21 - 2/12/21

\$124,355.76

Barr declares under the penalties of Law that this Account, Claim, or Demand is just and that no part has been paid.

Bradley J. Lindaman, Vice President

**Keller Channel Weir and Phalen Outlet Resiliency
Progress Payment Number 2**

1.0	Total Completed Through This Period:	<u>\$518,498.00</u>		
2.0	Total Completed Previously Completed:		<u>\$371,688.50</u>	
3.0	Total Completed This Period:			<u>\$146,809.50</u>
4.0	Amount Previously Retained:		<u>\$18,584.43</u>	
5.0	Amount Retained This Period (See Note 1):			<u>\$7,340.47</u>
6.0	Total Amount Retained:		<u>\$25,924.90</u>	
7.0	Retainage Released Through This Period:			<u>\$0.00</u>
8.0	Total Retainage Remaining:		<u>\$25,924.90</u>	
9.0	Amounts Previously Paid:	<u>\$353,104.08</u>		
10.0	Amount Due This Estimate:			<u><u>\$139,469.03</u></u>

Note 1: Retainage shall be 5 percent of the value of the Work completed.

SUBMITTED BY:

Name: Joe Pember Date: _____
 Title: Project Manager
 Contractor: Pember Companies, Inc.

Signature: _____

RECOMMENDED BY:

Name: Brad Lindaman Date: _____
 Title: District Engineer
 Engineer: Barr Engineering Company

Signature: _____

APPROVED BY:

Name: Larry Swope Date: _____
 Title: President
 Owner: Ramsey-Washington Metro Watershed District

Signature: _____

**Keller Channel Weir and Phalen Outlet Resiliency
Ramsey-Washington Metro Watershed District
Summary of Work Completed Through February 16, 2021 for Progress Payment Number 2**

Item	Description	Unit	Estimated Quantity	Unit Price	Extension	(1) Total Completed Through This Period		(2) Total Completed Previous Period		(3) Total Completed This Period	
						Quantity	Amount	Quantity	Amount	Quantity	Amount
General											
1.04.A	Mobilization/Demobilization	L.S.	1	58,900.00	58,900.00	0.60	\$35,340.00	0.60	\$35,340.00	0.0	\$0.00
1.04.B	Clearing and Grubbing	L.S.	1	6,500.00	6,500.00	0.80	\$5,200.00	0.00	\$0.00	0.8	\$5,200.00
1.04.C	Control of Water	L.S.	1	225,000.00	225,000.00	0.45	\$101,250.00	0.45	\$101,250.00	0.0	\$0.00
1.04.D	Construction Entrance	Each	3	1,000.00	3,000.00	2	\$2,000.00	0	\$0.00	2	\$2,000.00
1.04.E	Silt Fence	L.F.	450	2.70	1,215.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.F	Siltation Log	L.F.	250	4.20	1,050.00	165	\$693.00	0	\$0.00	165	\$693.00
1.04.G	Floatation Silt Curtain	L.F.	400	24.00	9,600.00	400	\$9,600.00	400	\$9,600.00	0	\$0.00
1.04.H	Erosion Control Blanket	S.Y.	347	3.70	1,283.90	0	\$0.00	0	\$0.00	0	\$0.00
1.04.I	Hydro-Mulch	S.Y.	780	3.00	2,340.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.J	Inlet Protection	Each	14	130.00	1,820.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.K	Traffic and Pedestrian Control	L.S.	1	10,000.00	10,000.00	0.75	\$7,500.00	0.75	\$7,500.00	0	\$0.00
Phalen Lake East and West Outlet Structures											
1.04.L	Remove, Salvage and Replace Split Rail Fence	L.F.	135	30.00	4,050.00	109	\$3,270.00	60	\$1,800.00	49	\$1,470.00
1.04.M	Remove and Salvage Existing Overflow Structure Grate Trash Rack	Each	2	3,000.00	6,000.00	2	\$6,000.00	1	\$3,000.00	1	\$3,000.00
1.04.N	Remove and Disposal of Existing 24" RCP Flared End Section and Trash Rack Inlet	Each	2	2,000.00	4,000.00	2	\$4,000.00	1	\$2,000.00	1	\$2,000.00
1.04.O	Excavate and Removal of Riprap from Infront of Structures and Regrade Area	L.S.	1	50,000.00	50,000.00	0.75	\$37,500.00	0.50	\$25,000.00	0.25	\$12,500.00
1.04.P	Construction Provisions/Methods to Protect Existing Concrete Structures D	L.S.	1	15,000.00	15,000.00	0.75	\$11,250.00	0.50	\$7,500.00	0.25	\$3,750.00
1.04.Q	Remove Partial Section of Existing Concrete Weir Wall	Each	2	7,500.00	15,000.00	2	\$15,000.00	1	\$7,500.00	1	\$7,500.00
1.04.R	36" RCP Class II	L.F.	140	300.00	42,000.00	124	\$37,200.00	94	\$28,200.00	30	\$9,000.00
1.04.S	36" RC Flared End Section w/Bull Nose Trash Rack	Each	4	5,000.00	20,000.00	3	\$15,000.00	2	\$10,000.00	1	\$5,000.00
1.04.T	Connect 36" RCP to Existing Outlet Control Structure	Each	4	10,000.00	40,000.00	3	\$30,000.00	2	\$20,000.00	1	\$10,000.00
1.04.U	Random Granite Riprap Mn/DOT Class IV	Ton	556	83.00	46,148.00	323	\$26,809.00	96	\$7,968.00	227	\$18,841.00
1.04.V	Granular Filter Material	Ton	277	32.50	9,022.50	58	\$1,885.00	31	\$1,007.50	27	\$877.50
1.04.W	72" Dia. RC Control Structure Manhole with Integral Base, Weir Wall and Door Hatch Cast in Top Slab	Each	4	15,000.00	60,000.00	3	\$45,000.00	1	\$15,000.00	2	\$30,000.00
1.04.X	Construct 8" Reinforced Concrete Weir Wall in Existing Outlet Structure	Each	4	5,500.00	22,000.00	3	\$16,500.00	1	\$5,500.00	2	\$11,000.00
1.04.Y	Aluminum Angle Frame Floor Door Hatch – Single Leaf	Each	4	2,500.00	10,000.00	2	\$5,000.00	0	\$0.00	2	\$5,000.00
1.04.Z	Furnish and Install 48" Wide x 48" High Drop Weir Gate (Whipps, Inc.™) with Electric Actuator	Each	4	20,500.00	82,000.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AA	Furnish and Install Custom Fabricated Special Overflow Structure Galvanized Trash Rack (Haala Ind.™)	Each	2	6,400.00	12,800.00	1	\$6,400.00	0	\$0.00	1	\$6,400.00
1.04.AB	Aggregate Fill	C.Y.	578	32.50	18,785.00	402	\$13,065.00	213	\$6,922.50	189	\$6,142.50
1.04.AC	Import Topsoil	C.Y.	58	70.00	4,060.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AD	Protect Trails/Paths and Repair/Restoration of any Damaged Bituminous	L.S.	1	40,000.00	40,000.00	0.35	\$14,000.00	0.35	\$14,000.00	0	\$0.00

**Keller Channel Weir and Phalen Outlet Resiliency
Ramsey-Washington Metro Watershed District
Summary of Work Completed Through February 16, 2021 for Progress Payment Number 2**

Item	Description	Unit	Estimated Quantity	Unit Price	Extension	(1) Total Completed Through This Period		(2) Total Completed Previous Period		(3) Total Completed This Period	
						Quantity	Amount	Quantity	Amount	Quantity	Amount
1.04.AE	Seeding	S.Y.	347	5.00	1,735.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AF	Site Restoration	L.S.	1	5,000.00	5,000.00	0	\$0.00	0	\$0.00	0	\$0.00
Keller Channel Weir											
1.04.AG	Remove Top 3 Feet of Existing Weir Wall	L.S.	1	18,000.00	18,000.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AH	Construction Provisions/Methods to Protect Existing Concrete Structure During Selective Demolition/Removals	L.S.	1	8,500.00	8,500.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AI	Concrete Modifications to Weir, (Add 1 foot to top of weir and 6 inches to side walls as shown on Drawings)	L.S.	1	8,000.00	8,000.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AJ	Repair/Regrade Existing Channel Side Slopes, Construct Level Access Pad Area for Control Panel, Remove and Replace Riprap Upstream and Downstream of Structure, Add Topsoil, Seed, and Erosion Control Blanket	L.S.	1	28,000.00	28,000.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AK	Furnish and Install 132" Wide x 30" High Drop Weir Gate (Whipps, Inc.™) with Interconnected Gearbox and Electric Actuator	Each	3	23,000.00	69,000.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AL	Valve Stem Cover Box/Lid Installed	Each	3	4,100.00	12,300.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AM	Protect Trails/Paths and Repair/Restoration of any Damaged Bituminous	L.S.	1	20,000.00	20,000.00	0	\$0.00	0	\$0.00	0	\$0.00
1.04.AN	Site Restoration	L.S.	1	14,000.00	14,000.00	0	\$0.00	0	\$0.00	0	\$0.00
Electrical											
1.04.AO	Electrical - Phalen Lake East and West Outlet Structures	L.S.	1	130,000.00	130,000.00	0.35	\$45,500.00	0.35	\$45,500.00	0	\$0.00
1.04.AP	Electrical - Keller Channel Weir	L.S.	1	40,000.00	40,000.00	0	\$0.00	0	\$0.00	0	\$0.00
Electrical Allowance											
1.05B	Schedule of Allowances	Each	1	21,000.00	21,000.00	0	\$0.00	0	\$0.00	0	\$0.00
Contract Base Extensions =						\$1,197,089.40	\$494,962.00	\$354,588.00	\$140,374.00		
Change Order 1											
C.O.1.A	Crushed Granite Stone (Barton CA1)	Ton	400	83.00	33,200.00	277	\$22,991.00	201	\$16,683.00	76	\$6,308.00
C.O.1.B	Type 5 Stabilization Geotextile	SY	350	2.50	875.00	218	\$545.00	167	\$417.50	51	\$127.50
Change Order 1 Extensions =						\$34,075.00	\$23,536.00	\$17,100.50	\$6,435.50		
Contract Grand Total =						\$1,231,164.40	\$518,498.00	\$371,688.50	\$146,809.50		

Galowitz Olson, PLLC
10390 39th Street North
Lake Elmo, Minnesota 55042
Office: (651) 777-6960
Fax: (651) 777-8937

Ramsey-Washington Metro Watershed District
C/O Tina Carstens
2665 Noel Drive
Little Canada MN 55117

Page: 1
February 18, 2021
File No: 9M

General Account	Balance
	<u>\$4,372.25</u>

Permit Application Coversheet

Date March 03, 2021

Project Name Phalen Parking Lot Improvements Phase 2 Project Number 21-03

Applicant Name Bryan Murphy, City of St. Paul Parks and Recreation

Type of Development Parking Lot

Property Description

This project is located at two locations around Lake Phalen: the 'North Boat Launch' and 'Arcade Street Entrance.' Phase 1 of this project was previously permitted separately (Permit #19-07). The applicant is proposing to conduct a partial pavement rehabilitation, partial reconstruction/reconfiguration of two parking lots. The base bid includes work at the North Boat Launch, with a bid alternate that includes the Arcade Street Entrance work as well. Assuming both sites are completed, three infiltration basins are proposed to meet stormwater treatment requirements. Pretreatment methods include grass strips and a Rain Guardian sumped inlet structure. The proposed project results in a 1/2 acre decrease in impervious area. A portion of this work will occur within the 100-year floodplain, and the applicant has demonstrated there will be no net fill in accordance with District Rule D (Flood Control).

Watershed District Policies or Standards Involved:

- | | |
|--|---|
| <input type="checkbox"/> <i>Wetlands</i> | <input checked="" type="checkbox"/> <i>Erosion and Sediment Control</i> |
| <input checked="" type="checkbox"/> <i>Stormwater Management</i> | <input checked="" type="checkbox"/> <i>Floodplain</i> |

Water Quantity Considerations

The proposed grading plan and cut/fill analysis is sufficient to demonstrate no adverse impacts to the 100-year floodplain.

Water Quality Considerations

Short Term

The proposed erosion and sediment control plan is sufficient to protect downstream water resources during construction.

Long Term

The proposed stormwater management plan is sufficient to protect the long term quality of downstream water resources.

Staff Recommendation

Staff recommends approval of this permit with the special provisions.

Attachments:

- Project Location Map
- Project Grading Plan

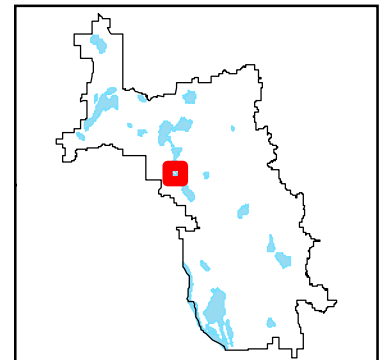
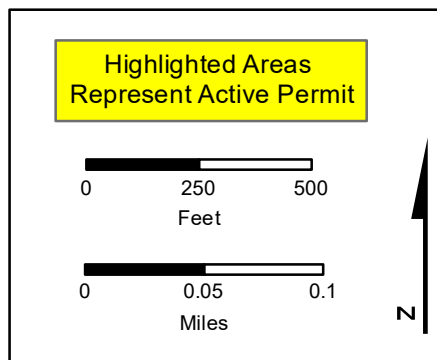
#21-03 Phalen Parking Lot Improvements Phase 2



Copyright nearmap 2015

Wetlands	
■	Manage A
■	Manage B
■	Manage C
	Lake
	Sediment Pond
	Not Assessed

	RWMWD Boundary
→	Flow Arrows
→	Major Flow Arrows
	Subwatersheds
	Creeks
	Permits

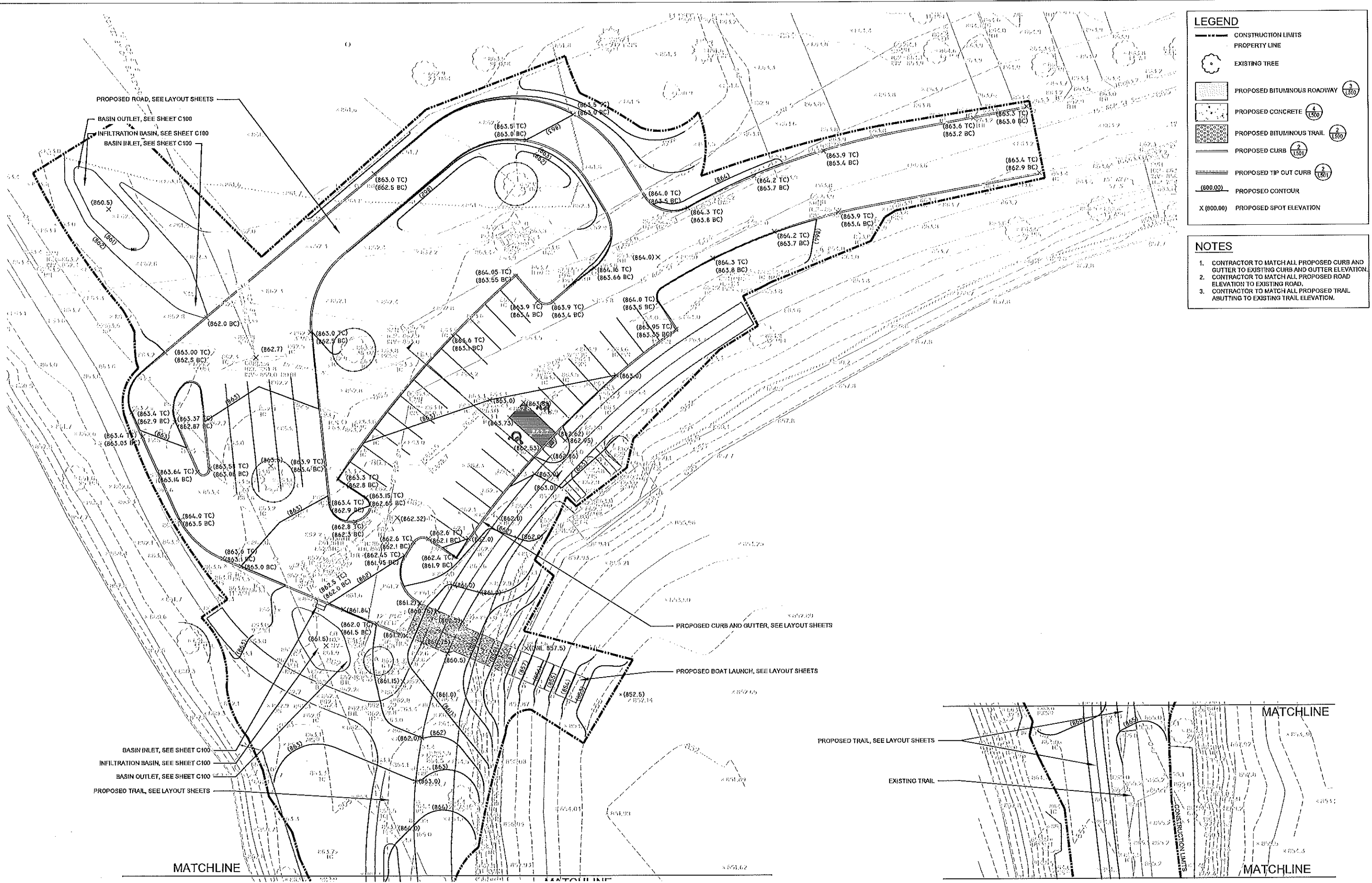


21-03

Special Provisions

1. The applicant shall add a note to the plans that the specified erosion and sediment control practices are the minimum. Additional practices may be required during the course of construction.
2. The applicant shall submit revised erosion control plans:
 - A. Ensure redundant perimeter control is specified where soil disturbance is occurring within 50' of surface waters.
 - B. Add locations for construction entrances.
 - C. Sheet C100: Erosion control should cover all disturbed areas (ex: BMP is outside of silt fence perimeter).
3. The applicant shall submit the final, signed plans set.
4. The applicant shall submit contact information for the trained erosion control coordinator responsible for implementing the Stormwater Pollution Prevention Plan (SWPPP).
5. The applicant shall submit a copy of the approved Minnesota Pollution Control Agency's NPDES Permit coverage for the project.

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LEGEND

- CONSTRUCTION LIMITS
- PROPERTY LINE
- EXISTING TREE
- ▨ PROPOSED BITUMINOUS ROADWAY (3) (L800)
- ▩ PROPOSED CONCRETE (4) (L500)
- ▧ PROPOSED BITUMINOUS TRAIL (2) (L500)
- PROPOSED CURB (2) (L501)
- PROPOSED TIP OUT CURB (2) (L501)
- PROPOSED CONTOUR
- X (800.00) PROPOSED SPOT ELEVATION

NOTES

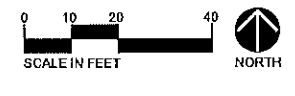
1. CONTRACTOR TO MATCH ALL PROPOSED CURBS AND GUTTER TO EXISTING CURB AND GUTTER ELEVATION.
2. CONTRACTOR TO MATCH ALL PROPOSED ROAD ELEVATION TO EXISTING ROAD.
3. CONTRACTOR TO MATCH ALL PROPOSED TRAIL ABUTTING TO EXISTING TRAIL ELEVATION.

SAINT PAUL MINNESOTA
 Parks and Recreation
 Department
 400 City Hall Annex
 25 West Street
 Saint Paul, MN 55102

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 Landscape Architect under the laws of the State of Minnesota.

Printed Name: BRAD J. ROY
 Signature: [Signature]
 Date: 2/10/2021 License #: 52727

1 NORTH END BOAT LAUNCH GRADING PLAN
 L105 1"=20'



2 NORTH END BOAT LAUNCH GRADING PLAN
 L105 1"=20'



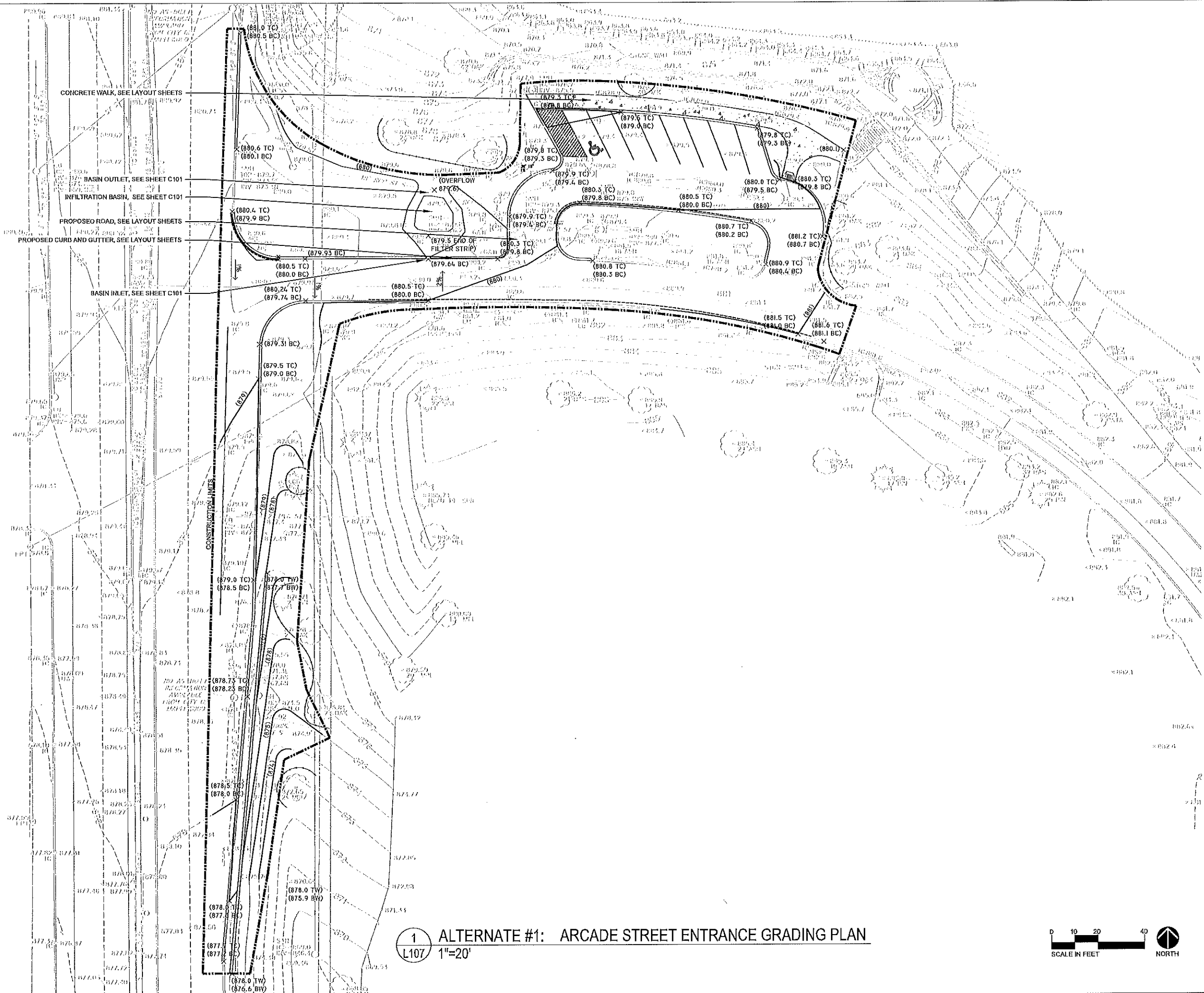
City of Saint Paul Department of Parks and Recreation
PHALEN REGIONAL PARK
MULTIMODAL TRANSPORTATION IMPROVEMENTS PHASE II
 1600 PHALEN DR, SAINT PAUL, MN 55106

No.	Date	Revision Description

PROJECT NUMBER: L105-29
 DATE: 2/10/2021
 DRAWN BY: CY
 CHECKED BY: BM
 SUPERVISOR: BM

DRAFT NOT FOR CONSTRUCTION
 NORTH END BOAT LAUNCH GRADING PLAN
L105


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LEGEND

- CONSTRUCTION LIMITS
- PROPERTY LINE
- EXISTING TREE
- PROPOSED BITUMINOUS ROADWAY (3) (1500)
- PROPOSED CONCRETE (4) (1500)
- PROPOSED BITUMINOUS TRAIL (2) (1500)
- PROPOSED CURB (2) (1500)
- PROPOSED TIP OUT CURB (2) (1500)
- PROPOSED CONTOUR (800.00)
- PROPOSED SPOT ELEVATION (X (800.00))

- NOTES**
1. CONTRACTOR TO MATCH ALL PROPOSED CURB AND GUTTER TO EXISTING CURB AND GUTTER ELEVATION.
 2. CONTRACTOR TO MATCH ALL PROPOSED ROAD ELEVATION TO EXISTING ROAD ELEVATION.
 3. CONTRACTOR TO MATCH ALL PROPOSED TRAIL ABUTTING TO EXISTING TRAIL ELEVATION.



SAINT PAUL MINNESOTA
 Parks and Recreation Department
 400 City Hall Annex
 25 West Street
 Saint Paul, MN 55102

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 Landscape Architect under the laws of the State of Minnesota.

Printed Name: BRYAN J. JUDY
 Signature: [Signature]
 Date: 2/19/2021, License #: 6237

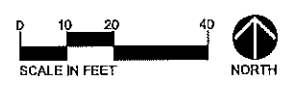
City of Saint Paul Department of Parks and Recreation
PHALEN REGIONAL PARK
 MULTIMODAL TRANSPORTATION IMPROVEMENTS PHASE II
 1600 PHALEN DR, SAINT PAUL, MN 55106

No.	Date	Revision Description

PROJECT NUMBER	L107-29
DATE	2/19/2021
DRAWN BY	CY
CHECKED BY	RM
SUPERVISOR	BH

DRAFT NOT FOR CONSTRUCTION
 ARCADE STREET ENTRANCE GRADING PLAN
L107

1 ALTERNATE #1: ARCADE STREET ENTRANCE GRADING PLAN
 L107 1"=20'



Stewardship Grant Application Summary

Project Name: Cherokee Hills 2 Phase 2

Application Number: 21-05 CS

Board Meeting Date: 3/3/2021

Applicant Name: Vicki Pream

Residential **Commercial/Government**

Project Overview:

This project is located off Shirlee Lane and Nancy Place in the City of Shoreview in a townhome association. The applicant is proposing to install a stormwater collection and conveyance system that will feed into a rain garden planted with native plants to help alleviate frequent flooding that occurs in this area. A majority of the stormwater will run off into the existing turf and into the existing storm sewer system. Therefore staff recommend 50% coverage for this project.

This project is eligible for 50% funding up to \$15,000.

BMP type(s):

Rain Garden(1)

Grant Request:

\$13,989.00

Recommendation:

Staff recommends approval of this application.

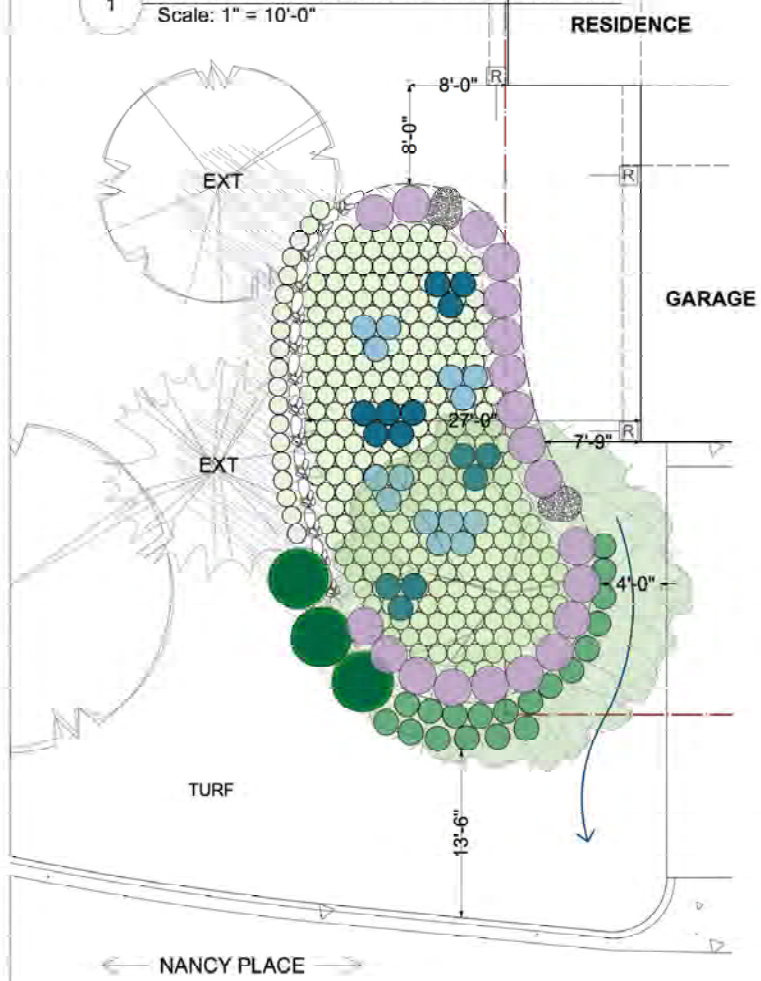
Subwatershed:

Snail Lake

Location Maps:



1 BMP #2: RAIN GARDEN PLANTING PLAN
Scale: 1" = 10'-0"



PLANT SCHEDULE

SYMBOL	COMMON NAME	LATIN NAME	SIZE	QTY	SPACING
●	PRAIRIE DROPSEED	SPOROBOLUS HETEROLEPIS	2"	18	24" O.C.
○	PLAINS OVAL SEDGE	CAREX BREVIOR	2"	258	18" O.C.
●	BLUE FLAG IRIS	IRIS VERSICOLOR	2"	14	24" O.C.
●	JOE PYE WEED 'PHANTOM'	EUPATORIUM 'PHANTOM'	#1	10	36" O.C.
●	GREAT BLUE LOBELIA	LOBELIA SIPHILITICA	2"	14	24" O.C.
●	BLACK CHOKEBERRY	ARONIA MELANOCARPA	#5	3	5' O.C.
⊗	RIVER BIRCH	BETULA NIGRA	#25 CLPBB	1	AS PER PLAN
TOTAL PLANTS				318	

PLANT PALETTE



Cherokee II
4111 Nancy Pl
Shoreview, MN 55126

**RAIN GARDEN:
PLANTING PLAN**

DATE	REVISIONS
2/24/21	REVISED PLANT MATERIAL

outdoor LAB Landscape Design Inc.
1196 7th Street East, St. Paul, Minnesota 55106
email: info@outdoorlab.net phone: 651-202-3662

Date: 2/9/21	
DRAWN BY	EM
CHECKED	Checked
APPROVED	Approved
SCALE	1" = 10'-0" →
ORIGINAL SHEET SIZE 11x17	

L301

Consent Agenda Action Item

Board Meeting Date: March 3, 2021

Agenda Item No: 6E

Preparer: Tina Carstens, Administrator

Item Description: Change Order No. 2 for the Keller Channel Weir and Phalen Outlet Resiliency Modification Bid Award

Background:

The purpose of this project is to implement a design that will allow the district to remotely adjust the weir heights on the Keller channel structure and the Phalen outlet structure in accordance with an approved operating plan. Operation of the structures under certain conditions will help reduce upstream flood levels where homes exist in the floodplain.

Attached is change order number 2 for this project. This request is for an extension to the contract time for the contractor to complete their work. See the attached order and letter from the contractor.

Applicable District Goal and Action Item:

Goal: Manage risk of flooding – The District will reduce the public’s risk to life and property from flooding through programs and projects that protect public safety and well-being.

Action Item: Cooperate with appropriate stakeholders to identify, assess, and address potential flooding problems in the District.

Staff Recommendation:

Approve Change Order No. 2.

Financial Implications:

This change order does not change the contract price of this project.

Board Action Requested:

Approve Change Order No. 2.

Change Order No. 2
Ramsey-Washington Metro Watershed District
Keller Channel Weir and Phalen Outlet Resiliency

DATE OF ISSUANCE: February 24, 2021

Owner: Ramsey-Washington Metro Watershed District
2665 Noel Drive
Little Canada, MN 55117
Attn: Larry Swope

Contractor: Pember Companies, Inc.
N4449 469th St.
Menomonie, WI 54751
Attn: Joe Pember

Engineer: Barr Engineering Company
4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
Attn: Brad Lindaman

C.O.2.A Contract Completion Extension

Description of Change:

The contractor is requesting an extension to the Contract Time to complete their work. The basis for this request is rooted in permit delays from Ramsey County Parks and Recreation and the Department of Natural Resources.

Pember was awarded the work at the November 4, 2020 board meeting. Pember provided the required documents on November 10, 2020, and a "Notice to Proceed" letter was provided to them on December 11. At that time, the contractor mobilized at Lake Phalen and prepared their work area on land. But, they were unable to work in the water until the permit from the Minnesota Department of Natural Resources (DNR) was received on December 23. A permit application was originally to the DNR made by the district on September 16, 2020.

In addition, the contractor's ability to mobilize and work at the Keller Channel site was also delayed. A request to Ramsey County Parks & Recreation to obtain an access agreement was made on November 23, 2020. That approval was made by the county board on February 16, 2021. But, the contractor has only received an oral indication of that approval and no copies of the signed permits have been delivered yet. The delay prohibited the contractor from accessing the Keller control structure to perform their work. They now are starting work in this area based on the oral approval.

The permit delays imposed on the contractor were significant and beyond their control. The contractor in good faith, adjusted their schedule, and did what they could in the locations where permission had been provided to maximize efficiencies given the situation. The contractor is also proposing to provide

temporary power and manual operation of the control gates if needed to manage flood flows this spring.

Measurement and Payment:

None


Change in Contract Time:

Substantial completion date will be changed from March 31, 2021 to May 15, 2021 and the final completion date will be changed from June 18, 2021 to July 3, 2021.

Total Impact on Contract Price:

None

This Change Order No. 2 is:

Submitted By:  _____ Date: February 24, 2021
(ENGINEER) Bradley J. Lindaman, Project Engineer
Barr Engineering Company

Authorized By: _____ Date: _____
(OWNER) Larry Swope, President
Ramsey-Washington Metro Watershed District

Approved By: _____ Date: _____
(CONTRACTOR) Joe Pember, Project Manager
Pember Companies, Inc.

Attachments:

Pember request letter dated February 12, 2021

From: Scott Hagen
Date: February 12, 2021 at 10:05:30 AM EST
To: Joe Pember, Terry Ludtke
Subject: Maplewood extension

Due to some of the following circumstances we are asking for some sort of an extension or a different window to work on the Keller channel. This job was awarded to Pember companies back in late October of 2020. We took our normal steps in putting together shop drawings and meetings for scheduling immediately as we all knew this was going to be a tight job given the window. The pre-construction meeting was set for November 19th 2020. We had three representatives from Pember Companies attending that meeting. Terry Ludtke and I (Scott Hagen) would be the two field supervisors on this project. Joe Pember would be the project manager for this job. At this meet we were all a bit taken back to say the least as we listened to group after group claiming a permit was needed for several things. There was no DNR permit to enter the water yet. (We were assured this would be quick though) We ended up getting this permit finally issued on 12-23-20 over a month later. The next permit brought up in the meeting was the St. Paul parks access permit. This permit was signed on the 9th of December just shy of three weeks after the meeting. The next permit was the forestry permit which came in the following week I believe. We finally had a meeting onsite on the 11th of December to talk about access and also to meet with the forester. At this time we presented our plan for pedestrians and also our plan for the space needed for equipment and materials. Our site shrunk into less than half after talking to the forester. He had us fencing off all the drip lines of the trees to prevent soil compaction even though it's in the middle of winter already. This meant we shrunk our site from bad to worse making this job even more difficult given barely any space to work. This job was speced to start on December 1st of 2020. Joe sent an email out on December 4th letting the engineer and many others know that we were ready to get started on the first and we are already starting to worry about time as this is a tight job. We final stepped foot on the grounds on the 14th of December to put up some fencing and to start hauling in some things but were not able to do anything productive yet as we were still waiting on our DNR permit to enter the water. The weir gates were also a huge problem as the wait times were huge. The spec weir gate provider was Whipps. This company was 12 to 16 weeks out on delivery after approved shop drawings. The company we used was Fontaine which was also 12 to 16 weeks out on delivery after approved shop drawings. The shop drawings got approved in mid-December. We finally got our DNR permit signed on the 23rd of December. We were finally able to go to work on the 28th. This took 27 full days away from us of nice weather that we could have used to complete this job on time. To take that a step further, we had intent of placing a second crew on the Keller channel if needed to make our deadline but to this day (2-12-2021) we still have no permit to access the site. We are running out of time.

Due to all these things we ask for another option. Option number one would be an extension for substantial. If the water is too sensitive for the fish spawn after March, maybe you could offer up a different window of time to do the Keller portion of the project. A tie when the fish are not spawning we could come in and complete the Keller portion of the project.

Scott Hagen
Pember Companies
715-933-0306
Shagen@pembercompanies.com

* * * * *

Permit Program

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RAMSEY-WASHINGTON

METRO WATERSHED DISTRICT

MEMORANDUM

Date: March 3, 2021

To: Board of Managers and Staff

From: Nicole Soderholm, Permit Coordinator
Mary Fitzgerald, District Inspector

Subject: February Enforcement Action Report

During February 2021:

Number of Violations: 0

Activities:

Permitting assistance to private developers and public entities, miscellaneous inquiries, ongoing ESC site inspections and reporting, WCA administration and procedures, new permit review with Barr Engineering, permit pre-submittal meetings, Minnesota Erosion Control Association (MECA) Annual Conference, employee performance reviews

Note: Staff have been inspecting all active construction sites through the winter months. Little active work has been completed in the month of February due to consistent below zero temperatures. Staff will continue to inspect sites as activity and temperature climb.

Project Updates:

#18-11 Whistler Pines (Shoreview)

Staff conducted a routine inspection on February 2nd and found the site to be inactive at the time. Staff noted that silt fence seemed to be sagging and damaged throughout the site, and would need to be repaired promptly to ensure it can work effectively during snowmelt conditions. All other erosion control items were compliant at the time of inspection. Staff will continue to communicate with the site's contacts to ensure they are repairing all necessary items.

#20-28 Anchor Block Storage Facility (North St. Paul)

Staff completed a routine inspection of February 3rd, and found the site to be compliant – with little active construction occurring. Staff did observe a small amount of snow stockpiled near a previously constructed infiltration basin adjacent to the site. Staff communicated with the site’s superintendent to ensure additional snow is not stockpiled near the basin, as it could impact infiltration if the snow is mixed with sediments and salts. Staff will continue to inspect the site until completion.

#20-36 The Parkway (St. Paul)

Staff will be attending an initial erosion control walk-through on February 26th with the site’s project superintendent. This project will consist of a multi-family housing building with a parking lot and outdoor pavilion/play area. Stormwater will be treated onsite with an underground infiltration system. After completing an initial erosion control walk-through, staff will continue to inspect the site on a regular basis to ensure compliance with the permit.

Permits Closed:

None

Permits Approved by Staff:

None

* * * * *

Stewardship Grant Program

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Stewardship Grant Program Budget Status Update

March 3, 2021

Homeowner	Coverage	Number of Projects: 2	Funds Allocated
Habitat Restoration and rain garden w/o hard surface drainage	50% Cost Share \$15,000 Max	1	\$1,085
Rain garden w/hard surface drainage, pervious pavement, green roof	75% Cost Share \$15,000 Max	1	\$2,800
Master Water Steward Project	100% Cost Share \$15,000 Max	0	\$0
Shoreland Restoration	100% Cost Share \$15,000 Max	0	\$0

Commercial, School, Government, Church, Associations, etc.	Coverage	Number of Projects: 2	Funds Allocated
Habitat Restoration	50% Cost Share \$15,000 Max	1	\$13,989*
Shoreland Restoration (below 100-year flood elevation w/actively eroding banks)	100% Cost Share \$100,000 Max	1	\$150,000 (Proposed work on Twin Lake)
Priority Area Projects	100% Cost Share \$100,000 Max	0	\$0
Non-Priority Area Projects	75% Cost Share \$50,000 Max	0	\$0
Public Art/Project Research	50% Cost Share	1	\$10,000
Aquatic Veg Harvest/LVMP Development	50% Cost Share \$15,000 Max	0	\$0

Maintenance	50% Cost Share \$5,000 Max for 5 Years	41	\$31,500
Consultant Fees			\$1,373
Total Allocated			\$41,500

2021 Stewardship Grant Program Budget	
Budget	\$1,000,000
Total Funds Allocated	\$210,747
Total Available Funds	\$789,253

**These numbers include \$13,989 in project funds pending approval at the March 3, 2021 board meeting.*

* * * * *

Action Items

* * * * *

Request for Board Action

Board Meeting Date: March 3, 2021

Agenda Item No: 11A

Preparer: Tina Carstens, Administrator

Item Description: Ryan Drive and Keller Parkway Conveyance Upgrades

Background:

This project is a continuation of the effort and recommendations of the Owasso Basin Bypass Feasibility Study performed by Barr Engineering in 2020. You will find the background and discussion of project specifics including construction documents in the attached memo.

Applicable District Goal and Action Item:

Goal: Manage risk of flooding – The District will reduce the public’s risk to life and property from flooding through programs and projects that protect public safety and well-being.

Action Item: Cooperate with appropriate stakeholders to identify, assess, and address potential flooding problems in the District.

Staff Recommendation:

Staff recommends approval of the preliminary design, estimated costs, and proposed project schedule, and direct staff to finalize the design and bidding documents and solicit bid proposals.

Financial Implications:

This construction project will be funded through the Flood Risk Reduction Fund where there are sufficient funds available. In addition, staff is in communication with the City of Little Canada regarding cost sharing on this project.

Board Action Requested:

Approve the preliminary design, estimated costs, and proposed project schedule, and direct staff to finalize the design and bidding documents and solicit bid proposals.

Memorandum

To: Ramsey Washington Metro Watershed District Board of Managers
From: Barr Engineering Co.
Subject: Ryan Drive and Keller Pkwy Conveyance Upgrades
Date: February 24, 2021
Project: 23/62-1379.00
c: Tina Carstens – RWMWD Administrator

Construction documents including bidding documents, technical specifications, and construction drawings are being prepared for the Ryan Drive and Keller Pkwy Conveyance Upgrades project. This project is a continuation of the effort and recommendation of the Owasso Basin Bypass Feasibility Study performed by Barr Engineering Co. (Barr) in 2020. This project covers two locations, Ryan Drive and Keller Pkwy, and involves modifying existing infrastructure to provide a reduction in flood-risk for habitable structures (i.e., homes and businesses) within the Gervais Creek subwatershed.

The design at Ryan Drive includes the removal of an existing drainage culvert beneath Ryan Drive, replacing it with a larger box culvert, the raising of the existing roadway to remove a low point in the road profile, and localized drainage improvements. The design for Keller Pkwy includes the removal of two existing drainage culverts beneath Keller Pkwy, replacing them with larger box culverts, and localized drainage improvements. These two designs contribute to a net reduction of the 96-hour, 100-year storm event water surface elevations at these locations. Conveyance improvements at these two locations result in 6-12 structures (4 homes near Keller Parkway and 2-8 homes in North Star Estates) being removed from the modelled 100-year flood zone in the near term. These projects are an important step towards full implementation of the elements of feasibility studies for the area, completed in 2020. A range of homes is provided for North Star Estates due to uncertainty regarding site-specific surface elevations.

Additionally, Barr and RWMWD staff are engaged in an active dialogue with project stakeholders – the City of Little Canada, Ramsey County, and BNSF Railway – regarding their potential partnership (i.e., cost-sharing) on specific design elements. We have received positive feedback from the City of Little Canada, and the City is currently working through their evaluation process.

The engineer's opinion of probable cost is shown in the Table 1. The opinion of probable cost provided is made on the basis of Barr's experience and qualifications and represents our best judgment as experienced and qualified professionals familiar with the project. Because we have no control over the cost of labor, materials, equipment or services furnished by others, or over the contractor's methods of determining prices, or over competitive bidding or market conditions, Barr cannot and does not guarantee that proposals, bids, or actual costs will not vary from the opinion of probable cost presented.

Table 1: Engineer's Opinion of Probable Cost

Item	IFA Submittal	Notes
Construction Subtotal	\$808,000	1,2,3,4,5,6,7,8
Construction Contingency (20%)	\$162,000	1,4,8
Engineer's Opinion of Probable Construction Cost	\$970,000	1,2,3,4,5,6,7,8
Engineering Subtotal	\$194,000	9
Engineer's Opinion of Probable Construction Cost + Engineering	\$1,164,000	9
Estimated Accuracy Range	Low (-10%)	\$1,048,000
	High (+20%)	\$1,397,000

Notes:

- 1 Quantities based on Design Work Completed (90%).
- 2 Unit Prices Based on Information Available at This Time.
- 3 Limited Soil Boring and Field Investigation Information Available.
- 4 This design level (Class 1, 70-100% design completion per ASTM E 2516-11) cost estimate is based on 90% designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -10% to +20%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.
- 5 Estimate assumes that projects will not be located on contaminated soil, although contaminated soil is accounted for in the drainage ditch/creek cleaning.
- 6 Estimate costs are to finalize the design, administer bidding process, provide contract administration and oversight during construction and prepare permit applications for the project. The estimated costs do not include maintenance, monitoring or additional tasks following construction.
- 7 Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials.
- 8 Estimate costs are reported to nearest thousand dollars.
- 9 Engineering includes estimated fees associated with construction administration and observation.

Request for Board of Managers

It is requested that the RWMWD Board of Managers approve the preliminary design, specifications, estimate of costs and proposed schedule (below) and direct Barr to finalize the design, prepare the bidding documents and advertise the project for bids from contractors to construct the Ryan Drive and Keller Pkwy Conveyance Upgrades project. If the Board of Managers authorizes solicitation of bids to construct this project, the following tasks would be completed:

- March 3, 2021 – Board of Managers authorizes Barr to solicit bids
- March 15, 2021 (estimated) – Advertise in construction bulletin and local papers
- April 5, 2021 (estimated)– Open bids (3-week bidding period)

- April 7, 2021 (estimated) – Present bid results to the Board
 - Note that due to ongoing coordination with project stakeholders (e.g., City of Little Canada) to partner (i.e., cost-share) with the RWMWD on this project, additional scope items may be added during the bidding phase, issued as Addenda. Depending on this timing and City bidding duration requirements, the bidding schedule may be extended. If extended, bid results will be presented to the Board at a later meeting.

Attachments

- Issued for Approval Drawings for the Ryan Drive and Keller Pkwy Conveyance Upgrades project
- Table of Contents for the Project Specifications

CONTRACT DOCUMENTS
RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES
LITTLE CANADA, MINNESOTA
RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

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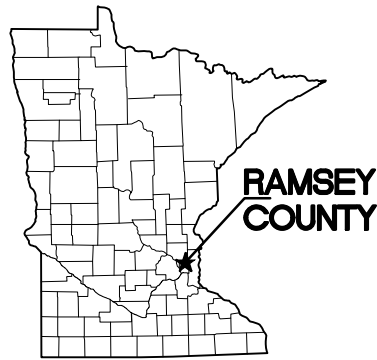
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KB-3	Bridge No. XXX Precast Concrete End Section Type III
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KB-5	Bridge No. XXX Embankment Protection For Box Culverts
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B-02	Keller Pkwy Boring Logs

RAMSEY-WASHINGTON METRO WATERSHED DISTRICT

RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES

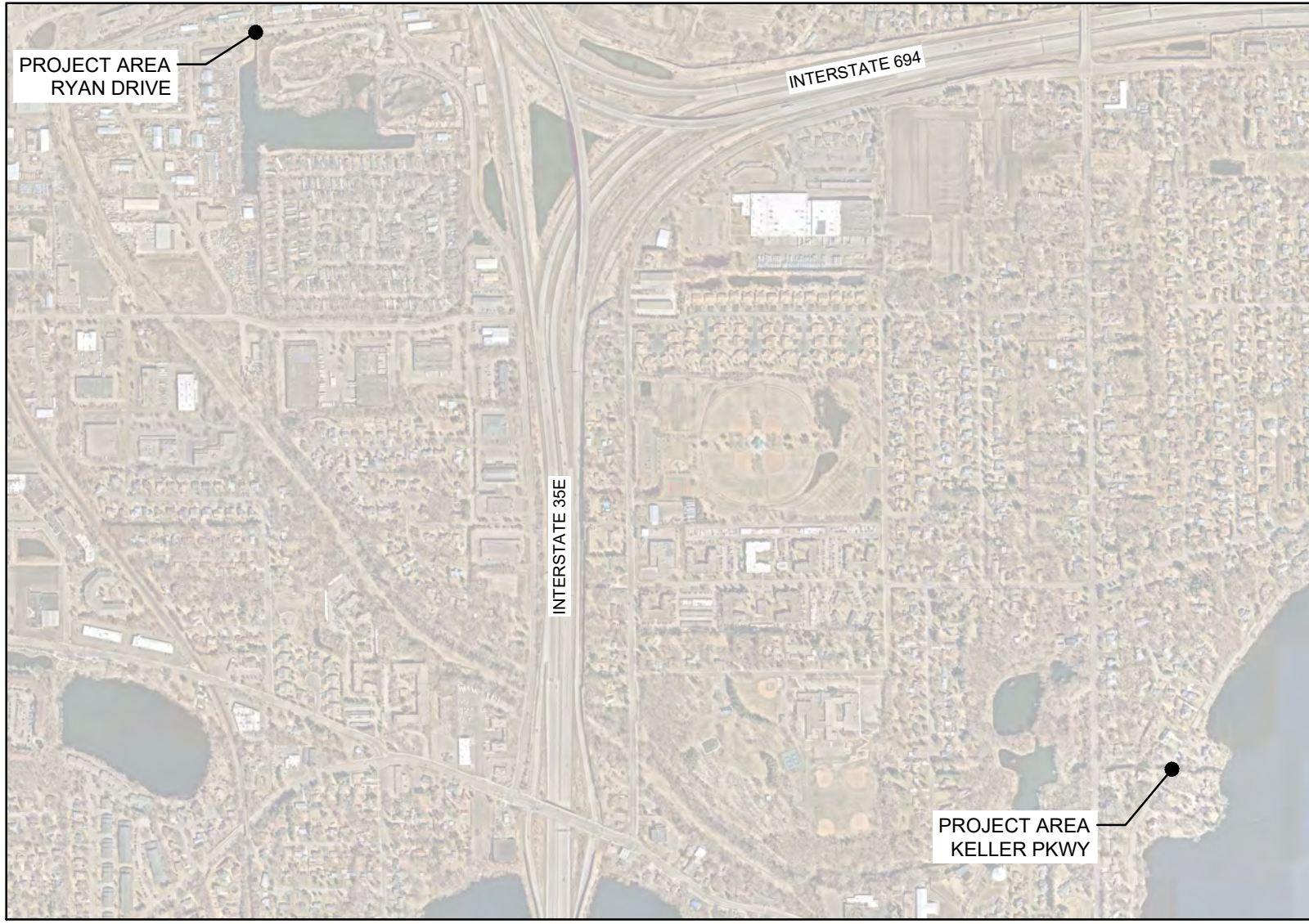
DRAWING INDEX



LOCATION MAP

LEGEND:

EXISTING	PROPOSED	
--- 520 ---	— 520 —	MAJOR CONTOUR
- - - 520 - - -	— 520 —	MINOR CONTOUR
— — — — —	— — — — —	ROAD/ALIGNMENT
— OE — OE — OE —	— OE — OE — OE —	OVERHEAD POWER
— U — U — U —	— U — U — U —	CENTURY LINK
— GAS — GAS — GAS —	— GAS — GAS — GAS —	EXCEL GAS LINE
— W — W — W —	— W — W — W —	WATER LINE
— SAN — SAN — SAN —	— SAN — SAN — SAN —	SANITARY SEWER LINE
— SS — SS — SS —	— SS — SS — SS —	STORM SEWER
— — — — —	— — — — —	CULVERT
— — — — —	— — — — —	PROPERTY LINE
— x — x — x —	— x — x — x —	FENCE/GUARDRAIL
— — — — —	— — — — —	CONSTRUCTION LIMITS
— □ — □ — □ —	— □ — □ — □ —	SILT FENCE
— ○ — ○ — ○ —	— ○ — ○ — ○ —	SILT CURTAIN



VICINITY MAP

NOTE: 2019-08-29 NEARMAP ORTHOGRAPHIC IMAGE SHOWN
 PROJECT COORDINATE SYSTEM
 HORIZONTAL: MnDOT RAMSEY COUNTY, US FOOT, NAD83 DATUM
 VERTICAL: NAVD88 DATUM

CONTACTS

BARR PROJECT MANAGER / ENGINEER:
 SAMUEL REDINGER
 BARR ENGINEERING
 PHONE: 952-842-3588
 EMAIL: SREDINGER@BARR.COM

CITY OF LITTLE CANADA CONTACT:
 -
 EMAIL: -

RAMSEY COUNTY CONTACT:
 -
 EMAIL: -

WATERSHED ADMINISTRATOR:
 TINA CARSTENS
 RAMSEY WASHINGTON METRO WATERSHED DISTRICT
 PHONE: 651-792-7960
 EMAIL: tina.carstens@rwmwd.org

G-01....	COVER SHEET AND DRAWING INDEX
G-02....	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)-1
G-03....	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)-2
G-04....	STANDARD DETAILS FOR EROSION/SEDIMENTS CONTROL BMP's
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R-02....	RYAN DRIVE SITE PLAN
R-03....	RYAN DRIVE PLAN AND PROFILE
R-04....	RYAN DRIVE SECTIONS
R-05....	RYAN DRIVE STREAM PLAN, PROFILE, AND SECTIONS
R-06....	RYAN DRIVE DETAILS
RB1....	BRIDGE NO. XXX GENERAL PLAN AND ELEVATIONS
RB2....	BRIDGE NO. XXX PRECAST CONCRETE BARREL DETAILS
RB3....	BRIDGE NO. XXX PRECAST CONCRETE END SECTION TYPE I
RB4....	BRIDGE NO. XXX EMBANKMENT PROTECTION FOR BOX CULVERTS
K-01....	KELLER PKWY EXISTING CONDITIONS, REMOVALS AND EROSION & SEDIMENT CONTROL
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R-03....	KELLER PKWY PLAN AND PROFILE
R-04....	KELLER PKWY SECTIONS
R-05....	KELLER PKWY STREAM PLAN, PROFILE, AND SECTIONS
R-06....	KELLER PKWY RETAINING WALL ELEVATION AND DETAILS
KB1....	BRIDGE NO. XXX GENERAL PLAN AND ELEVATIONS
KB2....	BRIDGE NO. XXX PRECAST CONCRETE BARREL DETAILS
KB3....	BRIDGE NO. XXX PRECAST CONCRETE END SECTION TYPE III
KB4....	BRIDGE NO. XXX PRECAST CONCRETE END SECTION TYPE III
KB5....	BRIDGE NO. XXX EMBANKMENT PROTECTION FOR BOX CULVERTS
B-01....	RYAN DRIVE BORING LOG
B-02....	KELLER PKWY BORING LOGS



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CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.

ISSUED FOR
 PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\2021\179-000238213790_G-01.DWG PLOT SCALE: 1:2 PLOT DATE: 2/22/2021 3:30 PM

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.		CLIENT BID	02/25/21				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Ph: 1-800-632-2277	Scale Date Drawn Checked Designed Approved	NTS 1/24/2020 JMD3 SOR SOR	RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES	BARR PROJECT No. 23/62-1379.00			
PRINTED NAME: SAMUEL O. REDINGER SIGNATURE: _____ DATE: _____ LICENSE # 58632		CONSTRUCTION									CLIENT PROJECT No. -	DWG. No. G-01	REV. No. A	
NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION	RELEASED TO/FOR	A	B	C	0	1	2	3	DATE RELEASED

1.0 GENERAL CONSTRUCTION ACTIVITY INFORMATION:

THIS STORMWATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN PREPARED IN COMPLIANCE WITH THE MINNESOTA GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY NO. MNR100001 (GENERAL PERMIT), AS REQUIRED BY THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA) UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM/STATE DISPOSAL SYSTEM (NPDES/SDS) PROGRAM.

THE PROJECT IS LOCATED IN THE CITY OF LITTLE CANADA, RAMSEY COUNTY, WITHIN THE RAMSEY-WASHINGTON METRO WATERSHED DISTRICT, MINNESOTA. PROPOSED CONSTRUCTION ACTIVITIES WILL TAKE PLACE AT TWO DIFFERENT SITES. RYAN DRIVE-OWASSO BASIN CULVERT SITE IS LOCATED WITHIN THE SW ¼ OF SECTION 31, T30N, R22W, THE APPROXIMATE CENTROID IS AT LATITUDE OF 45.037 AND A LONGITUDE: -93.097. KELLER PARKWAY-GERVAIS CREEK CULVERTS SITE IS LOCATED WITHIN THE SE ¼ OF SECTION 5, T29N, R22W, THE APPROXIMATE CENTROID IS AT LATITUDE OF 45.024 AND A LONGITUDE OF -93.075.

THIS PROJECT IS A FLOOD CONTROL PROJECT TO UP-GRADE THE EXISTING CONVEYANCE SYSTEM IN THE RAMSEY-WASHINGTON METRO WATERSHED DISTRICT. THE PURPOSE OF THE PROJECT IS TO INCREASE FLOW THROUGH THE SYSTEM BY REMOVING EXISTING CULVERTS RESTRICTING FLOW AND REPLACING THEM WITH LARGER CAPACITY CULVERTS TO PREVENT FLOODING AND PROTECT THE SURFACE WATERS WITHIN THE WATERSHED. THE PROJECT WORK INCLUDES MOBILIZATION AND DEMOBILIZATION, REMOVAL AND REPLACEMENT OF EXISTING BITUMINOUS PAVEMENT, EXCAVATION FOR REMOVAL AND INSTALLATION OF NEW CULVERTS, CONTROL OF WATER AND DEWATERING, INSTALLATION OF NEW CULVERTS WITH SUPPORT SYSTEM, EXCAVATION AND GRADING OF CHANNEL TO FIT NEW CULVERTS, RIPRAP AND FILTER INSTALLATION AT INLETS AND OUTLETS OF NEW CULVERTS, RAISING ROAD GRADES AND MATCHING INTO EXISTING ROAD SURFACE, REPLACING BITUMINOUS PAVEMENT, INSTALLATION OF SAFETY FENCING/RAILS, SITE RESTORATION WITH NATIVE SEED MIXES AND SOD, TEMPORARY AND PERMANENT EROSION CONTROL BMP'S. THE PROJECT AS PROPOSED HAS A TOTAL DISTURBANCE AREA OF 0.76 ACRES. THE PROJECT IS UNDER ONE ACRE AND DOES NOT REQUIRE A GENERAL AUTHORIZATION TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY (npdes PERMIT). EROSION PREVENTION AND SEDIMENT CONTROL MEASURES ARE REQUIRED TO MINIMIZE SEDIMENT FROM BEING TRANSPORTED INTO OWASSO BASIN OR GERVAIS CREEK, WHICH ARE NOT LISTED ON THE SPECIAL OR IMPAIRED WATERS LIST. REFER TO PROJECT DRAWINGS FOR FURTHER DETAILS. (CSW PERMIT PART III.A.1)

1.1 PROJECT SIZE AND CUMULATIVE IMPERVIOUS SURFACE:

- THE ANTICIPATED AREA OF DISTURBANCE IS APPROXIMATELY 0.76 ACRES.
- THE TOTAL AREA OF PRE-CONSTRUCTION IMPERVIOUS AREA IS APPROXIMATELY 0.51 ACRES.
- THE TOTAL AREA OF POST-CONSTRUCTION IMPERVIOUS AREA IS APPROXIMATELY 0.51 ACRES.
- THE TOTAL NEW IMPERVIOUS AREA IS APPROXIMATELY 0.00 ACRES.

1.2 DATES OF CONSTRUCTION:

- ANTICIPATED START DATE: TBD
- ANTICIPATED END DATE: TBD

1.3 CONTACT INFORMATION:

OWNER: RAMSEY-WASHINGTON METRO WATERSHED DISTRICT
 MAILING ADDRESS: 2665 NOEL DRIVE
 LITTLE CANADA, MN 55117
 CONTACT PERSON: TINA CARSTENS
 PHONE NUMBER: 651-792-7960
 ALTERNATE CONTACT PERSON: DAVE VLASIN
 PHONE NUMBER: 651-792-7972

TITLE: ADMINISTRATOR
 EMAIL ADDRESS: tina.carstens@rwmwd.org
 TITLE: WATERSHED PROJECT MANAGER
 EMAIL ADDRESS: david.vlasin@rwmwd.org

OPERATOR / GENERAL CONTRACTOR (WILL OVERSEE IMPLEMENTATION OF THE SWPPP): [INSERT NAME]
 MAILING ADDRESS: [INSERT ADDRESS]
 CONTACT PERSON: [INSERT NAME]
 PHONE NUMBER: [INSERT NUMBER]

TITLE: [INSERT TITLE]
 EMAIL ADDRESS: [INSERT ADDRESS]

PARTY RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORMWATER MANAGEMENT SYSTEM:

(NO PERMANENT STORMWATER TREATMENT SYSTEM IS REQUIRED WITH THIS PROJECT SO IT DOES NOT REQUIRE A PARTY RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE TO BE LISTED).

2.0 RECEIVING WATERS:

WATERS WITHIN ONE MILE (NEAREST STRAIGHT LINE DISTANCE) THAT ARE LIKELY TO RECEIVE STORMWATER RUNOFF FROM THE PROJECT SITE (CSW PERMIT ITEM 5.10) INCLUDE:

NAME OF WATER BODY	TYPE	WATER BODY ID	SPECIAL WATER?	IMPAIRED WATER? (1)	PUBLIC WATER WITH WORK IN WATER RESTRICTIONS?
OWASSO BASIN	BASIN	NONE	NO	NO	NO
GERVAIS CREEK	CREEK	NONE	NO	NO	YES
GERVAIS LAKE	LAKE	62-0007-00	NO	YES	YES

(1) REFER TO CSW PERMIT SECTION 23. IMPAIRED WATER FOR THE FOLLOWING POLLUTANT(S) OR STRESSOR(S): PHOSPHORUS (NUTRIENT EUTROPHICATION BIOLOGICAL INDICATORS), TURBIDITY, TOTAL SUSPENDED SOLIDS (TSS), DISSOLVED OXYGEN, OR AQUATIC BIOTA (FISH BIOASSESSMENT, AQUATIC PLANT BIOASSESSMENT, AND AQUATIC MACROINVERTEBRATE BIOASSESSMENT)

2.1 SPECIAL AND IMPAIRED WATERS: THE MPCA'S SPECIAL AND IMPAIRED WATERS SEARCH TOOL WAS USED TO LOCATE SPECIAL AND IMPAIRED WATERS WITHIN ONE MILE (AERIAL RADIUS MEASUREMENT) OF THE PROJECT SITE. GERVAIS LAKE HAS AN EPA-APPROVED IMPAIRMENT FOR MERCURY IN FISH TISSUE. THESE IMPAIRMENTS ARE CONSIDERED NON-CONSTRUCTION RELATED AND DO NOT REQUIRE ADDITIONAL BEST MANAGEMENT PRACTICES (BMPs) OR PLAN REVIEW FOR COMPLIANCE WITH THE GENERAL PERMIT. (CSW PERMIT ITEM 2.7 AND SECTION 23)

THIS PROJECT DOES NOT INCLUDE ANY ADDITIONAL BMPs OR OTHER SPECIFIC CONSTRUCTION RELATED IMPLEMENTATION ACTIVITIES IDENTIFIED IN AN APPROVED TOTAL MAXIMUM DAILY LOAD (TMDL). (CSW PERMIT ITEM 5.19)

2.2 PUBLIC WATERS WITH WORK IN WATER RESTRICTIONS: OWASSO BASIN AND GERVAIS CREEK ARE NOT IDENTIFIED BY THE DNR AS A PUBLIC WATER. WORK IS RESTRICTED FOR LAKES IN THE SOUTHERN AREA OF MINNESOTA BETWEEN APRIL 1ST THROUGH JUNE 30TH. DURING THE RESPECTIVE RESTRICTION PERIODS, ALL EXPOSED SOILS WITHIN 200 FEET OF THE WATER'S EDGE WILL HAVE EROSION PREVENTION STABILIZATION ACTIVITIES INITIATED IMMEDIATELY AFTER CONSTRUCTION ACTIVITY HAS CEASED (AND COMPLETED WITHIN 24 HOURS). (CSW PERMIT ITEM 5.11)

2.2 PUBLIC WATERS WITH WORK IN WATER RESTRICTIONS: THIS PROJECT DOES NOT INCLUDE WORK IN PUBLIC WATERS. (CSW PERMIT ITEM 5.11)

2.3 WETLAND IMPACTS: THIS PROJECT DOES NOT INCLUDE WETLAND IMPACTS. (CSW PERMIT ITEMS 2.4 AND 2.10, AND SECTION 22)

2.4 ENVIRONMENTAL REVIEW AND OTHER REQUIRED REVIEWS: STORMWATER MITIGATION MEASURES ARE NOT REQUIRED AS A RESULT OF AN ENVIRONMENTAL REVIEW (E.G., EAW OR EIS), ENDANGERED OR THREATENED SPECIES REVIEW, ARCHEOLOGICAL SITE REVIEW, OR OTHER LOCAL, STATE, OR FEDERAL REVIEW CONDUCTED FOR THE PROJECT. (CSW PERMIT ITEMS 2.8, 2.9, AND 5.16)

2.5 KARST AREAS OR DRINKING WATER SUPPLY MANAGEMENT AREAS: THIS PROJECT DOES NOT INCLUDE ANY KARST OR DRINKING WATER SUPPLY MANAGEMENT AREAS. (CSW PERMIT ITEMS 16.19, 16.20, AND 18.10)

3.0 PROJECT PLANS AND SPECIFICATIONS:

REQUIRED FEATURE	SHEET NUMBER
• PROJECT LOCATION AND CONSTRUCTION LIMITS	TBD
• EXISTING AND FINAL GRADES, INCLUDING DRAINAGE AREA BOUNDARIES, DIRECTIONS OF FLOW AND ALL DISCHARGE POINTS WHERE STORMWATER IS LEAVING THE SITE OR ENTERING A SURFACE WATER	TBD
• SOIL TYPES AT THE SITE	TBD
• LOCATIONS OF IMPERVIOUS SURFACES	TBD
• LOCATIONS OF AREAS NOT TO BE DISTURBED (E.G., BUFFER ZONES, WETLANDS, ETC.)	TBD
• LOCATIONS OF AREAS OF STEEP SLOPES	TBD
• LOCATIONS OF AREAS WHERE CONSTRUCTION WILL BE PHASED TO MINIMIZE DURATION OF EXPOSED SOILS	TBD
• PORTIONS OF THE SITE THAT DRAIN TO A PUBLIC WATER WITH DNR WORK IN WATER RESTRICTIONS FOR FISH SPAWNING TIMEFRAMES	TBD
• LOCATIONS OF ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPs AS REQUIRED IN PERMIT SECTIONS 8 THROUGH 10 AND 14 THROUGH 19	TBD
• BUFFER ZONES AS REQUIRED IN PERMIT ITEMS 9.17 AND 23.11	TBD
• LOCATIONS OF POTENTIAL POLLUTION-GENERATING ACTIVITIES IDENTIFIED IN PERMIT SECTION 12	TBD
• STANDARD DETAILS FOR EROSION AND SEDIMENT CONTROL BMPs TO BE INSTALLED AT THE SITE	TBD

4.0 BEST MANAGEMENT PRACTICES (BMPs):

4.1 EROSION PREVENTION PRACTICES:

- BEFORE LAND DISTURBING ACTIVITIES BEGIN, THE LIMITS OF THE AREAS TO BE DISTURBED DURING CONSTRUCTION WILL BE DELINEATED WITH FLAGS, STAKES, SIGNS, SILT FENCE, ETC.
- TEMPORARY STABILIZATION OF SOILS AND SOIL STOCKPILES: (CSW PERMIT ITEMS 8.4, 8.5, AND 23.9)
 - AREAS OF EXPOSED SOIL WILL BE STABILIZED WITH EROSION CONTROL BLANKET, PRESERVATION OF MATURE VEGETATION, OR EQUIVALENT MEASURES.
 - IF PRESENT, SOIL STOCKPILES WILL BE STABILIZED WITH MULCH, STRAW, OR PLASTIC SHEETING, OR EQUIVALENT MEASURES.
 - TEMPORARY STOCKPILES WITHOUT SIGNIFICANT SILT, CLAY, OR ORGANIC COMPONENTS (E.G., CLEAN AGGREGATE STOCKPILES, DEMOLITION CONCRETE STOCKPILES, SAND STOCKPILES) AND THE CONSTRUCTED BASE COMPONENTS OF ROADS, PARKING LOTS, AND SIMILAR SURFACES ARE EXEMPT FROM THESE STABILIZATION REQUIREMENTS.
- STABILIZATION OF DITCH AND SWALE WETTED PERIMETERS: (CSW PERMIT ITEMS 8.6 THROUGH 8.8)
 - IF SOILS WITHIN EXISTING STORMWATER DITCHES OR SWALES ARE DISTURBED, THEY WILL BE STABILIZED WITH EROSION CONTROL BLANKET, RIPRAP, OR EQUIVALENT MEASURES.
 - MULCH, HYDROMULCH, TACKIFIER, POLYACRYLAMIDE, OR SIMILAR EROSION PREVENTION PRACTICES WILL NOT BE USED TO STABILIZE ANY PART OF AN EXISTING STORMWATER DITCH OR SWALE WITH A CONTINUOUS SLOPE OF GREATER THAN 2 PERCENT.
 - THE LAST 200 LINEAL FEET OF LENGTH OF THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DITCH OR SWALE THAT DRAINS WATER FROM ANY PORTION OF THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE SITE, WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE INTO ANY SURFACE WATER WILL BE STABILIZED WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE.
 - STABILIZATION OF THE REMAINING PORTIONS OF ANY TEMPORARY OR PERMANENT DITCHES OR SWALES WILL BE COMPLETED WITHIN 14 CALENDAR DAYS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE AND CONSTRUCTION IN THAT PORTION OF THE DITCH HAS TEMPORARILY OR PERMANENTLY CEASED.
- ENERGY DISSIPATION AT PIPE OUTLETS: ENERGY DISSIPATION AT PIPE OUTLETS WILL BE PROVIDED WITH ONE OR MORE OF THE FOLLOW METHODS: RIP RAP, SPLASH PADS, GABIONS, OR EQUIVALENT MEASURES. (CSW PERMIT ITEM 8.9)
- EROSION PREVENTION IMPLEMENTATION TIMELINES: (CSW PERMIT ITEMS 5.4, 8.4 THROUGH 8.6, AND 23.9)
 - STABILIZATION OF EXPOSED SOIL AREAS (INCLUDING STOCKPILES) WILL BE INITIATED IMMEDIATELY TO LIMIT SOIL EROSION WHENEVER ANY CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS.
 - IF THE EXPOSED SOIL AREAS DRAIN TO A DISCHARGE POINT THAT IS WITHIN ONE MILE (AERIAL RADIUS MEASUREMENT) OF A SPECIAL OR IMPAIRED WATER (SEE SECTION 2.0), STABILIZATION OF EXPOSED SOIL AREAS (INCLUDING STOCKPILES) WILL BE INITIATED IMMEDIATELY TO LIMIT SOIL EROSION WHENEVER ANY CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 7 CALENDAR DAYS.
 - THE FOLLOWING ACTIVITIES CAN BE TAKEN TO INITIATE STABILIZATION: PREPPING THE SOIL FOR VEGETATIVE OR NON-VEGETATIVE STABILIZATION, APPLYING MULCH OR OTHER NON-VEGETATIVE PRODUCT TO THE EXPOSED SOIL AREA, OR SEEDING OR PLANTING THE EXPOSED AREA.
- ADDITIONAL EROSION PREVENTION MEASURES: THE FOLLOWING ADDITIONAL EROSION PREVENTION METHODS WILL BE IMPLEMENTED AT THE SITE DURING CONSTRUCTION: (CSW PERMIT ITEMS 8.2, 8.3, AND 8.10)
 - CONSTRUCTION PHASING WILL BE UTILIZED TO MINIMIZE THE AREA OF SOIL EXPOSED AT ANY ONE TIME.
 - ON BOTH SITES; RYAN DRIVE AND KELLER PARKWAY ONLY REMOVE BITUMINOUS PAVEMENT NECESSARY TO REMOVE AND REPLACE THE EXISTING CULVERTS TO MINIMIZE THE AMOUNT OF DISTURBED AREA OF EXPOSED SOIL. ONCE NEW CULVERTS ARE INSTALLED THE REMAINING BITUMINOUS PAVEMENT NECESSARY TO COMPLETE THE GRADE CHANGES CAN BE REMOVED JUST PRIOR TO RAISING GRADES AND MATCHING EXISTING PAVEMENTS AND COMPLETING THE REPLACEMENT OF THE BITUMINOUS PAVEMENT.
 - SOIL DISTURBANCE WILL BE MINIMIZED WHEREVER POSSIBLE TO AID IN EROSION PREVENTION.
 - EXISTING VEGETATION WILL BE PRESERVED WHEREVER POSSIBLE TO LIMIT EXPOSED SOIL AND THUS WILL SERVE AS NATURAL VEGETATIVE BUFFERS.
 - EXPOSED SOIL ON STEEP SLOPES ($\leq 3H:1V$) WILL BE STABILIZED USING EROSION CONTROL BLANKET.

4.2 SEDIMENT CONTROL PRACTICES:

- DOWNGRADIENT PERIMETER CONTROLS: (CSW PERMIT ITEMS 9.2 THROUGH 9.6)
 - SEDIMENT CONTROL PRACTICES WILL BE ESTABLISHED ON ALL DOWNGRADIENT PERIMETERS AND LOCATED UPGRADIENT OF ANY BUFFER ZONES. PERIMETER SEDIMENT CONTROLS WILL INCLUDE: SILT FENCE, SEDIMENT CONTROL LOGS, FLOTATION SILT CURTAIN, RETAIN EXISTING VEGETATION WHERE POSSIBLE, BERMS, AND ROCK CHECKS, OR EQUIVALENT MEASURES.
 - PERIMETER SEDIMENT CONTROL PRACTICES MUST BE INSTALLED BEFORE ANY UPGRADIENT LAND-DISTURBING ACTIVITIES BEGIN AND REMAIN IN PLACE UNTIL PERMANENT COVER HAS BEEN ESTABLISHED.
 - IF SEDIMENT CONTROL PRACTICES HAVE BEEN ADJUSTED OR REMOVED TO ACCOMMODATE SHORT-TERM ACTIVITIES (SUCH AS CLEARING, GRUBBING, OR PASSAGE OF VEHICLES), THE CONTROLS MUST BE RE-INSTALLED IMMEDIATELY AFTER THE SHORT-TERM ACTIVITY HAS BEEN COMPLETED. SEDIMENT CONTROL PRACTICES MUST BE RE-INSTALLED BEFORE THE NEXT PRECIPITATION EVENT, EVEN IF THE SHORT-TERM ACTIVITY IS NOT COMPLETE.
 - IF THE DOWNGRADIENT SEDIMENT CONTROLS ARE OVERLOADED (BASED ON FREQUENT FAILURE OR EXCESSIVE MAINTENANCE REQUIREMENT), INSTALL ADDITIONAL UPGRADIENT SEDIMENT CONTROL PRACTICES OR REDUNDANT BMPs TO ELIMINATE THE OVERLOADING AND AMEND THE SWPPP TO IDENTIFY THESE ADDITIONAL PRACTICES.
- SOIL STOCKPILE PERIMETER CONTROLS: TEMPORARY SOIL STOCKPILES WILL BE SURROUNDED BY: SILT FENCE, SEDIMENT CONTROL LOGS, PLASTIC SHEETING, OR EQUIVALENT MEASURES, AND SHALL NOT BE PLACED IN ANY NATURAL BUFFERS OR SURFACE WATERS. (CSW PERMIT ITEMS 9.9 AND 9.10)
- STORM DRAIN INLET PROTECTION: (CSW PERMIT ITEMS 9.7 AND 9.8)
 - INLET PROTECTION BMPs WILL BE INSTALLED AROUND ALL STORM DRAIN INLETS DOWNGRADIENT OF CONSTRUCTION ACTIVITIES.
 - STORM DRAIN INLETS WILL BE PROTECTED UNTIL ALL SOURCES WITH POTENTIAL FOR DISCHARGING TO THE INLET HAVE BEEN STABILIZED.
 - INLET PROTECTION BMPs WILL BE: FILTER SILT FENCE BOX, SEDIMENT CONTROL LOGS, OR EQUIVALENT MEASURES.
- VEHICLE TRACKING BMPs: (CSW PERMIT ITEMS 9.11 AND 9.12)
 - VEHICLE TRACKING BMPs WILL BE INSTALLED TO MINIMIZE THE TRACKING OUT OF SEDIMENT FROM THE CONSTRUCTION AREA AND WILL INCLUDE: ROCK OR WOODCHIP PADS, MUD MATS, OR AN EQUIVALENT SYSTEM.
 - IF SUCH VEHICLE TRACKING BMPs ARE NOT ADEQUATE TO PREVENT SEDIMENT FROM BEING TRACKED ONTO THE PAVED ROAD, STREET SWEEPING WILL ALSO BE EMPLOYED. SEDIMENT WILL BE REMOVED BY SWEEPING WITHIN 24 HOURS.
- MINIMIZATION OF SOIL COMPACTION AND PRESERVATION OF TOPSOIL: SOIL COMPACTION WILL BE MINIMIZED AND TOPSOIL WILL BE PRESERVED WHERE POSSIBLE. (CSW PERMIT ITEMS 5.24, 9.14, AND 9.15)
- PRIORITIZATION OF ONSITE INFILTRATION AND SEDIMENT REMOVAL: (CSW PERMIT ITEM 9.16)
 - PRIOR TO OFFSITE DISCHARGE, INFILTRATION AND SEDIMENT REMOVAL WILL BE IMPLEMENTED ONSITE WHERE POSSIBLE.
 - DISCHARGES FROM BMPs WILL BE DIRECTED TO VEGETATED AREAS OF THE SITE (INCLUDING ANY NATURAL BUFFERS) IN ORDER TO INCREASE SEDIMENT REMOVAL AND MAXIMIZE STORMWATER INFILTRATION. IF EROSION IS NOTED TO OCCUR AS THE RESULT OF SUCH A DISCHARGE, VELOCITY DISSIPATION BMPs WILL BE CONSIDERED AND INSTALLED AS NECESSARY TO PREVENT EROSION.
- BUFFER ZONE OR REDUNDANT SEDIMENT CONTROLS TO PROTECT SURFACE WATERS: (CSW PERMIT ITEM 9.17)
 - A 50-FOOT NATURAL BUFFER WILL BE PRESERVED IN CONSTRUCTION AREAS DISCHARGING TO A NON-SPECIAL/NON-IMPAIRED SURFACE WATER OR WETLAND. IF A NON-SPECIAL/NON-IMPAIRED SURFACE WATER OR WETLAND IS LOCATED WITHIN 50 FEET OF THE PROJECT'S EARTH DISTURBANCES AND STORMWATER FLOWS TO THE SURFACE WATER, OR WHEN A BUFFER IS INFEASIBLE, REDUNDANT SEDIMENT CONTROLS WILL BE PROVIDED.
 - REDUNDANT PERIMETER CONTROLS WILL BE INSTALLED AT LEAST 5 FEET APART UNLESS LIMITED BY LACK OF AVAILABLE SPACE.
- SEDIMENTATION TREATMENT CHEMICALS: NOT APPLICABLE; USE OF SEDIMENTATION TREATMENT CHEMICALS (E.G., POLYMERS, FLOCCULANTS, ETC.) IS NOT ANTICIPATED AS PART OF THE PROJECT. (CSW PERMIT ITEMS 5.22 AND 9.18)
- TEMPORARY SEDIMENT BASIN(S): THE PROJECT WILL NOT INCLUDE 10 OR MORE ACRES OF DISTURBED SOIL DRAINING TO A COMMON LOCATION OR 5 OR MORE ACRES DRAINING TO A COMMON LOCATION WITHIN 1 MILE OR A SPECIAL OR IMPAIRED WATER THEREFORE TEMPORARY SEDIMENT BASINS ARE NOT REQUIRED. (CSW PERMIT ITEMS 5.6, 9.13, AND 23.10 AND SECTION 14)

4.3 DEWATERING AND BASIN DRAINING: (CSW PERMIT SECTION 10 AND ITEM 10.5)

- THE FOLLOWING WILL BE USED TO TREAT/DISPOSE OF TURBID OR SEDIMENT-LADEN WATER DURING DEWATERING: FILTER BAGS, OR EQUIVALENT MEASURES.
- THE FOLLOWING WILL BE USED TO PREVENT EROSION OR SCOUR OF DISCHARGE POINTS DURING DEWATERING OR BASIN DRAINING: RIPRAP OR TURF REINFORCEMENT MAT, OR EQUIVALENT MEASURES.
- FILTERS FOR BACKWASH WATER WILL BE MANAGED ON THE SITE OR PROPERLY DISPOSED OF BY: HAULING OFF SITE OR EQUIVALENT MEASURES.

4.4 BMP DESIGN FACTORS: THE FOLLOWING BMP DESIGN FACTORS HAVE BEEN CONSIDERED IN DESIGNING THE TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL BMPs:

- EXPECTED AMOUNT, FREQUENCY, INTENSITY, AND DURATION OF PRECIPITATION: APPROXIMATELY 2.4 INCHES OF PRECIPITATION FROM THE 1-YEAR, 24 HOUR STORM EVENT (ATLAS 14).
- NATURE OF STORMWATER RUNOFF AND RUN-ON AT THE SITE, INCLUDING FACTORS SUCH AS EXPECTED FLOW FROM IMPERVIOUS SURFACES, SLOPES, AND SITE DRAINAGE FEATURES: RUN OFF FROM EXISTING PAVED ROAD DITCHES.
- STORMWATER VOLUME, VELOCITY, AND PEAK FLOW RATES TO MINIMIZE DISCHARGE OF POLLUTANTS IN STORMWATER AND TO MINIMIZE CHANNEL AND STREAMBANK EROSION AND SCOUR IN THE IMMEDIATE VICINITY OF DISCHARGE POINTS: RIPRAP PROTECTION AT RUN OFF DISCHARGE POINTS.
- RANGE OF SOIL PARTICLE SIZES EXPECTED TO BE PRESENT: CLAY, SANDY CLAY, SANDY SILT, SILTY SAND, SAND, AND GRAVEL.

4.5 BMP QUANTITIES: ANTICIPATED EROSION PREVENTION AND SEDIMENT CONTROL BMP QUANTITIES NEEDED FOR THE LIFE OF THE PROJECT: APPROXIMATELY 1,460 FEET OF A COMBINATION OF SILT FENCE AND SEDIMENT LOGS, 1 ROCK CHECK, 80 FEET OF FLOTATION SILT CURTAIN, 0.25 ACRE OF SEED AND BLANKET, AND 640 SQ. YD. SOD, (SEE PROJECT BID FORM FOR MORE DETAILS).

(SEE PAGE 2 OF 2)

ISSUED FOR PROJECT APPROVAL

CADD USER: JACOB M. DUMRE FILE: M:\DESIGN\2621379\262137900\262137900_G-02-3_RYAN DR KELLER PKWY SWPPP.DWG PLOT SCALE: 1/2" PLOT DATE: 2/28/2021 9:41 AM

		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.		CLIENT 02/28/21				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435		Scale AS SHOWN		RYAN DRIVE AND KELLER PKWY CONVEYENCE UPGRADES		BARR PROJECT No. 23/62-1379.00	
		PRINTED NAME		CONSTRUCTION				Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277		Date 1/21/2021		Drawn JNB		CLIENT PROJECT No.	
		SIGNATURE		RELEASED TO/FOR		A B C 0 1 2 3		Ph: (952) 832-2601 www.barr.com		Checked SOR		Designed JNB		DWG. No. G-02	
		DATE		DATE RELEASED						Approved BJL		STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PAGE 1 OF 2		REV. No. A	
NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION										
				02/25/2021	ISSUED FOR PROJECT APPROVAL										

5.0 PERMANENT STORMWATER MANAGEMENT SYSTEM:

A PERMANANT STORMWATER MANAGEMENT SYSTEM IS REQUIRED IF THE PROJECT RESULTS IN ONE ACRE OR MORE OF NEW IMPERVIOUS SURFACES OR RESULTS IN A NET INCREASE OF ONE OR MORE ACRES OF CUMMULATIVE NEW IMPERVIOUS SURFACES IN TOTAL OR IF THE PROJECT IS PART OF A LARGER PLAN OF DEVELOPMENT. (CSW PERMIT ITEM 15.3)

5.1 A PERMANENT STORMWATER TREATMENT SYSTEM IS NOT REQUIRED. (CSW PERMIT ITEMS 5.15, 15.4-15.9, AND 23.14)

5.6 THIS PROJECT DOES NOT DISCHARGE TO A TROUT STREAM (OR A TRIBUTARY TO A TROUT STREAM). (CSW PERMIT ITEM 23.12)

6.0 INSPECTION AND MAINTENANCE ACTIVITIES:

6.1 PERSONS WITH REQUIRED TRAINING: TRAINED INDIVIDUALS INCLUDE THOSE PARTIES RESPONSIBLE FOR INSTALLING, SUPERVISING, REPAIRING, INSPECTING, AND MAINTAINING EROSION PREVENTION AND SEDIMENT CONTROL BMPS AT THE SITE. TRAINED INDIVIDUALS ARE ALSO RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND COMPLIANCE WITH THE GENERAL PERMIT UNTIL THE CONSTRUCTION ACTIVITIES ARE COMPLETE. PERMANENT COVER HAS BEEN ESTABLISHED, AND A NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED. (CSW PERMIT ITEMS 5.20, 5.21, AND 11.9 AND SECTION 21)

THESE INDIVIDUALS WILL BE TRAINED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL PERMIT, INCLUDING THE REQUIREMENT THAT THE CONTENT AND EXTENT OF TRAINING WILL BE COMMENSURATE WITH THE INDIVIDUAL'S JOB DUTIES AND RESPONSIBILITIES.

BELOW IS A LIST OF PEOPLE RESPONSIBLE FOR THIS PROJECT WHO ARE KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMPS.

TRAINED INDIVIDUAL	RESPONSIBILITY	TRAINING ENTITY*	TRAINING DATE
JACOB N. BURGGRAFF BARR ENGINEERING CO. 4300 MARKETPOINTE DR. BLOOMINGTON, MN 55435 952-832-2743 JBURGGRAFF@BARR.COM	REPARATION OF THE SWPPP	DESIGN OF CONSTRUCTION SWPPPS U OF MN, APRIL 2008, UPDATED NOV. 2010, MARCH 2014, MAY 2017 EXPIRES MAY 31, 2020	MAY 2018
GREG NELSON BARR ENGINEERING CO. 4300 MARKETPOINTE DR. BLOOMINGTON, MN 55435 952-832-2770 612-599-8889 GNELSON@BARR.COM	OVERSIGHT OF SWPPP IMPLEMENTATION, REVISION, AND AMMENDMENT	CONSTRUCTION SITE MANAGEMENT BARR ENGINEERING	MAY 2018
[INSERT NAME]	PERFORMANCE OF SWPPP INSPECTIONS	[INSERT ENTITY]	[INSERT DATE]
[INSERT NAME]	PERFORMANCE OR SUPERVISION OF INSTALLATION, MAINTENANCE, AND REPAIR OF BMPS	[INSERT ENTITY]	[INSERT DATE]

*TRAINING DOCUMENTATION AVAILABLE UPON REQUEST.

6.2 FREQUENCY OF INSPECTIONS: A TRAINED PERSON WILL ROUTINELY INSPECT THE ENTIRE CONSTRUCTION SITE. (CSW PERMIT ITEMS 11.2, 11.10, AND 23.13)

- AT LEAST ONCE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION
- WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS

INSPECTION FREQUENCY MAY BE ADJUSTED UNDER THE FOLLOWING CIRCUMSTANCES:

- WHERE PARTS OF THE CONSTRUCTION AREAS HAVE PERMANENT COVER, BUT WORK REMAINS ON OTHER PARTS OF THE SITE, INSPECTIONS OF THE AREAS WITH PERMANENT COVER MAY BE REDUCED TO ONCE PER MONTH.
- WHERE CONSTRUCTION AREAS HAVE PERMANENT COVER AND NO CONSTRUCTION ACTIVITY IS OCCURRING ON THE SITE, INSPECTIONS CAN BE REDUCED TO ONCE PER MONTH AND, AFTER 12 MONTHS, MAY BE SUSPENDED COMPLETELY UNTIL CONSTRUCTION ACTIVITY RESUMES.
- WHERE CONSTRUCTION ACTIVITY HAS BEEN SUSPENDED DUE TO FROZEN GROUND CONDITIONS, THE INSPECTIONS MAY BE SUSPENDED. THE REQUIRED INSPECTIONS AND MAINTENANCE SCHEDULE MUST BEGIN WITHIN 24 HOURS AFTER RUNOFF OCCURS AT THE SITE OR UPON RESUMING CONSTRUCTION, WHICHEVER COMES FIRST.

6.3 INSPECTION REQUIREMENTS: EACH CONSTRUCTION STORMWATER SITE INSPECTION WILL INCLUDE INSPECTION OF THE FOLLOWING AREAS: (CSW PERMIT ITEMS 11.3 THROUGH 11.8)

- ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS AND POLLUTION PREVENTION MANAGEMENT MEASURES
- SURFACE WATERS FOR EVIDENCE OF EROSION AND SEDIMENT DEPOSITION
- CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING
- STREETS AND OTHER AREAS ADJACENT TO THE PROJECT FOR EVIDENCE OF OFF SITE ACCUMULATIONS OF SEDIMENT

6.4 MAINTENANCE REQUIREMENTS: MAINTENANCE OF THE FOLLOWING AREAS AND BMPS WILL BE PERFORMED AS FOLLOWS: (CSW PERMIT ITEMS 11.3 THROUGH 11.8)

- NONFUNCTIONAL BMPS WILL BE REPAIRED, REPLACED, OR SUPPLEMENTED WITH FUNCTIONAL BMPS BY THE END OF THE NEXT BUSINESS DAY AFTER DISCOVERY OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.
- PERIMETER CONTROL DEVICES WILL BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN THEY BECOME NONFUNCTIONAL OR THE SEDIMENT REACHES 1/2 OF THE HEIGHT OF THE DEVICE.
- TEMPORARY AND PERMANENT SEDIMENTATION BASINS WILL BE DRAINED AND THE SEDIMENT REMOVED WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME.
- DELTA AND SEDIMENT DEPOSITED IN SURFACE WATERS WILL BE REMOVED, AND THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL WILL BE RE-STABILIZED. THE REMOVAL AND STABILIZATION WILL BE COMPLETED WITHIN 7 CALENDAR DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. IF PRECLUDED DUE TO ACCESS CONSTRAINTS, REASONABLE EFFORTS TO OBTAIN ACCESS WILL BE USED. REMOVAL AND STABILIZATION WILL TAKE PLACE WITHIN 7 CALENDAR DAYS OF OBTAINING ACCESS.
- TRACKED SEDIMENT ON PAVED SURFACES WILL BE REMOVED WITHIN 1 CALENDAR DAY OF DISCOVERY.

- AREAS UNDERGOING STABILIZATION WILL BE RESTABILIZED AS NECESSARY TO ACHIEVE REQUIRED COVER.

6.5 RECORDKEEPING REQUIREMENTS: (CSW PERMIT ITEMS 11.11 AND 24.5 AND SECTIONS 6 AND 20)

- ALL INSPECTIONS AND MAINTENANCE ACTIVITIES WILL BE RECORDED IN WRITING WITHIN 24 HOURS OF BEING CONDUCTED AND THESE RECORDS WILL BE RETAINED WITH THE SWPPP. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY WILL INCLUDE THE DATE AND TIME; NAME OF INSPECTOR(S); FINDINGS OF INSPECTIONS; CORRECTIVE ACTIONS (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES); AND DATE OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCHES IN 24 HOURS AND THE AMOUNT OF RAINFALL FOR EACH EVENT.
 - IF ANY DISCHARGE IS OBSERVED DURING THE INSPECTION, THE LOCATION AND APPEARANCE OF THE DISCHARGE (I.E., COLOR, ODOR, SETTLED OR SUSPENDED SOLIDS, OIL SHEEN, AND OTHER OBVIOUS INDICATORS OF POLLUTANTS) WILL BE DOCUMENTED AND A PHOTOGRAPH WILL BE TAKEN.
- THE SWPPP WILL BE AMENDED TO INCLUDE ADDITIONAL OR MODIFIED BMPS TO CORRECT PROBLEMS OR ADDRESS SITUATIONS WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER, OR SEASONAL CONDITIONS THAT HAS A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER.
 - THE SWPPP WILL BE AMENDED WHEN INSPECTIONS OR INVESTIGATIONS BY THE SITE OWNER, OPERATOR, OR CONTRACTORS OR BY USEPAM/PCA OFFICIALS INDICATE THAT THE SWPPP IS NOT EFFECTIVE IN ELIMINATING OR MINIMIZING THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER; THE DISCHARGES ARE CAUSING WATER QUALITY STANDARD EXCEEDANCES; OR THE SWPPP IS NOT CONSISTENT WITH A USEPA APPROVED TMDL.
 - ANY AMENDMENTS TO THE SWPPP PROPOSED AS A RESULT OF THE INSPECTION WILL BE DOCUMENTED AS REQUIRED WITHIN 7 CALENDAR DAYS.
 - AMENDMENTS WILL BE COMPLETED BY AN APPROPRIATELY TRAINED INDIVIDUAL. CHANGES INVOLVING THE USE OF A LESS STRINGENT BMP WILL INCLUDE A JUSTIFICATION DESCRIBING HOW THE REPLACEMENT BMP IS EFFECTIVE FOR THE SITE CHARACTERISTICS.
- RECORDS RETENTION: THE SWPPP, INCLUDING ALL CHANGES TO IT, AND INSPECTION AND MAINTENANCE RECORDS WILL BE KEPT AT THE SITE DURING CONSTRUCTION BY THE PERMITTEE WHO HAS OPERATIONAL CONTROL OF THE SITE. THE SWPPP CAN BE KEPT IN EITHER A FIELD OFFICE OR IN AN ON SITE VEHICLE DURING NORMAL WORKING HOURS.
- RECORD AVAILABILITY: THE PERMITTEES WILL MAKE THE SWPPP, INCLUDING INSPECTION REPORTS, MAINTENANCE RECORDS, AND TRAINING RECORDS, AVAILABLE TO FEDERAL, STATE, AND LOCAL OFFICIALS WITHIN THREE DAYS UPON REQUEST FOR THE DURATION OF THE PERMIT COVERAGE AND FOR THREE YEARS FOLLOWING THE NOTICE OF TERMINATION.
- COPIES OF INSPECTION RECORDS FOR THE TIME PERIOD OF THAT PAYMENT APPLICATION SHALL ACCOMPANY THE PAYMENT APPLICATION TO THE RAMSEY-WASHINGTON METRO WATERSHED DISTRICT.

7.0 POLLUTION PREVENTION MEASURES:

- ANY CONSTRUCTION PRODUCTS AND LANDSCAPE MATERIALS THAT HAVE THE POTENTIAL TO LEACH POLLUTANTS WILL BE STORED UNDER COVER (E.G., PLASTIC SHEETING OR TEMPORARY ROOFS) TO PREVENT DISCHARGE OF POLLUTANTS THROUGH MINIMIZATION OF CONTACT WITH STORMWATER. STORAGE OF SUCH MATERIALS WITHIN THE PROJECT AREA WILL BE MINIMIZED TO THE EXTENT POSSIBLE. (CSW PERMIT ITEM 12.2)
- PESTICIDES, FERTILIZERS, AND TREATMENT CHEMICALS WILL BE STORED UNDER COVER (E.G., PLASTIC SHEETING, TEMPORARY ROOFS, WITHIN A BUILDING, OR IN WEATHER-PROOF CONTAINERS) TO PREVENT DISCHARGE OF POLLUTANTS THROUGH MINIMIZATION OF CONTACT WITH STORMWATER. STORAGE OF SUCH MATERIALS WITHIN THE PROJECT AREA WILL BE MINIMIZED TO THE EXTENT POSSIBLE. (CSW PERMIT ITEM 12.3)
- HAZARDOUS MATERIALS AND TOXIC WASTE (E.G., OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT SOLVENTS, PETROLEUM-BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) WILL BE STORED AND DISPOSED OF IN COMPLIANCE WITH MINNESOTA RULES CHAPTER 7045, INCLUDING SECONDARY CONTAINMENT (AS APPLICABLE). HAZARDOUS MATERIALS WILL BE PROPERLY STORED IN SEALED CONTAINERS TO PREVENT SPILLS, LEAKS, OR OTHER DISCHARGES AND PREVENT PRECIPITATION FROM FALLING ONTO THE CONTAINERS OR STORED HAZARDOUS MATERIALS. (CSW PERMIT ITEMS 2.3 AND 12.4)
- SOLID WASTE WILL BE COLLECTED, STORED, AND DISPOSED OF PROPERLY IN COMPLIANCE WITH MINNESOTA RULES CHAPTER 7035. THIS INCLUDES STORAGE WITHIN COVERED TRASH CONTAINERS AND DAILY REMOVAL OF LITTER AND DEBRIS. STORAGE OF SOLID WASTE WITHIN THE PROJECT AREA WILL BE MINIMIZED TO THE EXTENT POSSIBLE. (CSW PERMIT ITEM 12.5)
- PORTABLE TOILETS WILL BE LOCATED AWAY FROM SURFACE WATERS AND POSITIONED AND SECURED TO THE GROUND SO THEY WILL NOT BE TIPPED OR KNOCKED OVER. SANITARY WASTE WILL BE DISPOSED OF IN ACCORDANCE WITH MINNESOTA RULES, CHAPTER 7041. PORTABLE TOILETS WILL BE PERIODICALLY EMPTIED AND THE WASTE HAULED OFF-SITE BY A LICENSED HAULER. (CSW PERMIT ITEM 12.6)
- VEHICLE FUELING WILL ONLY OCCUR IN DESIGNATED AREAS. SPILL KITS SIZED APPROPRIATELY FOR THE AMOUNT OF REFUELING TAKING PLACE WILL BE LOCATED. SPILL KITS WILL BE CLEARLY LABELED AND CONTAIN MATERIALS TO ASSIST IN SPILL CLEANUP INCLUDING ABSORBENT PADS, BOOMS FOR CONTAINING SPILLS, AND HEAVY-DUTY PROTECTIVE GLOVES. SPILLS WILL BE REPORTED TO THE MINNESOTA DUTY OFFICER AS REQUIRED BY MINNESOTA STATUTES, SECTION 115.061. (CSW PERMIT ITEMS 2.3 AND 12.7)
 - ANY FUEL TANKS BROUGHT ON-SITE WILL HAVE PROPERLY SIZED CONTAINMENT AND WILL NOT BE TAPPED OFF TO AVOID SPILLS FROM OVERFILLING. FUEL TANKS WILL MEET INDUSTRY STANDARDS (DESIGNED TO HOLD FUEL TYPE, PROPERLY MAINTAINED, NOT ILLEGALLY MODIFIED, NOT MISSING LEAK INDICATOR FLOATS FOR DOUBLE WALLED TANKS, SIGHT GAUGES NOT USED, ETC.) OR BE REMOVED FROM THE WORK AREA.
 - GUIDELINES FOR SPILL PREVENTION AND RESPONSE INCLUDE:
 - TAKE REASONABLE STEPS TO PREVENT THE DISCHARGE OF SPILLED OR LEAKED CHEMICALS, INCLUDING FUEL, FROM ANY AREA WHERE CHEMICALS OR FUEL WILL BE LOADED OR UNLOADED, INCLUDING THE USE OF DRIP PANS OR ABSORBENTS UNLESS INFEASIBLE;
 - PERFORM REGULAR PREVENTATIVE MAINTENANCE ON TANKS AND FUEL LINES;
 - INSPECT PUMPS, CYLINDERS, HOSES, VALVES, AND OTHER MECHANICAL EQUIPMENT ON-SITE FOR DAMAGE OR DETERIORATION;
 - DO NOT WASH OR RINSE FUELING AREAS WITH WATER;
 - MAINTAIN ADEQUATE SUPPLIES TO CLEAN UP DISCHARGED MATERIALS AND PROVIDE AN APPROPRIATE DISPOSAL METHOD FOR RECOVERED SPILLED MATERIALS;
 - REPORT AND CLEAN UP SPILLS IMMEDIATELY AS REQUIRED BY MINNESOTA STATUTES, SECTION 115.061, USING DRY CLEAN UP MEASURES WHERE POSSIBLE; AND
 - MAINTAIN COPIES OF SAFETY DATA SHEETS (SDSS) FOR HAZARDOUS MATERIALS ON-SITE IN LOCATIONS READILY AVAILABLE TO EMERGENCY RESPONDERS.
- IF VEHICLE AND EQUIPMENT WASHING IS NECESSARY, A VEHICLE WASH STATION WILL BE LOCATED IN A DESIGNATED AREA. RUNOFF FROM THE WASHING AREA WILL BE CONTAINED IN A SEDIMENT BASIN AND WASTE FROM THE WASHING ACTIVITY WILL BE PROPERLY DISPOSED OF. ANY SOAPS, DETERGENTS, OR SOLVENTS WILL BE PROPERLY USED AND STORED. ANY DETERGENTS AND OTHER CLEANERS NOT PERMITTED FOR DISCHARGE WILL NOT BE USED. (CSW PERMIT ITEMS 2.3 AND 12.8)
- THE PROJECT WILL NOT RESULT IN CONCRETE OR OTHER WASHOUT ACTIVITIES. IF NECESSARY, A DESCRIPTION OF THE STORAGE AND DISPOSAL OF CONCRETE AND OTHER WASHOUT WASTES SO THAT WASTES DO NOT CONTACT THE GROUND WILL BE ADDED. (CSW PERMIT ITEMS 2.3 AND 12.9)

8.0 PERMANENT COVER AND PERMIT TERMINATION CONDITIONS:

- THE AREAS DISTURBED DURING CONSTRUCTION WILL BE STABILIZED WITH PERMANENT COVER UPON COMPLETION OF WORK. PERMANENT COVER MAY BE VEGETATIVE OR NON-VEGETATIVE, AS APPROPRIATE. ESTABLISHMENT OF PERMANENT COVER MAY INCLUDE THE FOLLOWING ACTIVITIES: A COMBINATION OF SEEDING AND EROSION CONTROL BLANKET AND SOD. (CSW PERMIT ITEM 5.17)
- FOR A CONSTRUCTION-SITE TO ACHIEVE "PERMANENT COVER", THE FOLLOWING REQUIREMENTS MUST BE COMPLETED PRIOR TO TERMINATION OF PERMIT COVERAGE: (CSW PERMIT SECTIONS 4 AND 13)
 - ALL SOIL DISTURBING CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED AND PERMANENT COVER HAS BEEN INSTALLED OVER ALL AREAS. VEGETATIVE COVER CONSISTS OF A UNIFORM PERENNIAL VEGETATION WITH A DENSITY OF 70% OF ITS EXPECTED FINAL GROWTH. VEGETATION IS NOT REQUIRED WHERE THE FUNCTION OF A SPECIFIC AREA DICTATES NO VEGETATION (SUCH AS IMPERVIOUS SURFACES OR THE BASE OF A SAND FILTER).
 - ALL SEDIMENT HAS BEEN REMOVED FROM CONVEYANCE SYSTEMS, INCLUDING CULVERTS.
 - ALL TEMPORARY SYNTHETIC EROSION PREVENTION AND SEDIMENT CONTROL BMPS HAVE BEEN REMOVED. BMPS DESIGNED TO DECOMPOSE ON-SITE MAY BE LEFT IN PLACE.

WITHIN 30 DAYS AFTER THE TERMINATION CONDITIONS ARE COMPLETE, A NOTICE OF TERMINATION (NOT) FORM WILL BE SUBMITTED TO THE MPCA.

ISSUED FOR PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\236213790_G-03_3_RYAN DR KELLER PKWY SWPPP DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:42 AM

BARR M:\AutoCAD\2011\AutoCAD 2011 Support\enu\Template\Bar_2011_Template.dwt Plot at 1: 10/06/2010 14:09:50

NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
A	JNB	SOR	BJL	02/25/2021	ISSUED FOR PROJECT APPROVAL

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.

PRINTED NAME: _____
SIGNATURE: _____
DATE: _____ LICENSE # _____

CLIENT	02/25/21								
BID									
CONSTRUCTION									
RELEASED TO/FOR	A	B	C	0	1	2	3		
DATE RELEASED									

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277
Ph: (952) 832-2601
www.barr.com

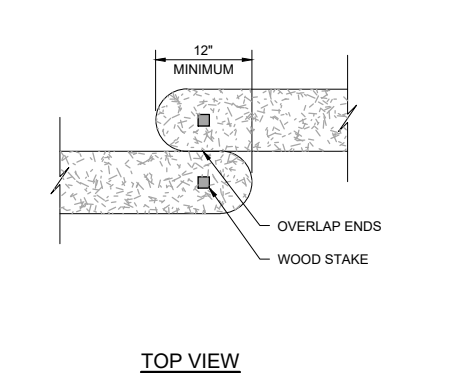
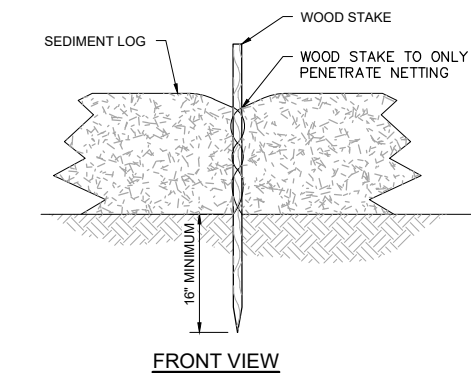
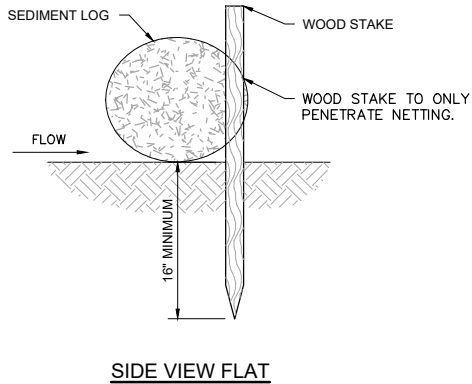
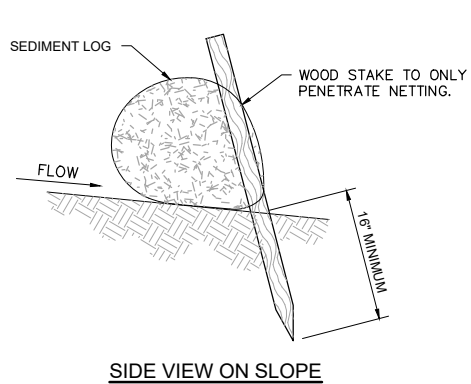
Scale	AS SHOWN
Date	1/21/2021
Drawn	JNB
Checked	SOR
Designed	JNB
Approved	BJL



RYAN DRIVE AND KELLER PKWY
CONVEYANCE UPGRADES

STORMWATER POLLUTION PREVENTION PLAN
(SWPPP) PAGE 2 OF 2

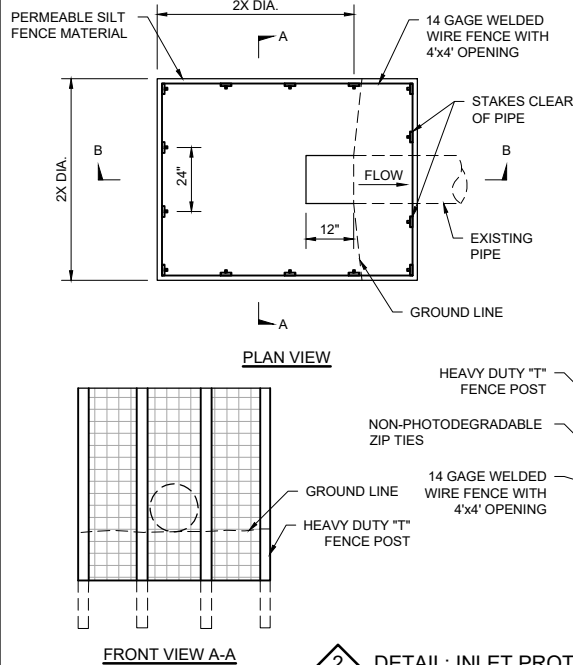
BARR PROJECT No.	23/62-1379.00
CLIENT PROJECT No.	
DWG. No.	G-03
REV. No.	A



NOTES:

1. SEDIMENT LOG SHOULD BE INSTALLED ALONG CONTOURS (CONSTANT ELEVATION).
2. NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN REACHING 1/2 OF LOG HEIGHT.
4. SEDIMENT LOG SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED OR REPLACED AS REQUIRED.

1 DETAIL: SEDIMENT LOG - STAKING
NOT TO SCALE



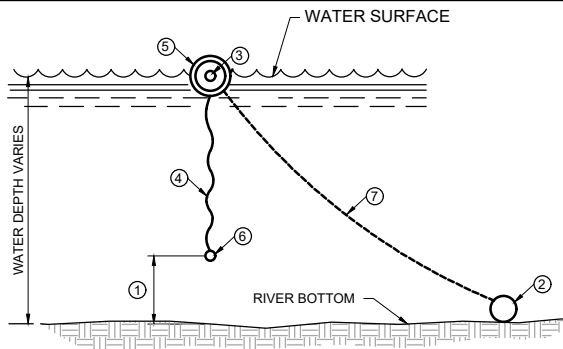
NOTES:

1. INLET PROTECTION SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED OR IMMEDIATELY FOLLOWING PIPE INSTALLATION, AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. MATERIALS SHALL BE SUFFICIENT TO ALLOW FLOW WHILE BLOCKING SEDIMENT. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER FILTER FABRIC.
3. POSTS, FILTER FABRIC AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

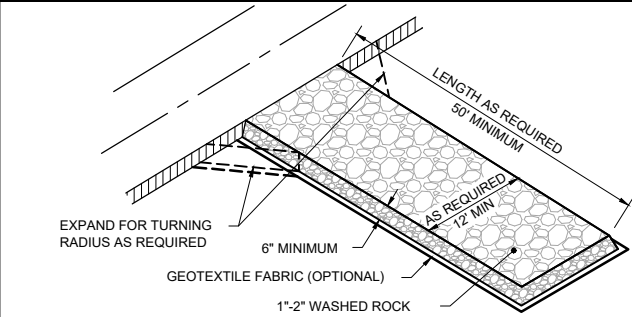
2 DETAIL: INLET PROTECTION - FILTER FENCE BOX
NOT TO SCALE

NOTES:

1. 6" MAXIMUM FOR WATER DEPTHS UP TO 3'-0" DEEP AND 1'-0" MAXIMUM FOR DEPTHS OVER 3'-0".
2. 24 LB (MIN.) ANCHOR @ 100'-0" O.C. SPACING (MAX.) ELIMINATE ANCHOR AND ANCHOR CABLE FOR WATER DEPTHS LESS THAN 3'-0" OR DISTANCE BETWEEN SHORE ANCHORS FOR TENSION CABLE OF LESS THAN 100'-0".
3. 5/16"Ø (MIN.) TENSION CABLE. ANCHOR TENSION CABLE AT BOTH SIDES WITH STEEL POSTS OF DIAMETER AND LENGTH TO PREVENT BENDING AND PULL-OUT.
4. 22 OZ VINYL COATED NYLON FABRIC CURTAIN.
5. FLOAT - 8" MINIMUM DIAMETER PLASTIC SEGMENTS.
6. CURTAIN WEIGHT - CONTINUOUS GALVANIZED STEEL CHAIN 5/16"Ø (MIN.), OR SEGMENTS OF 5/16"Ø STEEL CABLE 24" LONG @ 12" O.C. BETWEEN PIECES. CURTAIN WEIGHT TO BE HEAVY ENOUGH TO HOLD CURTAIN VERTICAL IN CURRENT AND WAVES FOR TYPICAL SITE.
7. 5/16"Ø (MIN.) GALVANIZED CABLE. ATTACH CABLE TO TENSION CABLE AND ANCHOR.



4 DETAIL: FLOTATION SILT CURTAIN
NOT TO SCALE



NOTES:

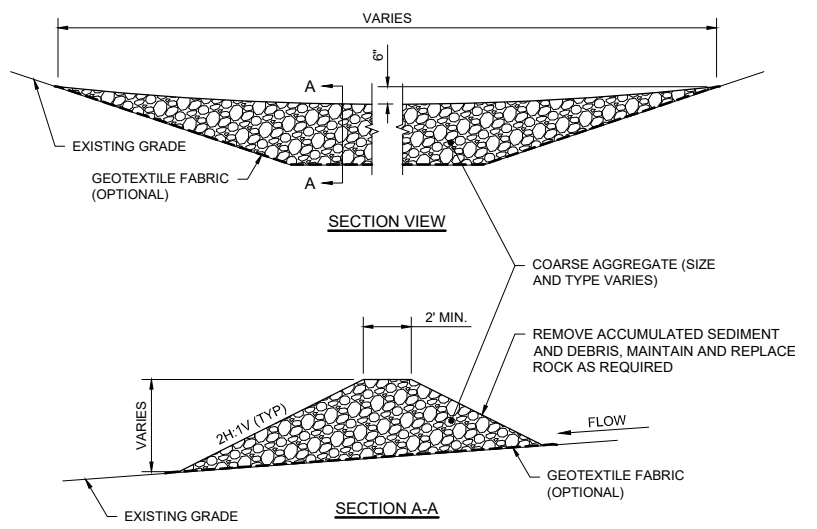
1. ENTRANCE SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED OR REPLACED AS REQUIRED TO PREVENT TRACKING OFFSITE.
2. ENTRANCE SHALL BE REMOVED IN CONJUNCTION WITH FINAL GRADING AND SITE STABILIZATION.
3. PROTECTION OF CURB & GUTTER, TRAILS AND SIDEWALKS DUE TO CONSTRUCTION ENTRANCE LOCATION SHALL BE CONSIDERED INCIDENTAL.

6 DETAIL: ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE



GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG.
1-800-252-1166

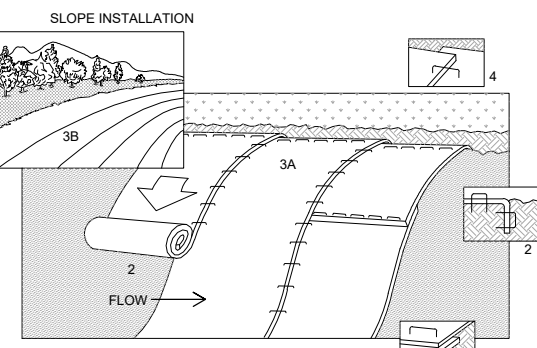
CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-LOCATING ALL SITE UTILITIES, PRIVATE AND PUBLIC, PRIOR TO STARTING THE WORK. ALL UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE UTILITY OWNER.



NOTES:

1. AGGREGATE SIZE MAY VARY AND DEPENDING ON CHANNEL SIZE, FLOW, SEDIMENT LOAD OR OTHER SITE CONDITIONS. AGGREGATE USED SHOULD BE RELATIVELY FREE OF SEDIMENT PRIOR TO INSTALLATION.
2. ROCK FILTER DIKE SHALL BE CLEANED OR REPLACED WHEN SEDIMENT BUILD UP REACHES 1/2 OF THE DIKE HEIGHT. ALTERNATIVELY A SECOND ROCK FILTER DIKE MAY BE INSTALLED DOWNSTREAM OF THE EXISTING DIKE AT A SUITABLE DISTANCE.
3. ROCK FILTER DIKE SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. ROCK, GEOTEXTILE AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

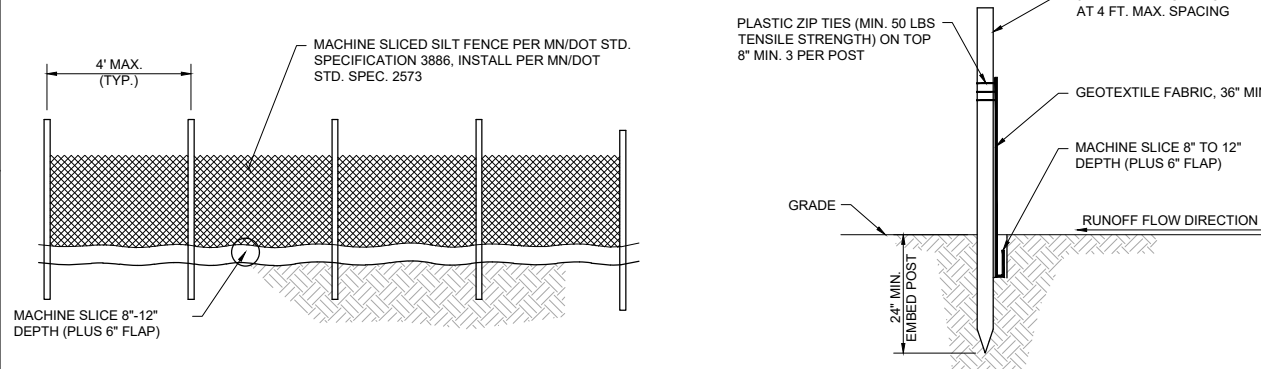
3 DETAIL: ROCK FILTER DIKE
NOT TO SCALE



NOTES:

1. REFER TO MANUFACTURER RECOMMENDATIONS FOR STAPLE PATTERNS FOR SLOPE INSTALLATIONS.
2. PREPARE SOIL BY LOOSENING TOP 1-2 INCHES AND APPLY SEED (AND FERTILIZER WHERE REQUIRED) PRIOR TO INSTALLING BLANKETS. GROUND SHOULD BE SMOOTH AND FREE OF DEBRIS.
3. BEGIN (A) AT THE TOP OF THE SLOPE AND ROLL THE BLANKETS DOWN OR (B) AT ONE END OF THE SLOPE AND ROLL THE BLANKETS HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6" OVERLAP, WITH THE UPHILL BLANKET ON TOP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
6. BLANKET MATERIALS SHALL BE AS SPECIFIED OR AS APPROVED BY ENGINEER.

5 DETAIL: EROSION CONTROL BLANKET - INSTALLATION
NOT TO SCALE



NOTES:

1. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. SILT FENCE AND ANY ACCUMULATED SEDIMENT SHALL BE REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. SILT FENCE INSTALLATION AND MATERIALS SHALL MEET THE REQUIREMENTS OF MN/DOT SPECIFICATIONS 2573 AND 3886.
3. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER SILT FENCE. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
4. WHEN SEDIMENT BUILD UP REACHES 1/3 OF FENCE HEIGHT, THE SILT FENCE SHOULD BE REMOVED OR A SECOND SILT FENCE INSTALLED UPSTREAM OF THE EXISTING FENCE AT A SUITABLE DISTANCE.
5. WHEN SPLICES ARE NECESSARY MAKE SPlice AT POST ACCORDING TO SPlice DETAIL. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE. ROTATE BOTH POSTS TOGETHER AT LEAST 180 DEGREES TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL. CUT THE FABRIC NEAR THE BOTTOM OF THE POSTS TO ACCOMMODATE THE 6 INCH FLAP. THEN DRIVE BOTH POSTS AND BURY THE FLAP. COMPACT BACKFILL.

7 DETAIL: SILT FENCE - MACHINE SLICED
NOT TO SCALE

CADD USER: Jacob M. Daley FILE: M:\DESIGN\2021\1790_G04_ EROSION\DETAILS.DWG PLOT SCALE: 1/2" = 1'-0" PLOT DATE: 2/22/2021 3:51 PM

NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION
A	JNB	SOR	BJL	02/25/2021	ISSUED FOR PROJECT APPROVAL

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PRINTED NAME: BRADLEY J. LINDAMAN
SIGNATURE: _____
DATE: 1/8/2021 LICENSE # 22178

CLIENT	02/25/21
BID	
CONSTRUCTION	
RELEASED TO/FOR	A B C 0 1 2 3
DATE RELEASED	

Project Office:
BARR ENGINEERING CO.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277
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Scale	AS SHOWN
Date	1/18/2021
Drawn	GGN/GWB
Checked	JNB
Designed	BARR
Approved	BJL

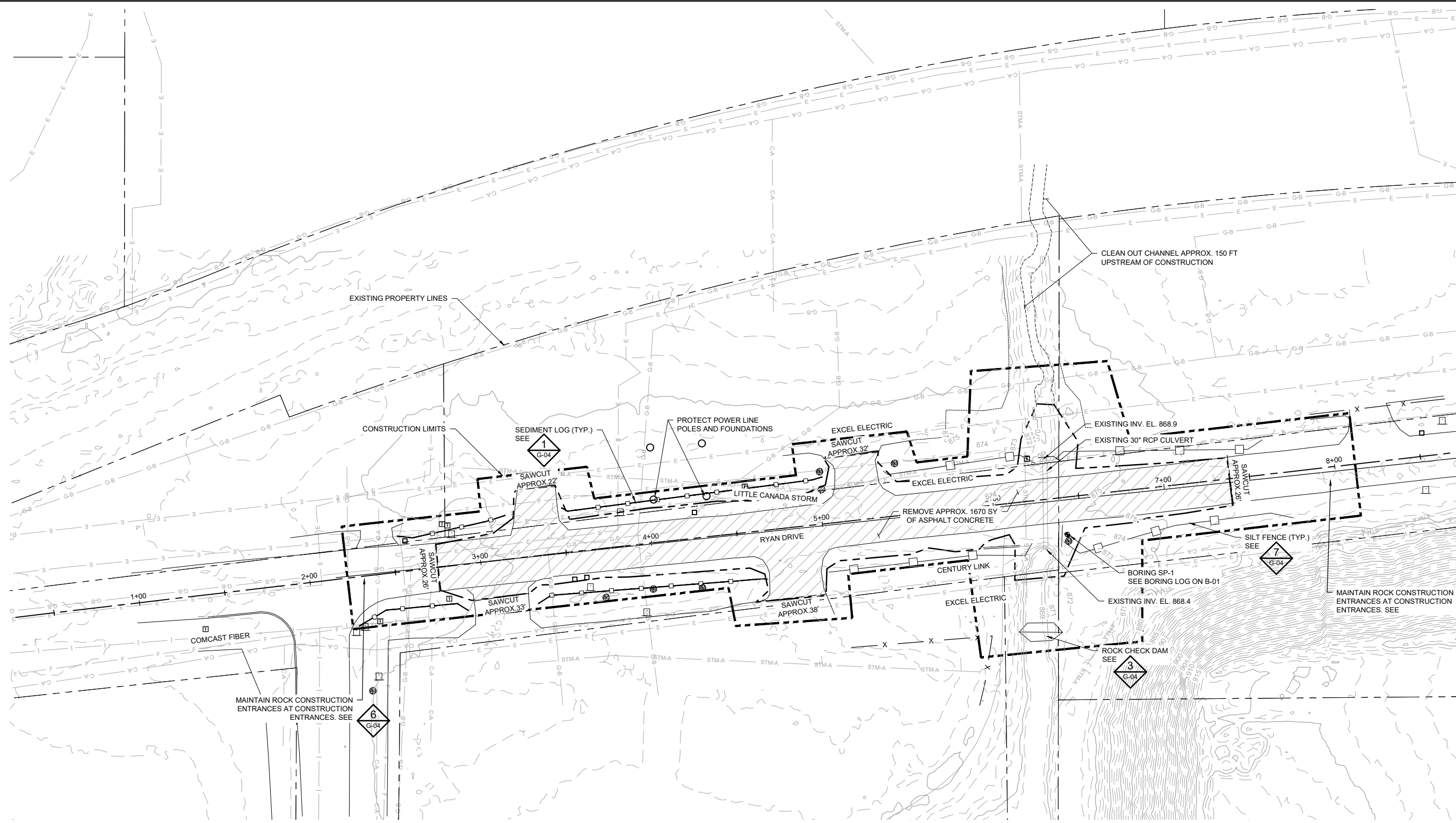


RYAN DRIVE AND KELLER PKWY
CONVEYENCE UPGRADES

STANDARD DETAILS FOR
EROSION AND SEDIMENT CONTROL BMP'S

BARR PROJECT No.	23/62-1379.00
CLIENT PROJECT No.	
DWG. No.	G-04
REV. No.	A

ISSUED FOR
PROJECT APPROVAL

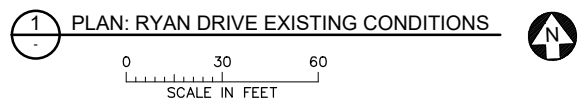


EROSION CONTROL NOTES:

- FIRST PHASE OF CONSTRUCTION ONLY REMOVE NECESSARY BITUMINOUS PAVEMENT TO COMPLETE THE REMOVAL AND REPLACEMENT OF THE EXISTING CULVERTS TO MINIMIZE THE AMOUNT OF DISTURBED AREA OF EXPOSED SOIL OVER THE LENGTH OF THE PROJECT.
- INSTALL ROCK CHECK DAM DOWNSTREAM OF SITE PRIOR TO REMOVAL AND REPLACEMENT OF NEW CULVERT INSTALLATION. DO NOT BLOCK BY-PASS FLOWS.
- TOPSOIL, SEED AND EROSION CONTROL BLANKET OVER ALL DISTURBED AREAS. SEE **5** G-04

GENERAL NOTES:

- PROTECT ALL EXISTING UTILITIES AND COMMUNICATIONS UNLESS OTHERWISE NOTED IN THE DRAWINGS.

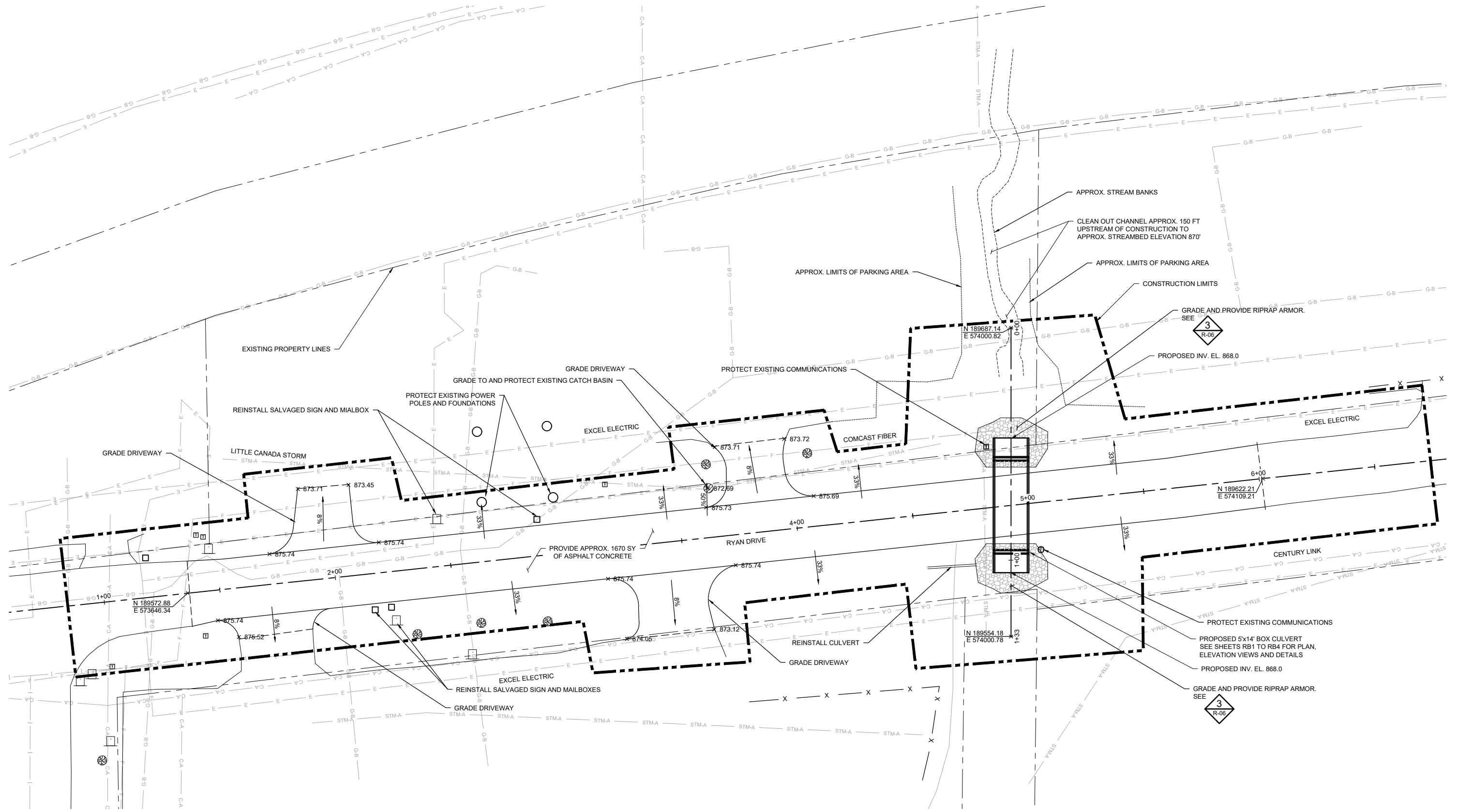


ISSUED FOR PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\23621379_01 RYAN DR EXISTING.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:27 AM

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. PRINTED NAME: SAMUEL O. REDINGER SIGNATURE: _____ DATE: _____ LICENSE # 58632				CLIENT: BARR ENGINEERING CO. BID: _____ CONSTRUCTION: _____ RELEASED TO/FOR: _____ DATE RELEASED: _____				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Scale: R-01 Date: 10/27/2020 Drawn: JMD3 Checked: SOR Designed: SOR Approved: _____				RAMSEY-WASHINGTON METRO WATERSHED DISTRICT				RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES RYAN DRIVE EXISTING CONDITIONS, REMOVALS, AND EROSION & SEDIMENT CONTROL				BARR PROJECT No. 23/62-1379.00 CLIENT PROJECT No. _____ DWG. No. R-01 REV. No. A			
NO. BY CHK. APP. DATE REVISION DESCRIPTION				A JMD3 SOR BJL 02/25/2021 ISSUED FOR PROJECT APPROVAL																							

CADD USER: Jacob M. Daire FILE: M:\DESIGN\236213790_R-02 SITE LAYOUT.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:29 AM



1 PLAN: RYAN DRIVE PROPOSED CONDITIONS

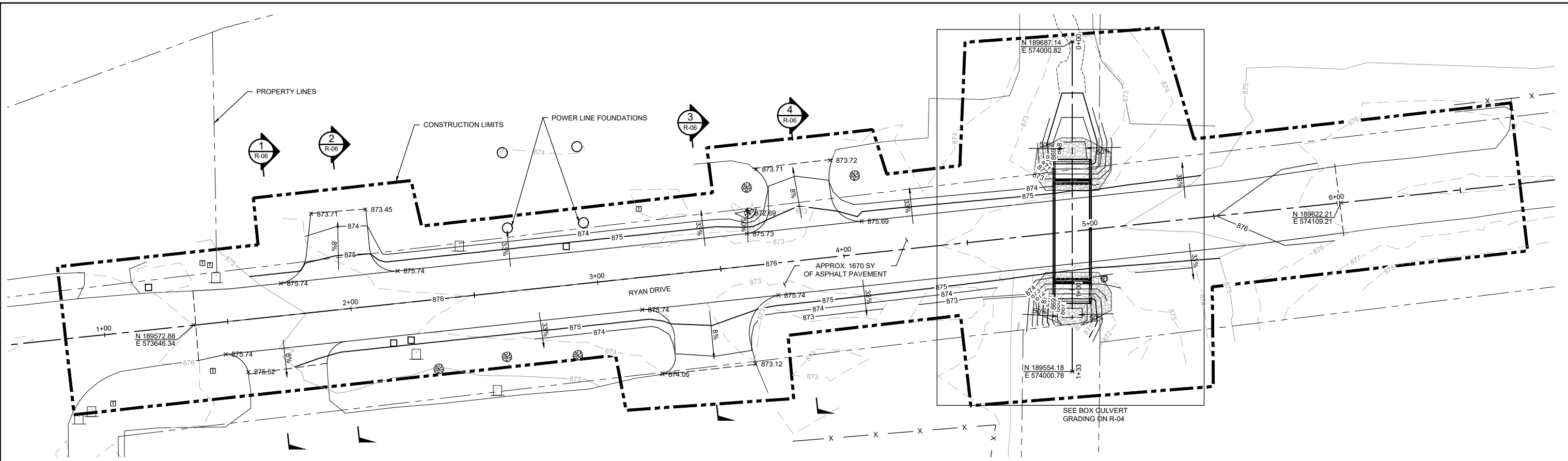
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PROJECT APPROVAL

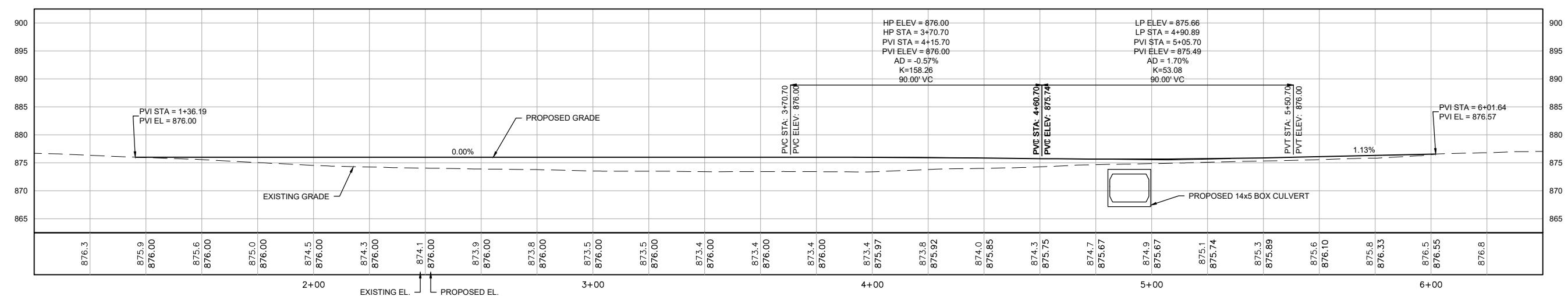
				I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.				CLIENT BID CONSTRUCTION				02/25/21				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435				Scale AS SHOWN Date 10/27/2020 Drawn JMD3 Checked SOR Designed SOR Approved				RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES				BARR PROJECT No. 23/62-1379.00			
A JMD3 SOR BJL 02/25/2021 ISSUED FOR PROJECT APPROVAL				PRINTED NAME SAMUEL O. REDINGER				RELEASED TO/FOR				A B C 0 1 2 3				Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				RAMSEY-WASHINGTON METRO WATERSHED DISTRICT				CLIENT PROJECT No.							
NO. BY CHK. APP. DATE REVISION DESCRIPTION				SIGNATURE DATE LICENSE # 58632				DATE RELEASED								RYAN DRIVE PROPOSED SITE LAYOUT				DWG. No. R-02				REV. No. A							

CADD USER: Jacob M. Daire FILE: M:\DESIGN\2021\1790_R-03 ROAD PLAN AND PROFILE.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:33 AM



1 PLAN: RYAN DRIVE GRADING PLAN

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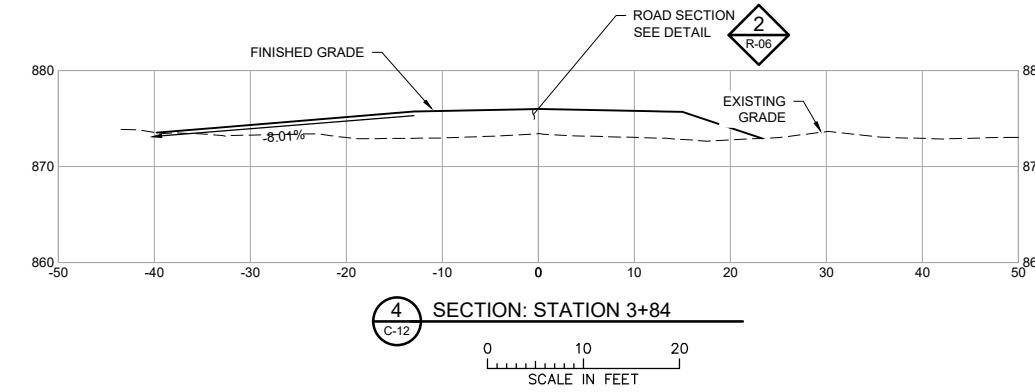
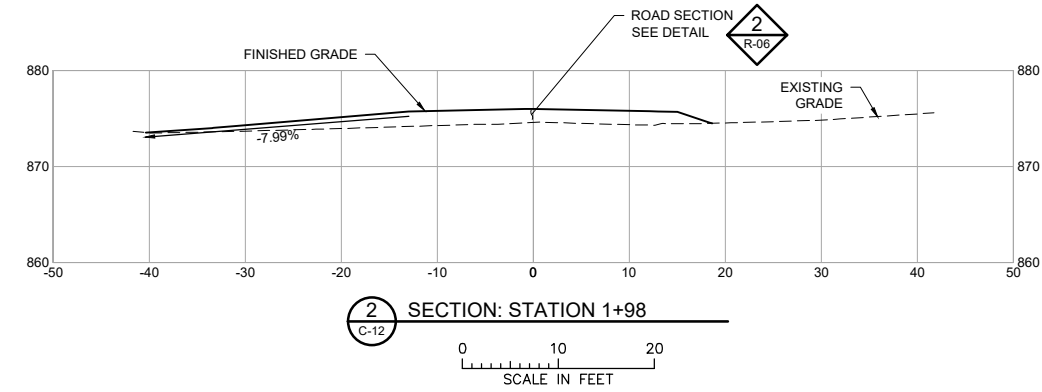
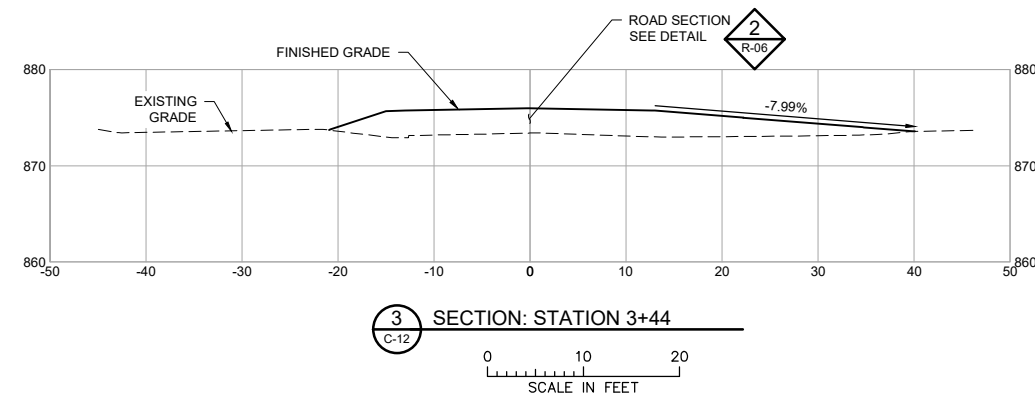
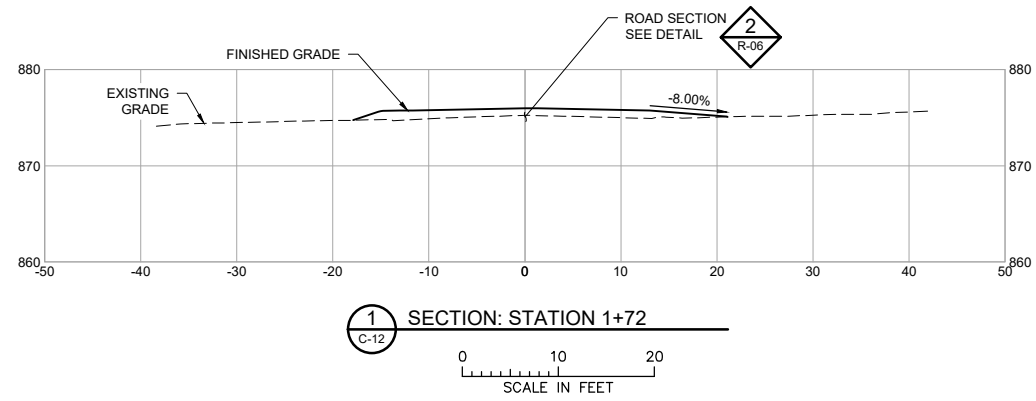
1 PROFILE: RYAN DRIVE PROFILE

0 20 40 0 10 20
HORIZ. SCALE IN FEET VERT. SCALE IN FEET

ISSUED FOR PROJECT APPROVAL

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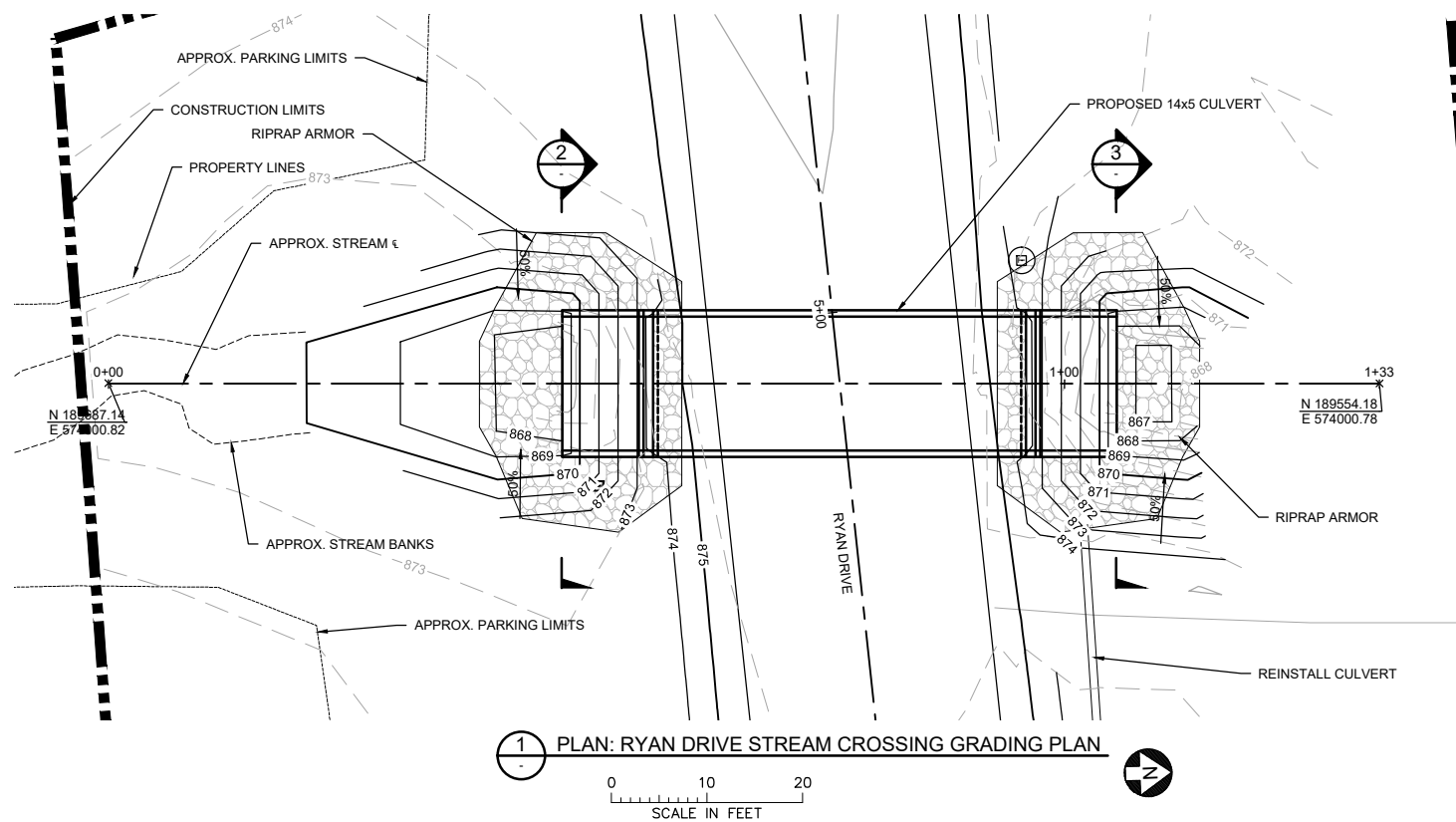




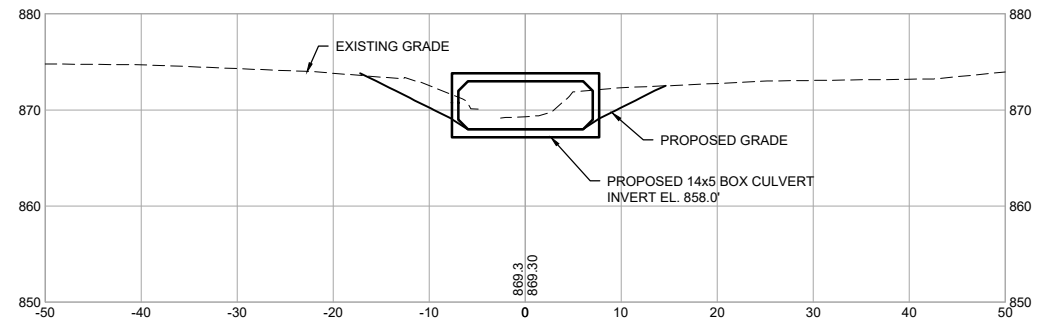
ISSUED FOR
PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\23621379_04 ROAD SECTIONS.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:35 AM

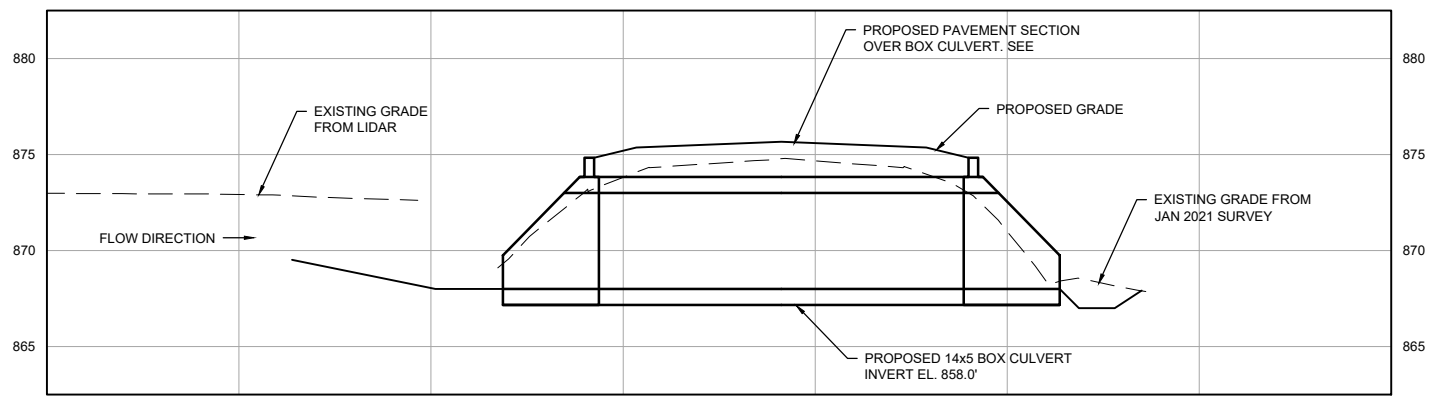
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				PRINTED NAME: SAMUEL O. REDINGER				RELEASED TO/FOR				A B C 0 1 2 3				Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com		RAMSEY-WASHINGTON METRO WATERSHED DISTRICT		RYAN DRIVE ROAD SECTIONS		CLIENT PROJECT No.					
A JMD3 SOR BJL 02/25/2021 ISSUED FOR PROJECT APPROVAL				SIGNATURE: _____				DATE RELEASED												DWG. No. R-04		REV. No. A					
NO. BY CHK. APP. DATE REVISION DESCRIPTION				DATE: _____ LICENSE # 58632																							



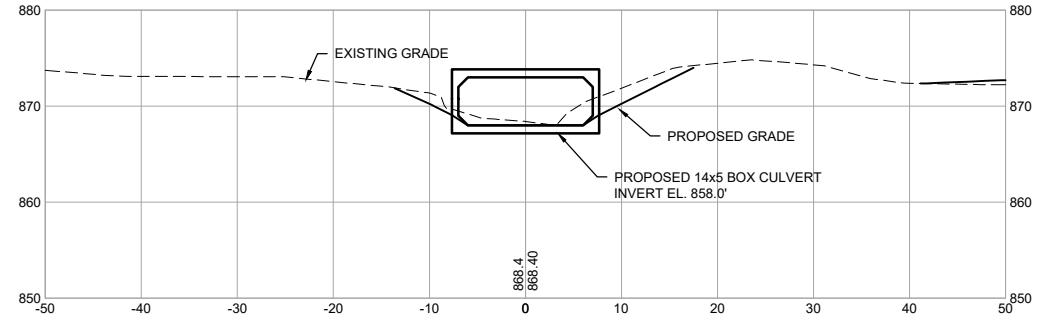
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2 SECTION: STREAM PROFILE STA. 0+47
HORIZ. SCALE IN FEET



1 PROFILE: STREAM PROFILE
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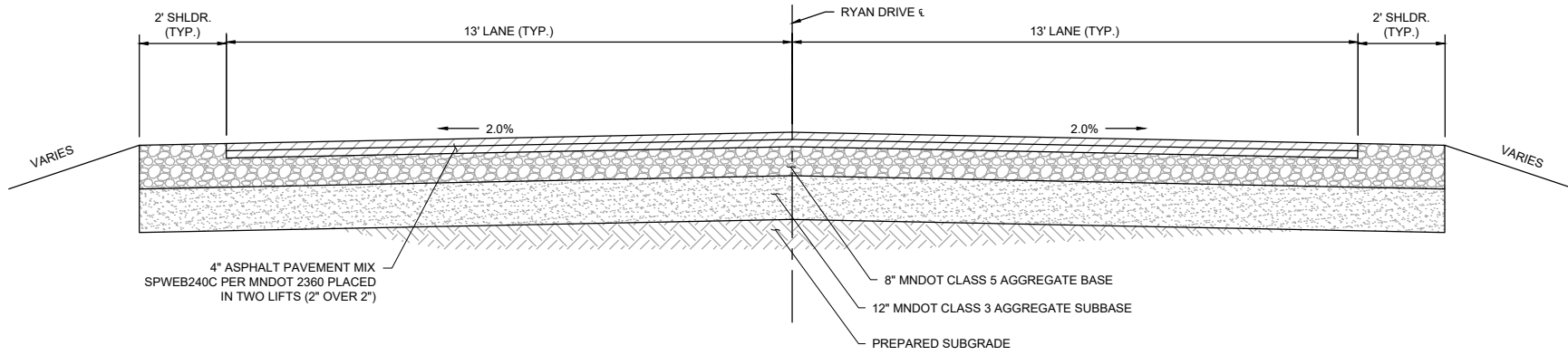


3 SECTION: STREAM PROFILE STA. 1+05
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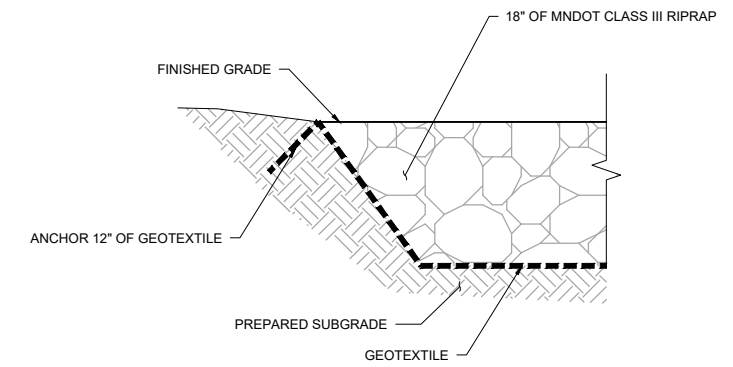
ISSUED FOR PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\236213790_0-05 STREAM PROFILE AND SECTIONS.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:37 AM

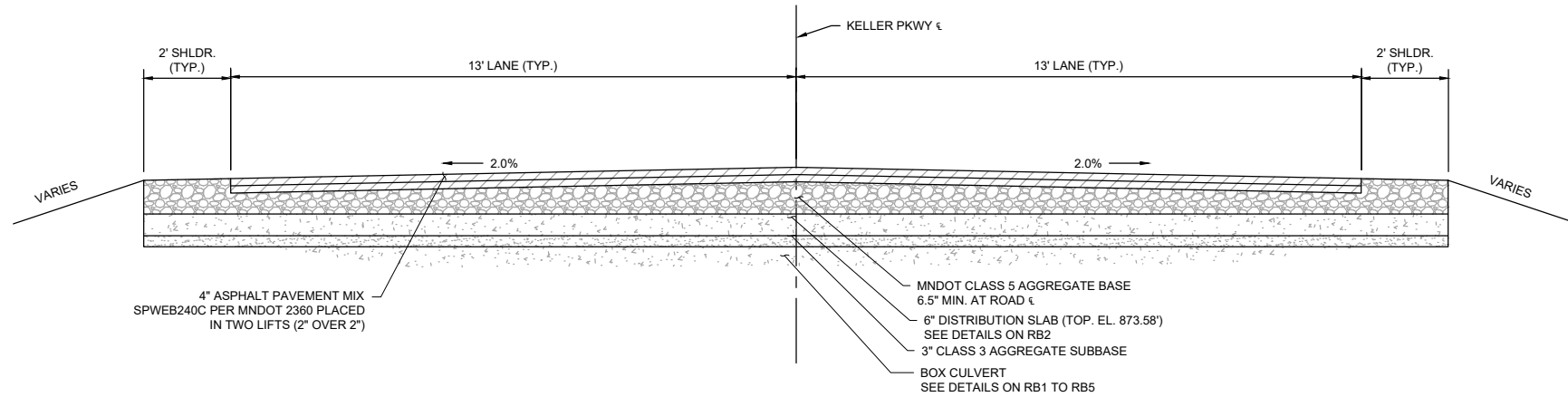
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. PRINTED NAME: SAMUEL O. REDINGER SIGNATURE: _____ DATE: _____ LICENSE # 58632				CLIENT: 02/25/21 BID: _____ CONSTRUCTION: _____ RELEASED TO/FOR: A B C 0 1 2 3 DATE RELEASED: _____				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 Ph: 1-800-632-2277 www.barr.com		Scale: AS SHOWN Date: 10/27/2020 Drawn: JMD3 Checked: SOR Designed: SOR Approved: _____		BARR PROJECT No. 23/62-1379.00 CLIENT PROJECT No. RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES RYAN DRIVE STREAM PLAN, PROFILE AND SECTIONS		DWG. No. R-05 REV. No. A	
NO.	BY	CHK	APP.	DATE	REVISION DESCRIPTION										
A	JMD3	SOR	BJL	02/25/2021	ISSUED FOR PROJECT APPROVAL										



1 DETAIL: TYPICAL LANE AND SHOULDER SECTION NOT OVER BOX CULVERT
 R-03
 LOOKING UP STATION
 0 2 4
 SCALE



3 DETAIL: RIPRAP TYPICAL SECTION
 R-05
 1"=1'-0"
 0 1 2
 SCALE



2 DETAIL: TYPICAL LANE AND SHOULDER SECTION OVER BOX CULVERT
 R-03
 LOOKING UP STATION
 0 2 4
 SCALE

ISSUED FOR
PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\236213790_R-06 DETAILS.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:16 AM

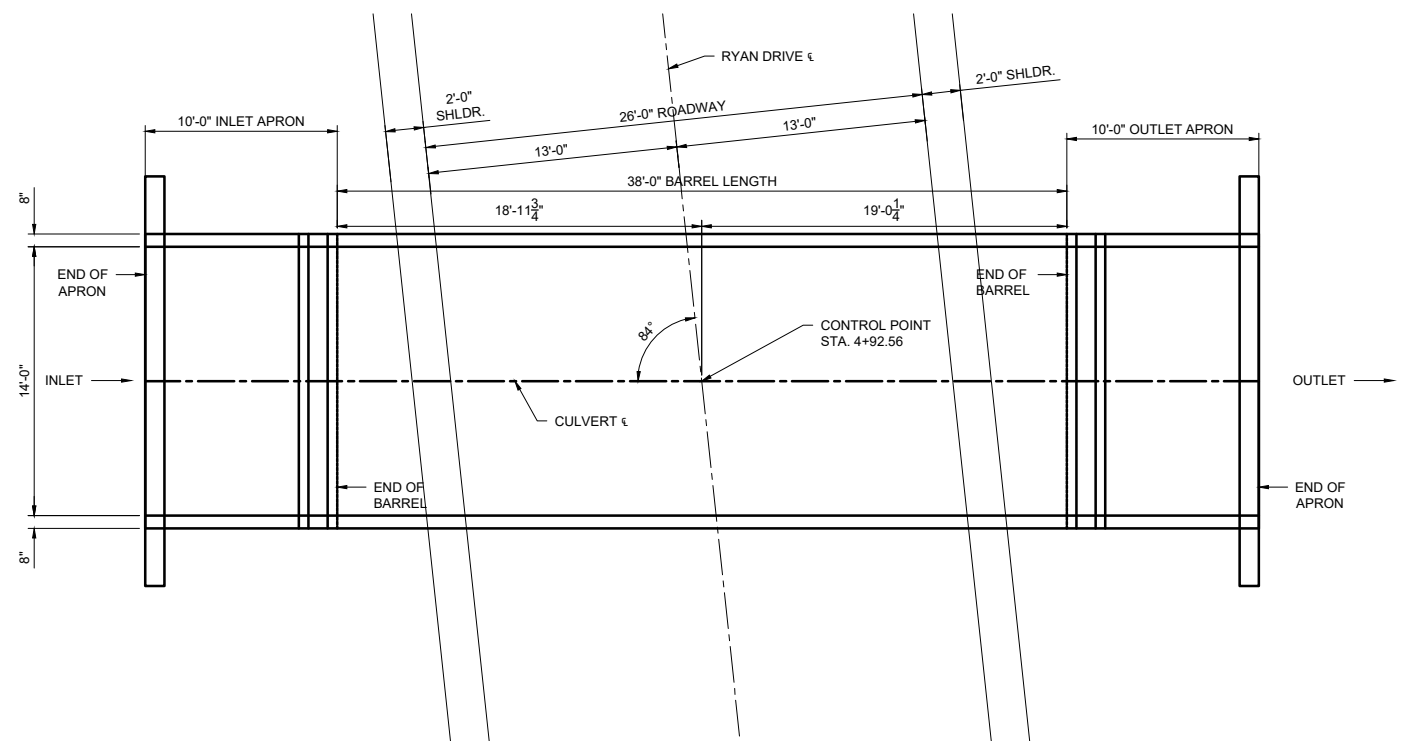
				I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.				CLIENT BID CONSTRUCTION				02/25/21				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435				Scale AS SHOWN Date 10/27/2020 Drawn JMD3 Checked SOR Designed SOR Approved				BARR PROJECT No. 23/62-1379.00 CLIENT PROJECT No.							
A JMD3 SOR BJL 02/25/2021 ISSUED FOR PROJECT APPROVAL				PRINTED NAME SAMUEL O. REDINGER				RELEASED TO/FOR A B C 0 1 2 3				Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				RAMSEY-WASHINGTON METRO WATERSHED DISTRICT				RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES				DWG. No. R-06				REV. No. A			
NO. BY CHK. APP. DATE REVISION DESCRIPTION				DATE _____ LICENSE # 58632				DATE RELEASED								RYAN DRIVE TYPICAL ROAD DETAILS															

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PATH & FILENAME: \$\$\$@PATH@FILENAME@\$\$\$

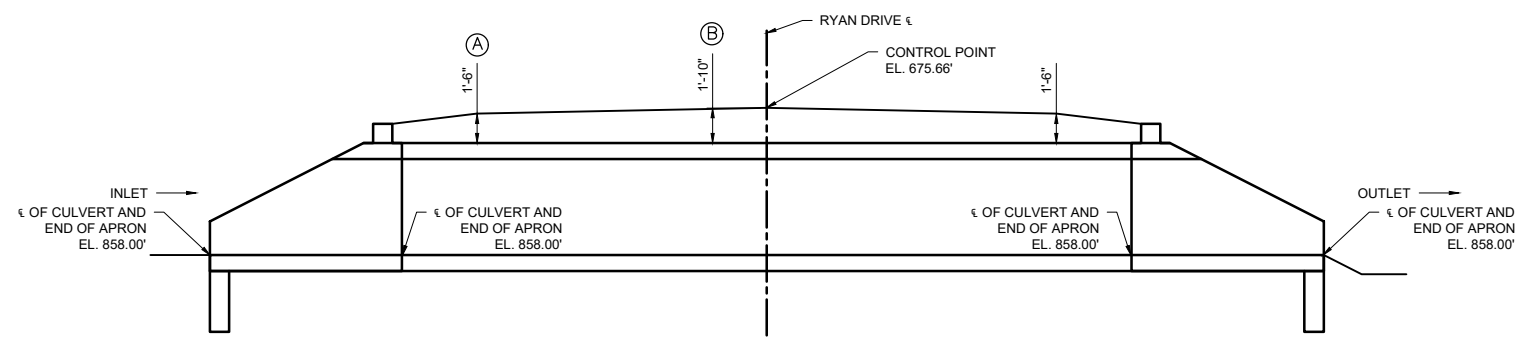
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PLOTTED : \$\$\$@DATE@\$\$\$



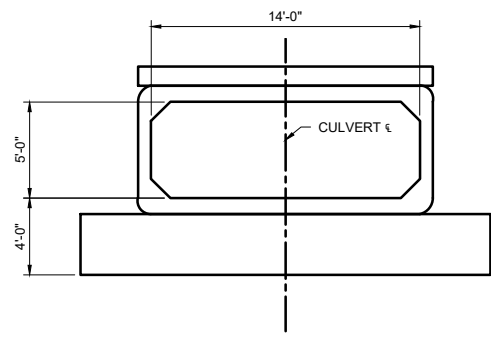
1 PLAN: RYAN DRIVE GENERAL PLAN

0 5 10
SCALE IN FEET



2 ELEVATION: SIDE ELEVATION LOOKING UP STATION

0 5 10
SCALE IN FEET



3 ELEVATION: END ELEVATION

0 5 10
SCALE IN FEET

SCHEDULE OF QUANTITIES FOR ENTIRE CULVERT		
ITEM	UNIT	S.P. NO. 0125-25 QUANTITY
14X5 PRECAST CONCRETE BOX CULVERT	LIN. FT.	38
14X5 PRECAST CONCRETE BOX CULVERT END SECTION (1)	EACH	2

(1) END SECTION TO BE TYPE I.

DESIGN DATA	
DESIGNED IN ACCORDANCE WITH 2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.	
HL-93 LIVE LOAD	
BARREL INSIDE WIDTH =	14'-0"
BARREL INSIDE HEIGHT =	5'-0"
BARREL LENGTH =	38'-0"
EST. MIN. FILL DEPTH A =	1'-6"
EST. MAX. FILL DEPTH B =	1'-10"
SKWEW ANGLE =	0°
DESIGN SPEED =	
CURRENT ADT (YEAR) =	
PROJECTED ADT (YEAR) =	
HL-93 LRFR	
BRIDGE OPERATING RATING FACTOR RF = .	

LIST OF SHEETS	
NO.	DESCRIPTION
RB1	GENERAL PLAN AND ELEVATION
RB2	PRECAST CONCRETE BARREL DETAILS
RB3	PRECAST CONCRETE END SECTION TYPE I
RB4	EMBANKMENT PROTECTION FOR BOX CULVERTS

I HEREBY CERTIFY THAT THIS PLAN 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.

SIGNED _____ DATE _____
LICENSED PROFESSIONAL ENGINEER

NAME: _____ LIC NO. _____

CONSTRUCTION NOTES:

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A 1/2" OR 3/4" CHAMFER UNLESS OTHERWISE NOTED.

CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPEC. 2411 AND 2412, EXCEPT AS NOTED.

REFER TO REMAINDER OF GRADING PLAN FOR SUPERSTRUCTURE EXCAVATION AND BACKFILL. SPEC. 2451.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS.

REFER TO TITLE SHEET FOR THE SUBSURFACE UTILITY INFORMATION.

BRIDGE NO. _____

LOCATION: RYAN DRIVE STEAM CROSSING

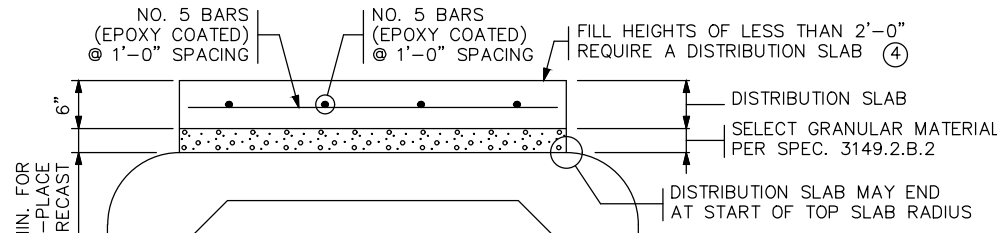
MAIN 14 x 5 MNDOT STD. PRECAST CONCRETE CULVERT

IDENTIFICATION NO. 513

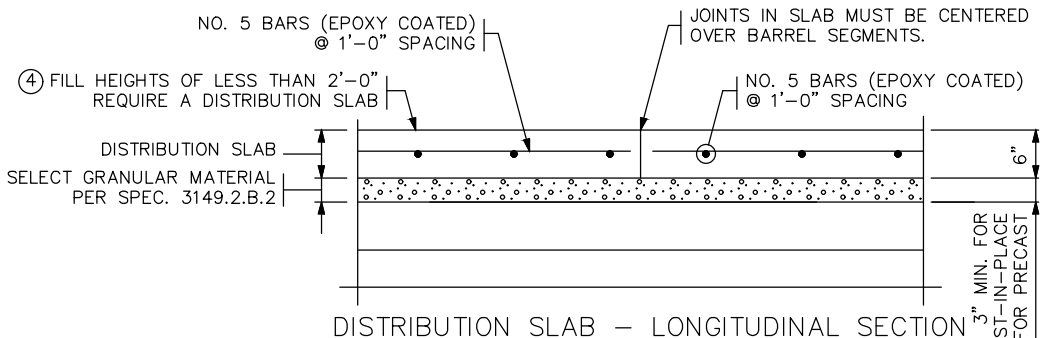
GENERAL PLAN AND ELEVATION

SEC. 31 T 30 N R 22 W
TOWNSHIP RAMSEY COUNTY

DES: PKN DR: JMD3
CHK: _____



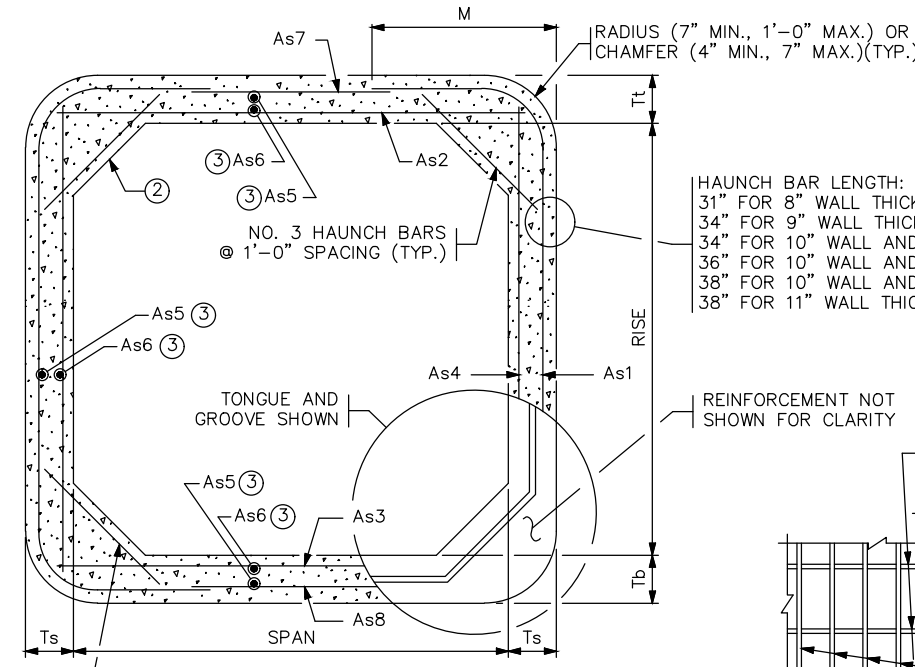
DISTRIBUTION SLAB SECTION



DISTRIBUTION SLAB - LONGITUDINAL SECTION

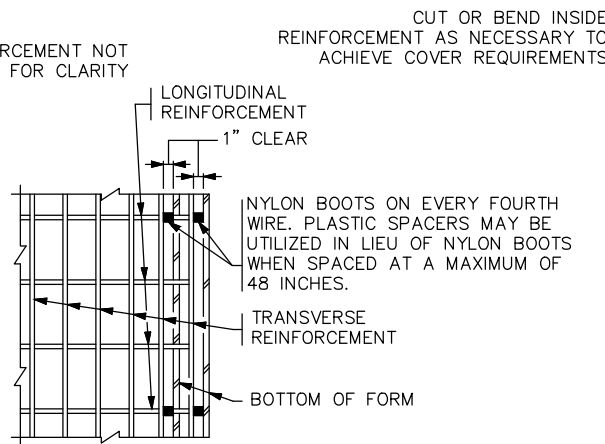
CONSTRUCTION NOTES

- CONSTRUCT CULVERTS PER SPEC. 2412 EXCEPT AS NOTED.
- REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.
- PROVIDE WELDED WIRE REINFORCEMENT, SHEAR REINFORCEMENT AND REINFORCEMENT BARS PER THE APPLICABLE REQUIREMENTS OF AASHTO M259.
- 11/2" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.
- ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
 - (a) 1 OR 2 LAYERS OF WELDED WIRE REINFORCEMENT OR
 - (b) 1 LAYER OF WELDED WIRE REINFORCEMENT AND 1 LAYER OF REINFORCEMENT BARS OR
 - (c) 1 LAYER OF REINFORCEMENT BARS.
- DEVELOP REINFORCEMENT IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE REINFORCEMENT, INCREASE THE AREA OF REINFORCEMENT BY 8%, AND SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4. "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".
- MAXIMUM SIZE OF REINFORCEMENT BARS IS NO. 6. THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE IS W23 PER LAYER (MAXIMUM OF 2 LAYERS).
- SPACE CENTER TO CENTER OF TRANSVERSE WIRES NOT LESS THAN 2" NOR MORE THAN 4". SPACE CENTER TO CENTER OF LONGITUDINAL WIRES NOT MORE THAN 8".
- WHEN USING As1, As7, AND As8 REINFORCEMENT AS ONE CONTINUOUS CAGE WITH SPLICES OCCURRING IN THE CENTER OF THE TOP AND BOTTOM OF THE BOX SECTION, THE MIN. LAP LENGTH FOR THE As7 AND As8 IS 15".
- WELDING IS NOT PERMITTED ON REINFORCEMENT BARS OR WELDED WIRE REINFORCEMENT, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE REINFORCEMENT IS ACCEPTABLE.
- WHEN REINFORCEMENT IS CUT, PLACE ADDITIONAL REINFORCEMENT ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.
- USE CONCRETE MIX NO. 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.
- SHOP DRAWING APPROVAL PER SPEC. 3238.2.A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.
- COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.
- TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN. LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.
- ① USE 1" DIAMETER CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS.
- ② USE 12" VERTICAL, 12" HORIZONTAL HAUNCHES ON ALL BOX SIZES.
- ③ PLACE LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 IN ALL SLABS AND WALLS WITH A MINIMUM OF 0.06 SQ. IN./FT.
- ④ ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A 6" THICK DISTRIBUTION SLAB WITH CONCRETE MIX 3S52.
- PLACE CAST-IN-PLACE DISTRIBUTION SLABS WITH 3" MIN. SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.
- PRECAST DISTRIBUTION SLABS MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND SLAB.
- EXTEND THE WIDTH OF THE DISTRIBUTION SLAB TO THE OUTSIDE EDGES OF THE ROADWAY SHOULDERS UNLESS DIRECTED BY THE ENGINEER.
- REDESIGN THE DISTRIBUTION SLAB PER THE MNDOT PAVEMENT DESIGN MANUAL IF IT IS USED AS PAVEMENT SURFACE.
- PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB IS CONSIDERED INCIDENTAL.
- ⑤ REFER TO SPEC, 2412 FOR SEALANT REQUIREMENTS.

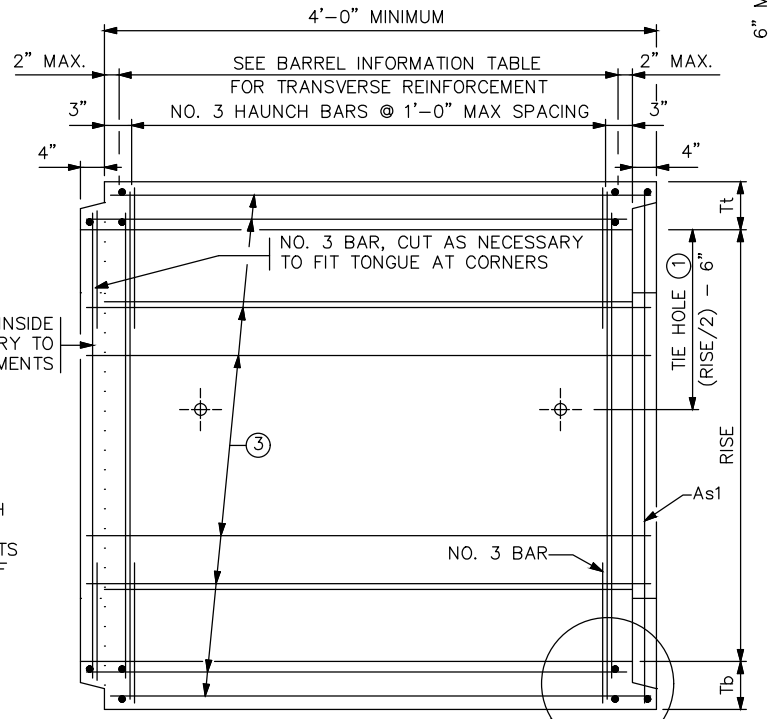


TRANSVERSE BARREL SECTION

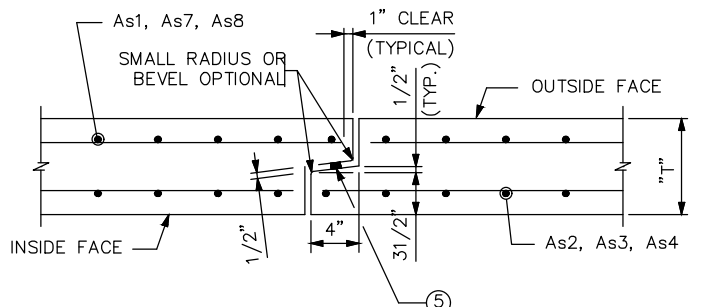
HAUNCH BAR LENGTH:
 31" FOR 8" WALL THICKNESS
 34" FOR 9" WALL THICKNESS
 34" FOR 10" WALL AND 10" SLAB
 36" FOR 10" WALL AND 11" SLAB
 38" FOR 10" WALL AND 12" SLAB
 38" FOR 11" WALL THICKNESS



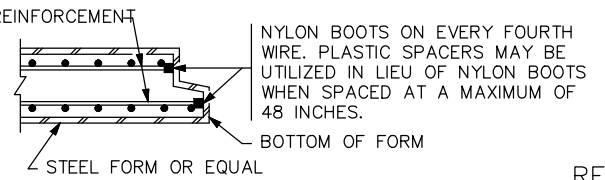
PLAN



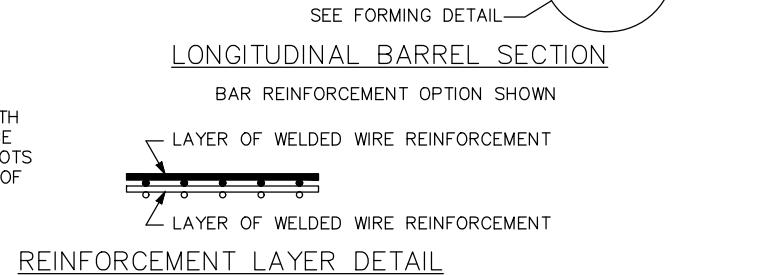
LONGITUDINAL BARREL SECTION



TONGUE AND GROOVE JOINT DETAIL



SECTION FORMING DETAIL



REINFORCEMENT LAYER DETAIL

BARREL INFORMATION TABLE * * *																								
LOCATION	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED * *	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE REINFORCEMENT											
							SPAN (FT.)	RISE (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		As1		As2		As3		As4		As7		As8	
													AREA (IN./FT.)	LENGTH (FT.)	M (FT.)	AREA (IN./FT.)	LENGTH (FT.)	AREA (IN./FT.)	LENGTH (FT.)	AREA (IN./FT.)	LENGTH (FT.)	AREA (IN./FT.)	LENGTH (FT.)	AREA (IN./FT.)
					YES	NO																		
					YES	NO																		

* ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.
 * * FOR PEDESTRIAN CULVERT APPLICATIONS HIDE-AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED, SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.
 * * * BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL-93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL-93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.

REVISION: FEBRUARY 22, 2018
 APPROVED: MARCH 24, 2011
Nancy D. Ambenberger
 STATE BRIDGE ENGINEER

STATE PROJ. NO - (T.H.) STA. + . FIG. 5-395.101(A)

CERTIFIED BY _____ DATE _____ TITLE: PRECAST CONCRETE BARREL DETAILS

DES: PKN DR: JMD3 APPROVED: _____ BRIDGE NO. _____
 CHK: _____ CHK: _____ SHEET NO. RB2 OF RB4 SHEETS

FILENAME: \$\$\$@FILENAME\$\$\$
 TIME : \$@TIME@
 PLOTTED : \$\$\$@DATE@
 PATH & FILENAME: \$\$\$@PATH@FILENAME\$\$\$

FILENAME: \$\$\$@FILENAME@\$\$\$

PATH & FILENAME: \$\$\$@PATHFILENAME@\$\$\$

TIME : @\$TIME@\$

PLOTTED : \$\$\$@DATE@\$\$\$

REVISION: FEBRUARY 22, 2018

APPROVED: MARCH 24, 2011

Nancy M. Rubenberger
STATE BRIDGE ENGINEER

STATE PROJ. NO - (T.H.) STA. + .

CERTIFIED BY _____ DATE _____
LICENSED PROFESSIONAL ENGINEER

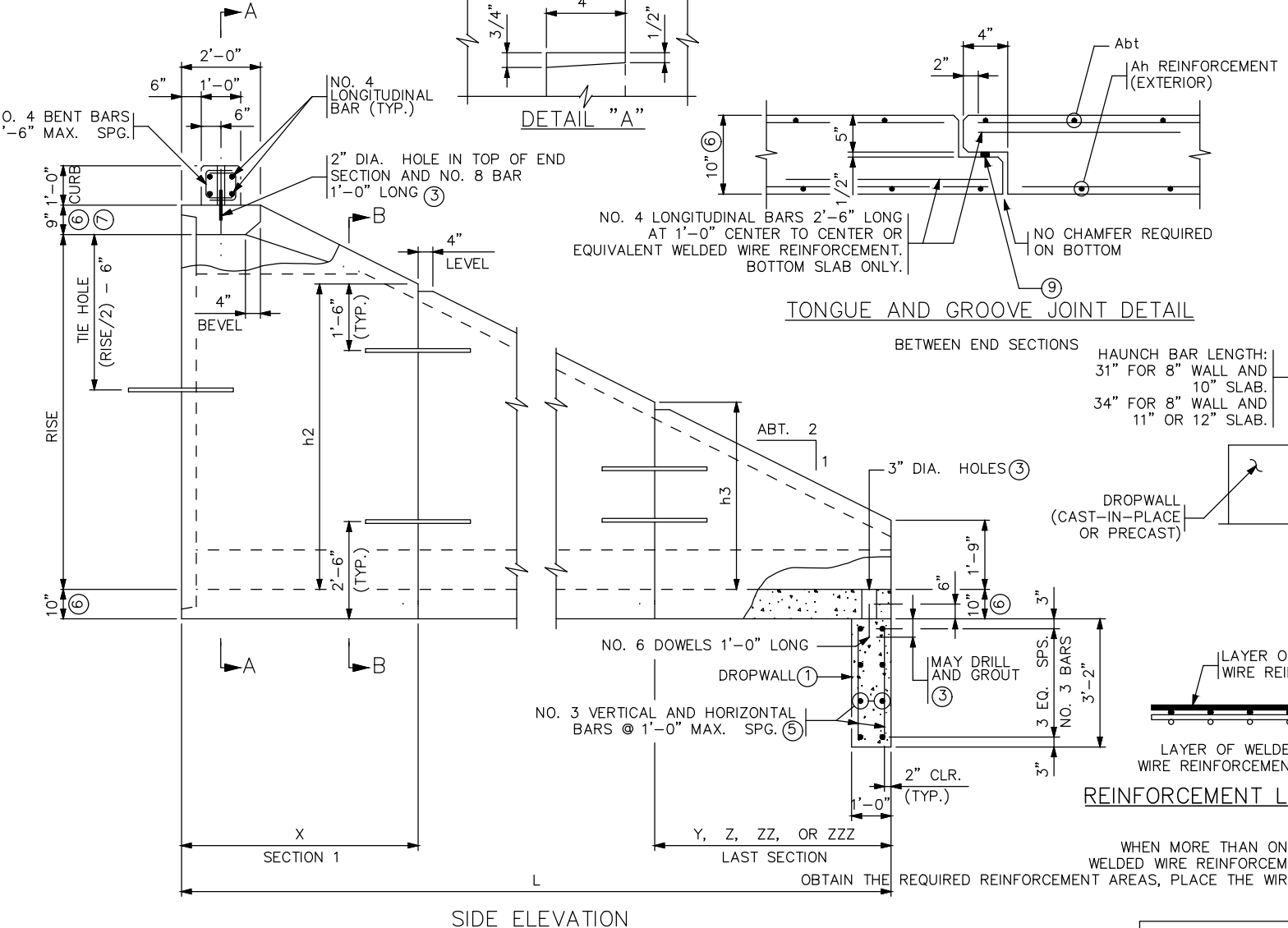
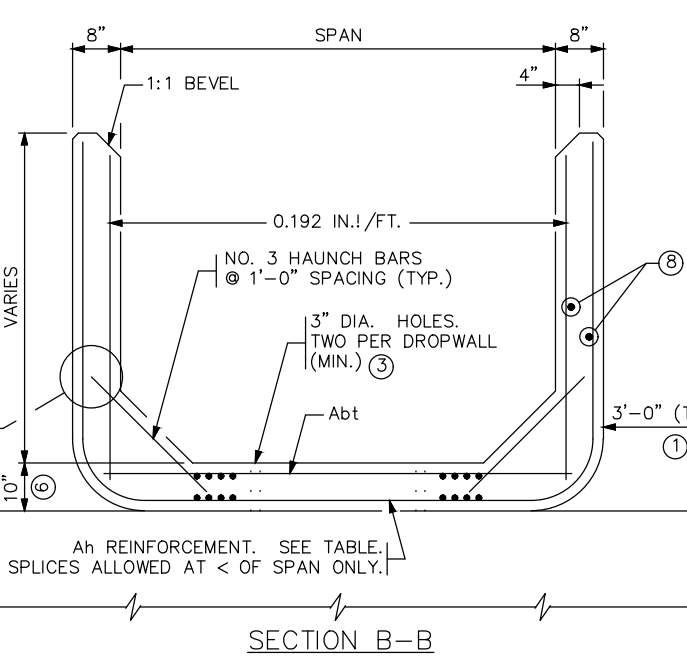
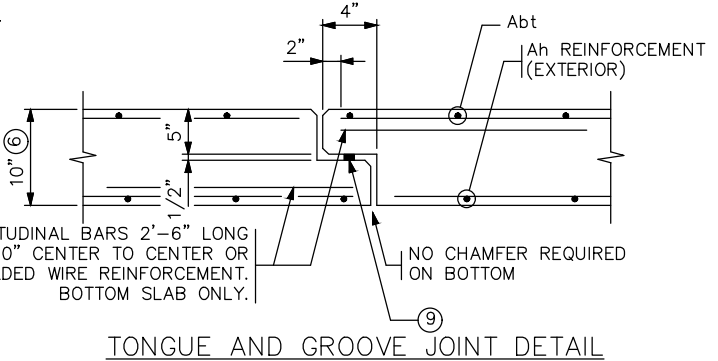
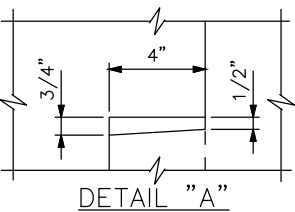
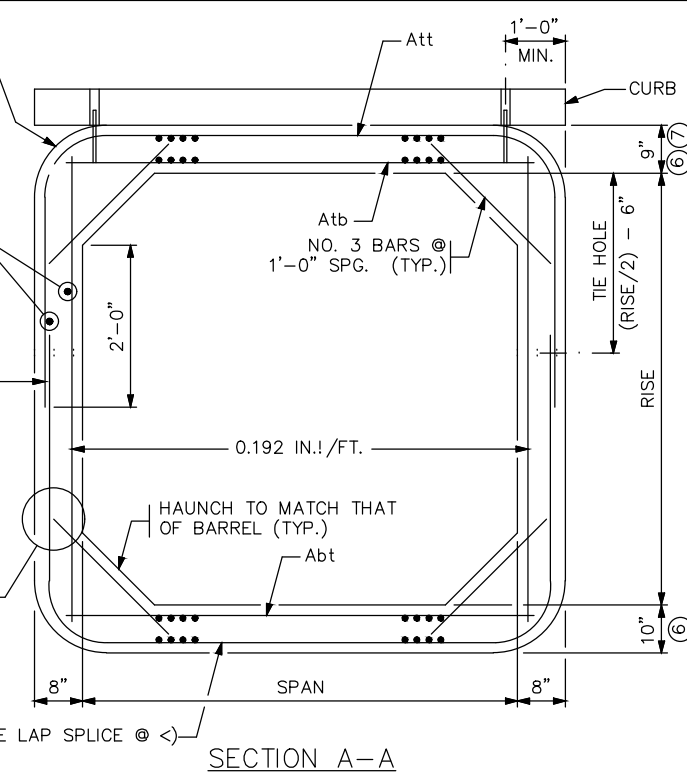
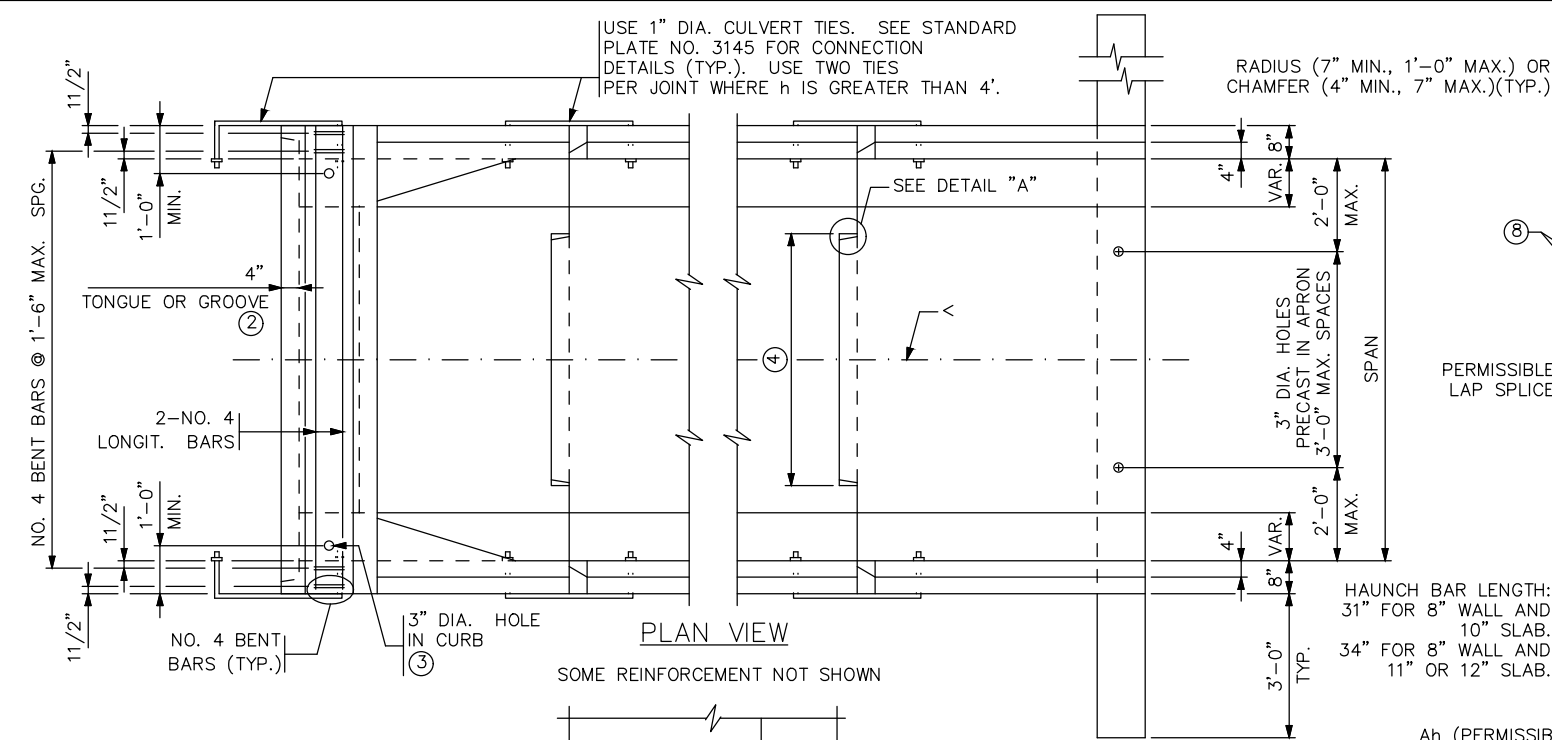
NAME: _____ LIC. NO. _____

TITLE: PRECAST CONCRETE END SECTION
TYPE I - SINGLE OR DOUBLE BARREL
FOR SKEWS UP TO 71/2'

DES: PKN DR: JMD3 APPROVED: _____
CHK: _____ CHK: _____

SHEET NO. RB3 OF RB4 SHEETS BRIDGE NO. _____

FIG. 5-395.102



APRON DIMENSIONS & Ah REINFORCEMENT

RISE FT.	L	SECTION 1		h2	SECTION 2		h3	SECTION 3		h4	SECTION 4		h5	SECTION 5		h6
		X	Ah		Y	Ah		Z	Ah		ZZ	Ah		ZZZ	Ah	
4	8	8'	(4') 0.192	1'-9"(3'-9")	(4') (0.192)	(1'-9")										
5	10	6'	0.192	3'-9"	4' 0.192	1'-9"										
6	12	6'	0.192	4'-9"	6' 0.192	1'-9"										
7	14	6'	0.192	5'-9"	8' (4') 0.192	1'-9"(3'-9")	(4') (0.192)	(1'-9")								
8	16	6'	0.20	6'-9"	6' 0.192	3'-9"	4' 0.192	1'-9"								
9	18	6'	0.29	7'-9"	6' 0.20	4'-9"	6' 0.192	1'-9"								
10	20	6'	0.42	8'-9"	6' 0.29	5'-9"	8' (4') 0.192	1'-9"(3'-9")	(4') (0.192)	(1'-9")						
11	22	6'	0.60	9'-9"	6' 0.42	6'-9"	6' 0.192	3'-9"	4' 0.192	1'-9"						
12	24	6'	0.78	10'-9"	6' 0.60	7'-9"	6' 0.20	4'-9"	6' 0.192	1'-9"						
13	26	6'	1.03	11'-9"	6' 0.78	8'-9"	6' 0.28	5'-9"	8' (4') 0.192	1'-9"(3'-9")	(4') (0.192)	(1'-9")				
14	28	6'	1.38	12'-9"	6' 1.03	9'-9"	6' 0.40	6'-9"	6' 0.192	3'-9"	4' 0.192	1'-9"				

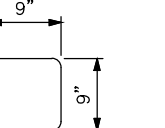
- CONSTRUCTION NOTES**
- SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.
- USE CONCRETE MIX NO. 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.
- ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.
- ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.
- SEE STANDARD FIG. 5-395.115 FOR EMBANKMENT PROTECTION.
- FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.
- MAXIMUM SIZE OF REINFORCEMENT BARS IS NO. 6, EXCEPT NO. 7 OR 8 BARS MAY BE USED FOR Abt ON SPANS GREATER THAN 14'. THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE IS W23 PER LAYER (MAXIMUM OF 2 LAYERS).
- WITH DOUBLE BOXES LOCATE DROPWALL JOINTS BETWEEN END SECTIONS. SEE STANDARD FIG. 5-395.111 FOR ALTERNATE DROPWALLS. LIMITS OF EXCAVATION FOR DROPWALL ARE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. DROPWALL CONCRETE MIX IS 3S52, OR 3Y82 IF PRECAST. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS. DROPWALL NOT REQUIRED FOR NON-WATERWAY USE.
 - CHECK LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED.
 - FILL HOLE WITH GROUT. GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".
 - 3'-6" MIN. TONGUE AND 3'-7" MIN. GROOVE FOR CULVERTS WITH 6'-0" SPANS. 5'-0" MIN. TONGUE AND 5'-1" MIN. GROOVE FOR CULVERTS WITH SPANS GREATER THAN 6'-0". CENTER TONGUE AND GROOVE ON < OF EACH APRON JOINT. TONGUE AND GROOVE JOINT ON ALL THREE SIDES OF APRON IS PERMISSIBLE.
 - WELDED WIRE REINFORCEMENT OF EQUAL AREA MAY BE SUBSTITUTED FOR REBAR.
 - APRON TOP AND BOTTOM SLAB THICKNESS MAY BE 8" FOR CULVERTS WITH 6' SPANS ONLY. BOTTOM SLAB THICKNESS MAY BE INCREASED UP TO 2" MAX. PROVIDED CONCRETE COVER IS 1 1/2" MIN., 2" MAX.
 - 10" MINIMUM TOP SLAB FOR 14' AND 16' SPANS.
 - PLACE LONGITUDINAL REINFORCEMENT PERPENDICULAR TO THE CULVERT SPAN WITH A MINIMUM OF 0.06 SQUARE INCHES PER PERIPHERAL FOOT ON ALL FACES OF THE BARREL.
 - REFER TO SPEC, 2412 FOR SEALANT REQUIREMENTS.

Att, Abt REINFORCEMENT

SPAN (FT.)	Att (IN./FT.)	Abt (IN./FT.)
6	0.27	0.44
8	0.47	0.60
10	0.62	0.74
12	0.88	1.06
14	1.20	1.58
16	1.52	2.09

Abt REINFORCEMENT

SPAN (FT.)	Abt (IN./FT.)
6-10	0.20
12	0.30
14	0.39
16	0.39



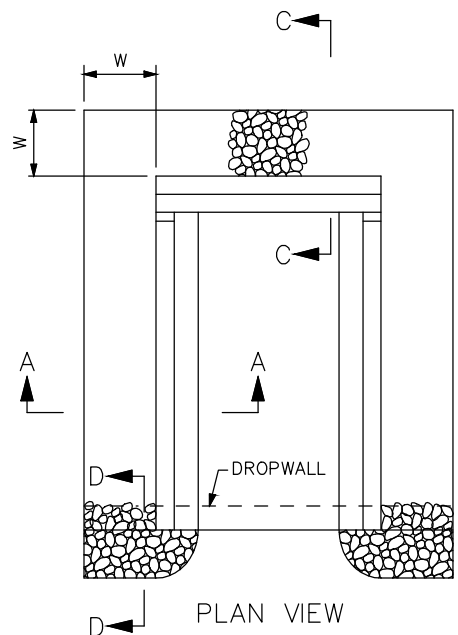
CONSTRUCTION NOTES

THIS PLAN SHEET IS FOR CULVERT EMBANKMENT PROTECTION ONLY. REFER TO THE GRADING PLANS FOR ADDITIONAL RIPRAP OR OTHER SCOUR PROTECTION MEASURES.

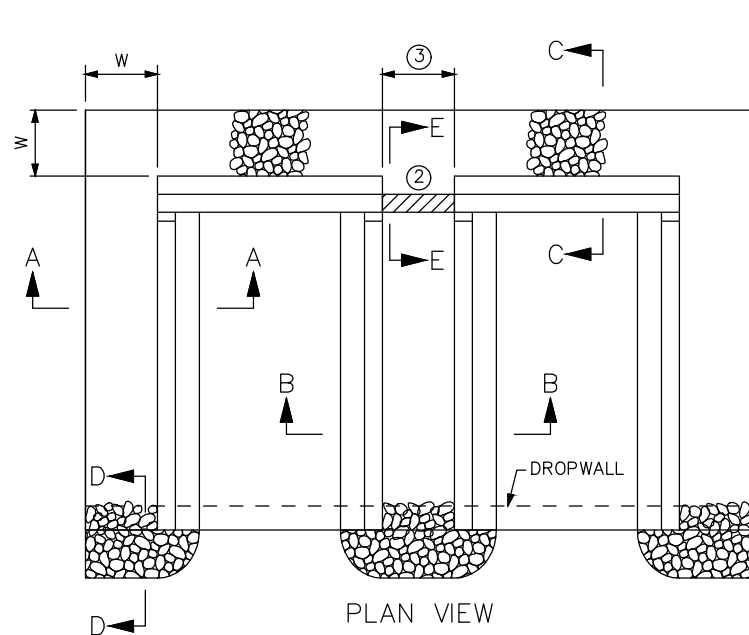
PROVIDE RIPRAP PER SPECS. 2511 AND 3601.

EMBANKMENT PROTECTION, INCLUDING MATERIAL PLACED BETWEEN BARRELS THAT ARE LESS THAN 2'-0" APART, IS INCIDENTAL.

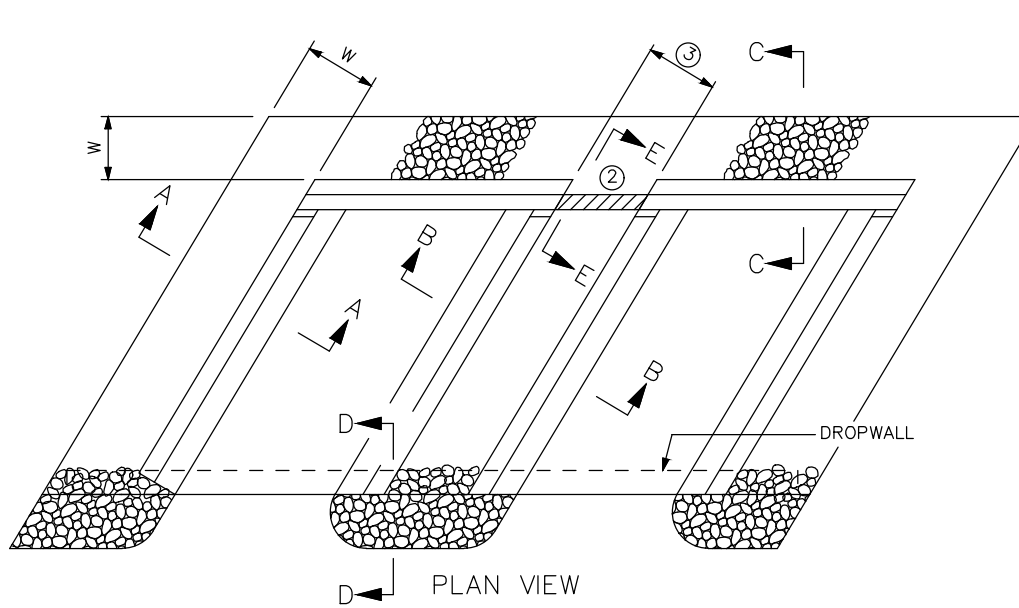
- ① FOR TYPE OF GEOTEXTILE FILTER MATERIAL REQUIRED, SEE SPEC. 3733. PROVIDE GEOTEXTILE STRIPS CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. BURY THE TOP EDGE TO PREVENT UNDERMINING.
- ② IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. IF PEA ROCK IS USED PROVIDE APPROVED GROUT SEEPAGE CUTOFF CORE, MINIMUM 12" THICK BETWEEN THE CULVERT'S TWO ENDS AND PROVIDE CLASS I GROUTED RIPRAP IN LIEU OF CLASS III RIPRAP.
- ③ REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES.



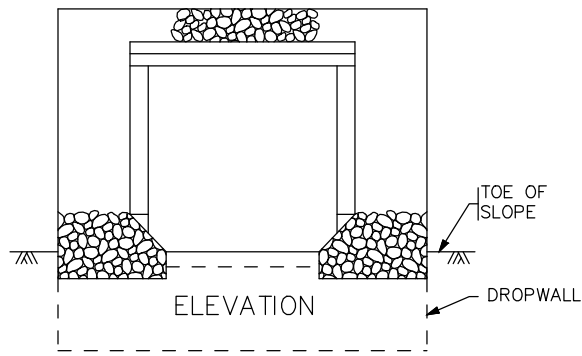
PLAN VIEW



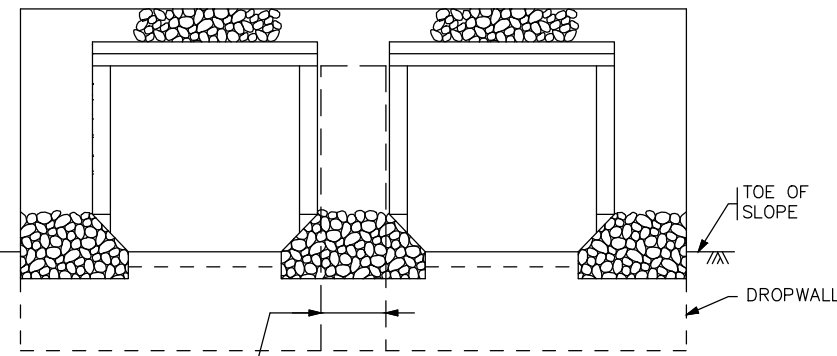
PLAN VIEW



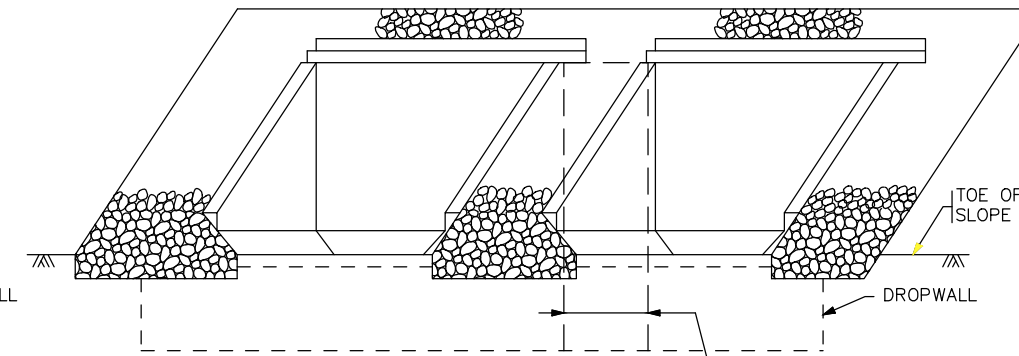
PLAN VIEW



ELEVATION



ELEVATION

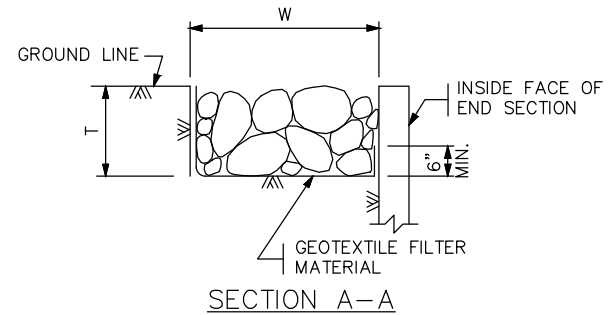


ELEVATION

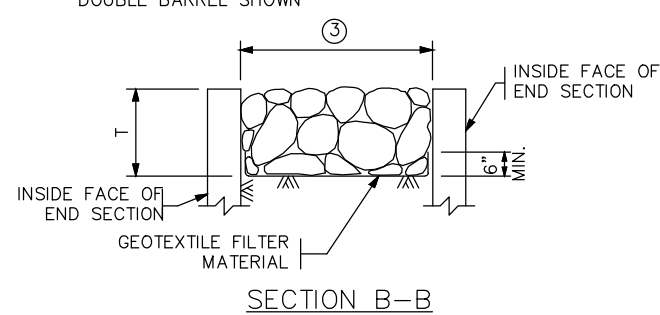
SINGLE BARREL
CLASS III OR IV SHOWN FOR SKEWS UP TO 71/2°

MULTIPLE BARREL
FOR SKEWS UP TO 71/2° CLASS III OR IV SHOWN DOUBLE BARREL SHOWN

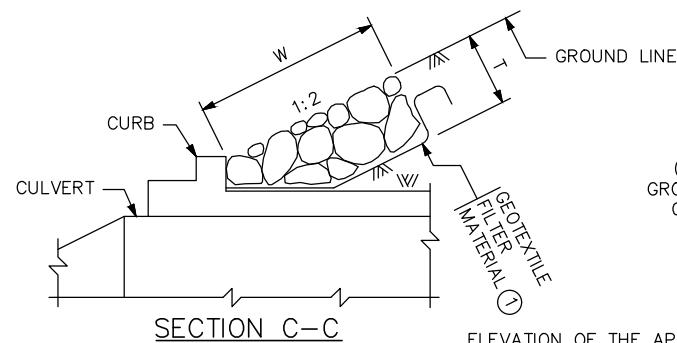
MULTIPLE BARREL
FOR SKEWS OVER 71/2° CLASS III OR IV SHOWN DOUBLE BARREL SHOWN, OTHER BARREL CONFIGURATIONS SIMILAR.



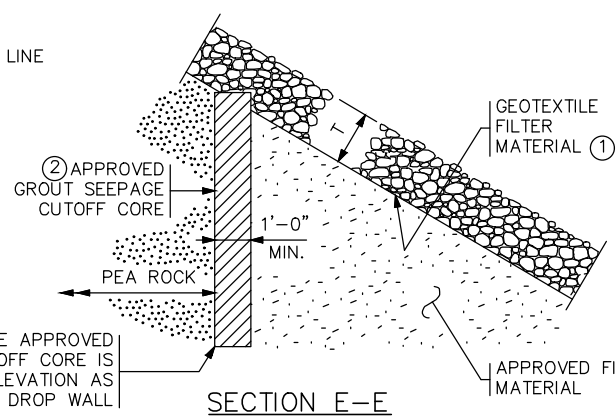
SECTION A-A



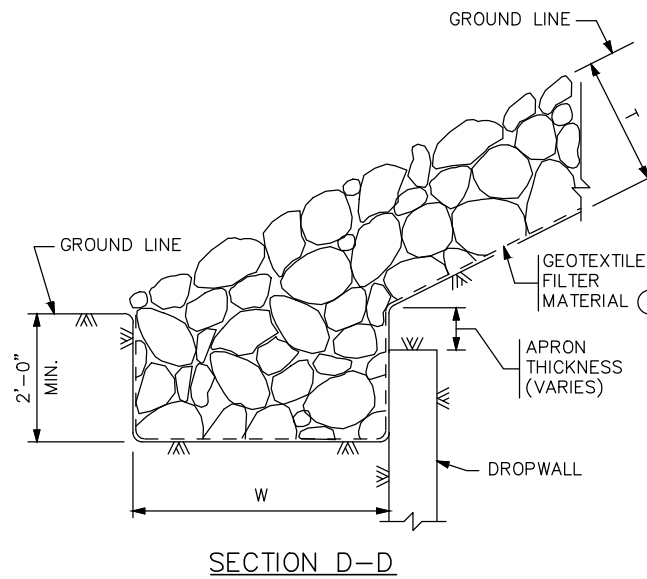
SECTION B-B



SECTION C-C



SECTION E-E



SECTION D-D

RIPRAP CLASS

RIPRAP CLASS	RIPRAP CLASS	T	W
<input checked="" type="checkbox"/>	III	1'-6"	3'-0"
<input type="checkbox"/>	IV	2'-0"	4'-0"

DESIGNER NOTE:
REMOVE PRIOR TO PLOTTING FINAL PLAN
DESIGNER TO SELECT EITHER CLASS III OR IV RIPRAP USING CHECK BOX ABOVE.

TIME : \$@TIME@\$
PLOTTED : \$\$\$@DATE\$\$\$
PATH & FILENAME: \$\$\$@PATHFILENAME\$\$\$


FILENAME: \$\$\$@FILENAME\$\$\$

REVISION: 10-22-2019
APPROVED: SEPTEMBER 11, 2014
Nancy Dubenberger
STATE BRIDGE ENGINEER

ELEVATION OF THE APPROVED GROUT SEEPAGE CUTOFF CORE IS TO BE THE SAME ELEVATION AS THE BOTTOM OF THE DROP WALL

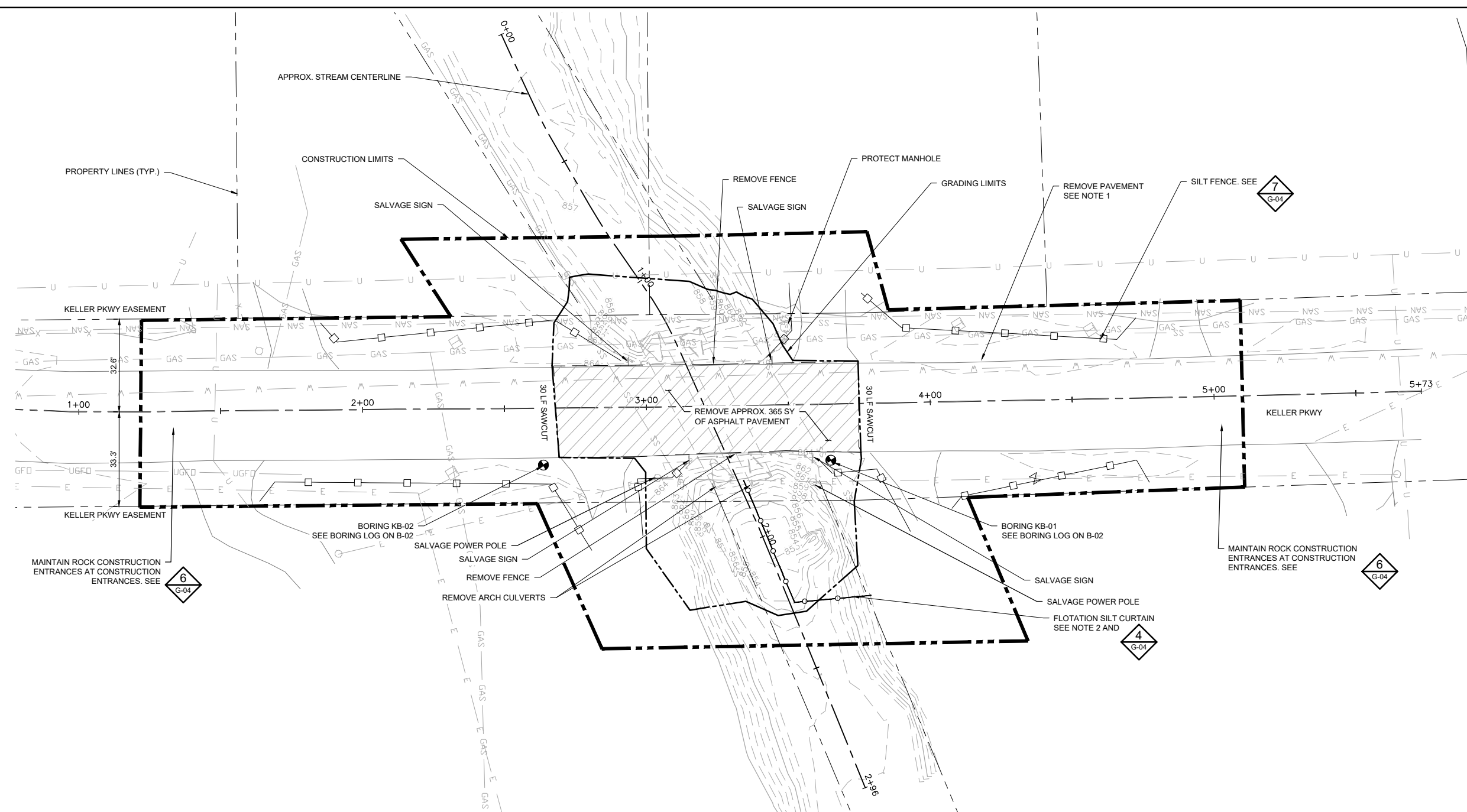
STATE PROJ. NO. - (T.H.) STA. + .		FIG. 5-395.115	
CERTIFIED BY	DATE	DES: PKN	DR: JMD3
NAME:	LIC. NO.	CHK:	CHK:
EMBAKMENT PROTECTION FOR BOX CULVERTS		APPROVED:	
		BRIDGE NO.	
		SHEET NO. RB4 OF RB4 SHEETS	

EROSION CONTROL NOTES:


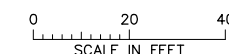
1. FIRST PHASE OF CONSTRUCTION ONLY REMOVE NECESSARY BITUMINOUS PAVEMENT TO COMPLETE THE REMOVAL AND REPLACEMENT OF THE EXISTING CULVERTS TO MINIMIZE THE AMOUNT OF DISTURBED AREA OF EXPOSED SOIL OVER THE LENGTH OF THE PROJECT.
2. USE FLOATATION SILT CURTAIN DOWNSTREAM OF CULVERT INSTALLATIONS TO SEGREGATE AREAS OF ACTIVE CONSTRUCTION TO PREVENT SEDIMENT FROM REACHING RECEIVING WATERS. DO NOT BLOCK BY-PASS FLOWS.
3. TOPSOIL, SEED AND EROSION CONTROL BLANKET OVER ALL DISTURBED AREAS. SEE 

GENERAL NOTES:

1. PROTECT ALL EXISTING UTILITIES AND COMMUNICATIONS UNLESS OTHERWISE NOTED IN THE DRAWINGS.



1 PLAN: KELLER PKWY EROSION/SEDIMENT CONTROL

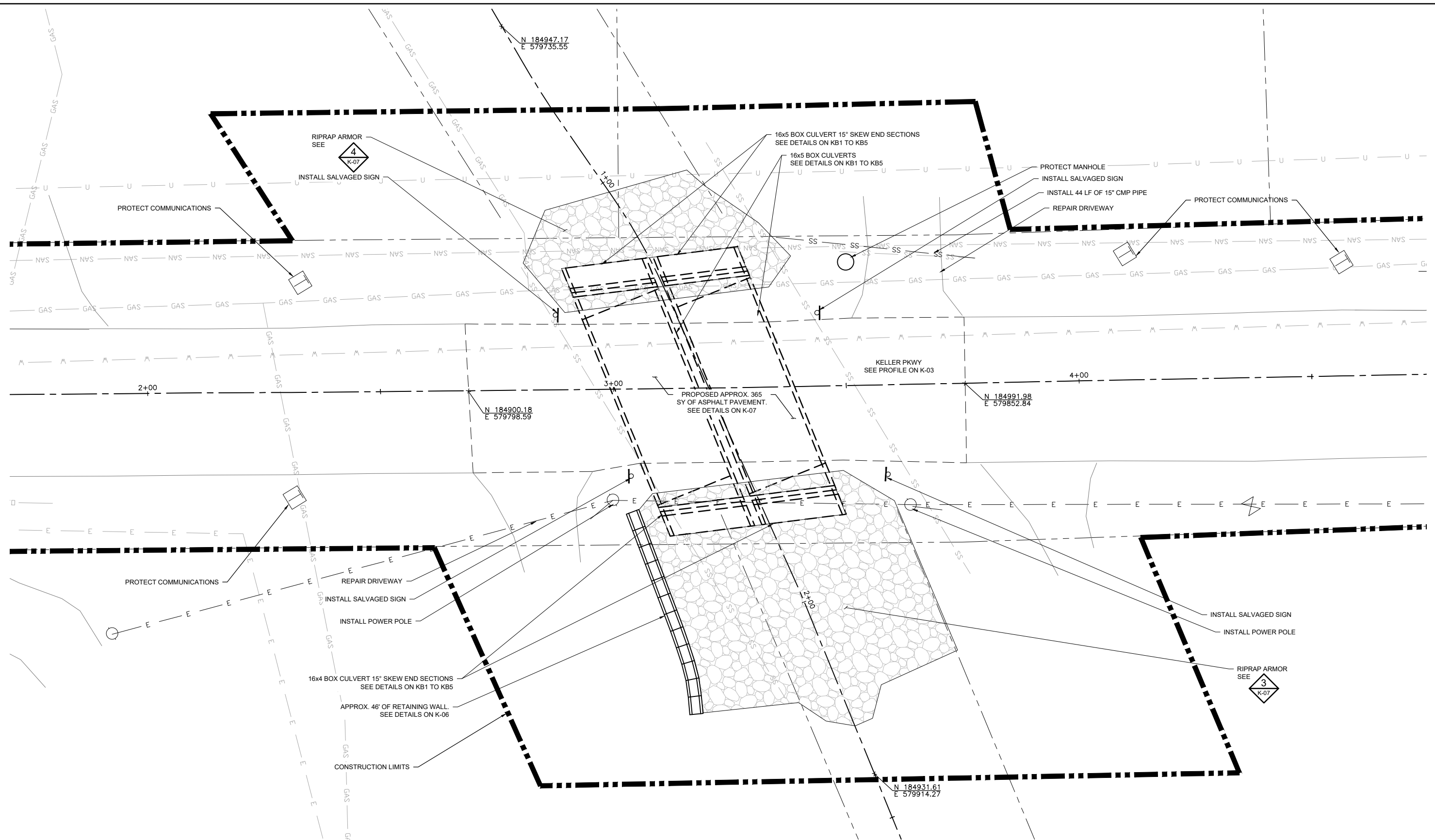
SCALE IN FEET

ISSUED FOR
PROJECT APPROVAL

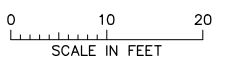
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. PRINTED NAME: SAMUEL O. REDINGER SIGNATURE: _____ DATE: _____ LICENSE # 58632				CLIENT BID: 02/25/21 CONSTRUCTION: _____ RELEASED TO/FOR: A B C 0 1 2 3 DATE RELEASED: _____				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Scale: AS SHOWN Date: 10/27/2020 Drawn: JMD3 Checked: SOR Designed: SOR Approved: _____				RAMSEY-WASHINGTON METRO WATERSHED DISTRICT				BARR PROJECT No. 23/62-1379.00 CLIENT PROJECT No. _____ DWG. No. K-01 REV. No. A			
NO. BY CHK. APP. DATE REVISION DESCRIPTION				A JMD3 SOR BJL 02/25/2021 ISSUED FOR PROJECT APPROVAL								RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES KELLER PKWY EXISINTG CONDITIONS, REMOVALS AND EROSION & SEDIMENT CONTROL											

CADD USER: jacob.m. Daire FILE: M:\DESIGN\23621379_00\23621379_00\KELLER PKWY ER SED CONTROL.DWG PLOT SCALE: 1:2 PLOT DATE: 2/23/2021 9:48 AM

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\23621379_00\KELLER PKWY PROPOSED DWG PLOT SCALE: 1:2 PLOT DATE: 2/22/2021 3:11 PM



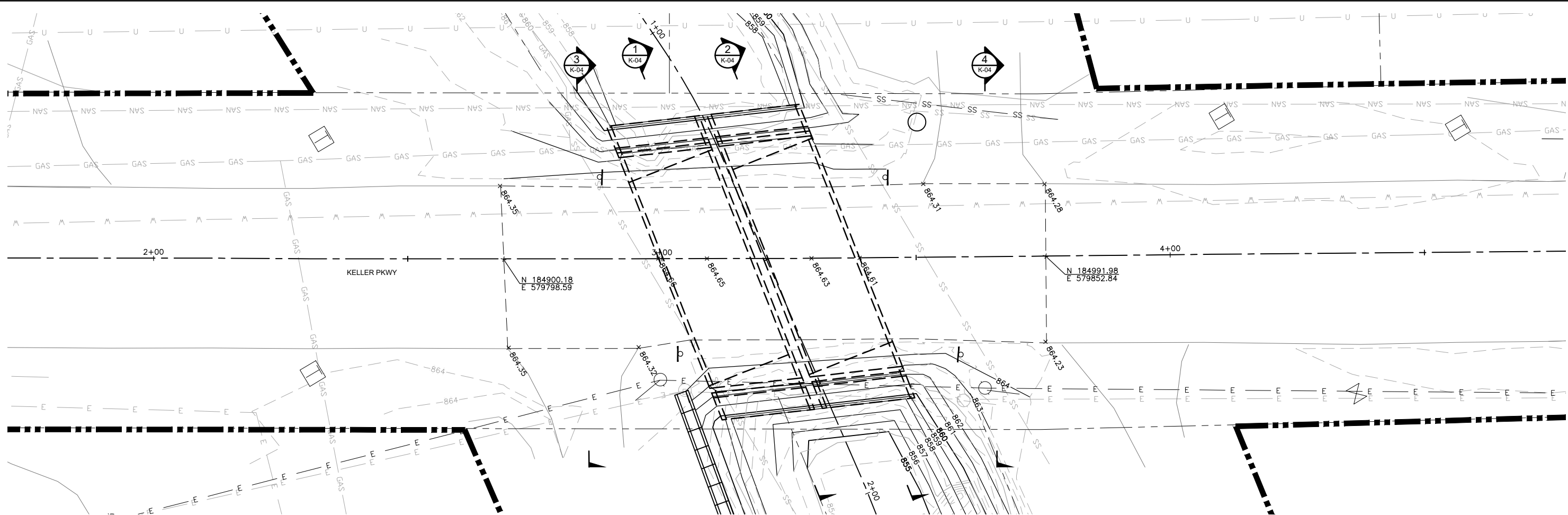
1 PLAN: KELLER PKWY EXISTING CONDITIONS



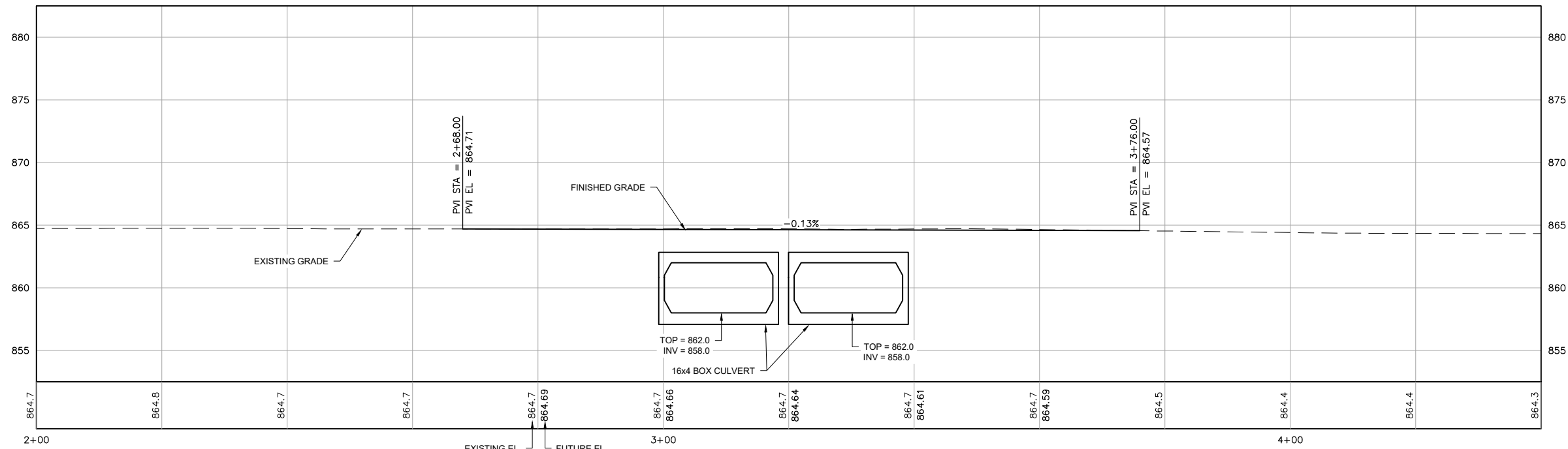
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				I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.				CLIENT BID CONSTRUCTION				02/25/21				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Scale AS SHOWN		RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES				BARR PROJECT No. 23/62-1379.00	
				PRINTED NAME SAMUEL O. REDINGER				RELEASED TO/FOR				A B C 0 1 2 3				Date 10/27/2020		KELLER PKWY PROPOSED SITE PLAN				CLIENT PROJECT No.					
NO. BY CHK. APP. DATE				REVISION DESCRIPTION				DATE RELEASED				A B C 0 1 2 3				Checked SOR		METRO WATERSHED DISTRICT				DWG. No. K-02					
				SIGNATURE												Designed SOR		Approved				REV. No. A					
				DATE																							

CADD USER: jacob.m. Daire FILE: M:\DESIGN\23621379_00\2362137900_K-03 ROAD PMP.DWG PLOT SCALE: 1:12 PLOT DATE: 2/22/2021 3:06 PM



1 PLAN: KELLER PKWY PLAN VIEW
 0 10 20
 HORIZONTAL SCALE IN FEET



2 PROFILE: PROPOSED KELLER PKWY PROFILE
 0 10 20 0 5 10
 HORIZONTAL SCALE IN FEET VERTICAL SCALE IN FEET

ISSUED FOR PROJECT APPROVAL

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
A	JMD3	SOR	BJL	02/25/2021	ISSUED FOR PROJECT APPROVAL

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PRINTED NAME: SAMUEL O. REDINGER
 SIGNATURE: _____
 DATE: _____ LICENSE # 58632

CLIENT	02/25/21								
BID									
CONSTRUCTION									
RELEASED TO/FOR	A	B	C	0	1	2	3		
DATE RELEASED									

BARR ENGINEERING CO.
 4300 MARKETPOINTE DRIVE
 SUITE 200
 MINNEAPOLIS, MN 55435
 Ph: 1-800-632-2277
 Fax: (952) 832-2601
 www.barr.com

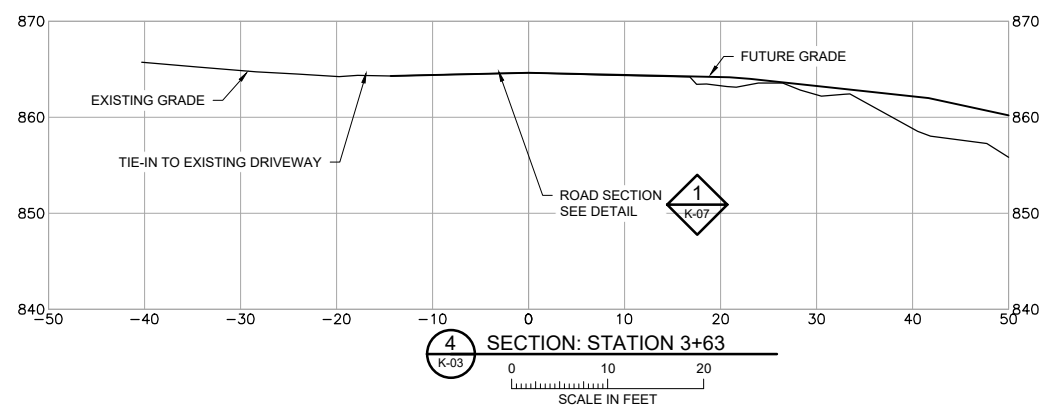
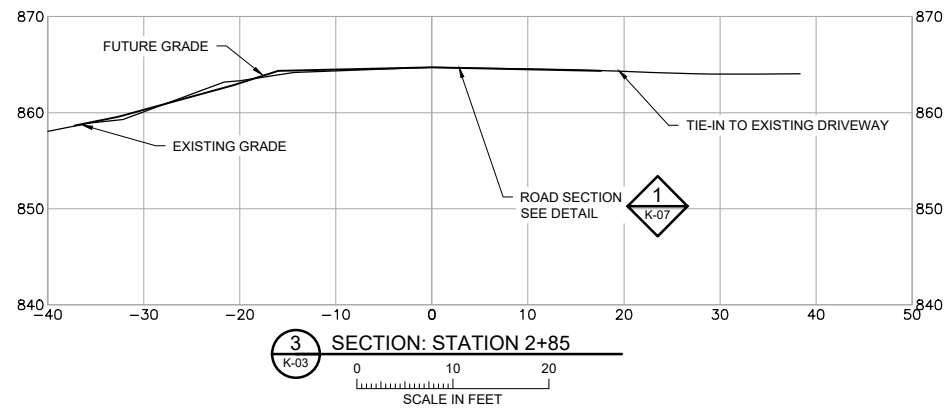
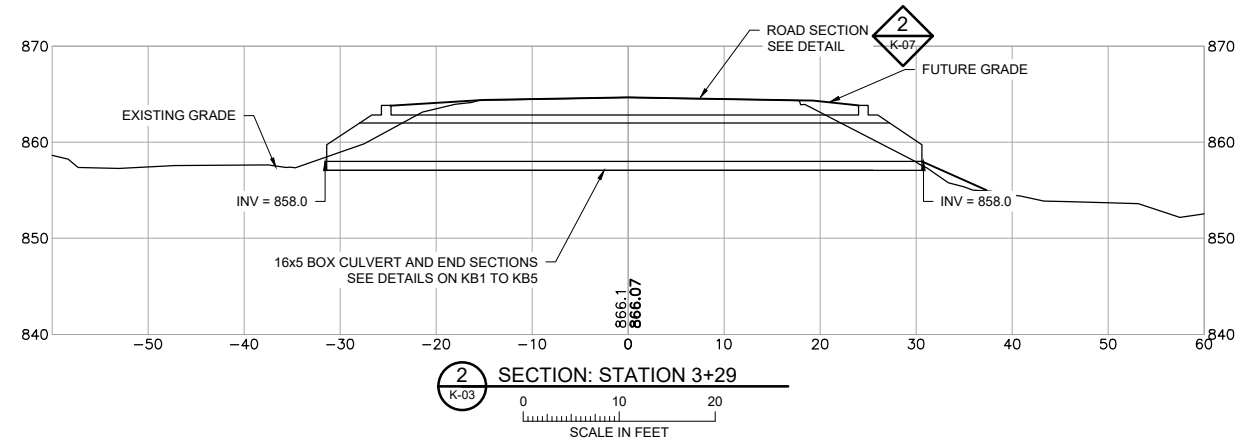
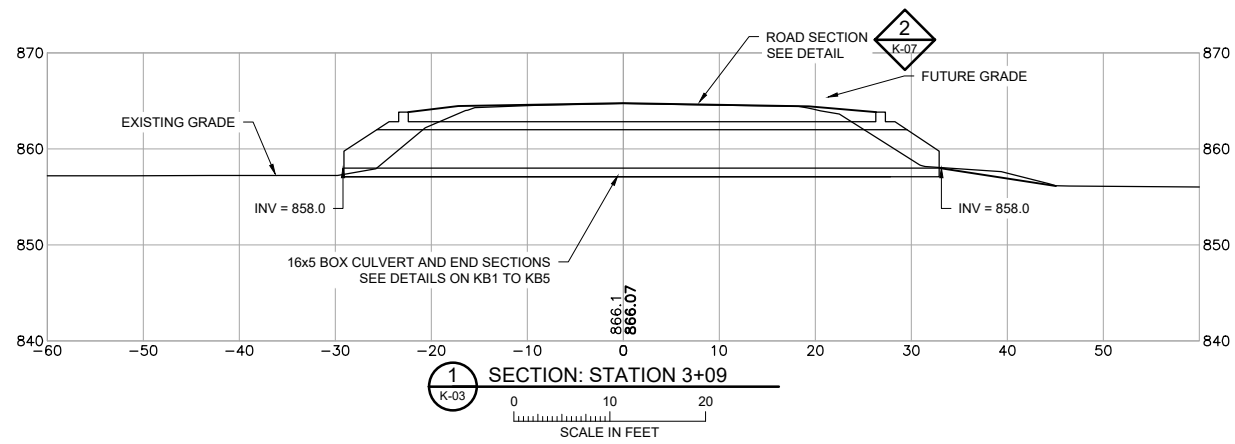
Scale	AS SHOWN
Date	10/27/2020
Drawn	JMD3
Checked	SOR
Designed	SOR
Approved	



RYAN DRIVE AND KELLER PKWY
 CONVEYANCE UPGRADES

KELLER PKWY
 PROPOSED PROFILE AND SECTIONS

BARR PROJECT No.	23/62-1379.00
CLIENT PROJECT No.	
DWG. No.	K-03
REV. No.	A



ISSUED FOR
PROJECT APPROVAL

CADD USER: jacob.m. Daire FILE: M:\DESIGN\23621379_00\2362137900_K-04 SECTIONS.DWG PLOT SCALE: 1:2 PLOT DATE: 2/22/2021 2:58 PM

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION
A	JMD3	SOR	BJL	02/25/2021	ISSUED FOR PROJECT APPROVAL

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PRINTED NAME: SAMUEL O. REDINGER
SIGNATURE: _____
DATE: _____ LICENSE #: 58632

CLIENT	02/25/21								
BID									
CONSTRUCTION									
RELEASED TO/FOR	A	B	C	0	1	2	3		
DATE RELEASED									

BARR Engineering Co.
4300 MARKETPOINTE DRIVE
Suite 200
MINNEAPOLIS, MN 55435

Project Office:
BARR ENGINEERING CO.
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MINNEAPOLIS, MN 55435

Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277
Ph: 1-800-632-2277

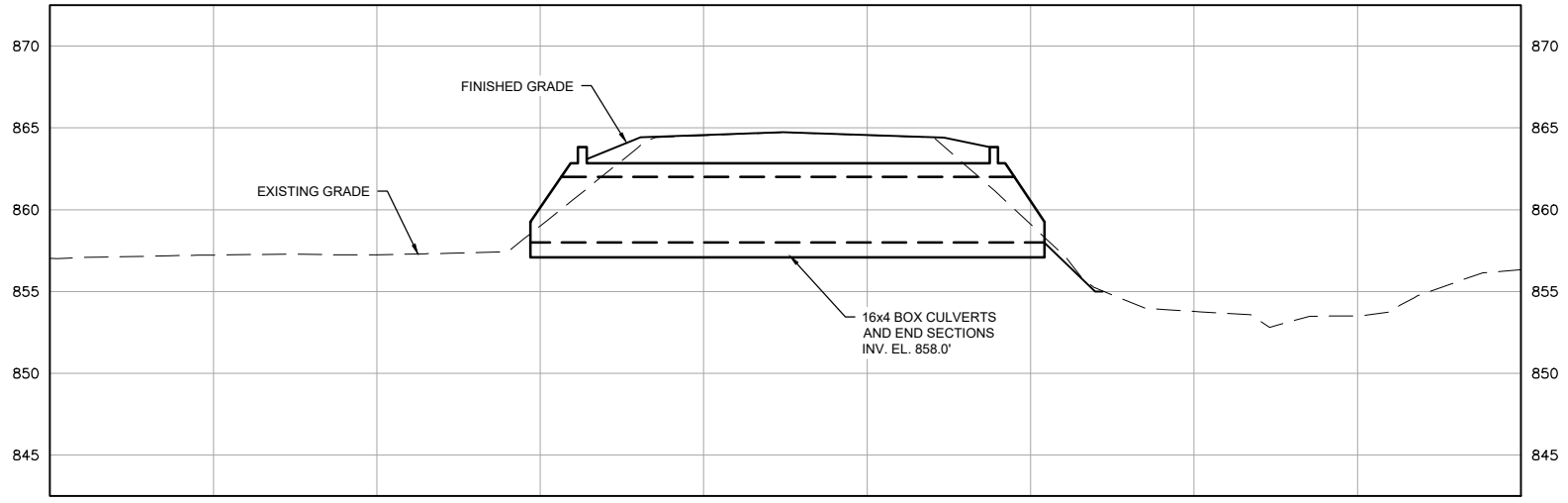
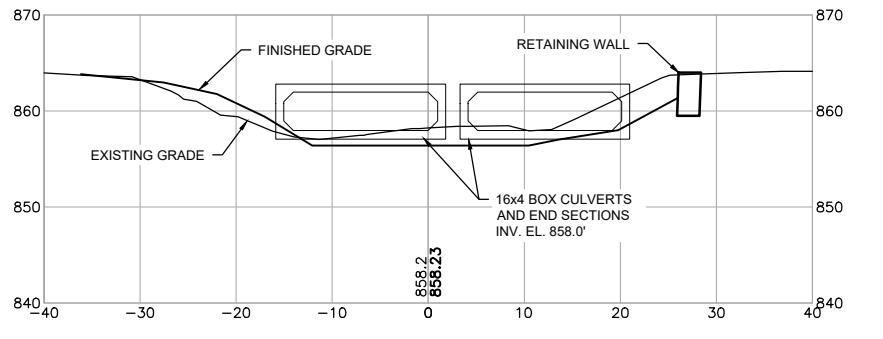
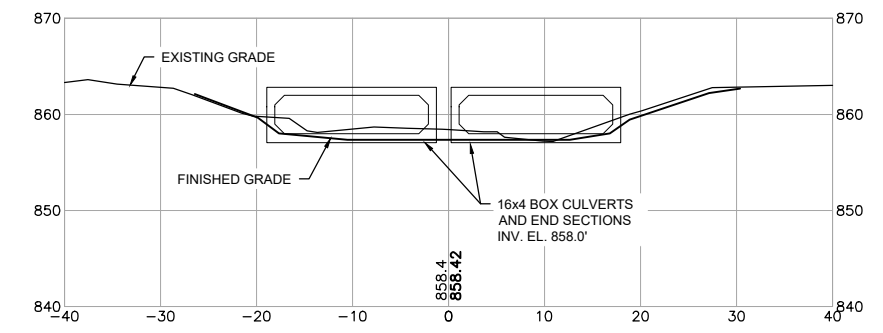
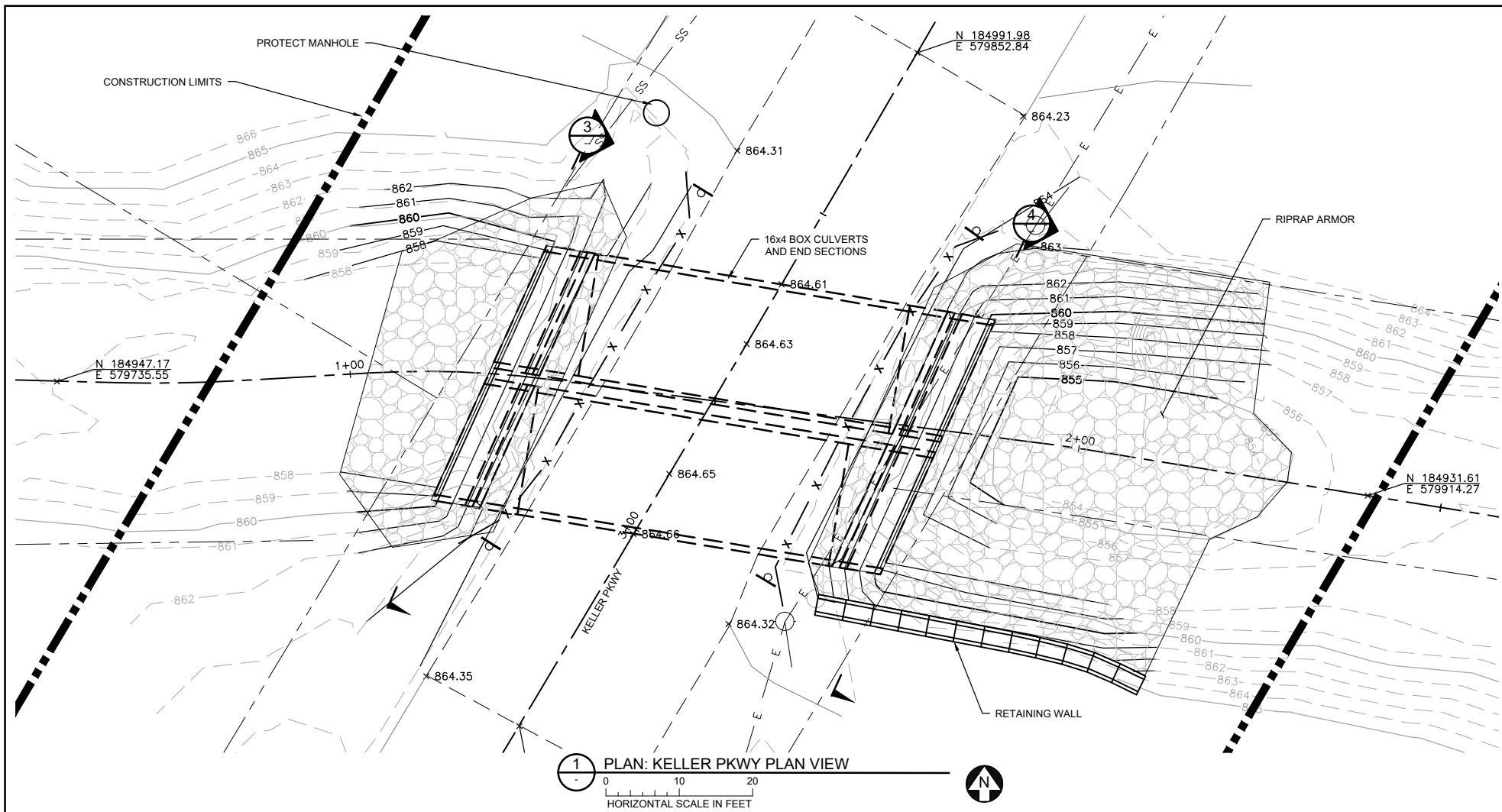
Scale	AS SHOWN
Date	10/27/2020
Drawn	JMD3
Checked	SOR
Designed	SOR
Approved	

RAMSEY-WASHINGTON
METRO WATERSHED DISTRICT

RYAN DRIVE AND KELLER PKWY
CONVEYANCE UPGRADES

KELLER PKWY
ROAD SECTIONS

BARR PROJECT No.	23/62-1379.00
CLIENT PROJECT No.	
DWG. No.	K-04
REV. No.	A

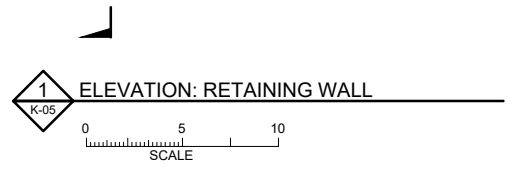
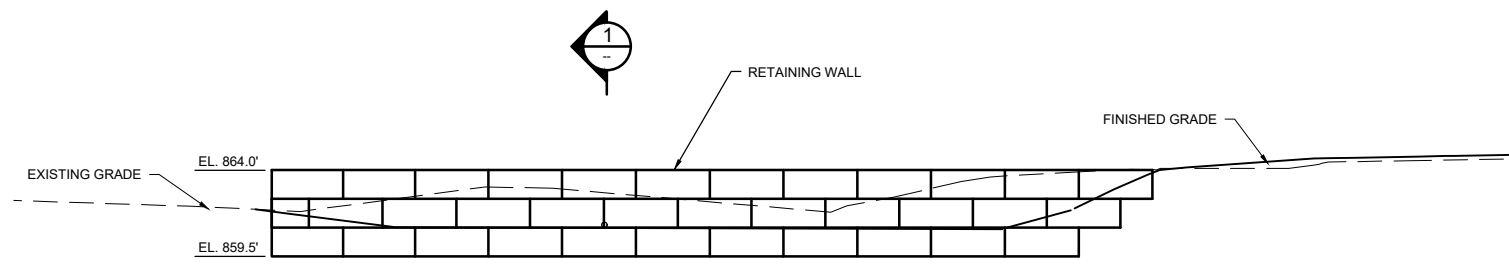


ISSUED FOR PROJECT APPROVAL

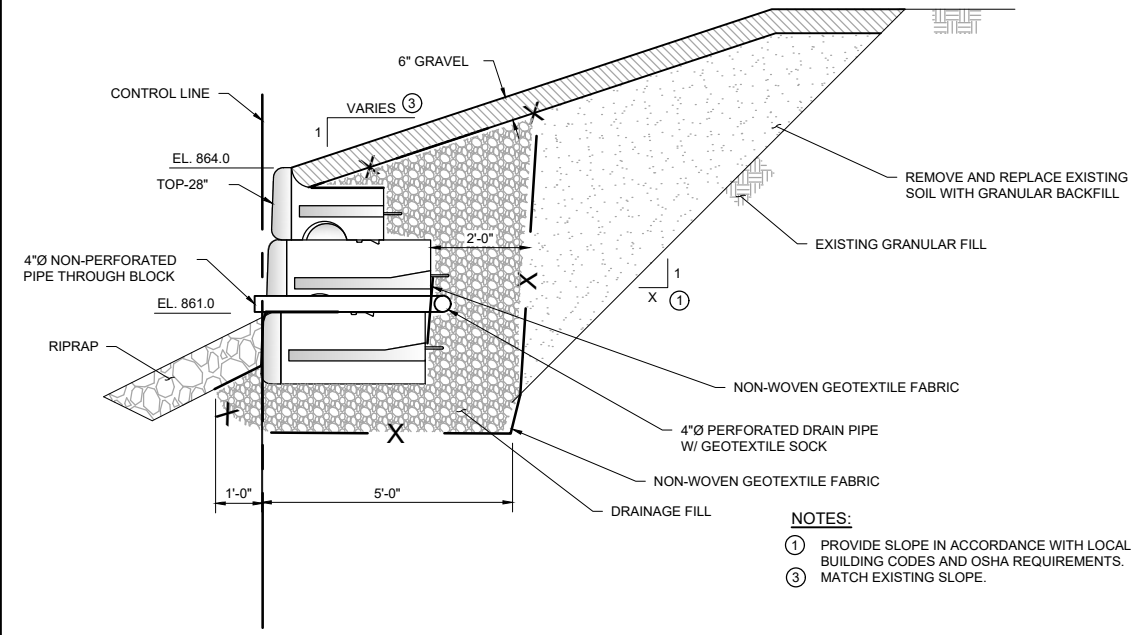
CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\236213790_K-05 STREAM PNP.DWG PLOT SCALE: 1:2 PLOT DATE: 2/22/2021 2:54 PM

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. PRINTED NAME: SAMUEL O. REDINGER SIGNATURE: _____ DATE: _____ LICENSE # 58632				CLIENT BID: 02/25/21 CONSTRUCTION: _____ RELEASED TO/FOR: _____ DATE RELEASED: _____				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Scale: AS SHOWN Date: 10/27/2020 Drawn: JMD3 Checked: SOR Designed: SOR Approved: _____				BARR PROJECT No. 23/62-1379.00 CLIENT PROJECT No. _____ DWG. No. K-05 REV. No. A			
NO. BY CHK. APP. DATE REVISION DESCRIPTION				A JMD3 SOR BJL 02/25/2021 ISSUED FOR PROJECT APPROVAL				RYAN DRIVE AND KELLER PKWY CONVEYANCE UPGRADES KELLER PKWY STREAM PLAN, PROFILE AND SECTIONS				RAMSEY-WASHINGTON METRO WATERSHED DISTRICT							

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\23621379_00_WALL ELEV AND DETAILS.DWG PLOT SCALE: 1:2 PLOT DATE: 2/22/2021 2:48 PM

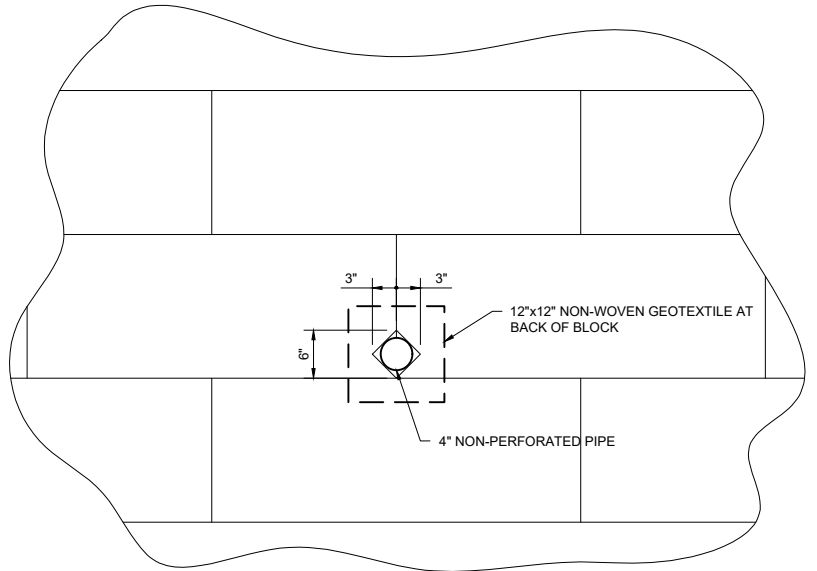
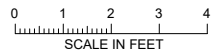


1 ELEVATION: RETAINING WALL



- NOTES:**
- PROVIDE SLOPE IN ACCORDANCE WITH LOCAL BUILDING CODES AND OSHA REQUIREMENTS.
 - MATCH EXISTING SLOPE.

1 SECTION: SEGMENTAL RETAINING WALL



- NOTE:**
- CUT OPENING AT GEOTEXTILE TO ALLOW PASSAGE OF DRAIN PIPE.

2 DETAIL: WALL PENETRATION
NOT TO SCALE

GENERAL

- WORK INCLUDES FURNISHING AND INSTALLING CONCRETE RETAINING WALL UNITS TO THE LINES AND GRADES DESIGNATED ON THE CONSTRUCTION DRAWINGS AND AS SPECIFIED HEREIN.
- CONTRACTOR SHALL PROTECT THE MATERIALS FROM DAMAGE. DAMAGED MATERIAL SHALL NOT BE INCORPORATED IN THE PROJECT.

MATERIALS

- WALL UNITS
 - WALL UNITS SHALL BE REDI-ROCK® AS PRODUCED BY A LICENSED MANUFACTURER.
 - WALL UNITS SHALL BE MADE WITH READY-MIXED CONCRETE IN ACCORDANCE WITH ASTM C94, LATEST REVISION PER THE FOLLOWING LIMITS:
 - AIR CONTENT: 4 1/2% - 7 1/2%
 - F_c (28 DAY) PSI: 4,000
 - SLUMP: 5" ± 1 1/2"
 - EXTERIOR BLOCK DIMENSIONS SHALL BE UNIFORM AND CONSISTENT. MAXIMUM DIMENSIONAL DEVIATIONS SHALL BE 1% EXCLUDING THE ARCHITECTURAL SURFACE. MAXIMUM WIDTH (FACE TO BACK) DEVIATION INCLUDING THE ARCHITECTURAL SURFACE SHALL BE 1.0 INCH.
 - EXPOSED FACE SHALL BE COBBLESTONE. OTHER SURFACES TO BE SMOOTH FORM TYPE. DIME-SIZE BUG HOLES ON THE BLOCK FACE MAY BE PATCHED AND/OR SHAKE-ON COLOR STAIN CAN BE USED TO BLEND INTO THE REMAINDER OF THE BLOCK FACE.
- LEVELING PAD AND DRAINAGE FILL SHALL CONSIST OF NOT LESS THAN 95% CRUSHED MATERIAL AND MUST MEET THE REQUIREMENTS OF MDOT CLASS 26A (COARSE AGGREGATE) EXCEPT, NO MORE THAN 5% PASSING THE NO. 4 SIEVE.
- GRANULAR BACKFILL MATERIAL SHALL BE MDOT CLASS II
- NON-WOVEN GEOTEXTILE CLOTH SHALL BE PLACED BETWEEN THE FREE DRAINING BACKFILL AND RETAINED SOIL AND MEET THE REQUIREMENTS OF MDOT SEC. 910.
- DRAINAGE PIPE SHALL MEET THE REQUIREMENT OF MDOT SEC. 404.

CONSTRUCTION OF WALL SYSTEM

- EXCAVATION
 - CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.
- FOUNDATION SOIL PREPARATION
 - NATIVE FOUNDATION SOIL SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR OR 90% OF MODIFIED PROCTOR PRIOR TO PLACEMENT OF THE LEVELING PAD MATERIAL.
- LEVELING PAD PLACEMENT
 - LEVELING PAD SHALL BE PLACED AS SHOWN ON THE CONSTRUCTION DRAWINGS.
 - LEVELING PAD SHALL BE PLACED ON UNDISTURBED NATIVE SOILS.
 - LEVELING PAD SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR OR 90% OF MODIFIED PROCTOR TO ENSURE A LEVEL, HARD SURFACE ON WHICH TO PLACE THE FIRST COURSE BLOCKS. PAD SHALL BE CONSTRUCTED TO THE PROPER ELEVATION TO ENSURE THE FINAL ELEVATION SHOWN ON THE PLANS.
- UNIT INSTALLATION
 - THE FIRST COURSE OF WALL UNITS SHALL BE PLACED ON THE PREPARED LEVELING PAD WITH THE AESTHETIC SURFACE FACING OUT AND THE FRONT EDGES TIGHT TOGETHER. ALL UNITS SHALL BE CHECKED FOR LEVEL AND ALIGNMENT AS THEY ARE PLACED.
 - ENSURE THAT UNITS ARE IN FULL CONTACT WITH LEVELING PAD. PROPER CARE SHALL BE TAKEN TO DEVELOP STRAIGHT LINES ON BASE COURSE PER WALL LAYOUT.
 - THE BACKFILL IN FRONT AND BACK OF ENTIRE BASE ROW SHALL BE PLACED AND COMPACTED TO FIRMLY LOCK THEM IN PLACE. CHECK ALL UNITS AGAIN FOR LEVEL AND ALIGNMENT. ALL EXCESS MATERIAL SHALL BE SWEEPED FROM TOP OF UNITS.
 - INSTALL NEXT COURSE OF WALL UNITS ON TOP OF BASE ROW. POSITION BLOCKS TO BE OFFSET FROM SEAMS OF BLOCKS BELOW. BLOCKS SHALL BE PLACED FULLY FORWARD SO KNOB AND GROOVE ARE ENGAGED. CHECK EACH BLOCK FOR PROPER ALIGNMENT AND LEVEL. BACKFILL TO 24 INCH WIDTH BEHIND BLOCK WITH DRAINAGE FILL. SPREAD BACKFILL IN UNIFORM LIFTS NOT EXCEEDING 9 INCHES. EMPLOY METHODS USING LIGHTWEIGHT COMPACTION EQUIPMENT THAT WILL NOT DISRUPT THE STABILITY OR BATTER OF THE WALL. HAND-OPERATED PLATE COMPACTION EQUIPMENT SHALL BE USED AROUND THE BLOCK AND WITHIN 3 FEET OF THE WALL TO ACHIEVE CONSOLIDATION. COMPACT BACKFILL TO 95% OF STANDARD PROCTOR (ASTM D 698, AASHTO T-99) DENSITY WITHIN 2% OF ITS OPTIMUM MOISTURE CONTENT.
 - INSTALL EACH SUBSEQUENT COURSE IN LIKE MANNER. REPEAT PROCEDURE TO THE EXTENT OF WALL HEIGHT.
 - ALLOWABLE CONSTRUCTION TOLERANCE AT THE WALL FACE IS 2 DEGREES VERTICALLY AND 1 INCH IN 10 FEET HORIZONTALLY.

DESIGN CRITERIA

DESIGN FOLLOWS THE NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA) DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS, SECOND EDITION.

MINIMUM FACTORS OF SAFETY:

- OVERTURNING: 1.5
- SLIDING: 1.5
- BEARING CAPACITY: 2.0
- DEEP SEATED STABILITY: 1.3

BEARING:

- A. ALLOWABLE SOIL BEARING PRESSURE: 3000 PSI

RETAINED BACKFILL CHARACTERISTICS:

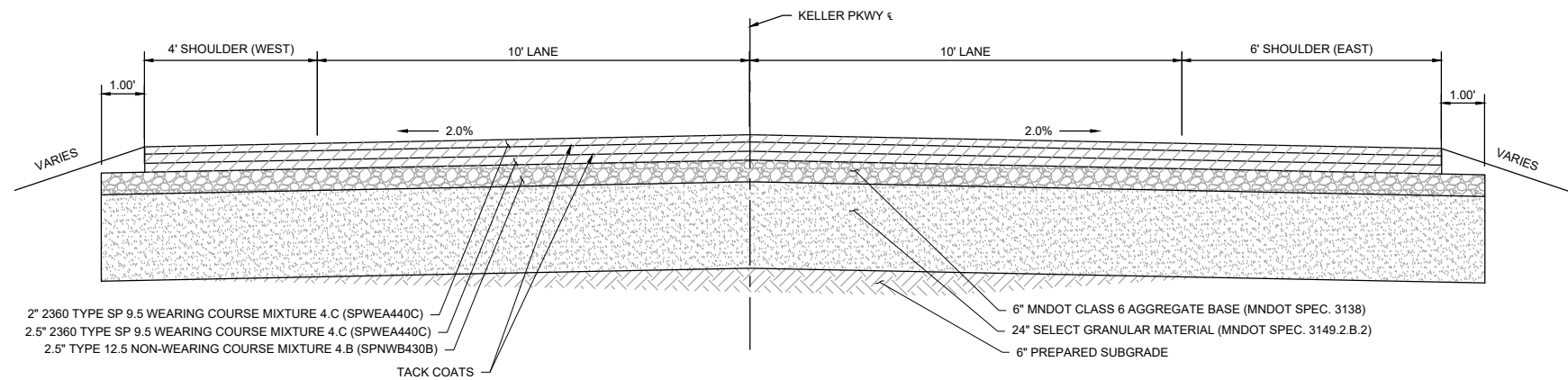
- A. INTERNAL ANGLE OF FRICTION (φ_s) ≥ 35°
- B. COHESION (C) = 0
- C. MOIST UNIT WEIGHT (γ_m) = 120 PSF

LOADING:

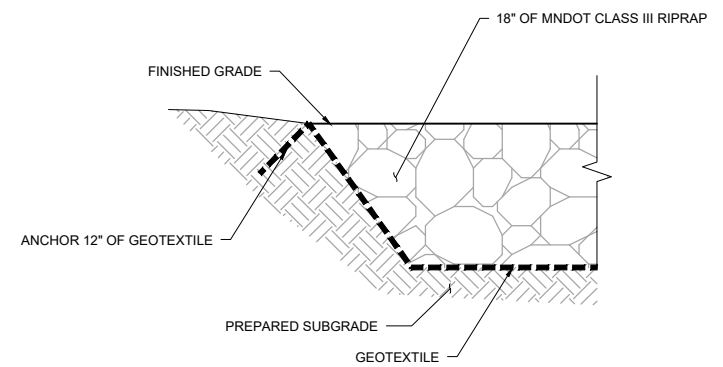
- A. WALL IS NOT DESIGNED FOR A SURCHARGE LOAD BEHIND WALL. ANY FUTURE LOADS SHOULD BE KEPT A MINIMUM OF 15 FEET BEHIND BACK OF WALL.
- B. WALL IS DESIGNED FOR A BALANCED HYDROSTATIC HEAD.

ISSUED FOR PROJECT APPROVAL

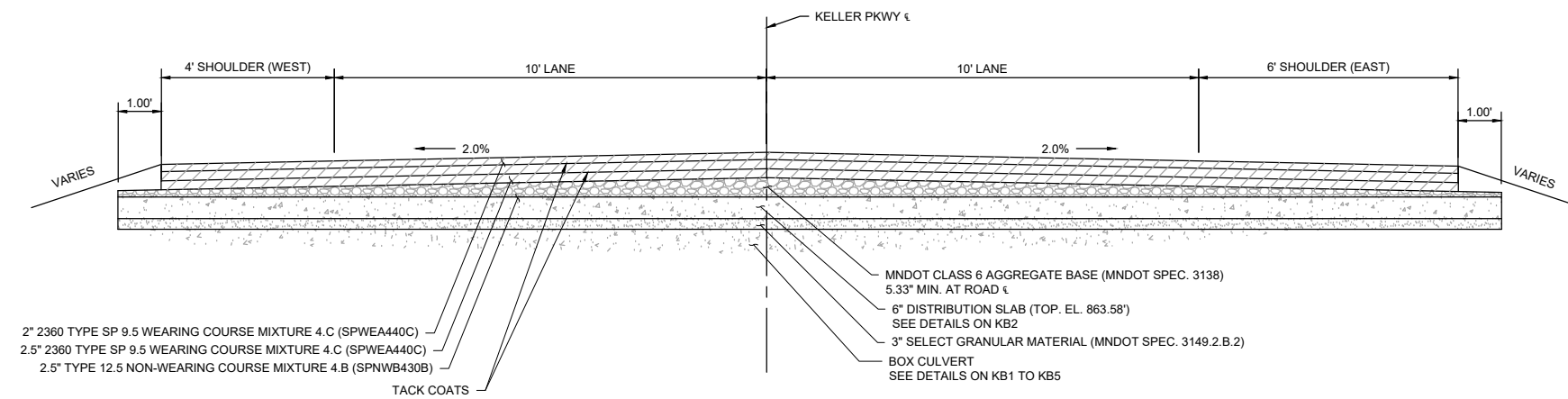
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				RELEASED TO/FOR: _____ DATE RELEASED: _____				A B C 0 1 2 3		DWG. No. K-06 REV. No. A					



1 DETAIL: TYPICAL LANE AND SHOULDER SECTION NOT OVER BOX CULVERT
 K-03
 LOOKING UP STATION
 0 2 4
 SCALE



3 DETAIL: RIPRAP TYPICAL SECTION
 K-05
 1"=1'-0"
 0 1 2
 SCALE



2 DETAIL: TYPICAL LANE AND SHOULDER SECTION OVER BOX CULVERT
 K-03
 LOOKING UP STATION
 0 2 4
 SCALE

ISSUED FOR
PROJECT APPROVAL

CADD USER: Jacob M. Daire FILE: M:\DESIGN\23621379_00\236213790_K-07 DETAILS.DWG PLOT SCALE: 1:2 PLOT DATE: 2/26/2021 10:08 AM

				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.				CLIENT BID CONSTRUCTION				02/25/21				Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435				Scale AS SHOWN		BARR PROJECT No. 23/62-1379.00							
				PRINTED NAME SAMUEL O. REDINGER								Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Date 10/27/2020		CLIENT PROJECT No.											
				SIGNATURE												Drawn JMD3		DWG. No. K-07											
				DATE												Checked SOR		REV. No. A											
NO.				BY				CHK				APP.				DATE				REVISION DESCRIPTION				Designed SOR					
A				JMD3				SOR				BJL				02/25/2021				ISSUED FOR PROJECT APPROVAL				Approved					

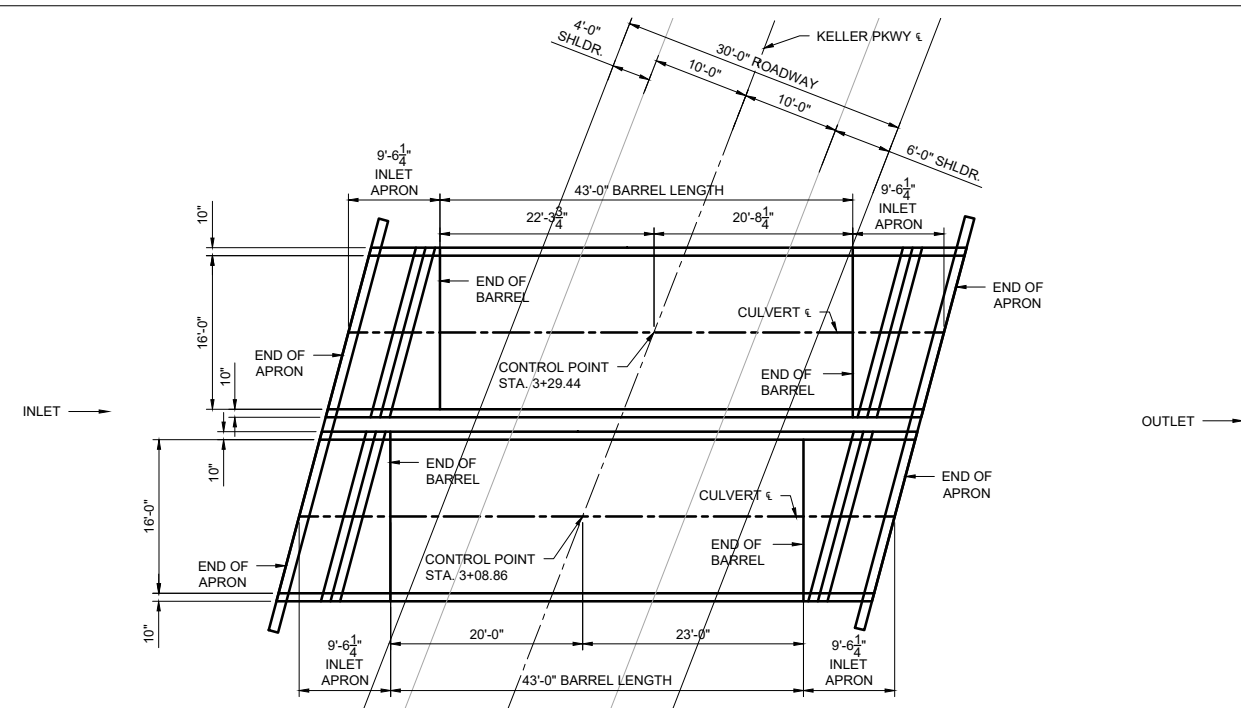


RYAN DRIVE AND KELLER PKWY
CONVEYANCE UPGRADES

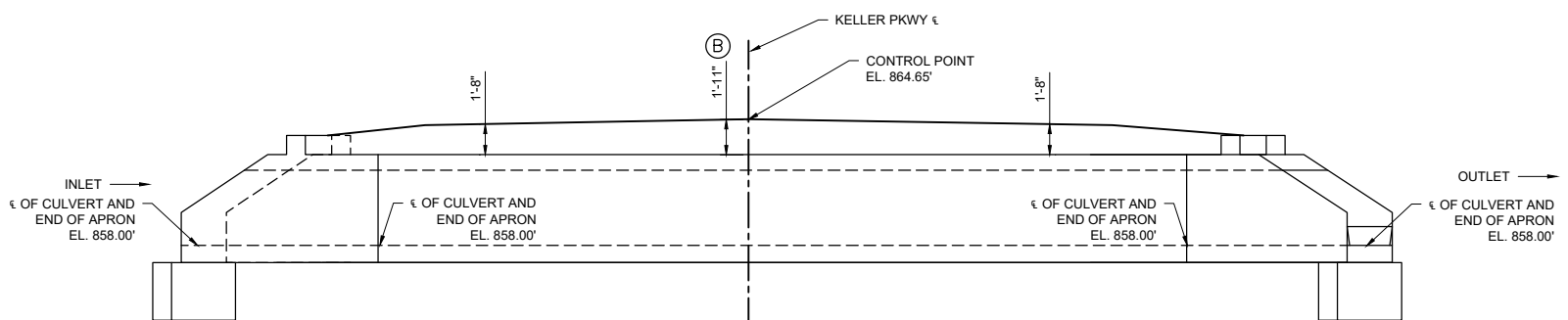
KELLER PKWY
TYPICAL ROAD DETAILS

FILENAME: \$\$\$@FILENAME\$\$\$

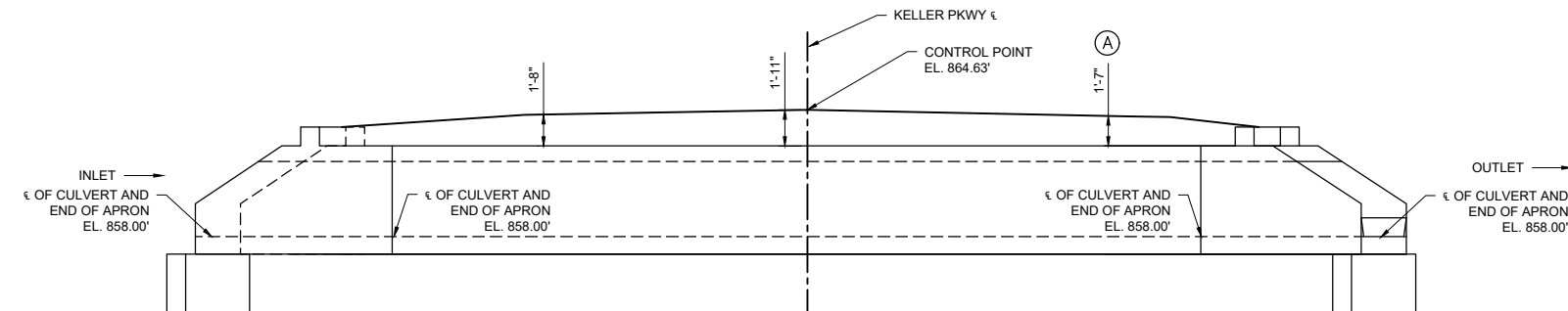
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 PLOTTED : \$\$\$@DATE\$\$\$
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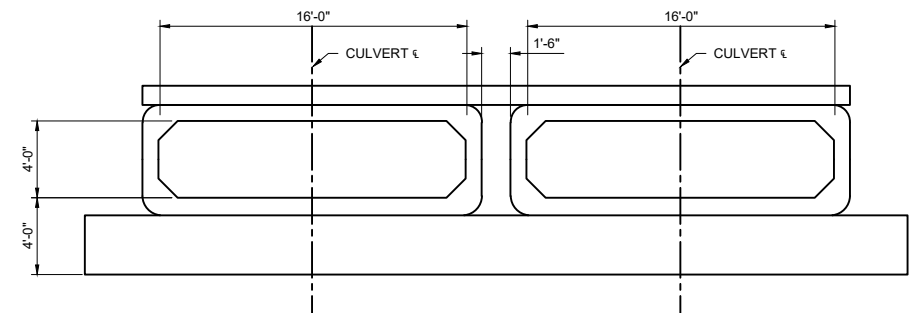
1 PLAN: RYAN DRIVE GENERAL PLAN
 SCALE IN FEET



2 ELEVATION: SIDE ELEVATION OF SOUTH CULVERT LOOKING UP STATION
 SCALE IN FEET



3 ELEVATION: SIDE ELEVATION NORTH CULVERT LOOKING UP STATION
 SCALE IN FEET



4 ELEVATION: END ELEVATION
 SCALE IN FEET

DESIGN DATA
 DESIGNED IN ACCORDANCE WITH 2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

HL-93 LIVE LOAD
 BARREL INSIDE WIDTH = 16'-0"
 BARREL INSIDE HEIGHT = 4'-0"
 BARREL LENGTH = 43'-0" (X2)
 EST. MIN. FILL DEPTH A = 1'-7"
 EST. MAX. FILL DEPTH B = 1'-11"
 SKEW ANGLE = 15°

DESIGN SPEED =
 CURRENT ADT (YEAR) =
 PROJECTED ADT (YEAR) =

HL-93 LRFR
 BRIDGE OPERATING RATING FACTOR RF = .

LIST OF SHEETS

NO.	DESCRIPTION
KB1	GENERAL PLAN AND ELEVATION
KB2	PRECAST CONCRETE BARREL DETAILS
KB3	PRECAST CONCRETE END SECTION TYPE III
KB4	PRECAST CONCRETE END SECTION TYPE III
KB5	EMBANKMENT PROTECTION FOR BOX CULVERTS

SCHEDULE OF QUANTITIES FOR ENTIRE CULVERT

ITEM	UNIT	S.P. NO. 0125-25 QUANTITY
16X4 PRECAST CONCRETE BOX CULVERT	LIN. FT.	43 (X2)
16X4 PRECAST CONCRETE BOX CULVERT END SECTION (1)	EACH	4

(1) END SECTION TO BE TYPE III.

I HEREBY CERTIFY THAT THIS PLAN 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.

SIGNED _____ DATE _____
 LICENSED PROFESSIONAL ENGINEER

NAME: _____ LIC NO. _____

CONSTRUCTION NOTES:

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A 1/2" OR 3/4" CHAMFER UNLESS OTHERWISE NOTED.

CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPEC. 2411 AND 2412, EXCEPT AS NOTED.

REFER TO REMAINDER OF GRADING PLAN FOR SUPERSTRUCTURE EXCAVATION AND BACKFILL. SPEC. 2451.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS.

REFER TO TITLE SHEET FOR THE SUBSURFACE UTILITY INFORMATION.

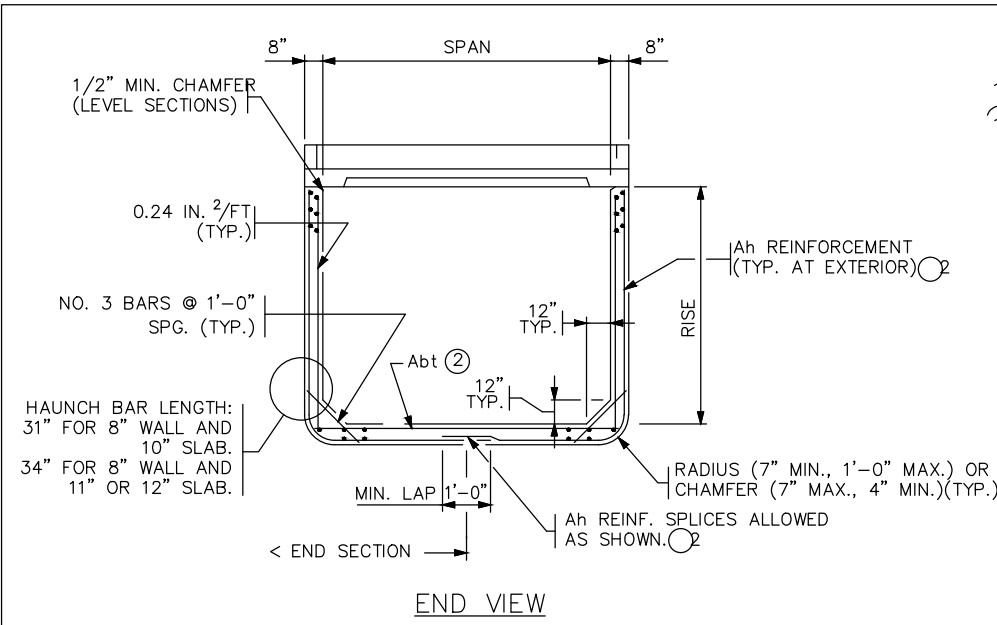
BRIDGE NO.
 LOCATION: KELLER PKWY STEAM CROSSING
 MAIN 16 x 4 MNDOT STD. PRECAST CONCRETE CULVERT
 IDENTIFICATION NO. 513
GENERAL PLAN AND ELEVATION
 SEC. 5 T 29 N R 22 W
 TOWNSHIP RAMSEY COUNTY

DES: PKN DR: JMD3
 CHK: _____ CHK: _____

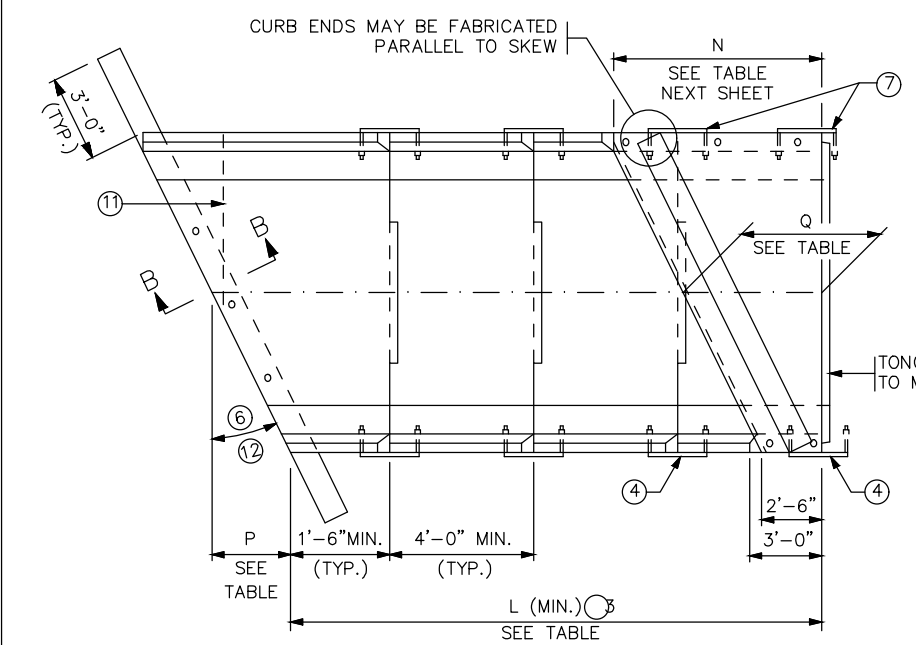
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TIME: \$@TIME@\$
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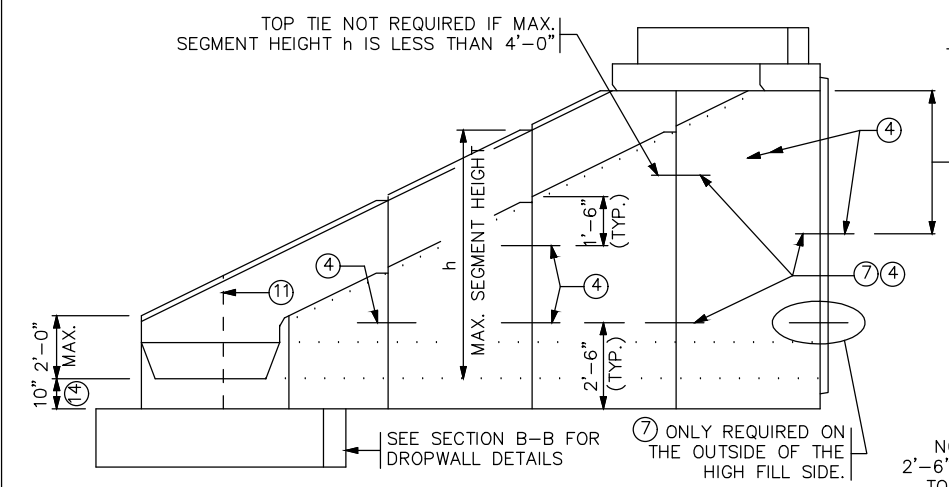


END VIEW

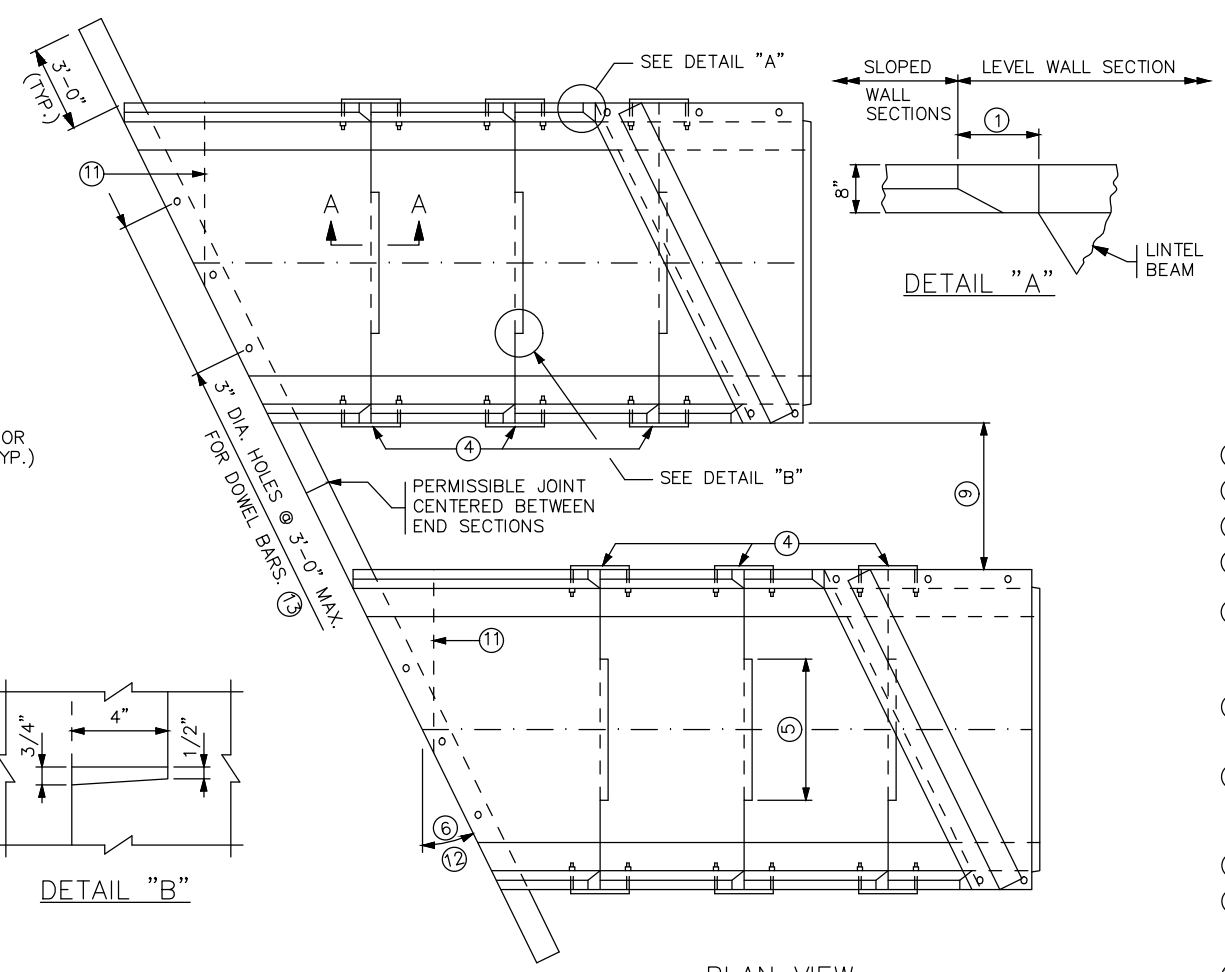


PLAN VIEW

SINGLE BARREL OPTION

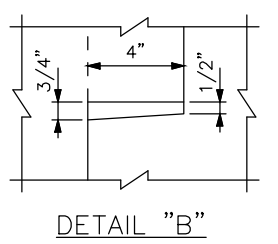


ELEVATION

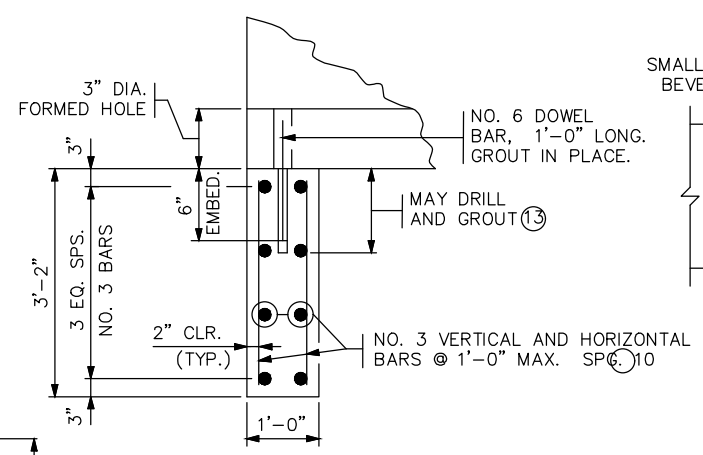


PLAN VIEW

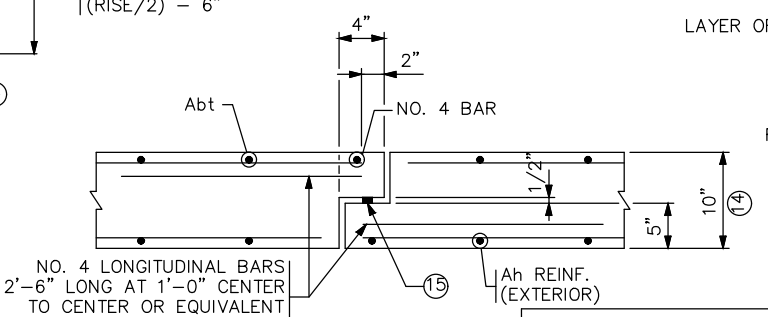
DOUBLE-BARREL OPTION



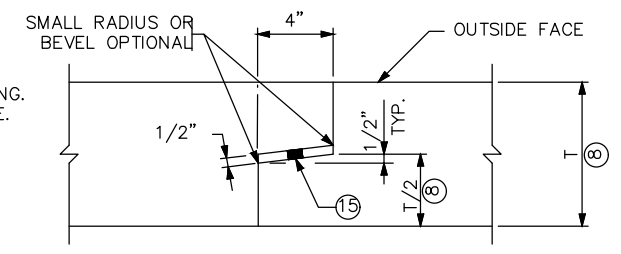
DETAIL "B"



SECTION B-B

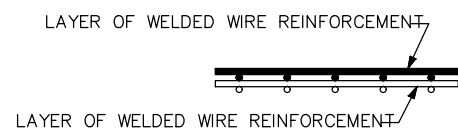


SECTION A-A



TONGUE AND GROOVE JOINT

MAKE DIMENSION OF TONGUE OR GROOVE ON ADJACENT PRECAST BARREL SECTIONS SO INSIDE WALLS ARE FLUSH.



REINFORCEMENT LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE REINFORCEMENT IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, PLACE THE WIRES OF THE WELDED WIRE REINFORCEMENT AS SHOWN

CONSTRUCTION NOTES

SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.

FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

USE CONCRETE MIX 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.

USE DROPWALL CONCRETE MIX 3S52, OR 3Y82 IF PRECAST. LIMITS FOR DROPWALL EXCAVATION TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. FURNISHING AND INSTALLATION OF DROPWALL IS INCLUDED IN PRICE BID FOR END SECTIONS.

PLACE LONGITUDINAL REINFORCEMENT WITH A MINIMUM OF 0.06 SQ. IN. PER FT. ON BOTH FACES.

NO TONGUE OR GROOVE REQUIRED IN WALLS BETWEEN END SECTIONS.

SEE STANDARD FIG. 5-395.115 FOR EMBANKMENT PROTECTION.

- ① 81/8" @ 15"; 105/8" @ 30"; 1'-2" @ 45"
- ② SEE STANDARD FIG. 5-395.110(B) FOR REINFORCEMENT TABLES.
- ③ NUMBER OF SECTIONS VARIES WITH CULVERT RISE.
- ④ EXCEPT AS NOTED, USE 1" DIA. CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS. TWO TIES ARE REQUIRED PER JOINT WHERE h IS GREATER THAN 4'. 3'-6" MIN. TONGUE AND 3'-7" MIN. GROOVE FOR CULVERTS WITH SPANS 6'-0" SPANS. 5'-0" MIN. TONGUE AND 5'-1" MIN. GROOVE FOR CULVERTS WITH SPANS GREATER THAN 6'-0". CENTER TONGUE AND GROOVE ON < OF EACH APRON JOINT. TONGUE AND GROOVE JOINT ON ALL THREE SIDES OF APRON IS PERMISSIBLE.
- ⑥ FOR SKEW ANGLES OVER 71/2' UP TO 221/2', USE A 15' SKEW END SECTION. FOR SKEW ANGLES OVER 221/2' UP TO 371/2', USE A 30' SKEW END SECTION. FOR SKEW ANGLES OVER 371/2' UP TO 45', USE A 45' SKEW END SECTION.
- ⑦ PROVIDE EXTRA STRONG CONNECTION AT LOCATION SHOWN; REQUIRED ONLY ON HIGH FILL SIDE FOR 45' SKEW END SECTIONS OVER 6'-0" HIGH. FOR MULTIPLE BARREL OPTION, ONLY INCLUDE EXTRA STRONG TIES ON THE OUTSIDE OF THE HIGH FILL SIDE. SEE STANDARD FIG. 5-395.110(B) FOR DETAILS.
- ⑧ DIMENSION "T" IS EQUAL TO Tt, Tb OR Ts.
- ⑨ REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.
- ⑩ WELDED WIRE REINFORCEMENT OF EQUAL AREA MAY BE SUBSTITUTED FOR REBAR.
- ⑪ ON THE LAST SEGMENT OF THE 45' SKEWED APRONS, A TRANSVERSE JOINT IN THE BOTTOM IS PERMITTED. A SPECIAL TIE, SIMILAR TO THE SIDE TIE, MUST BE PROVIDED. THE TIE SHALL BE INSET AND THE SPACE FILLED WITH AN APPROVED GROUT.
- ⑫ FOR BOX CULVERTS WITH SPANS OF 16' THE MAXIMUM SKEW SHALL BE 30'.
- ⑬ FILL HOLE WITH GROUT. GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".
- ⑭ APRON BOTTOM SLAB THICKNESS MAY BE 8" FOR CULVERTS WITH 6' SPANS ONLY. BOTTOM SLAB THICKNESS MAY BE INCREASED UP TO 2" MAX. PROVIDED COVER IS 1 1/2" MIN., 2" MAX.
- ⑮ REFER TO SPEC, 2412 FOR SEALANT REQUIREMENTS.

LENGTH P				
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW	
6	0'-113/4"	2'-13/8"	3'-8"	
8	1'-3"	2'-83/8"	4'-8"	
10	1'-61/4"	3'-31/4"	5'-8"	
12	1'-93/8"	3'-101/4"	6'-8"	
14	2'-05/8"	4'-51/8"	7'-8"	
16	2'-37/8"	5'-0"		⑫

MIN. LENGTH L				
RISE (FT.)	15° SKEW	30° SKEW	45° SKEW	
4	7'-13/4"	7'-73/8"	8'-77/8"	
5	9'-21/2"	9'-111/8"	11'-57/8"	
6	11'-33/8"	12'-27/8"	14'-33/4"	
7	13'-41/4"	14'-65/8"	17'-13/4"	
8	15'-51/8"	16'-101/4"	19'-115/8"	
9	17'-57/8"	19'-2"	22'-95/8"	
10	19'-63/4"	21'-53/4"	25'-71/2"	
11	21'-75/8"	23'-93/8"	28'-51/2"	
12	23'-81/2"	26'-11/8"	31'-33/8"	
13	25'-93/8"	28'-47/8"	34'-13/8"	
14	27'-101/8"	30'-81/2"	36'-111/4"	

LENGTH Q				
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW	
6	3'-53/4"	4'-73/8"	6'-2"	
8	3'-9"	5'-23/8"	7'-2"	
10	4'-0"	5'-91/4"	8'-2"	
12	4'-33/8"	6'-41/8"	9'-2"	
14	4'-65/8"	6'-111/8"	10'-2"	
16	4'-97/8"	7'-61/8"		⑫

REVISION: FEBRUARY 22, 2018

APPROVED: MARCH 24, 2011
Nancy D. Wambacher
 STATE BRIDGE ENGINEER

STATE PROJ. NO - (T.H.) STA. + .

CERTIFIED BY _____ DATE _____
 LICENSED PROFESSIONAL ENGINEER
 NAME: _____ LIC. NO. _____

TITLE: PRECAST CONCRETE END SECTION
 TYPE III - SINGLE OR DOUBLE BARREL
 FOR SKEWS 71/2' TO 45'

DES: PKN DR: JMD3 APPROVED: _____
 CHK: _____ CHK: _____

BRIDGE NO. _____

FIG. 5-395.110(A)

SHEET NO. KB3 OF KB5 SHEETS

Ah REINFORCEMENT		
HEIGHT h (FT.)	Ah (IN ² /FT.)	
	15° & 30° SKEW	45° SKEW
7 OR LESS	0.192	0.192
8	0.20	0.24
9	0.29	0.36
10	0.42	0.53
11	0.60	0.75
12	0.78	0.98
13	1.03	1.36
14	1.38	1.85

Abt REINFORCEMENT	
SPAN (FT.)	Abt (IN./FT.)
6-10	0.20
12	0.30
14	0.39
16	0.39

LINTEL BEAM REINFORCEMENT		
SPAN (FT.)	BOTTOM REINFORCEMENT	
	A1	A2
6	NO. 4 @ 1'-0"	NO. 4 @ 9"
8	NO. 4 @ 1'-1"	NO. 4 @ 6"
10	NO. 4 @ 9"	NO. 5 @ 6"
12	NO. 5 @ 9"	NO. 6 @ 6"
14	NO. 6 @ 9"	NO. 8 @ 6"
16	NO. 6 @ 9"	NO. 8 @ 6"

LENGTH N			
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW
6	4'-33/8"	6'-41/4"	9'-2"
8	4'-97/8"	7'-6"	11'-2"
10	5'-41/4"	8'-77/8"	13'-2"
12	5'-103/4"	9'-93/4"	15'-2"
14	6'-51/8"	10'-115/8"	17'-2"
16	6'-115/8"	12'-11/2"	NA (7)

LINTEL BEAM THICKNESS			
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW
≤ 12	9"	9"	9"
14	10" (8)	10" (8)	10" (8)
16	10" (8)	10" (8)	NA (7)

CONSTRUCTION NOTES

SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.

GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".

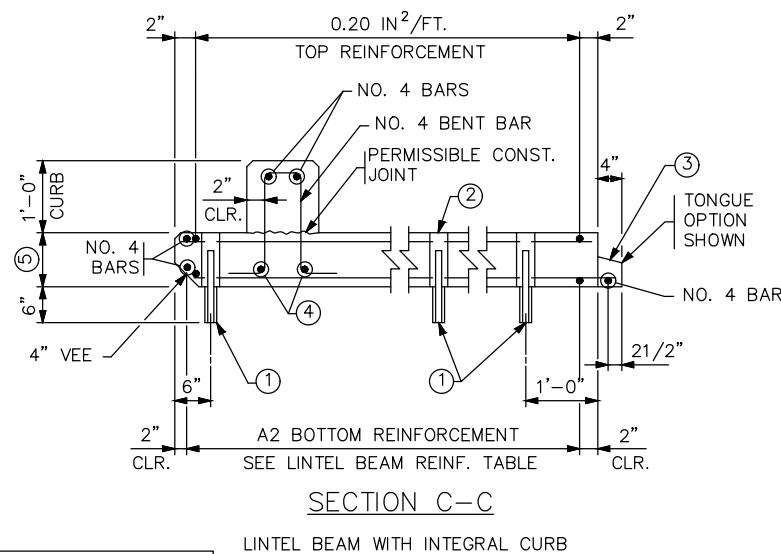
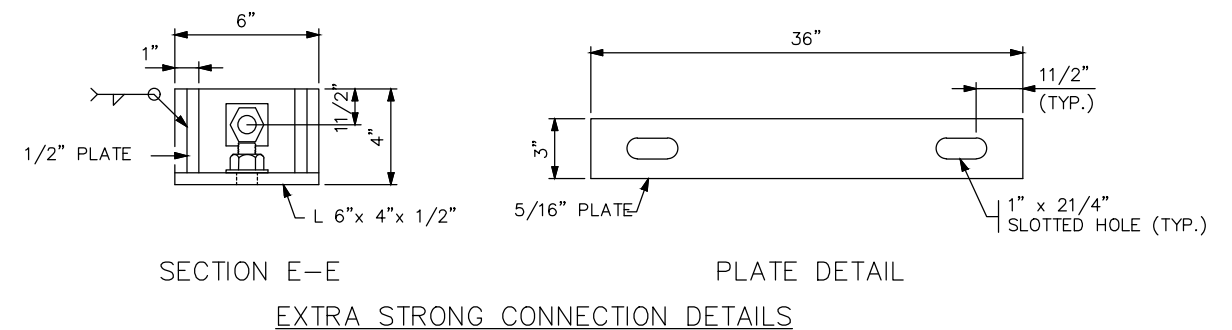
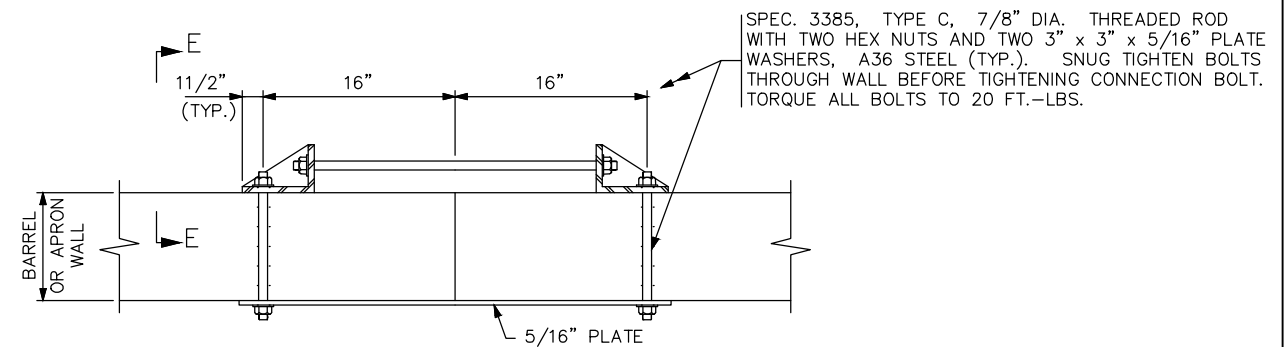
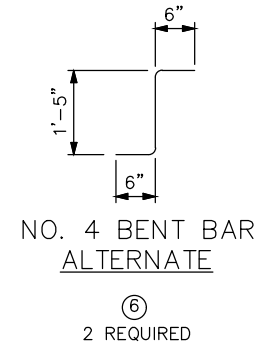
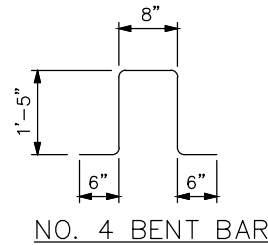
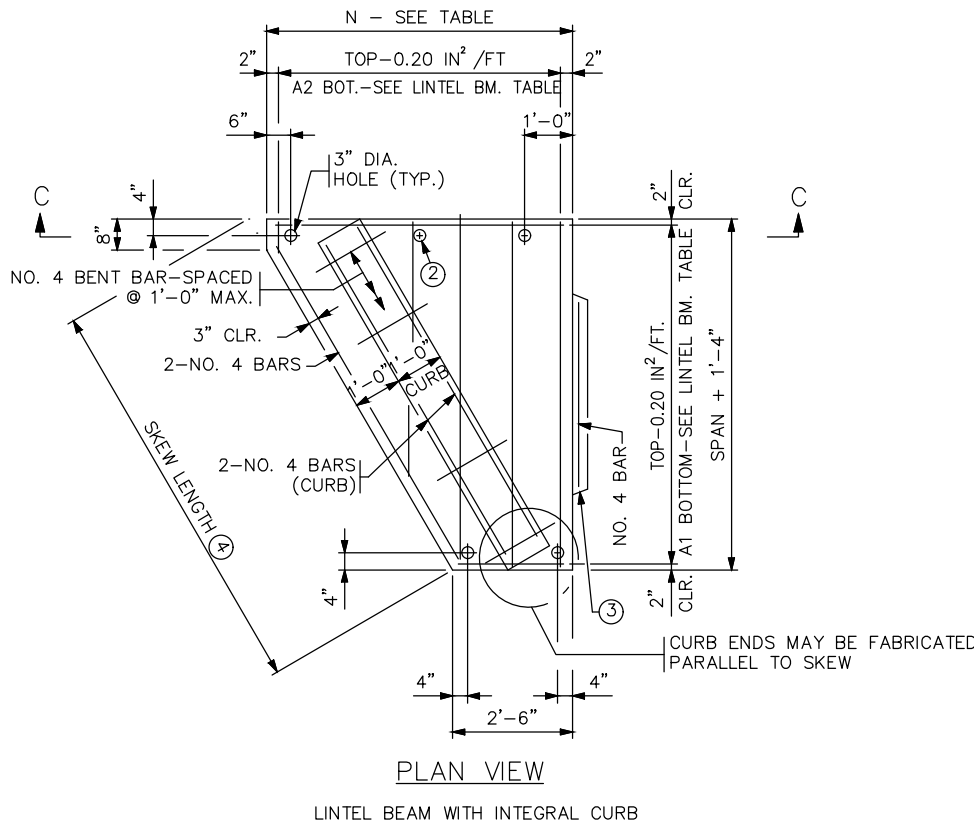
STRUCTURAL STEEL PER SPEC. 3306.

WELDING PER SPEC. 2471.

GALVANIZE STRUCTURAL STEEL PER SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

- NO. 8 DOWEL, 1'-0" LONG, 2" DIA. HOLE IN THE TOP OF THE WALL SECTION AND 3" DIA. HOLE IN THE LINTEL. FILL HOLE WITH GROUT.
- PROVIDE ADDITIONAL 3" HOLES AT 4'-0" MAXIMUM SPACING WHEN SIDE OF LINTEL BEAM IS OVER 6 FT.
- CHECK THE LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED. TONGUE AND GROOVE TO TERMINATE AT CULVERT RADIUS.
- FOR SKEW LENGTH UNDER 10' USE NO. 8 BARS. FOR SKEW LENGTH OF 10' TO 14' USE NO. 9 BARS. FOR SKEW LENGTH OVER 14' TO 18' USE NO. 10 BARS. FOR SKEW LENGTH OVER 18' TO 22' USE NO. 11 BARS OR EQUAL. SKEW LENGTH IS DISTANCE BETWEEN OUTSIDE FACES OF END SECTION ALONG LINTEL BEAM.
- SEE LINTEL BEAM THICKNESS TABLE ON THIS SHEET. USE LINTEL BEAMS WITH 5000 PSI 3W82 CONCRETE UNLESS OTHERWISE SPECIFIED.
- ALTERNATE BAR BEND MAY BE USED FOR NO. 4 BENT BARS.
- FOR CULVERTS WITH SPANS OF 16' THE MAXIMUM SKEW IS 30°.
- ALTERNATIVELY A 9" THICKNESS MAY BE USED WITH 6500 PSI 3W82 CONCRETE.



REVISION: 10-09-2015

APPROVED: MARCH 24, 2011

Nancy Swinberger
STATE BRIDGE ENGINEER

STATE PROJ. NO - (T.H.) STA. + .

FIG. 5-395.110(B)

CERTIFIED BY _____ DATE _____
LICENSED PROFESSIONAL ENGINEER LIC. NO. _____

TITLE: PRECAST CONCRETE END SECTION
TYPE III - SINGLE OR DOUBLE BARREL
FOR SKEWS 7 1/2' TO 45'

DES: PKN
CHK: _____
DR: JMD3
CHK: _____
APPROVED: _____

BRIDGE NO. _____

SHEET NO. KB4 OF KB5 SHEETS

FILENAME: \$\$\$@FILENAME@\$\$\$

TIME: \$@TIME@\$
PLOTTED: \$\$\$@DATE@\$\$\$
PATH & FILENAME: \$\$\$@PATH@FILENAME@\$\$\$

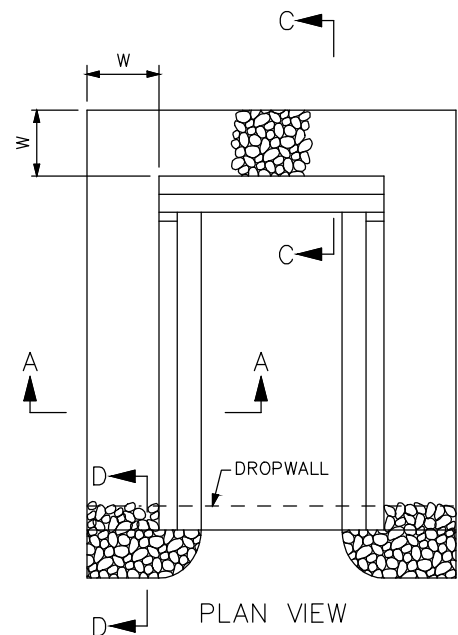
CONSTRUCTION NOTES

THIS PLAN SHEET IS FOR CULVERT EMBANKMENT PROTECTION ONLY. REFER TO THE GRADING PLANS FOR ADDITIONAL RIPRAP OR OTHER SCOUR PROTECTION MEASURES.

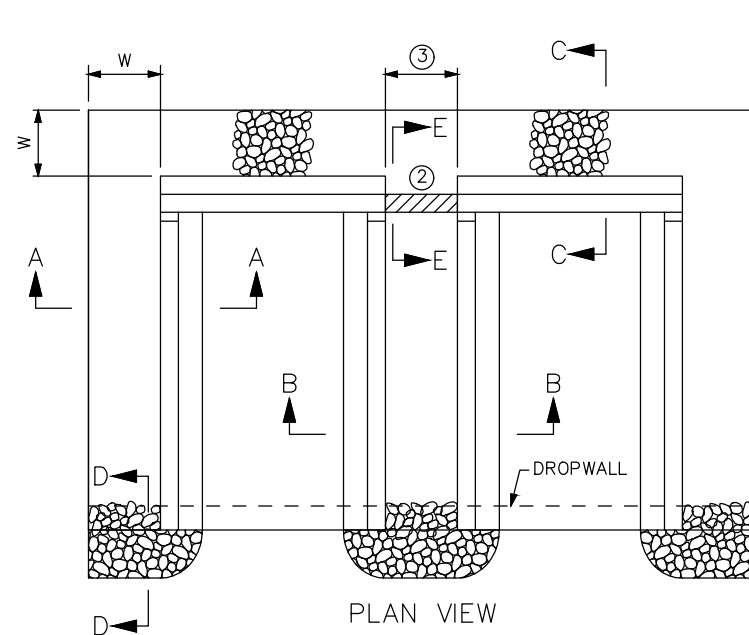
PROVIDE RIPRAP PER SPECS. 2511 AND 3601.

EMBANKMENT PROTECTION, INCLUDING MATERIAL PLACED BETWEEN BARRELS THAT ARE LESS THAN 2'-0" APART, IS INCIDENTAL.

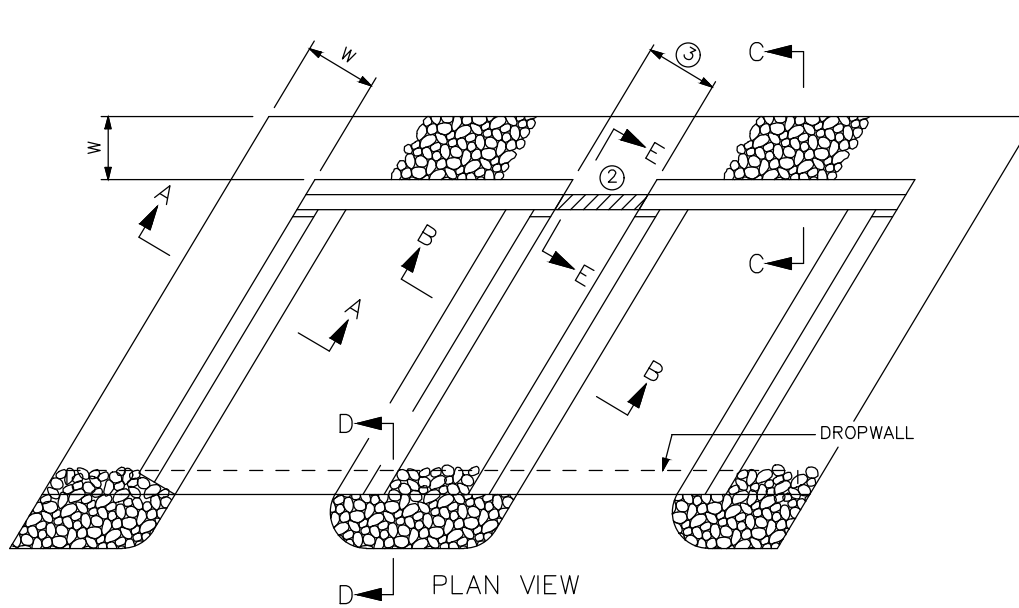
- ① FOR TYPE OF GEOTEXTILE FILTER MATERIAL REQUIRED, SEE SPEC. 3733. PROVIDE GEOTEXTILE STRIPS CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. BURY THE TOP EDGE TO PREVENT UNDERMINING.
- ② IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. IF PEA ROCK IS USED PROVIDE APPROVED GROUT SEEPAGE CUTOFF CORE, MINIMUM 12" THICK BETWEEN THE CULVERT'S TWO ENDS AND PROVIDE CLASS I GROUTED RIPRAP IN LIEU OF CLASS III RIPRAP.
- ③ REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES.



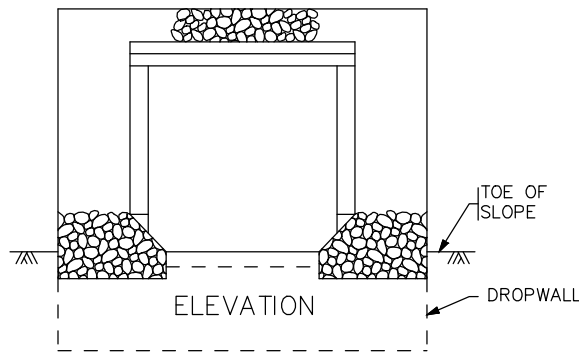
PLAN VIEW



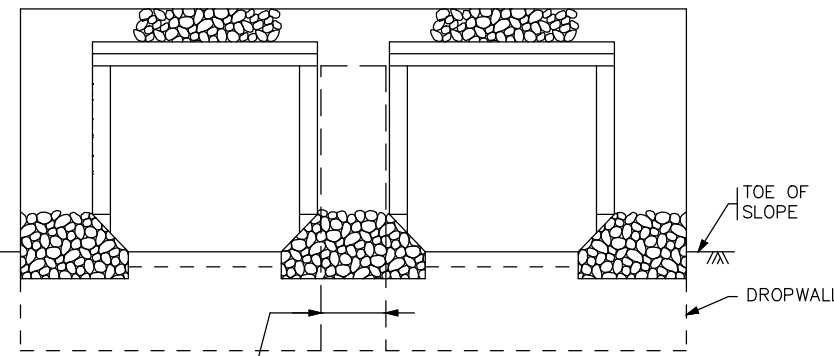
PLAN VIEW



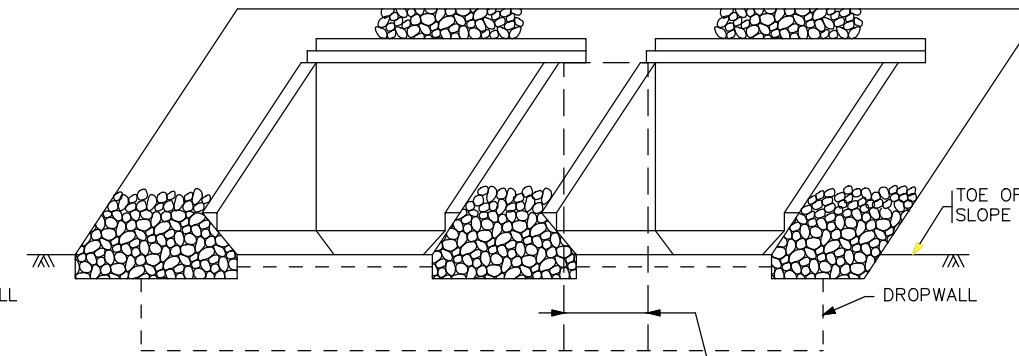
PLAN VIEW



ELEVATION



ELEVATION

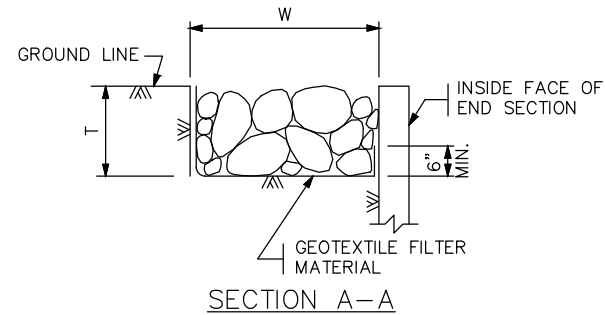


ELEVATION

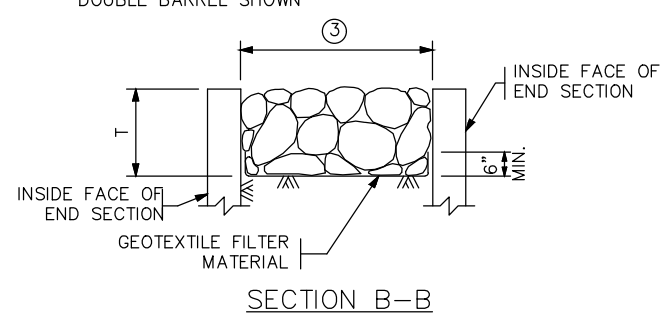
SINGLE BARREL
CLASS III OR IV SHOWN FOR SKEWS UP TO 71/2°

MULTIPLE BARREL
FOR SKEWS UP TO 71/2° CLASS III OR IV SHOWN DOUBLE BARREL SHOWN

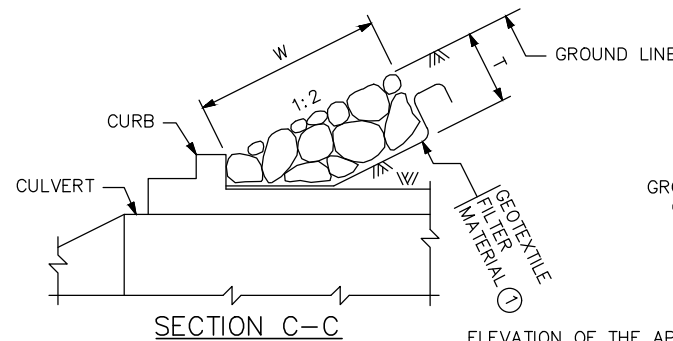
MULTIPLE BARREL
FOR SKEWS OVER 71/2° CLASS III OR IV SHOWN DOUBLE BARREL SHOWN, OTHER BARREL CONFIGURATIONS SIMILAR.



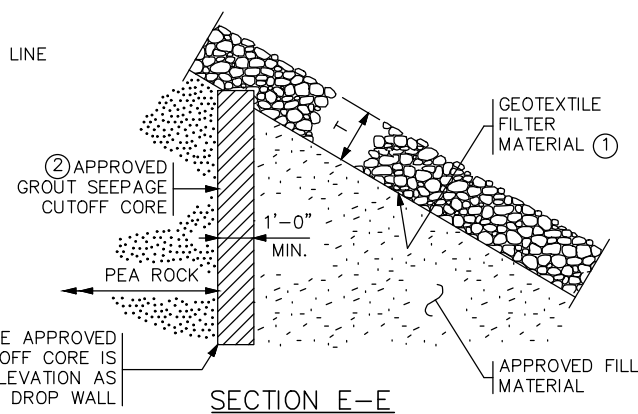
SECTION A-A



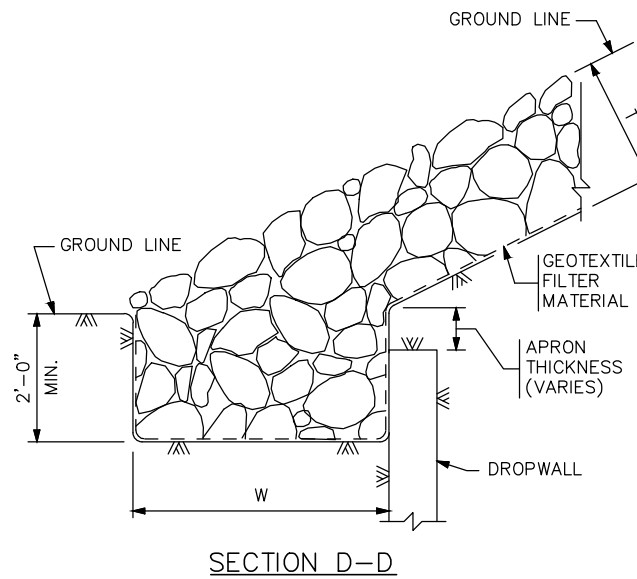
SECTION B-B



SECTION C-C



SECTION E-E



SECTION D-D

ELEVATION OF THE APPROVED GROUT SEEPAGE CUTOFF CORE IS TO BE THE SAME ELEVATION AS THE BOTTOM OF THE DROP WALL

RIPRAP CLASS

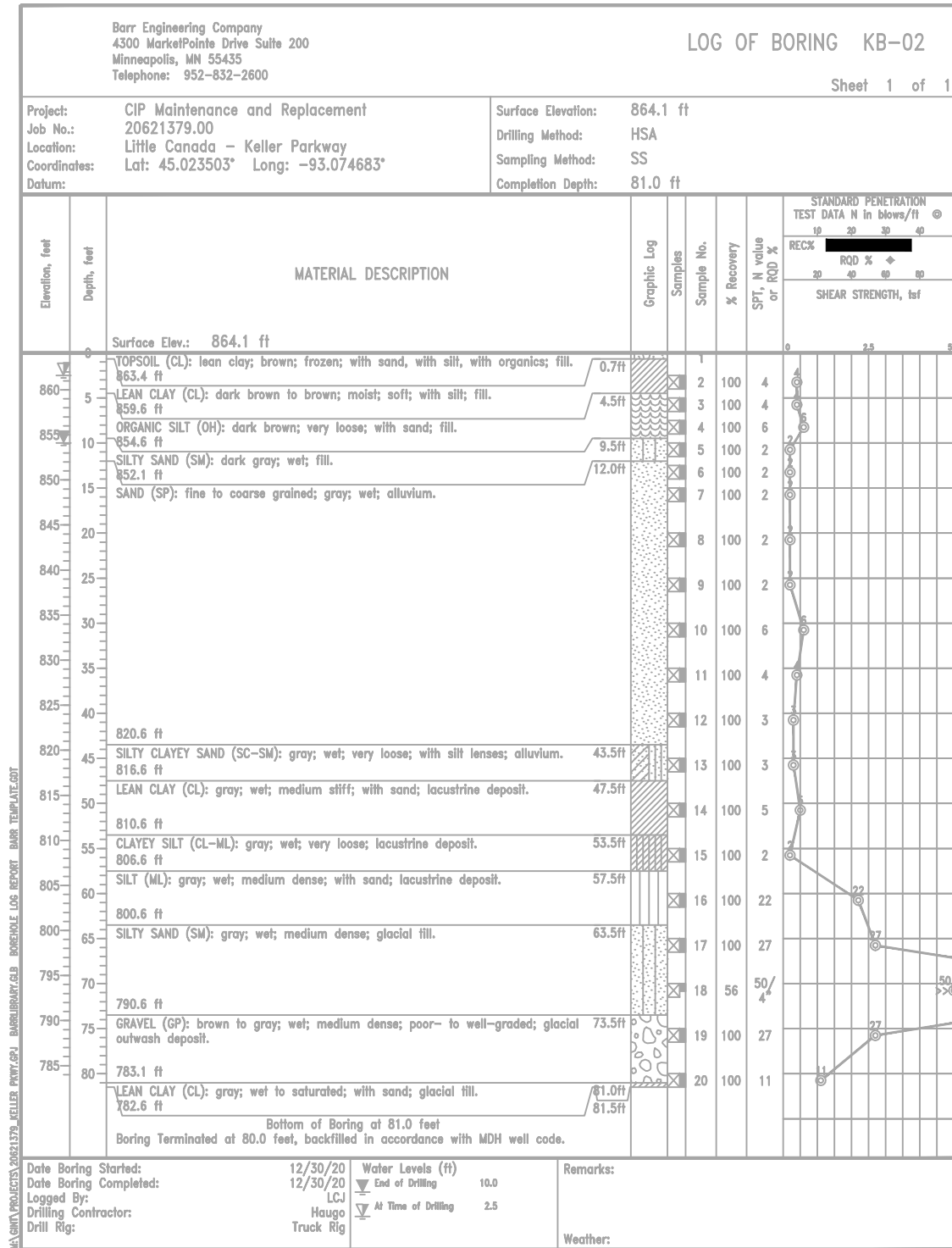
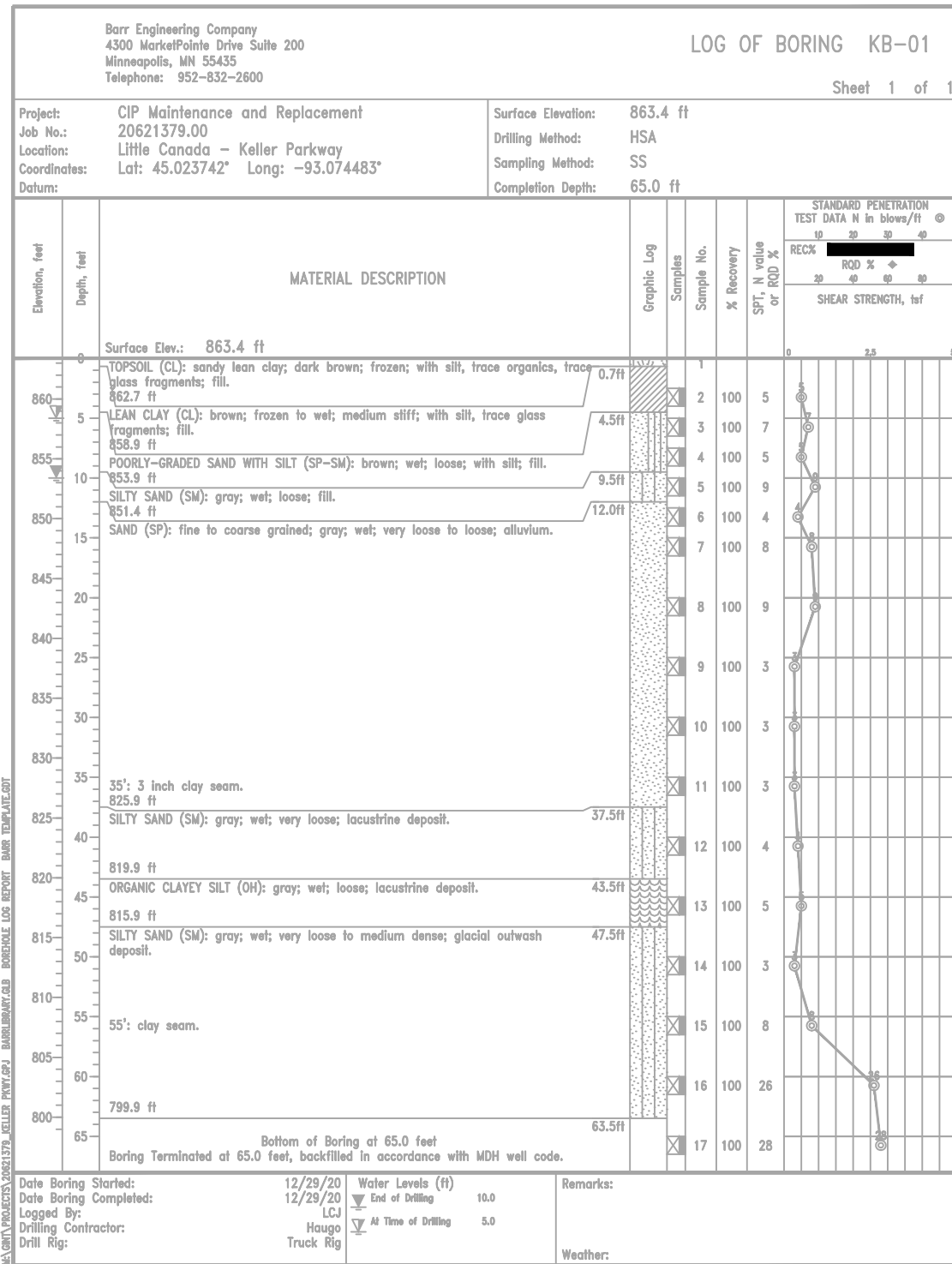
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REVISION: 10-22-2019
 APPROVED: SEPTEMBER 11, 2014
Nancy Dubenberger
 STATE BRIDGE ENGINEER

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		SHEET NO. KB5 OF KB5 SHEETS	
		BRIDGE NO.	



ISSUED FOR
PROJECT APPROVAL

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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.		CLIENT BID CONSTRUCTION	02/25/21					Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435	Scale AS SHOWN	RYAN DRIVE AND KELLER PKWY CONVEYENCE UPGRADES	BARR PROJECT No. 23/62-1379.00
PRINTED NAME: SAMUEL O. REDINGER		RELEASED TO/FOR	A B C 0 1 2 3	Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Drawn JMD3	KELLER PKWY BORING LOGS		CLIENT PROJECT No.
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Request for Board Action

Board Meeting Date: March 3, 2021

Agenda Item No: 11B

Preparer: Tina Carstens, Administrator

Item Description: North St. Paul Target Store BMP Retrofit Bid Award

Background:

At the February 2021 meeting, the board was presented with the plans and cost estimate for the North St. Paul Target Store BMP Retrofit project. The board directed staff to finalize the design and bidding documents and solicit bid proposals. The engineer's opinion of the probable cost for the construction of the project was \$1,190,000.

The virtual public bid opening was held on February 23, 2021, and the bid results are compiled in the attached table.

The managers should consider awarding the project to the lowest responsive and responsible bidder. Assuming the required bonds, insurance documentation, and other submittals meet contract requirements, and provided that permits and approvals are in place, the project will be started this spring with a fall completion.

Applicable District Goal and Action Item:

Goal: Achieve quality surface water – The District will maintain or improve surface water quality to support healthy ecosystems and provide the public with a wide range of water-based benefits.

Action Item: Implement retrofit water quality improvement projects.

Staff Recommendation:

Staff recommends the board award the project to Peterson Companies.

Financial Implications:

This project will be funded through Watershed Based Implementation Funding (\$93,042) as well as the Targeted Retrofit Fund where there are sufficient funds available.

Board Action Requested:

Accept the bids and award the North St. Paul Target Store BMP Retrofit project to Peterson Companies. Direct staff to prepare and mail the notice of award and prepare the agreements, and review the required submittals.

Bid Results Summary Table

Ramsey-Washington Metro Watershed District
Target North St. Paul Stormwater Retrofits
Bid Opening: Tuesday, February 23, 2021 - 10:00 a.m.

Contractor Name	5% Bid Bond	Addenda Acknowledged	Bid Signed	Successful Bidder Affidavit	Base Bid Amount	Order
Peterson Companies	yes	1 - v-bid	v-bid	yes	\$858,013.84	1
New Look Contracting, Inc.	yes	1 - v-bid	v-bid	yes	\$883,538.84	2
Sunram Construction, Inc.	yes	1 - v-bid	v-bid	yes	\$934,508.00	3
Max Steininger, Inc.	yes	1 - v-bid	v-bid	yes	\$947,858.03	4
Rosti Construction	yes	1 - v-bid	v-bid	yes	\$957,423.50	5
Lametti and Sons, Inc.	yes	1 - v-bid	v-bid	yes	\$969,000.00	6
Urban Companies	yes	1 - v-bid	v-bid	yes	\$1,028,308.84	7
Blackstone Contractors LLC	yes	1 - v-bid	v-bid	yes	\$1,193,454.54	8

Project Work Plan

Original Date: February 24, 2021

Updated:

Project: Emergency Response Plans
Project # 23621200.00 001

Project Team

District Staff: Tina Carstens

Barr Staff: Gareth Becker (Project Manager and Surveyor)
Erin Anderson Wenz (Principal)
Lulu Fang (modeling)
Greg Nelson (QA/QC)

Scope of Work

In 2014, the District began updating their hydrologic and hydraulic models to reflect more recent precipitation data that had been published for the Midwest by the National Oceanic and Atmospheric Administration (called "Atlas 14") as well as changes to storm sewer systems and drainage areas throughout the District. At the same time, the District began a process of identifying habitable structures that were at risk of flooding during the 100-year event. Only habitable buildings (homes, businesses, churches, schools, etc.) were identified during this process. Potential impacts to property, garages, canopies, and auxiliary structures were not included in the assessment. A distinction was made between structures at risk of flooding due to impacts from District waterbodies and projects versus those at risk of flooding from more local issues, such as undersized catchbasin and local storm sewer systems.

Since then, the District has been working on a number of feasibility studies whose goal is to find solutions to these flooding concerns and has begun implementation activities in several parts of the District. In the meantime, for areas where a feasible solution has not been found or for which a project will not be implemented within approximately 2 years, the District provides an emergency response plan to the city in which the structure of concern is located. This is a commitment that the District has made to its member cities—to provide information that the cities can use to protect properties in the event of an extreme storm event (100-year storm).



Figure 1 Starting in 2014, the District started a process to identify habitable structures at risk of flooding during the 100-year event.

The purpose of an emergency response plan (ERP) is to describe the responsibilities for operation and emergency procedures necessary to provide flood protection for habitable structures near District waterbodies (lakes, wetlands, and stormwater ponds) during extreme flooding events (100-year event). In some cases, although larger District projects have already been identified in areas deemed at risk of flooding, the projects won't be implemented for several years. In other cases, District projects that would remove homes from the 100-year floodplain have been deemed infeasible. In both cases, emergency response plans provide RWMWD's cities with guidance for the protection of homes and businesses during the 100-year flood event in the absence of projects that would otherwise remove them from the floodplain.

It is important to note that ERPs provided by RWMWD do not address flood protection of homes when water levels exceed the 100-year flood elevation or rise due to wind action. ERPs also do not address homes that may have less than 2 feet of freeboard during the 100-year flood level or lesser events; only homes with low-entry elevations at or below the 100-year flood level of nearby water bodies are addressed in the ERPs.

In the past, these plans have been focused around District lakes (Table 1). This scope is a little different as it will also address the protection of habitable structure near smaller District waterbodies, such as wetlands, stormwater ponds, and other projects (such as Willow Lake, Ames Lake, Owasso Basin, and PCU pond).

Table 1 below lists the District waterbodies for which adjacent habitable structures have been deemed at risk of flooding during the 100-year event and the current status of an emergency response plan for habitable structures in each area.

Table 1 Locations and status of emergency response plans throughout RWMWD

Emergency Response Plan Area*	Number of structures	Emergency Response Plan Status
Tanners Lake, Oakdale	4	Completed and given to the City of Oakdale
Gervais Lake, Little Canada	2	Completed and given to the City of Little Canada
Battle Creek Lake, Woodbury	Weir Drive (the only emergency access several businesses in the area)	Completed and given to the City of Woodbury
Lake Owasso, Roseville	5	Completed and given to the City of Roseville
Snail Lake, Shoreview	1	Completed and given to the City of Shoreview
Owasso Basin, Little Canada	Northstar Estates and up to 7 other structures in the area (elevations are still being confirmed by survey)*	To be completed under this scope
Willow Lake, White Bear Lake, and Vadnais Heights	2-4	To be completed under this scope
Kohlman Creek (PCU Pond, Markham Pond, Kohlman Creek), North St. Paul, Maplewood, and Oakdale	Up to 31 (elevations are still being confirmed by survey)	To be completed under this scope
Ames Lake, St. Paul Wakefield Lake, Maplewood Phalen Village, St. Paul Duluth Street Recreational Center, St. Paul Hoyt Pond, St. Paul	Up to 53 (elevations are still being confirmed by survey)	To be completed under this scope

* Detailed maps showing the structures considered to be at risk of flooding in each of these areas can be seen on the Beltline Resiliency Study story map, on the tabs marked "Phase 1 Inundation," "Phase 2 Inundation," "Phase 3 Inundation," and "Phase 4 Inundation." Note that in some cases, the structures highlighted in red have already been removed from the floodplain due to projects that have been implemented since 2014. The Beltline Resiliency Study story map (best viewed on Google Chrome) is located here: <https://maps.barr.com/RWMWD/BeltlineResiliency/StoryMapSeries/index.html>

The deliverable is an emergency response plan that addresses each habitable structure that could be flooded during a 100-year event, bundled for each city. Once handed over to the cities, the expectation is that the ERPs are reviewed annually to verify contacts and information included in the plan is current and leverage new lake level stations placed throughout the District, where appropriate.

Figures 2 through 4 below show some examples of the types of information that have been included in emergency response plans in the past. Charts like Figure 3 help cities understand when flooding might occur during an extreme storm event and how much time they might have to mobilize sandbagging or similar temporary flood risk reduction activities.

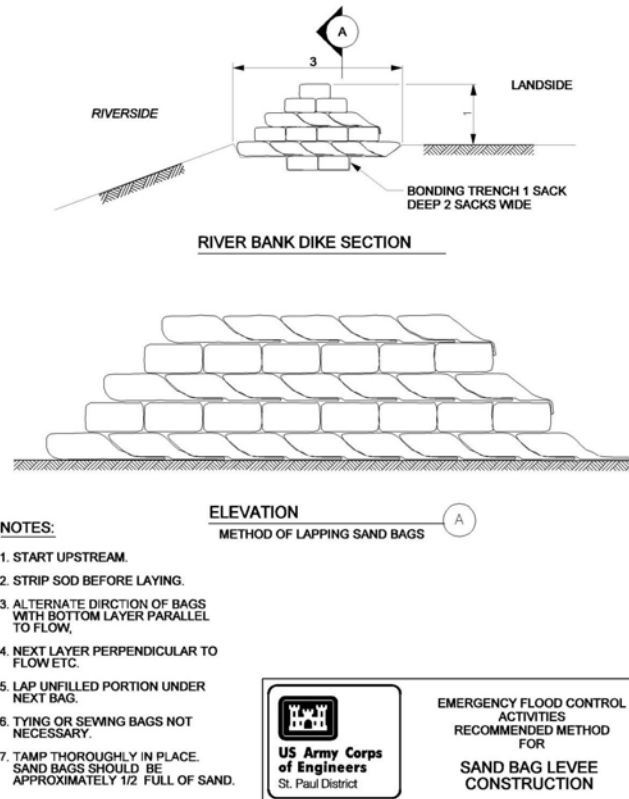


Figure 2 Example of US Army Corps of Engineers sand bag placement guidance

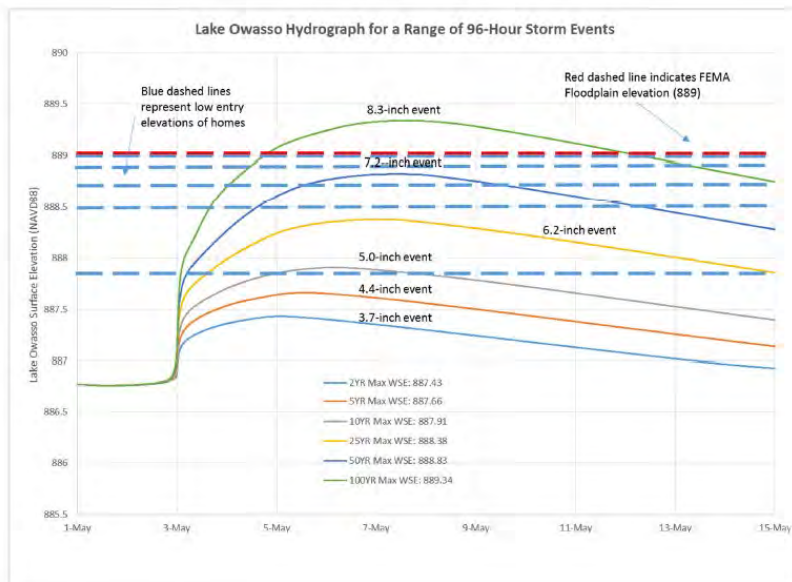
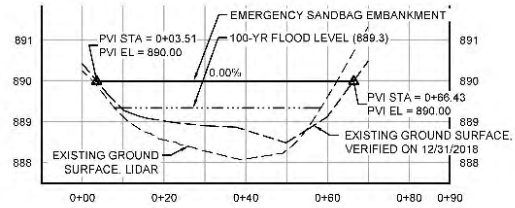


Figure 3 Lake Owasso elevations (determined from XP-SWMM modeling) during a range of 96-hour events. Blue dashed lines indicate the lowest low-entry elevation of the five houses deemed to be at risk of flooding during the 100-year (8.3-inch) event.

NOTE:

- 12/31/2018 SURVEY PERFORMED TO VERIFY GROUND SURFACE ELEVATIONS ALONG PROPOSED TEMPORARY EMBANKMENT LOCATION. HORIZONTAL AND VERTICAL POSITIONS OBTAINED UTILIZING MNDOT VRS BASE STATION.
- BARR ENGINEERING AND RAMSEY WASHINGTON METRO WATERSHED DISTRICT SHALL NOT BE HELD RESPONSIBLE FOR THE DATA PROVIDED ON THIS DRAWING OR FOR ANY USE OTHER THAN ITS INTENDED PURPOSE.

CONTROL POINTS				
POINT #	DESCRIPTION	ELEVATION	NORTHING	EASTING
104	XXX 0+04 END	890.0	189111.2	569526.6
105	XXX 0+86 END	890.0	189105.5	569581.5



Estimated Number of Sandbags Per Linear Foot of Levee	
Height in Feet	Bags Required
1	6
2	21
3	45

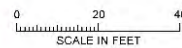


FIGURE 6
FLOOD WARNING EMERGENCY RESPONSE PLAN
XXX, Minnesota
Prepared by RWMWD

Figure 4 An excerpt from an Emergency Response Plan for a low-lying home on a District lake, showing the alignment, height, and number of sand bags needed to protect the home from flooding during a 100-year storm event.

Budget

Barr will complete the work outlined above on a time-and-expense basis for an estimated **\$60,000**.

Schedule

We propose the following milestone schedule:

Milestone	Estimated Date	Actual Date
Gather remaining survey information to confirm habitable structures at risk of flooding during the 100-year event	May 2021	TBD
Revisit properties confirmed to be at risk for more detailed survey	July 2021	TBD
Creation of draft emergency response plans for each property	October 2021	TBD
Presentation to the RWMWD Board and member cities	December 2021	TBD

Project Work Plan

Original Date: February 24, 2021

Updated:

Project: Shallow Lake Aeration Study
Project # 23621386.00

Project Team

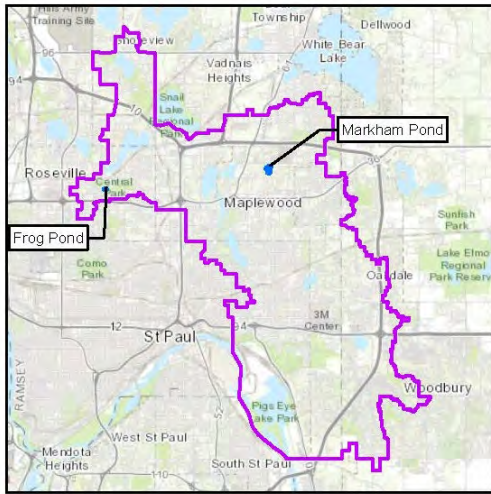
District Staff: Bill Bartodziej
Eric Korte

Barr Staff: Keith Pilgrim (Project Manager)
Erin Anderson Wenz (Principal)
Kevin Menken (Monitoring and Data Analysis)

Scope of Work

As described in the 2020 Internal Load Analysis of Shallow and Deep Lakes technical memorandum, most of the shallow lakes in the Ramsey-Washington Metro Watershed District have internal phosphorus loading rates of approximately 1 to 2 mg per square meter per day. These loading rates are high enough to have an impact on lake water quality, but low enough that aeration could be an effective tool in their management, especially given the type of phosphorus found in the lakes' sediments. For some lakes, typical alum treatments may be less effective due to burial from organic material and slow decay of organic phosphorus, requiring multiple doses over time. Aeration, though less typically used in internal load management, may offer an option that can be utilized from time to time, as needed. However, many questions remain about the practical use of aeration for internal load management, particularly in shallow lakes.

The purpose of the study to evaluate the effectiveness of aeration in managing the internal load of shallow lakes in the RWMWD. If aerating these ponds can be shown to effectively reduce the incoming loads of phosphorus from the ponds' sediments, we can consider upscaling that effort to a shallow lake system, such as Wakefield Lake.



The study will be completed in two smaller shallow systems (ponds) in detail, during 2021 and 2022. We propose studying a large and a small pond: Markham Pond in Maplewood and Frog Pond at the southeast corner of Bennett Lake in Roseville. Markham Pond already has an aeration system (RWMWD installed one in 2019 for the purpose of supporting the fishery over the winter months), making it a good candidate to study how a central aerator can effectively transfer oxygen into the water of an aquatic plant-dominated shallow lake. Frog Pond is a smaller pond with minimal aquatic plants but high concentrations of algae that have provoked public concerns about aesthetics and odors in the past.

This research project is broken into two years:

Year 1 (2021): Literature review and baseline study that includes the measurements described below, with no aeration during summer months in either pond (Markham Pond's aeration system currently only operates during the winter months).

Year 2 (2022): Evaluating the effect of aeration by collecting the same measurements that were collected in 2021. The existing aerator will be used in Markham Pond and a new aerator will be installed in Frog Pond, both aerators will be used during the summer months.

Proposed monitoring activities in 2021 and 2022 include:

- Dissolved oxygen transects across the ponds: Monthly May through September
- Continuous dissolved oxygen and pH probe meters installed in each pond. One dissolved oxygen and one pH probe per pond. Measurements to be taken from May through September.
- Porewater (water within the sediment) analysis. To determine the effectiveness of aeration at reducing phosphorus release from lake bottom sediment, porewater will be sampled (via a straw-like sampler) to analyze the change in phosphorus and a few additional parameters (e.g., hydrogen sulfide, iron, sulfate, and ammonia) from May to September, both without (in 2021) and with (in 2022) aeration.
- Sediment cores will be collected and analyzed for sediment phosphorus content.
- Surface water samples will be collected during each sampling event and analyzed for Total Phosphorus, Total Dissolved Phosphorus, ortho-Phosphorus, nitrate+nitrite, Total Kjeldahl Nitrogen, ammonia, and Total Suspended Solids.

It is assumed that District staff will be conducting routine water monitoring on a monthly basis from May to September. Parameters to be monitored are total phosphorus, total dissolved phosphorus, ortho phosphorus, Total Kjeldahl Nitrogen, nitrate+nitrite, ammonia, TSS, VSS, and chlorophyll *a*. Profiles (1 ft) of dissolved oxygen, temperature, pH, specific conductance, and redox should be measured for each

monitoring event. It is assumed that District staff will install and maintain the continuous dissolved oxygen and pH probes as well as water level sensors in the ponds and flow meters at the pond outlets. Barr will be responsible for the porewater analyses and sediment core extraction and analyses, with the assistance of one District staff member during sampling events. Reporting will consist of a technical memo and a presentation at the end of the project in December, 2022.

Budget

Barr will complete the work outlined above on a time and expense basis for an estimated **\$134,200 over the course of two years (2021 and 2022).**

Schedule

We propose the following milestone schedule:

Milestone	Estimated Date	Actual Date
Year 1 Monitoring Complete	October, 2021	TBD
Installation of Frog Pond Aeration System	Spring, 2022	TBD
Year 2 Monitoring Complete	October, 2022	TBD
Technical Memorandum of Research Results	December, 2022	TBD

Project Budget Tracking (Engineering)

Project Tasks	Estimated Budget	Spent to Date
Year 1 (2021) Monitoring (Field Work and Lab Costs) and Literature Review	\$55,800	\$0.00
Frog Pond Aeration System Installation in Spring, 2022	\$34,500	\$0.00
Year 2 (2022) Monitoring (Field Work and Lab Costs)	\$27,300	\$0.00
Technical Memorandum of Research Results	\$16,600	\$0.00
Total	\$134,200	\$0.00

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Administrator's Report

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MEMO

TO: Board of Managers and Staff
FROM: Tina Carstens, Administrator
SUBJECT: March Administrator's Report
DATE: February 26, 2021

A. Meetings Attended

Monday, February 1	9:00 AM	MAWD Board Meeting
Tuesday, February 2	10:00 AM	Watershed Based Implementation Funding
Wednesday, February 3	6:30 PM	Board Meeting
Thursday, February 4	8:00 AM	Water Resources Conference Planning
Friday, February 5	9:00 AM	WaterFest Planning
	1:30 PM	Meet with Board Member Aichinger
Monday, February 8	9:00 AM	Ryan Drive Coordination Meeting
Wednesday, February 10	6:00 PM	Performance Review
Friday, February 12	12:00 PM	Ames Lake Area Project Meeting
Monday, February 15	ALL DAY	Holiday
Wednesday, February 17	VARIOUS	Staff Performance Reviews
	4:00 PM	Meet with Board Member Swope
Thursday, February 18	9:00 AM	WaterFest Planning
Friday, February 19	10:00 AM	MAWD/MAWA Partnership Meeting
Monday, February 22	VARIOUS	Staff Performance Reviews
Tuesday, February 23	VARIOUS	Staff Performance Reviews
Wednesday, February 24	VARIOUS	Staff Performance Reviews
Thursday, February 25	10:30 AM	Phalen Chain of Lakes Residents Meeting
Friday, February 26	8:00 AM	New Board Member Orientation

B. Upcoming Meetings and Dates

April Board Meeting	April 7, 2021
Metro MAWD	April 21, 2021
CAC Meeting	April 27, 2021
CAC Meeting	June 8, 2021
Metro MAWD	July 21, 2021
CAC Meeting	September 28, 2021
Metro MAWD	October 20, 2021
CAC Meeting	October 26, 2021
CAC Meeting	December 7, 2021

C. WaterFest Update (Maddy Bohn, Sage Passi, Carrie Magnuson, Tina Carstens)

A WaterFest staff team, including our consultant, Maddy Bohn, has met many times in the last several months to discuss our plan for WaterFest 2021. We have been discussing ways to re- envision WaterFest in light of the challenges we face with COVID-19, which canceled our 2020 event.

Maddy approached the City of St. Paul about the potential for organizing a number of self-directed activities in Lake Phalen Park this summer during the week of June 19-17 instead of one big event on one day. The City is open to this idea and working closely with us to plan for a safe event. Maddy sent out a survey to past exhibitors inquiring about their interest and capacity to participate in this kind of self-directed event. She received about 50 responses, and we identified eight to ten organizations that we will initially approach about developing an activity for the event.

One exciting possibility we are exploring is incorporating some of the elements from the We Are Water exhibit that is currently on display at Hmong American Partnership's Little Mekong Plaza in St. Paul. This is the first outdoor version of the well-traveled digitally interactive water exhibit. The displays share facts and stories about Minnesota water and our connections to it, with Hmong water culture as a special focus.

We hope to get participation from our volunteer groups to assist with supervising the self-directed exhibits throughout the week. We will also contact our sponsors asking for their participation. Even though WaterFest will look much different than previous years, our goal is to continue to use the event to educate local citizens on the importance of water management.

D. Citizen Advisory Committee Update and Membership (Carrie Magnuson & Tina Carstens)

The Citizen Advisory Committee (CAC) met on February 9, 2021. The group included CAC members, one guest speaker, staff members Bill Bartodziej, Seth Bartodziej, Paige Ahlborg, Lauren Hazenson, and CAC staff liaison Carrie Magnuson. The following initiatives were discussed and further developed

1. We conducted annual organizational meeting tasks. Dana Larsen-Ramsay was re-elected as Chair, and Mark Gernes was re-elected as vice-chair by vote.
2. Building on the [Phalen Chain of Lakes Water Trail Map](#). The CAC helped develop a physical and static pdf map showing the Phalen Chain of Lakes showing points of interest, routes, and access points. These physical maps were distributed to local libraries and sporting goods stores with much success. The group wanted to build on that project by creating a companion video or a series of videos to build interest in recreating on the lakes. Seth Bartodziej has already captured a lot of content that would be useful for this initiative, including drone footage of the entire chain and winter recreation on the ice. The group proposes adding interviews and voice-overs to talk about the benefits of the area's recreating and the social importance of the lakes and parks surrounding them. The proposed audience would be individuals currently active in water activities, people new to the sport(s), and residents who walk/bike/roll around the lake.

3. We provided feedback on the Maplewood Climate Action Plan strategies. The CAC was approached by Sean Gosiewski, Program Director at Resilient Cities & Communities, and a team member working collaboratively with Maplewood to develop a Climate Action Plan. Sean reviewed the draft plan ([link here](#)) and asked the CAC members to give feedback.
4. The group also reviewed significant projects being done by RWMWD staff and partners.
5. Future meetings: April 27th, June 8th, September 28th, October 26th, December 7th

As you know, the staff made an outreach push to receive applications to our CAC based on the district areas underrepresented on the CAC. We received eleven new applications during the recruitment campaign. Four of the applicants live in a neighboring watershed. We have contacted those applicants and gave them contact information for their home watersheds. The remaining applicants have been reviewed by staff. The table below shows the current membership with the new recommended members shown in red.

RWMWD CAC MEMBERSHIP - March 2021		
Member Cities		Secondary Representation
Maplewood	Mark Gernes	Environmental Agency/Organization
Roseville	Hallie Finucane	Water Steward
Shoreview	Scott Ramsay	
St. Paul	Jill Danner	Master Naturalist
Gem Lake	<i>Open</i>	
Landfall	<i>Open</i>	
Little Canada	<i>Open</i>	
North St. Paul	Glen Olson	
Oakdale	<i>Open</i>	
Vadnais Heights	<i>Open</i>	
White Bear Lake	Gary Schroeher	
Woodbury	John Chikkala	
Other Representations		Secondary Representation
At Large	Katheryn Keefer	Shoreview
At Large	Tammy McCulloch	Woodbury
At Large	Gary Nelson	Maplewood
At Large	Stuart Knappmiller	St. Paul
Board Liaison	Cliff Aichinger	North St. Paul
Business Community	Dana Larsen-Ramsay	Shoreview
Environmental Agency/Organization	Jennifer Gruetzman	
Master Gardner	<i>Open</i>	
Master Naturalist	Karen Wold	Maplewood
School Community	Randee Edmundson	Maplewood
Faith-Based Organization Community	<i>Open</i>	
Minnesota Water Steward	Linda Neilson	Roseville
Minnesota Water Steward	Stephanie Wang	Woodbury

We were happy to see committed district volunteers show interest in our CAC but also several names that we haven't connected with in the past. Every applicant showed a strong interest in being part of our organization, and some bring a background in environmental science. We were happy to see new members from three cities that were previously not represented. Over the next year, we plan to reach out to the remaining cities to find interested residents to round out the membership.

Recommended Board Action: Approve the March 2021 Citizen Advisory Committee membership as shown in the table above.

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Project and Program Status Reports

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Memorandum

To: Board of Managers and Staff
From: Tina Carstens and Brad Lindaman
Subject: Project and Program Status Report – March 2021
Date: February 24, 2021

Response to recent questions about the accuracy of LIDAR information and XP-SWMM modeling for the purposes of determining flood risk to structures

In 2014, Ramsey County and Washington County created high-resolution aerial images that show structures throughout the two counties. The counties had the outlines of each structure digitized (electronically “traced” to record their shapes in a GIS format). Using GIS technology, Barr can digitally place these shapes on top of a network of elevations for the same areas created by LiDAR, a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the earth. Using GIS, we look at areas where the structure shapes and elevations intersect, and record the lowest elevation, which is the lowest ground elevation at the structure. We then compare these low points to the 100-year flood elevations (typically determined through XP-SWMM modeling) in each structure’s vicinity. If the low point at a structure is lower than the 100-year flood elevation for the area, the structure is deemed to be potentially “at risk” of flooding. Inundation footprints for the 100-year flood event throughout the RWMWD are estimated using LiDAR data, too.

It's important to note that LiDAR information can have an error up to 15 centimeters vertically and 1.5 meters horizontally. As a result, when we look across the district to determine whether structures are at risk of flooding, some structures that are actually high and dry may be deemed potentially at risk of flooding and, conversely, a structure that is actually low enough to be vulnerable may be missed. One recent example is the low home at Twin Lake. Barr’s process (described above) mistakenly identified the low home as being more than a foot higher than it actually was, due to some irregularities in the terrain in the area near the home that LiDAR did not accurately portray. Conversely, in the Willow Lake area, our process identified several structures that were deemed potentially at risk of flooding but were actually not at risk at all; a site survey revealed that not only was the ground immediately next to several structures high enough to protect the property from flood damage, but also that the low entry point of a few structures was 3 feet off the ground at loading docks. For these reasons, to determine whether or not a structure is truly at risk of flooding, an onsite survey is needed to confirm (or deny) what LiDAR and GIS suspects.

There is, of course, also error involved in many aspects of XP-SWMM modeling, which Barr often uses to determine the 100-year flood elevations throughout the RWMWD. There are many different inputs that describe drainage areas, storm sewer networks, infiltration, and precipitation, which are subject to the eccentricities of LiDAR data, survey data, runoff calculation methodology, data gathering, and

infrastructure record keeping. In fact, the design storms themselves (such as the 100-year storm) are based on statistical analyses of the frequency of historical precipitation depths and intensities, and do not exactly reflect a storm that will happen in the future. XP-SWMM models, like all hydrologic and hydraulic models, allow us to see relative differences in the impacts of the decisions we make, judged under the influence of standardized design storms. When there is enough historical precipitation and other monitoring data, we do calibrate our XP-SWMM models, comparing what was observed in a given system to what our model predicts under the same climatic influences, allowing us to tighten up any differences by adjusting the parameters most likely to be erroneous (typically, infiltration assumptions and certain hydraulic parameters that are involved in flow calculation).

Response to recent requests for more public-facing technical materials to accompany technical memoranda

In an effort to make technical memoranda more accessible to a public audience, Barr proposes to include an executive summary meant for a public audience, which can be used in the creation of project pages on the district's website.

The purpose of each executive summary will be to provide a high-level summary of the report, written for a layperson audience. The executive summary will aim to answer the following questions for each technical memo presented to the board:

1. Why was this study done?
2. How was the problem evaluated?
3. What are the conclusions and recommendations for next steps?

Barr is currently working on executive summaries for recent draft feasibility studies, such as the Owasso Basin bypass feasibility study.

Project feasibility studies

Interim emergency response planning for district areas at risk of flooding (Barr project manager: Gareth Becker; RWMWD project manager: Tina Carstens)

The purpose of this project is to provide information and guidance to cities throughout the RWMWD about how to protect low-lying habitable structures from flooding during the 100-year storm event. These emergency response plans address areas for which there is 1) not a feasible project that has been identified to protect structures or 2) a project that cannot be implemented in the near future due to logistical and/or budgeting reasons.

A scope summary describing this year's proposed efforts are included in this month's board packet for manager review and consideration.

Federal Emergency Management Agency (FEMA) flood mapping updates (Barr project manager: Brandon Barnes; RWMWD project manager: Tina Carstens)

The purpose of this project is to use the RWMWD's updated stormwater model to develop information required to update the FEMA floodplain maps. Minnesota Department of Natural Resources (DNR) grant funding is being used.

This month, Barr addressed DNR comments on the draft models and geographic information system (GIS) files that were provided in January.

The DNR has scheduled an input meeting on March 4 to provide an overview of the hydrologic and hydraulic analysis and data, review and discuss draft results, and collect feedback on the preliminary maps. DNR staff will coordinate and facilitate the meeting. Barr and RWMWD staff will also attend and be available to address questions as needed.

Due to the DNR's extended review of the first draft of the stormwater model, the project schedule was also extended and will now continue into spring 2021.

Kohlman Creek area flood risk reduction feasibility study (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate the benefit-cost relationships of infrastructure changes throughout the Kohlman Creek subwatershed by reviewing potential pipe alignments, land acquisition costs, utility conflicts, permitting issues, and related design as well as construction and long-term maintenance costs associated with each alternative that achieves the project objective of removing habitable structures from the 100-year floodplain in this area.

Completion of the Kohlman Creek area surveying is being coordinated with the remaining survey work in the Ames Lake area (described below). Survey elevations being collected include the low opening and low adjacent grade near each structure considered to be at risk of flooding. This information is needed to provide more accurate elevations than those estimated from LiDAR (light detection and ranging) to determine structures actually within the flood zone that warrant more attention.

Ames Lake area flood risk reduction feasibility study (Barr project manager: Erin Anderson Wenz; RWMWD project manager: Tina Carstens)

The purpose of this study is to evaluate the benefit-cost relationships of infrastructure changes that would remove habitable structures from the floodplain in this area. This study will be phased. The first phase (currently underway) involves communications with the City of Saint Paul about how to approach flood management in this area, which involves both regional and localized flooding issues. The second phase (if pursued) will encompass reviewing potential pipe alignments, land acquisition costs, utility conflicts, permitting issues, and related design as well as construction and long-term maintenance costs associated with each alternative that achieves the project objective, as defined in partnership with the city.

Survey elevations being collected include the low opening and low adjacent grade near each structure considered to be at risk of flooding, similar to and in conjunction with the elevation survey being conducted in the Kohlman Creek area.

Monitoring water quality and special project monitoring

Special project best management practice (BMP) monitoring (Barr project manager: Katie Turpin-Nagel; RWMWD project manager: Paige Ahlborg)

The primary objective of this project is to monitor specific water quality BMPs that the RWMWD has implemented, particularly those that include filtration media such as iron-enhanced sand, spent lime, or CC17 crushed limestone aggregate, and/or which leverage continuous monitoring and adaptive control (CMAC) technology.

This period, Barr began planning monitoring and maintenance efforts with the district for the Willow Pond CMAC spent-lime filter in Roseville's Willow Pond Park. The filter, though constructed in 2019, has not yet been placed online and monitored due to COVID-19 delays in 2020. The current plan is to bring the filter online and start monitoring the site in spring 2021.

Barr and the district also coordinated long-term monitoring of lakes, stormwater ponds, and watershed BMPs. The team discussed monitoring locations and frequency and identified water quality sampling parameters. The development of a more extensive chloride monitoring scheme in 2021 was also discussed. Barr and the district will soon identify stormwater ponds to sample for conductivity and chlorides in spring 2021.

Research projects

Shallow lake aeration study (Barr project manager: Keith Pilgrim; RWMWD project manager: Bill Bartodziej)

The purpose of this study is to evaluate the potential effectiveness of aeration in shallow lakes by studying the effect of aeration in two smaller shallow systems (Markham Pond and Frog Pond) in detail during 2021 and 2022.

At the January board meeting, Barr presented the information included in the 2020 study *Internal Load Analysis of Shallow and Deep Lakes*, which detailed the differences in internal phosphorus load mechanisms across several RWMWD lakes. One conclusion of the study was that aeration could potentially be used to decrease internal phosphorus loads in some shallow lakes, but that this tool deserves more research attention.

A scope summary describing this year's proposed research efforts are included in this month's board packet for manager review and consideration.

Project operations

2020 Tanners Lake alum facility monitoring (Barr project manager: Meg Rattei; RWMWD project manager: Eric Korte)

The purpose of this project is to complete monitoring and reporting required by the general National Pollutant Discharge Elimination/State Disposal System permit for municipal separate storm sewer systems (MS4s).

The alum treatment facility has been shut down for the winter. Over the next few months, Barr will summarize and analyze the data and complete the required MS4 report for the Tanners Lake alum treatment facility per its permit requirements. We are also completing the RWMWD MS4 permit application, which includes a section for the alum treatment facility. The district will submit the application to the Minnesota Pollution Control Agency upon completion.

Automated lake-monitoring systems (Barr project manager: Chris Bonick; RWMWD project manager: Eric Korte)

The purpose of this project is to install an automated system to monitor lake levels throughout the RWMWD and allow real-time transfer of data to the district's website for public consumption.

Connection to the lake level report graphs on the district's website is now live and was demonstrated at last month's board meeting. Barr and the RWMWD are modifying the graphs slightly, including to depict ice conditions during winter months.

Physical installation of the four newest stations (Spoon, Battle Creek, Twin, and Tanners lakes) is nearing completion. The status has not changed since last month; Xcel Energy and Kilmer Electric are working on the power connection at the Tanners Lake station. Barr and the district will install the monitoring equipment as soon as all stations have power.

Capital improvements

North St. Paul Target store stormwater retrofit project (Barr project manager: Katie Turpin-Nagel; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits at two Target retail stores and a Motel 6.

Barr has completed design and construction documents for the North Saint Paul site, and the project was advertised for bidding purposes on February 8. Bids were accepted online through 10:00 am on February 23 and then publicly presented and read aloud via WebEx. The bid results are summarized in a separate memorandum in this packet. The bids will be offered to the managers at the March board meeting for consideration of an award. After review of the bids, if the managers deem it is appropriate, they should accept the bids and award the work to the lowest and responsive bidder that is in the best interest of the project. This schedule will allow construction to start this spring, in time for fall completion.

Targeted BMP retrofit projects (Barr project manager: Matt Kumka; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to design, provide bid assistance for, and oversee construction of BMP retrofits on previously identified commercial, school, and faith-based properties throughout the RWMWD.

Final design and bidding have been completed on the St. Rose of Lima parking lot retrofit in partnership with City of Roseville. The city is taking the lead on contracting with the apparent low bidder (OMG Construction). The district's portion of the work includes reducing the impervious surface of the parking lot without losing stalls by reorienting the stall positions and adding larger islands to support trees. The City of Roseville is installing an underground storage and infiltration system, while the church is contributing money for asphalt reconstruction. Final cost-share amounts are currently being prepared.

Aldrich Arena soils and plantings (Barr project manager: Matt Metzger; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to incorporate green-infrastructure stormwater management into the Aldrich Arena campus renovations. The parking lot will be full-depth reclaimed by Ramsey County, which itself will not trigger the need for a RWMWD permit. The partnership between the RWMWD and Ramsey County will achieve treatment of runoff from the parking lots where none currently exists. A formalized joint-powers agreement outlining the partnership cost sharing, roles, and responsibilities was crafted between the RWMWD and Ramsey County.

This period, Barr coordinated with Ramsey County on as-built needs now that construction is complete, and reviewed drone flight data that could be used to create as-builts. We also reviewed future White Bear Avenue and Aldrich Arena site improvements that the county is planning to help identify BMP opportunities and constraints.

Wakefield Park/Frost Avenue stormwater project (Barr project manager: Michelle Kimble; RWMWD project manager: Paige Ahlborg)

The purpose of this project is to work with the City of Maplewood and its consultants to develop a site plan that involves stormwater management features with associated educational elements for the northern portion of Wakefield Park.

Now that construction is complete, Barr created a project construction report that details the events that took place during construction, including photos and other documentation. The report is available for manager review, upon request.

Keller channel weir and Phalen outlet resiliency modifications (Barr project manager: Greg Nelson; RWMWD project manager: Tina Carstens)

This project includes design, bid document development, bidding, permitting, and project procurement of modifications to the Keller channel structure and the Phalen outlet structure. The purpose is to implement a design that will allow the RWMWD to remotely adjust the weir heights on the Keller channel structure and the Phalen outlet structure in accordance with an approved operating plan.

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Operation of the structures under certain conditions will help reduce upstream flood levels where homes exist in the floodplain.

The Ramsey County Parks and Recreation permit was approved on February 16. Barr is waiting for signed, electronic and hard copies. The contractor has been given oral approval by the county and we expect them to mobilize to the area before March 1. To date, the contractor has only been working at Lake Phalen and not on Ramsey County Parks and Recreation property in the Keller channel.

During this recent period, the contractor continued to make good progress. From February 15 to February 22, cold weather hindered the ability to work safely and to operate equipment, so no progress was made during that time. As weather conditions improved, the work resumed. The required modifications to the east outlet have now been completed and nearing a similar status at the west outlet soon. Remaining work on these structures is associated with the gates and controls.

Progress payment no. 2 and change order no. 2 are included for board consideration at the March 3 meeting.

Ryan Drive and Keller Parkway conveyance (Barr project manager: Sam Redinger; RWMWD project manager: Dave Vlasin)

The purpose of this project is to implement improved conveyance through Gervais Creek, as recommended by the Owasso Basin bypass feasibility study.

Barr has continued to advance detailed design of both crossings to draft construction documents. An estimate of probable cost and the "issued for project approval" documents are offered for manger review and approval for bidding.

The City of Little Canada is amenable to partnering with the district on the Ryan Drive improvements and is currently working through its evaluation process. The level of the city's partnership (i.e., cost-sharing) has not been confirmed, but Barr and the RWMWD have met with the city and its engineer multiple times to discuss the merit of the Ryan Drive scope and the benefit to the city and its residents.

Ramsey County has indicated that a partnership on the Keller Parkway improvements is unlikely, although Barr and the RWMWD have not yet formally requested the county's support.

Barr and the district have begun discussions with BNSF Railway; the existing drainage infrastructure beneath an active BSNF rail line north of Ryan Drive warrants improvements both to structural integrity and hydraulic flows in the area. The initial conversation with BNSF was productive and we remain optimistic they will improve their system in the relatively near future. Their improvement would further the interim and long-term benefit of the district's work in the area.

This board packet includes the preliminary design and contract document table of contents for the work, as well as an estimate of probable construction costs and schedule, for board consideration at the March 3rd meeting. If the board feels it is appropriate they should approve the preliminary design and specifications, estimate of costs, and proposed schedule, and direct staff to finalize the design, prepare the bidding documents and advertise the project for purposes of bidding. This schedule would allow bids to be received prior to the April 7 board meeting, if additional scope is not added by other stakeholders.

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Coordination with third-party stakeholders (e.g., City of Little Canada, Ramsey County, BNSF Railway, etc.) is ongoing, however, and may impact when the project is ultimately issued for bid. For example, if the City of Little Canada and/or Ramsey County partners with the district on this project, additional scope may be requested (with costs covered by these entities) that could extend the bidding duration.

CIP project repair and maintenance

Beltline/Battle Creek tunnel five-year inspection (Barr project manager: Sam Redinger; RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain the existing Beltline and Battle Creek tunnel systems and infrastructure owned and operated by the RWMWD.

As previously mentioned, based on Barr's preliminary findings, a few defects warrant consideration for near-term rehabilitation. The repairs are localized and specific and outside of the previous project repair extents. These repairs, as well as remaining pipe inspections, will be completed, and a comprehensive inspection report provided this winter, when flows subside and the tunnel can be accessed safely.

Barr is developing the repair details and contracting documents for the contractor (PCiRoads, LLC) to bid on. Schedule conflicts have extended the expected completion time. The Beltline repair work is anticipated to be completed by the end of March. The repair timeline for the McKnight Basin outlet structure is more indefinite, as this structure is located on and accessed from Ramsey County parkland, requiring the county's approval.

CIP maintenance/repairs 2021 project (Barr project manager: Greg Nelson; RWMWD project manager: Dave Vlasin)

The purpose of this project is to maintain existing systems and infrastructure owned and operated by the RWMWD and to assist and facilitate stormwater pond cleanouts to allow other public entities to meet their MS4 requirements.

Fitzgerald Excavating & Trucking began open-channel muck excavation in Gervais Creek from Country Drive northwesterly to Owasso Basin. Trucks are hauling to the nearby landfill for disposal. Cold weather conditions prevented work to be performed from February 15 to February 22. As weather conditions improved, work resumed. No payment request has been submitted this month.

Natural Resources Update – Bill Bartodziej and Simba Blood

Strategic Aquatic Plant Harvesting Paper - published in *Lakeline*

This paper describes our experience with aquatic plant harvesting in Lake Kohlman. The main purpose of this study was to determine how much total phosphorus (TP) was removed from the lake system by plant harvesting. These data provide a solid base for the watershed to partner on certain harvesting efforts that are performed in an ecologically sound manner. Below is a review and summary of our findings:

1. Beginning in 2009, intensive in-lake and watershed management caused Kohlman, a shallow lake, to go from a relatively turbid to a clear water state. Because of this management, aquatic plants and filamentous algae flourished and grew to the water surface.
2. Harvesting took place in June-August 2015. Just over 50% (around 50 acres) of the lake surface area was harvested. On average the harvester worked 2-3 days per week, cutting down to a 3' water depth. This was a conservative approach and safeguarded against overharvest.
3. Total wet mass of plants harvested = 210,000 lbs
4. Total phosphorus in plants harvested = 73 lbs
5. Cost of harvesting = \$18,000
6. Cost of total phosphorus removal via harvesting = \$247 per pound of TP
7. External total phosphorus load from Kohlman Creek = 1,768 pounds
8. TP in plants harvested versus TP load = 4 percent
9. These data support the idea that harvesting is a process that effectively removes TP from a lake system at a reasonable cost. Although the primary goal of harvesting is to facilitate lake recreation, TP removal can be considered an ancillary benefit.

The published article is included at the end of the Project and Program Status Report for your information.

Public Involvement and Education Program – Sage Passi

Smart Salting Chloride Outreach to Schools



As schools gradually reopened in early February across the District, letters were mailed to the principals at twenty-six elementary schools encouraging them to adopt Smart Salting winter housekeeping tips related to salt use to help schools protect our local waters. This communication, similar to the one sent to churches in January, also identified the nearest water bodies where their stormwater flows and the chloride impairment status of those lakes, wetlands or creeks. Letters will be sent to high school and middle schools in the coming weeks.

Mounds Park Academy Continues Partnership of Growing Native Plants



Last spring when Covid 19 shut down schools, Mitch Thomsen, a science teacher at Mounds Park Academy, had to pack up his light racks and stash them in portables in the school parking lot. At that time he was told that they would need the space in the classroom for safe distancing when students returned to school. His classrooms had been growing native seedlings for their ongoing large-scale prairie and wetland buffer restoration project for many years as well as supplying us with plants for

many other projects in our watershed district. Committed to providing this kind of ecological hands-on experience for his students, Mitch modified his teaching plan for this year and had students collect seeds in the school's large restoration areas in the fall and take them home to stratify in their own refrigerators.

In February, we are providing him with materials so his students can start these seeds indoors and continue this growing process this year. Mitch also reached out to collaborate with us to prepare for a summer school session. We plan to involve his students in the restoration at Snail Lake Regional Park. He has also requested watershed involvement/support for several activities this summer including a turtle census, water quality analysis and planting on the school site.

"Veteran" Stewards Help Lead Virtual Watershed Tour for Water Stewards



As a part of the Minnesota Water Stewards training process, we typically take our new Stewards on a drive-around tour of various sites in our watershed at the beginning of the course to introduce them to projects, community engagement and water quality issues. This year, in late February because of Covid 19, we have invited three certified Water Stewards on February 24 to help guide these Stewards-in-training around parts of our Watershed through an online "tour." Each of them will tell stories about their involvement in their own capstone projects and describe their engagement in other watershed initiatives.

The Water Stewards, Linda Neilson (Roseville) above left, Michelle Natarajan (St. Paul) above center and Paul Gardner (Shoreview) above right will use images, maps and storytelling to provide an inside look at projects they initiated in Shoreview, Roseville and St. Paul. We will also feature several of the Watershed District's videos including the Phalen Chain of Lakes Water Trail and RWMWD Student Planting Tradition at Snail Lake Regional Park.

On February 11, we partnered with VLAWMO, Rice Creek Watershed District, South Washington Watershed District, EMWREP and the City of Rochester to implement a virtual check-in meeting with new Stewards. This training has been previous facilitated by Freshwater staff. We provided several hands on learning demos that illustrated concepts about water flow in watersheds, two groundwater videos, an overview and a discussion about climate change and how it influences our work, and outlined best practices in partnering with our staff and communities. Our next check-in meeting will be held on March 18.

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Communications Program – Lauren Hazenson

Communications Strategy and General Updates

This month, I hosted a successful professional development lunch (via Zoom) for communications staff of eight watersheds this month. After receiving strong support from attendees, I will continue to host a brown bag lunch for watershed communications staff every quarter. We also continued to develop the flood risk mitigation fact sheets, which will be reviewed by city and county public works staff next month. Finally, Communications continues to support the Waterfest planning efforts for this June.

Intern Seth Bartodziej is moving out of state and will be working remotely for a month before completing his internship at the end of March. Lauren has begun searching for his replacement, who will be hired at the beginning of April. Natural Resources intern Emily Simmons is working with Seth to complete a buckthorn removal tutorial video for residents and will continue working with Communications on various projects until April.

Publications/ Original Content

Communications began work on the 2020 annual report documents, with a planned publication in mid-April. We also continued to progress on the Wetland A interpretive signage, to be installed in April. The monthly e-news will be published after this report is submitted, and stats will be provided in the March report.

Social Media (Facebook, Twitter, Instagram)

Numbers as of 2/23 for February:

Audience: 2,562

Impressions/Post Views: 7,493

Engagement (likes, comments, shares): 268

Strategic Aquatic Plant Harvesting as a Multi-faceted In-Lake Management Tool

Bill Bartodziej, Keith Pilgrim, and Simba Blood

Introduction

The earliest record of aquatic plant harvesting in the Phalen Chain of Lakes Watershed, located in the Twin Cities (Minnesota), dates back to 1923. At that time, the county engineer stated that: “Weed growth has an evil effect on Ramsey County lakes in several ways” (Coates 1924). Hence, a paddle-wheel boat was customized with a mechanical cutting blade to chop vegetation under the water (Figure 1). This vegetation would then float to the surface, where it was laboriously harvested by hand, and then piled on the shore to dry. The main objectives of this operation were to create open water for navigation and improve the look of the lake. The practitioners were innovative county workers who were not privy to even the most basic concepts of limnology. The plants were just an unsightly physical barrier that had to be removed.

Fast-forward almost 100 years, and we have dramatically increased our

knowledge of aquatic plant ecology in lake systems, as well as our efficiency in harvesting, with bigger, faster, and more powerful machines. Now, government agencies find it necessary to permit aquatic plant management activities with the primary goal of preserving beneficial aquatic plant stands. Over the years, it has become more common to see aquatic plant management as a component in comprehensive lake management plans, especially ones that address shallow systems. In addition, harvesting has recently been considered as a nutrient reduction tool in watershed and Total Maximum Daily Load (TMDL) studies.

What is strategic aquatic plant harvesting?

Intensive in-lake and watershed management caused Kohlman (34 ha), the northernmost lake in the Phalen Chain of Lakes, to go from a relatively turbid to a clear water state (Figure 2). Aquatic plants responded by growing to the water surface, and the general lake condition

seemed to mimic the 1920s historical accounts that prompted harvesting. This change in lake state and a comprehensive water quality monitoring dataset gave us an excellent opportunity to develop and assess a strategic aquatic plant harvesting approach (Figure 3). We set out to be methodical and have the best available data to drive the aquatic plant harvesting process on Kohlman Lake. We balanced realistic management goals centering on navigation, recreation, aesthetics, water quality, and ecological function. We viewed the aquatic plant community as a critical component in the lake system and control was judicious. Available data and best professional judgement were used to set limits on the aquatic plant harvest. Data were collected during the operation to assess the degree of control and the effects of harvesting on water quality. Below, we summarize our experience with this approach and detail how Kohlman Lake responded to the harvesting operation. We also discuss how this tool may be used in lake and watershed management.

The backstory: Kohlman Lake turning to a clear water state

Surrounded by urban-residential land use, Kohlman Lake is relatively shallow with a maximum depth of four meters. The littoral area covers a majority of the lake surface, but Kohlman is still popular for boating and fishing. In the 1980s and '90s, total phosphorus (TP) levels were high, with a growing season average of near 100 ug/L. Nevertheless, Kohlman supported a rooted aquatic plant community with moderate algal blooms; however, notable blue-green algal blooms were rare. The submersed plant and algal communities did not severely impede recreational use, and shoreland owners



Figure 1. A 1924 Ramsey County harvester working in surfaced vegetation on Keller Lake.



Figure 2. The Phalen Chain of Lakes.

were generally happy with the overall condition of the lake.

In 2008, the Minnesota Pollution Control Agency placed Kohlman on the 303(d) Impaired Waters List due to growing season TP levels being consistently over the state standard of 60 ug/L. This triggered the Ramsey-Washington Metro Watershed District (RWMWD) to conduct a TMDL study. It was estimated that the watershed contributed 426 kg of TP and Kohlman experienced an internal TP load of 132 kg during a normal precipitation year. Mass balance modeling suggested that growing season reductions of 95 kg (22 percent) of TP from the watershed and 116 kg (88 percent) from internal loading would be needed to meet the state standard. Alum treatment, common carp management, and watershed best management practices were used to substantially reduce TP loading. Since project implementation, transparency and TP values in Kohlman

have satisfied the state standards (Figure 4). This combination of practices now seems to be a fairly standard approach for TP management in Twin Cities area shallow lakes.

The aquatic plant quandary in a shallow lake

With an improvement in water quality we observed a dramatic increase in the abundance of aquatic plants. During the first growing season after intensive in-lake

and watershed management, a majority of the littoral zone had plants growing to the water surface. Point-intercept surveys indicated that the dominant species were coontail (*Ceratophyllum demersum*), Canada elodea (*Elodea canadensis*), and expansive stands of surfaced filamentous algae (Figure 5). Spot herbicide treatments were used to control the invasive curly-leaf pondweed (*Potamogeton crispus*) and Eurasian watermilfoil (*Myriophyllum spicatum*). For more background data on the project, see Bartodziej et al. 2017a.

This expected aquatic plant response was clearly spelled out in our educational messages at the beginning of the project. We used straightforward phrases like, “clear water grows plants” and “a lot of plants in a shallow lake is normal.” But in reality, preemptive education did not work. Once a popular recreational lake is dominated by large expanses of topped-out vegetation, shoreland owners and lake

users often become frustrated and disgruntled. Although our watershed district does not have any sort of legal obligation to conduct aquatic plant management, we set out to investigate a solution that would satisfy water quality, ecological, and recreational based goals. Hence, a strategic aquatic plant harvesting approach was developed by the Ramsey-Washington Metro Watershed District (RWMWD) to address this shallow lake system’s response to improved water quality.

Strategic Aquatic Plant Harvesting

1. Use a judicious and conservative approach to set goals and limits on harvesting
2. When possible, secure data to support the overall harvesting operation
3. Collect data and closely monitor the harvesting activity and make necessary adjustments
4. Use the final dataset to assess if specific goals were achieved and to improve on future harvesting efforts
5. Incorporate harvesting into lake and watershed management plans when feasible

Figure 3. The main components of strategic aquatic plant harvesting.

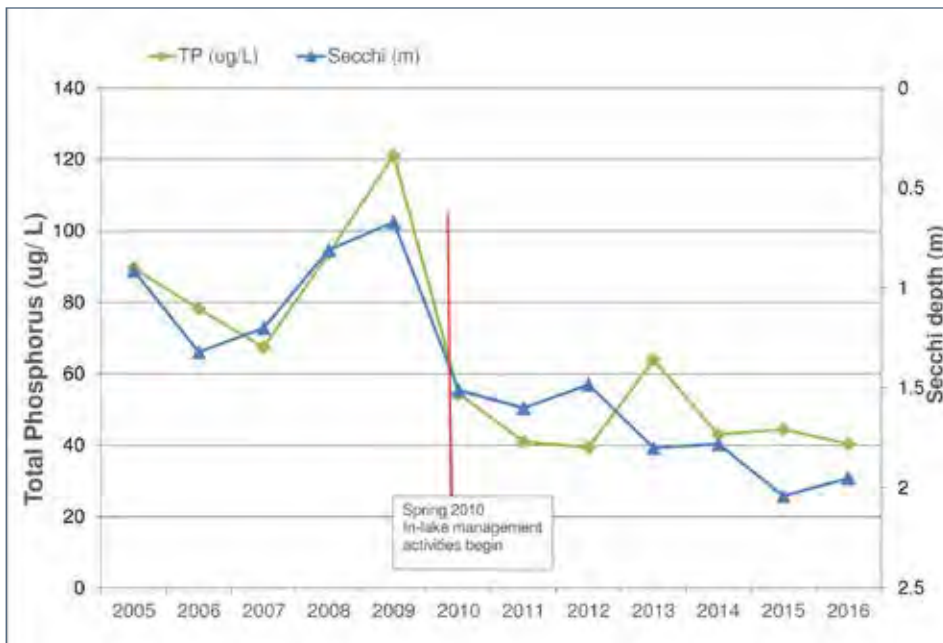


Figure 4. Lake Kohlman TP and Secchi depth before and after watershed and in-lake management activities.



Figure 5. Surfaced coontail and Canada elodea with mats of filamentous algae.

Our general approach

Our aim was to conduct strategic harvesting as a trial and then assess performance. In taking on this sort of management, we realized that aquatic plants lie at the center of shallow lake ecosystems, as they provide several ecosystem services such as habitat, food, cover and shading, temperature moderation, and nutrient uptake and sequestration (Carpenter and Lodge

1986). With this in mind, our overall approach to aquatic plant control was conservative. In June-August 2015, the RWMWD employed a private contractor to conduct aquatic plant harvesting. A paddlewheel driven harvester with a two-meter cutting swath was used in Kohlman Lake.

In developing a harvesting plan, the first question that naturally came to the forefront was: “To what degree can we manage aquatic plants without affecting

water quality?” While this question was being asked for Kohlman Lake, it was soon clear that the lake management literature did not provide solid guidelines or limits on harvest. Thus, we used our best professional judgement to determine a target control area and frequency of harvest. We mapped out a 20 ha area in the center of the lake that we wanted to keep perpetually free of surfaced aquatic plants and algae during the growing season. This is approximately 55 percent of the total surface area of the lake. In harvesting this area, it provided a large open-water space for power boat recreation. On average, the harvester worked two to three days per week to keep this area open. We instructed the harvester to set the cutting blade to a one-meter maximum depth. This decreased the efficiency of the harvesting operation and was costlier, but safeguarded against overharvest. It was our goal to create a balance, being conservative in plant control and preserving water quality, but still providing an ample area for recreational opportunities.

Data collection and water quality model construction

We used sonar, point-intercept surveys, and plant biomass sampling to closely monitor the aquatic plant community. GPS mapping was used to track the harvesting. Harvested plant material was hauled off site to a local public works yard for composting. The total wet weight of each harvesting effort was calculated using the total number of trailer loads and the average plant material payload weight. Random plant samples were taken off the trailer and sent to a laboratory for TP and wet to dry weight analyses.

We formulated a list of data necessary to quantitatively assess the effects of harvesting. This list included: (1) phosphorus in submerged plant tissue and in attached filamentous algae, (2) total biomass of plants and algae during the growing season, (3) water quality in Kohlman Lake and in the tributaries, (e.g., phosphorus, solids, chlorophyll *a*), (4) mass of plants harvested over time, and (5) mass of phosphorus harvested in plants. To glue these data together and understand the effect of harvesting, a custom zero-dimensional, completely

mixed mass balance water quality model was built that included inflows (flow and chemistry), lake temperature, climate (e.g., solar radiation), settling, phytoplankton growth and mortality, and aquatic plant growth and mortality. This model was used to quantify the Kohlman Lake phosphorus mass balance including uptake by aquatic plants and removal by harvesting, aquatic plant growth rate and deduced effects of harvesting, and the overall effects of harvesting on phytoplankton growth and abundance.

Effects of harvesting: Plant community and water quality

The depth of cut and the extent of harvesting can be surmised from the sonar images in Figure 6. Open water areas provided boaters with water skiing opportunities, and observations suggested that recreation was not substantially impeded by aquatic plants. One of our goals of the harvesting was to avoid severely setting back the native plant community through overharvest. Our measurements of aquatic plant biomass and modeling simulation suggest that aquatic plant growth was not affected by the harvesting (Figure 7). It's reasonable to consider that this result was due to the conservative approach of only cutting to a depth of 1 m.

The role of aquatic plants in moderating phosphorus availability and phytoplankton blooms is qualitatively understood, but rarely quantified by most

lake managers. It is largely recognized that any management activity that measurably affects aquatic plants also has the potential to affect phosphorus, triggering phytoplankton blooms, and affecting lake clarity. Water quality monitoring data suggest that the extent of harvesting did not impact water quality as total phosphorus remained within recently observed historic ranges during harvesting (Figure 8). There was a slight decrease in Secchi disk depth at the start of harvesting, however this corresponded with a large storm event delivering high flows, phosphorus, and suspended solids. Mass balance modeling confirms that increases in suspended solids, phosphorus and reduced Secchi disk depth in July was a function of external solids and phosphorus loading. Furthermore, harvesting in August corresponded to a decline in phosphorus and an increase in Secchi disk depth which were a response to lowered external solids and phosphorus loads.

Plant mass and phosphorus removal through harvesting

While substantial harvesting took place to preserve recreation, the mass of plants taken out of the lake was approximately 14 percent of the peak mass that would be present without harvesting. Modeling was necessary to generate an estimate of plant mass without harvesting, and to account for the macrophyte dynamics, which included both growth and mortality. As a result,

phosphorus uptake by plants (138 kg) was more than may be estimated by stand-alone plant biomass and phosphorus measurements. Aquatic plants were capturing a significant fraction of the phosphorus delivered by tributaries to Kohlman Lake (Table 1). Harvesting removed 24 percent of the TP captured by aquatic plants, and this accounted for four percent of the TP load derived from external sources.

Because harvesting removes a considerable amount of TP, the idea of incorporating this activity in TMDL studies as well as using submersed plants in water treatment systems has been discussed (Reisinger et al. 2008, Evans and Wilke 2010, Souza et al. 2013.). In addition, the cost of TP removal by aquatic plant harvesting is quite economical when compared to phosphorus management practices that take place in upland watershed areas, e.g., rain gardens (Bartodziej et al. 2017b). The cost of TP removal was \$545 per kg in Kohlman, and this is comparable to estimates generated from another RWMWD harvesting study.

Can harvesting be a multi-faceted lake management tool?

Overall, we are pleased with the results of the strategic harvesting approach used on Kohlman Lake. This shallow system was able to withstand a 14 percent (peak mass) harvest of aquatic plants while preserving water quality and

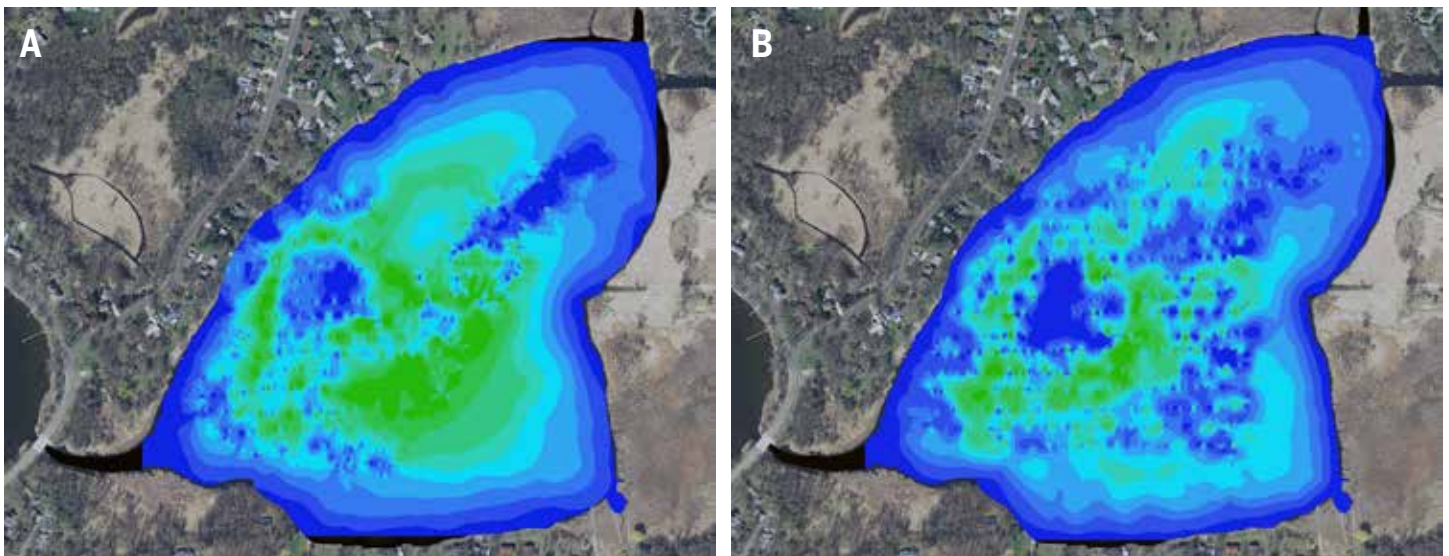


Figure 6. Results of sonar surveys showing plant height prior to the start of harvesting on June 23rd (A) and after the completion of harvesting on August 27th (B). The blue colors represent gradations of plant height between 0 and 1.5 meters while the green colors are plant heights between 1.5 to 2.7 meters.

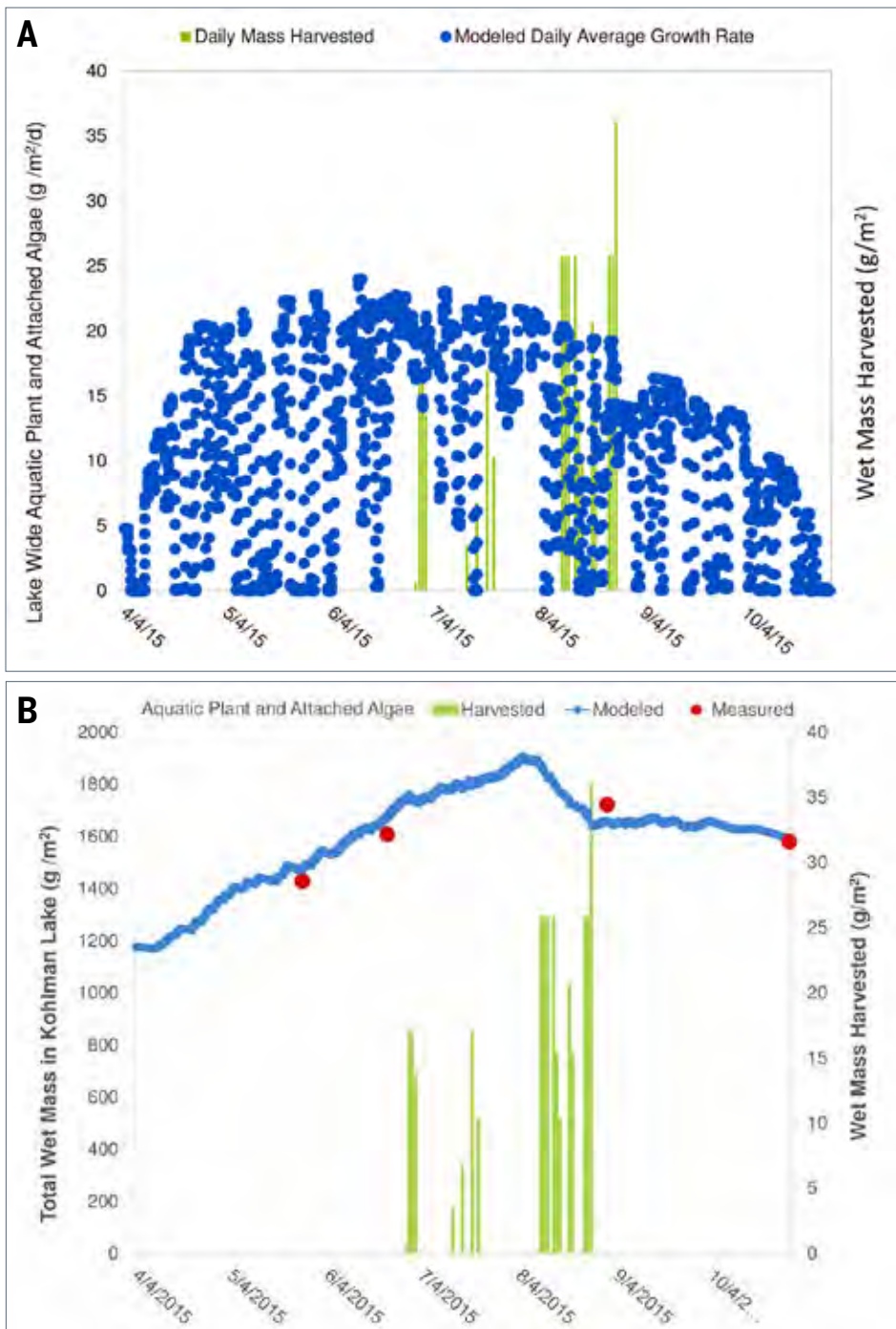


Figure 7. Modeled aquatic plant growth rate and aquatic plant mass harvested during the growing season (A), and a comparison of measured and modeled aquatic plant biomass (B).

improving recreation. Best professional judgement is always a component of lake and natural resources management, and this certainly came into play when setting a harvesting plan for Kohlman Lake. At the onset, we didn't have the luxury of citing a body of literature to support our plant management approach. However, having a robust historical dataset on Kohlman and collecting data while

harvesting gave us the ability to make critical assessments during the control operation. As more strategic harvesting studies become available, robust datasets will help managers determine precise harvesting objectives and relate these to water quality and other natural resources goals.

Data from this study suggest that harvesting certainly presents cost-

effective opportunities for TP removal, and has the potential to factor into dynamic and creative watershed management approaches. For instance, the RWMWD Board of Managers recently passed a resolution supporting a cost-share grant program for aquatic plant harvesting. Although the RWMWD as an organization does not manage aquatic plants, the Board may financially support and partner on harvesting efforts that fit into comprehensive TP reduction plans. This approach may gain some momentum as resource management organizations are increasingly challenged with excessive plant growth following intensive lake and watershed management, especially in shallow systems with urban watersheds.

This study points to strategic harvesting being an effective multi-faceted tool for lake and watershed managers. Although we currently do not have many data-rich, shallow lake harvesting studies to reference, we are making progress in better understanding shallow lake ecology and aquatic plant management. Consider 100 years ago, when the managers of the Phalen Chain of Lakes viewed all aquatic plants as "evil" that must be destroyed. We have certainly come a long way, and we look forward to the creative ways that strategic harvesting can contribute to water resources management in the future.

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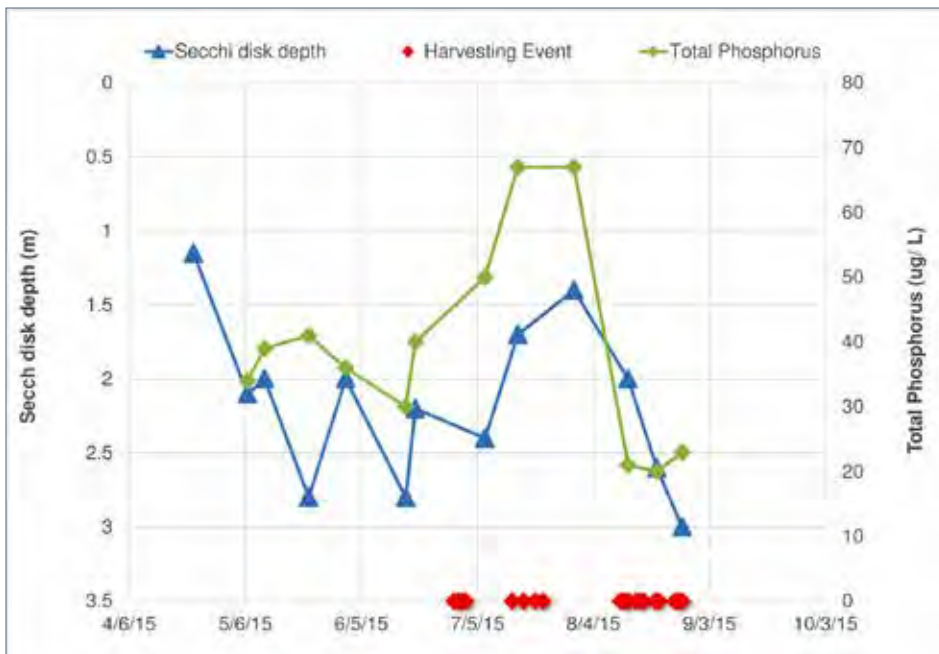


Figure 8. Secchi disk depth and total phosphorus in relation to harvesting events.

Table 1. Model estimates, total phosphorus (TP), and aquatic plant harvesting data generated from Kohlman Lake, April 15 to October 31, 2015.

Total Phosphorus and Aquatic Plant Data	Value
Estimates based on Model Output	
TP Total taken up by Plants (macrophytes plus attached filamentous algae)	138 kg
External TP Load from Primary Tributary	802 kg
Peak Wet Mass of Plants and Filamentous Algae - with no harvesting	2,014 g/m ²
Lakewide Peak Wet Mass of Plants and Algae - with no harvesting	680,732 kg
Harvesting Mass and TP in Plant Tissue	
Total Wet Mass of Plants Harvested	95,254 kg
Total Dry Mass of Plants Harvested	9,144 kg
Total Mass of Plants Harvested - by unit area (wet)	282 g/m ²
Peak Mass of Plants and Filamentous Algae (wet)	1,722 g/m ²
Average TP in Plants (dry)	3.6 g/kg
TP in Plants Harvested	33 kg
Percentages and Cost	
Total Mass of Plants Harvested versus Peak Mass in the Lake	14 percent
TP in Plants Harvested versus TP Total taken up by Plants	24 percent
TP in Plants Harvested versus TP Load	4 percent
Total Cost of Harvesting	\$18,000
Cost of TP Removal via Harvesting	\$545/kg

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