

Tuesday, October 8, 2019

6:00 PM

Prior Lake City Hall

www.plslwd.org

BOARD OF MANAGERS:

Mike Myser, President; Fred Corrigan, Vice President; Charlie Howley, Treasurer;

Bruce Loney, Secretary; Curt Hennes, Manager

Note: Indicated times are estimates; actual times may vary considerably. Individuals with items on the agenda or who wish to speak to the Board are encouraged to be in attendance when the meeting is called to order.

Board Workshop 4:00 PM – Wagon Bridge Conference Room (Downstairs)

4:00-4:30 p.m. Long-term Monitoring Plan (Jaime Rockney)

4:30-4:40 p.m. Succession Plan (Diane Lynch)

4:40-4:50 p.m. Governance Conference Update (Managers)

4:50-5:00 p.m. District Administrator Performance Evaluation Form (Mike Myser)

5:00-5:45 p.m. Draft WRMP Strategies & Implementation Activities (Carl Almer)

After Board Meeting, if needed. Draft WRMP Strategies & Implementation Activities

6:00 – 6:05 PM 1.0 **BOARD MEETING CALL TO ORDER & PLEDGE OF ALLEGIANCE**

6:05 – 6:10 PM 2.0 **PUBLIC COMMENT**

If anyone wishes to address the Board of Managers on an item not on the agenda or on the consent agenda please come forward at this time, turn on the microphone and state your name and address. (The Chair may limit your time for commenting.)

6:10 – 6:15 PM 3.0 **APPROVAL OF AGENDA** (Additions/Corrections/Deletions)

*******PUBLIC HEARING PLSLWD DRAFT RULE REVISIONS*******

(Testimony only. No Q & A or discussion)

6:30-7:00 PM 4.0 **OTHER OLD/NEW BUSINESS**

4.1 Programs & Projects Update (Discussion Only)

○ Water Quality, Water Storage and AIS Inspections

○ Spring Lake Impairment

4.2 Bid Authorization for Sutton Lake Conditioned Drawdown Project (Vote)

4.3 Health Care Savings Plan Authorization (Vote)

4.4 Integrated Pest Management Plan for Common Carp Update (Vote)

7:00-7:10 PM 5.0 **CONSENT AGENDA**

The consent agenda is considered as one item of business. It consists of routine administrative items or items not requiring discussion. Items can be removed from the consent agenda at the request of the Board member, staff member, or a member of the audience. Please state which item or items you wish to remove for separate discussion.

5.1 Meeting Minutes – September 10 Board Workshop & Board Meeting

5.2 Meeting Minutes—September 24 CAC

5.3 Claims List

5.4 Ferric Chloride Carp Barrier Contract Approval

7:10-7:25 PM

6.0 **TREASURER'S REPORT**

6.1 Cash & Investments (Discussion Only)

6.2 Financial Report (Discussion Only)

7:25-7:35 PM

7.0 Manager Presentations on Watershed-related Items (Discussion Only)

7:35 – 7:40 PM

8.0 **UPCOMING MEETING/EVENT SCHEDULE:**

- CAC MEETING CITY HALL 10/22 6:30-8:00 P.M.
- PRIOR LAKE ASSOCIATION ANNUAL MEETING 10/24 VFW
- CWCU 10/27 THE WOODS AT THE WILDS PARK 9-11:30 A.M.

7:40 – 7:45 PM

Group Photo of Managers

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

OCTOBER 2019 PROGRAMS & PROJECTS UPDATE

Capital Projects

PROJECT	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
Public Infrastructure Partnership Projects <i>Project Lead: Maggie & Diane</i>	<ul style="list-style-type: none"> Received quotes for Fairlawn Shores project and engaged contractor with lowest quote. 	<ul style="list-style-type: none"> Complete construction on Fairlawn Shores project in the next few weeks. Present the Red Wing Ave project engineering plan to the Board and Sand Creek Township.
Storage & Infiltration Projects <i>Project Lead: Diane</i>	<ul style="list-style-type: none"> Reviewed Sutton Lake project options at the Board meeting. 	<ul style="list-style-type: none"> Move forward with the easements and the bid authorization
Carp Management <i>Rough Fish Management (Class 611)</i> <i>Carp Management Project (Class 750 & 751)</i> <i>Project Lead: Maggie</i>	<ul style="list-style-type: none"> Moved forward with 2019 Accelerated Carp Management Strategies (ACM), including training carp with sound & bait. Coordinated with contract fabricator on the Northwood carp barrier to line up the work for later this fall. Completed initial survey work on Fish Lake in order to examine the fisheries. Received final quotes from fabricators for FeCl carp barrier and developed memo to Board to approve the contract. Continued to track radio-tagged carp across the lakes. Radio-tagged an additional nine carp on Upper Prior Lake and continued to collect information for an updated population estimate. Worked with WSB staff to update the draft IPM plan for Board approval. 	<ul style="list-style-type: none"> WSB and PLSLWD staff will continue to track the tagged carp. Complete installation of cameras at Arctic Lake outlet and one other location. Purchase a boat for District use for carp management activities. Install permanent Northwood carp barrier and FeCl barrier redesign. Carp removals in Geis wetland (electrofishing/box traps/trap nets). Complete additional survey work on Spring Lake and implant 7-10 additional radio-tags. Trap net wetland areas connected to Spring and Upper Prior Lakes that are suspected to be spawning grounds to see what degree carp are present. Work with WSB to schedule and coordinate upcoming carp removals/tagging as opportunities arise.

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

Operations & Maintenance

PROGRAM	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
Ferric Chloride System Operations <i>Project Lead: Jaime</i>	<ul style="list-style-type: none"> Met w/WSB about carp barrier Sampled 1x/week Inspect shed/pump 3x/week DMR Report 	<ul style="list-style-type: none"> New walkway and fish barrier Look into permanent fix to driveway for ferric delivery Sample 1x/week Inspect 3x/week DMR Report
Farmer-Led Council <i>Project Lead: Maggie</i>	<ul style="list-style-type: none"> Met with SWCD staff to coordinate items for upcoming County-wide event in February. Lined up large guest speaker, Dave Brandt, for the County-wide event. 	<ul style="list-style-type: none"> Explore farmer mentorship program with FLC members. Prep for next meeting in December. Meet with partners to start coordinating County-wide event to promote conservation practices.
Cost Share Incentives <i>Project Lead: Kathryn, Diane</i>	<ul style="list-style-type: none"> Verified installation of installed projects and processed applications. 	<ul style="list-style-type: none"> Process applications as they are received. Verify installation of completed projects.
Spring Lake Parcel Restoration Project <i>Project Lead: Maggie & Kathryn</i>	<ul style="list-style-type: none"> AES completed maintenance at the site. 	<ul style="list-style-type: none"> Order and install large sign visible from lake. Monitor restoration and control invasive species during growing season. Install small plant identification signs.
Raymond Park Restoration Project <i>Project Lead: Kathryn</i>	<ul style="list-style-type: none"> Maintenance work continues including August site visit by GRG 	<ul style="list-style-type: none"> Install educational interpretative signs. GRG will continue maintenance at park in 2019. Follow-up visits will keep buckthorn and other invasives at bay. Additional seeding will be done this year, if needed. Meet w/ City staff to discuss project transfer as per project agreement.

PRIOR LAKE - SPRING LAKE

WATERSHED DISTRICT

Operations & Maintenance

PROGRAM	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
<i>Fish Lake Shoreline & Prairie Restoration Project</i> <i>Project Lead: Kathryn</i>	<ul style="list-style-type: none">• MN Native Landscapes continues initial restoration work.• Coordinated with Spring Lake Township & MNL.	<ul style="list-style-type: none">• MN Native Landscapes will continue initial restoration work.
<i>CR 12/17 Wetland Restoration</i> <i>Project Lead: Maggie</i>	<ul style="list-style-type: none">• Met onsite with the County, City, and PLSLWD to brainstorm solutions to the outlet problems on site and to wrap up the vegetation maintenance obligations for the District by next year.• AES completed additional maintenance at the site (woody invasive removal, IESF maintenance).	<ul style="list-style-type: none">• AES will visit site to finish IESF maintenance.• Coordinate with the County & City to make sure that the issues have been resolved at the outlet structures.
<i>Lower Prior Lake Retrofit Projects</i> <i>Project Lead: Maggie</i>	<ul style="list-style-type: none">• MNL completed maintenance work at site.	<ul style="list-style-type: none">• Continue to work with MNL on site maintenance until the projects are fully established and accepted by the City of Prior Lake.• Install interpretive signs for projects.

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

Planning

PROGRAM	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
<i>District Plan Update</i> <i>Project Lead: Diane</i>	<ul style="list-style-type: none">• Staff reviewed a draft at the Board Workshop	<ul style="list-style-type: none">• Meet with Board to review the financial spreadsheet
<i>Feasibility Reports</i> <i>Project Lead: Maggie</i>		<ul style="list-style-type: none">• EOR will complete the two feasibility studies this fall as part of the WBF grant

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

Education & Outreach

PROGRAM	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
Website and Media <i>Project Lead: Kathryn</i>	<ul style="list-style-type: none">• As of October 3, 12:00 pm:• Website articles posted: Rules Update; CWCU invitation;• Prior Lake Am articles on CWCU.• Facebook & Twitter- continuing Trivia Tuesday (question posted on Tues, answer posted Wed).	<ul style="list-style-type: none">• Continue writing posts and updates about projects• Will tweet and/or update Facebook about projects & news.• Write article for next SCENE edition.
Citizen Advisory Committee <i>Project Lead: Diane & Kathryn</i>	Met on September 24 with guest, Jennie Skancke, DNR. Held elections. New Chair Christian Morkeberg and Vice-Chair Marianne Breitbach	<ul style="list-style-type: none">• Plan for 2020 activities• Review the Management Plan at the October meeting
MS4 Education Program <i>Project Lead: Kathryn</i>	<ul style="list-style-type: none">• Implementing education activities from 2019 Education & Outreach plan• Added information in the Plan update	<ul style="list-style-type: none">• Implement education activities.

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

Monitoring & Research

PROGRAM	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
Monitoring <i>Project Lead: Jaime</i>	<ul style="list-style-type: none">• Meet w/MCWD about WISKI• Data management.• Database maintenance/entry.• Long Term Monitoring Plan• Took samples and flow measurements	<ul style="list-style-type: none">• Data management.• QA/QC data.• Enter data into the water quality database• Finish Long-Term Monitoring Plan for WRMP
Aquatic Vegetation Management and Surveys (Class 626 and 637) <i>Project Lead: Jaime</i>	<ul style="list-style-type: none">• Summer aquatic plant surveys	<ul style="list-style-type: none">• BioBase mapping desilt pond

PRIOR LAKE - SPRING LAKE

WATERSHED DISTRICT

Regulation

PROGRAM	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
<i>BMPs & Easements</i> <i>Project Lead: Maggie & Kathryn</i>	<ul style="list-style-type: none">• Worked with landowners to resolve existing violation issues on their properties prior to the annual inspections.• Completed follow-up easement inspections.• Worked on easement baseline reports.• Wrote post-inspection letters for annual inspections.• Engaged surveyor for survey work on two easement areas where the line is not clearly marked.• Assisted a landowner with a mortgage consent for an easement amendment.	<ul style="list-style-type: none">• Review amendment requests as they are received and work with landowners towards closing out approved amendment requests.• Work with landowners to resolve easement violations.• Complete baseline documentation for each conservation easement property.• Survey easement boundary for A600404 and A722055 Parcel B.• Send post-inspection letters for completed inspections.
<i>Permitting</i> <i>Project Lead: Maggie & Jeff</i>	<ul style="list-style-type: none">• Completed erosion & sediment control inspections for permits in active construction. Followed-up with permittees on problem areas.• Worked with Living Hope Church to get issues at #17.01 permit site resolved.• Final maintenance work on enforcement project at Permit #05.15 completed.	<ul style="list-style-type: none">• Continue to inspect, follow-up on and close remaining open permits.
<i>Rules Revisions</i> <i>Project Lead: Diane</i>	<ul style="list-style-type: none">• Board completed its initial review of the Rules Update and forwarded them on for formal review.	<ul style="list-style-type: none">• Public Hearing.

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

Prior Lake Outlet Structure & Channel

ACTIVITY	LAST MONTH'S STAFF ACTIVITIES	NEXT STEPS
<i>Prior Lake Outlet Channel</i> <i>Project Lead: Jaime</i>	<ul style="list-style-type: none">• Weekly channel inspections• Cleared obstructions in culverts• Cleared vegetation outlet structure• Fall channel inspection• Open/close low-flow gate and main gate for FEMA construction activities	<ul style="list-style-type: none">• Weekly channel inspections.• Continue to manage outlet structure gates for FEMA bank repair
<i>Channel Bank Erosion (FEMA)</i> <i>Project Lead: Diane</i>	<ul style="list-style-type: none">• No activity	<ul style="list-style-type: none">• Commence work the week of October 7
<i>JPA/MOA & TAC Meetings & Admin</i> <i>Project Lead: Diane & Jaime</i>	<ul style="list-style-type: none">• 2020 PLOC Workplan and budget	<ul style="list-style-type: none">• Finalize 2020 Workplan and budget at the October 10 Cooperator meeting.
<i>Invasive Species Removal</i> <i>Project Lead: Jaime</i>	<ul style="list-style-type: none">• Buckthorn foliar treatment at Segments 1, 2, 3, 4, 7.	<ul style="list-style-type: none">• Annual Report
<i>MS4 Permit</i> <i>Project Lead: Diane & Jaime</i>	<ul style="list-style-type: none">• No activity	<ul style="list-style-type: none">• Review annual permit draft
<i>PLOC Easements</i> <i>Project Lead: Diane</i>	<ul style="list-style-type: none">• No activity	<ul style="list-style-type: none">• No activity expected

memo



Project Name | Sutton Lake Outlet Structure Project
To | PLSLWD Board of Managers
Cc | Diane Lynch, PLSLWD Administrator
From | Carl Almer, EOR Project Manager
 | Kyle Crawford, EOR Project Engineer
Regarding | Request for Authorization to Solicit Contractor Bids

Date | October 3, 2019

The purpose of this memorandum is to request authorization to solicit bids for construction for the Sutton Lake Outlet Structure Project.

Project Background

The proposed project reduces downstream flood impact on Prior Lake by retrofitting the existing Sutton Lake outlet (ditch) to manage the water levels of Sutton Lake to provide additional flood storage and attenuate peak discharge. The proposed outlet structure is also designed to afford the ability to conduct temporary drawdown pending approval by the MnDNR of the proposed Operating Plan and future public proceedings necessary to meet the requirements of MN Statute 103G.408 and MN Rule 6115.0271 paragraph C.

Engineer's Estimate

The updated Engineer's Estimate for construction based on 100% plans, review of recent project bid tabs and supplier quotes is \$284,315. The attached estimate (dated 10/03/2019) also includes a recommended 10% construction contingency for a total of \$312,746.50.

Requested Action

It is requested that the Board of Managers authorize the District Administrator and District Engineer to solicit bids for construction of the Sutton Lake Outlet Structure project conditioned on execution of landowner easements and MnDNR approval of the Operating Plan.

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

SUTTON LAKE OUTLET

JORDAN, SCOTT COUNTY, MINNESOTA

LEGEND

FEATURE

EXISTING

PROPOSED

SILT FENCE
CONSTRUCTION FENCE
DELINEATED WETLAND
OVERHEAD ELECTRIC LINES
BURIED ELECTRIC LINES
FIBER OPTIC LINES
BURIED TELEPHONE
SPLIT RAIL WOODEN FENCE
CHAIN LINK FENCE

SANITARY SEWER LINE
SANITARY SEWER FORCE MAIN
SANITARY SEWER MANHOLE

STORM PIPE LINE
STORM MANHOLE
DRAIN TILE

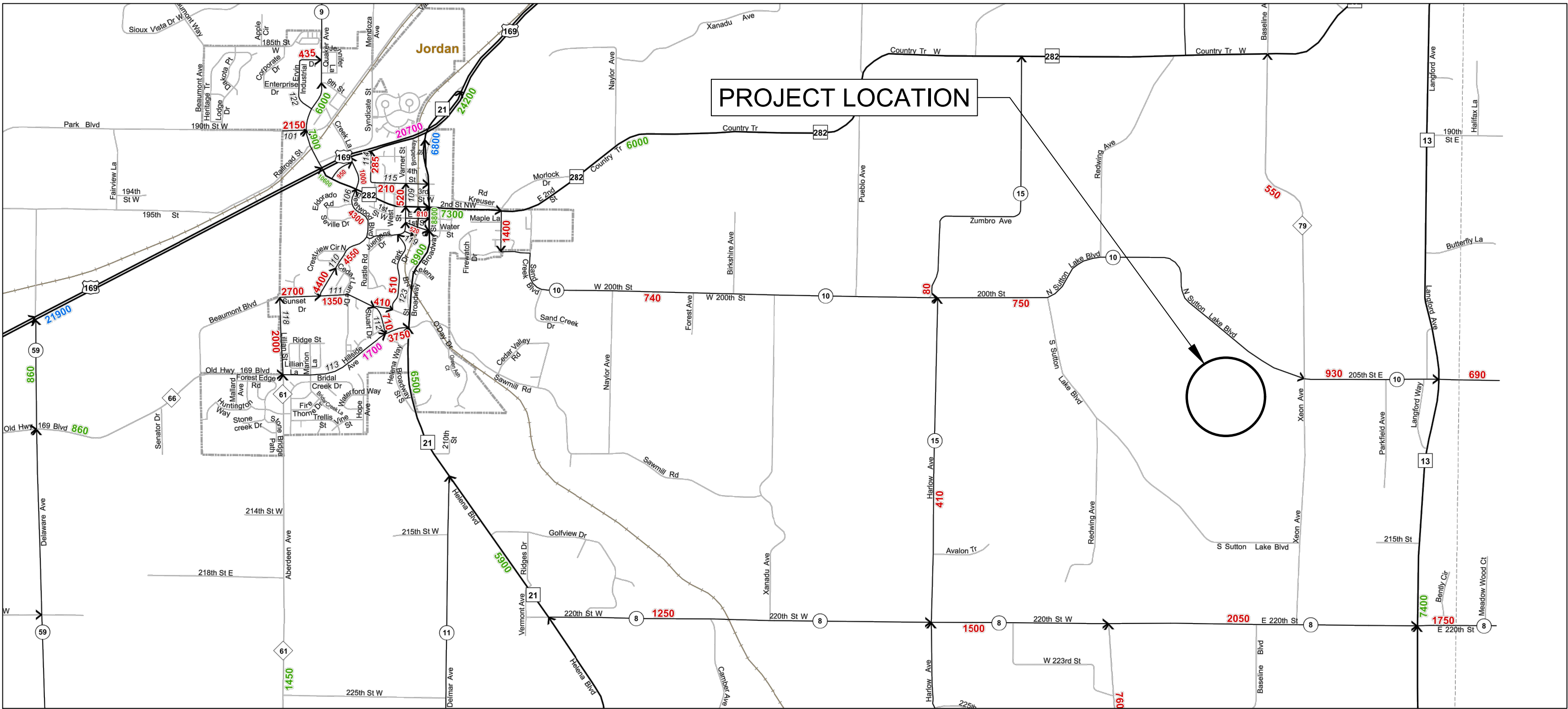
WATERMAIN
WATERMAIN MANHOLE
HYDRANT
GATE VALVE

TREE PROTECTION

MAJOR CONTOUR
MINOR CONTOUR

DRAINAGE FLOW ARROW

TREE



EXISTING UTILITIES

THE LOCATION OF UNDERGROUND FACILITIES AND/OR STRUCTURES AS SHOWN ON THE PLANS ARE BASED ON AVAILABLE RECORD AT THE TIME THE PLANS WERE PREPARED AND ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT. THE SUBSURFACE UTILITY INFORMATION SHOWN IS UTILITY QUALITY LEVEL D, AS DETERMINED USING THE GUIDELINES OF "C/ASCE 38-02 STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITIES 72 HOURS PRIOR TO CONSTRUCTION TO DETERMINE THE EXACT LOCATION OF ALL FACILITIES AND TO PROVIDE ADEQUATE PROTECTION OF SAID UTILITIES DURING THE COURSE OF WORK.

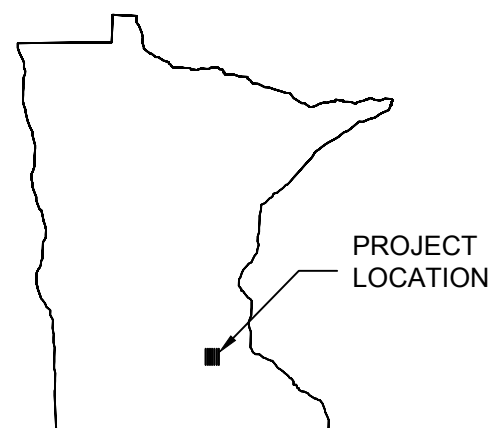
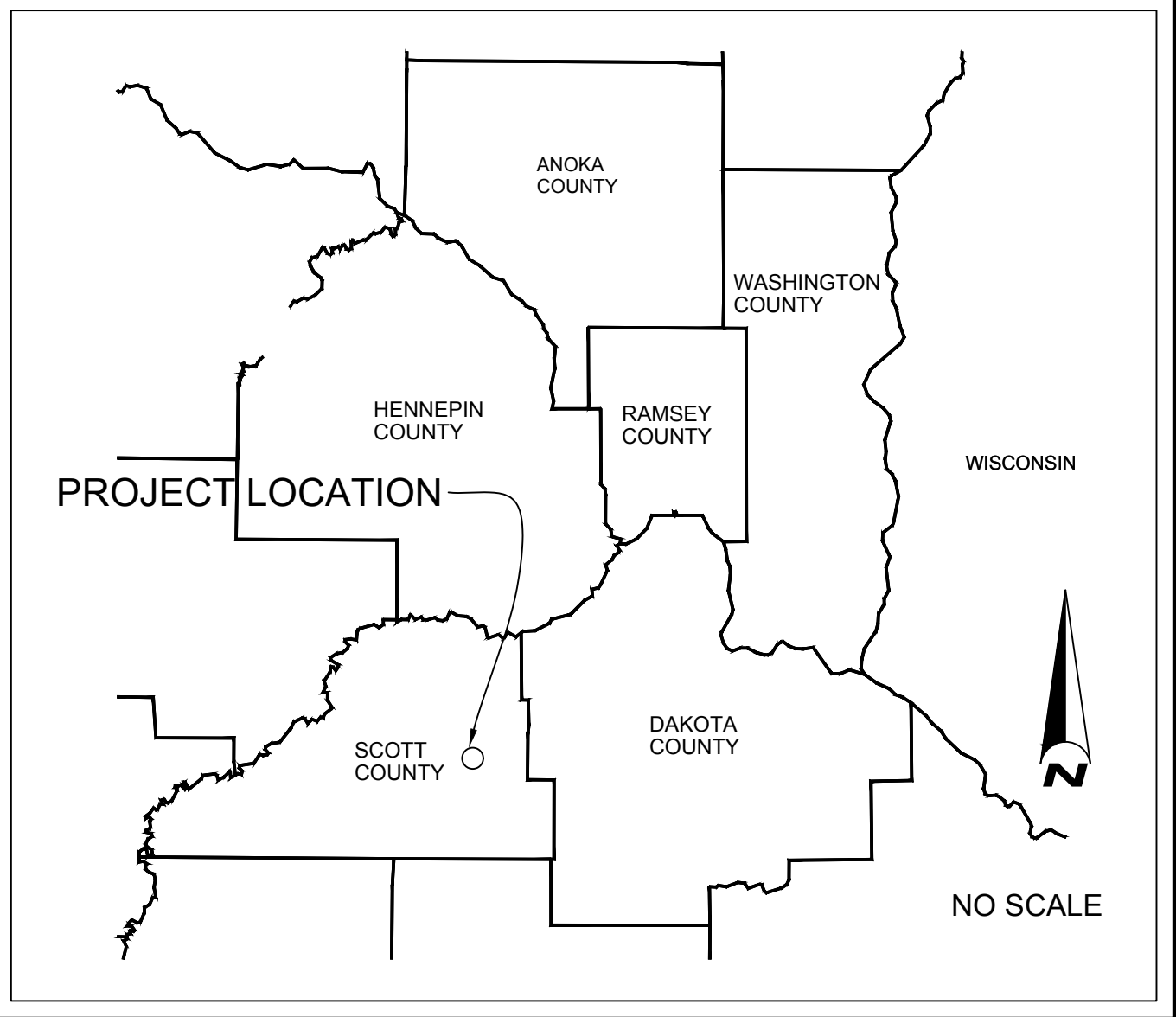
CONSTRUCTION NOTE

CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO MAINTAIN OPERATION OF EXISTING UTILITIES THROUGHOUT THE DURATION OF THE PROJECT. IN THE EVENT THAT AN INTERRUPTION OF SERVICE IS UNAVOIDABLE IN ORDER TO COMPLETE THE WORK, CONTRACTOR SHALL PROVIDE ADEQUATE NOTIFICATION TO ALL AFFECTED BUSINESSES A MINIMUM OF 3 WORKING DAYS IN ADVANCE OF ANY INTERRUPTION.

GOPHER STATE ONE-CALL

IT IS THE LAW THAT ANYONE EXCAVATING AT ANY SITE MUST NOTIFY GOPHER STATE ONE CALL (GSOC) SO THAT UNDERGROUND ELECTRIC, NATURAL GAS, TELEPHONE OR OTHER UTILITY LINES CAN BE MARKED ON OR NEAR YOUR PROPERTY BEFORE ANY DIGGING BEGINS. A 48-HOUR NOTICE, NOT INCLUDING WEEKENDS, IS REQUIRED. CALLS CAN BE MADE TO GSOC AT 1-800-252-1166 OR (651)454-0002, MONDAY THROUGH FRIDAY (EXCEPT HOLIDAYS) FROM 7 A.M. TO 5 P.M.

LOCATION MAP



SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
01	TITLE SHEET
02	SEQ AND NOTES
03	PROJECT OVERVIEW
04	EXISTING CONDITIONS & REMOVALS PLAN
05	EROSION AND SEDIMENT CONTROL PLAN
06	GRADING AND DRAINAGE PLAN
07	RESTORATION PLAN
08	DETAIL SHEET I
09	DETAIL SHEET II
10	DETAIL SHEET III

* THIS PLAN SET CONTAINS 10 PLAN SHEETS

GOVERNING SPECIFICATIONS

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING FIELD MANUAL FOR TEMPORARY CONTROL ZONE LAYOUTS.

CLIENT

**PRIOR LAKE SPRING LAKE
WATERSHED DISTRICT**
4646 DAKOTA ST SE
PRIOR LAKE, MN 55372

ENGINEER

EMMONS & OLIVIER RESOURCES, INC.
7030 6TH STREET NORTH
OAKDALE, MINNESOTA 55128-7534
TELEPHONE: (651) 770-8448
FAX: (651) 770-2552
eorinc.com

6			
5			
4			
3	10/03/2019	KDC	DRAFT BID PLANS - NOT FOR CONSTRUCTION
2	04/15/2019	KDC	70% DRAFT PLANS - NOT FOR CONSTRUCTION
1	03/21/2019	KDC	60% DRAFT PLANS - NOT FOR CONSTRUCTION
NO	DATE	BY	REVISION

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.

KYLE D. CRAWFORD, P.E.
DATE: 10/03/2019 LICENSE # 54906

SUBMISSION DATE:
10/03/2019

DESIGN BY
KDC

DRAWN BY
KDC

EOR PROJECT NO.
00758-0114

EOR Emmons & Olivier
Resources, Inc.
7030 6th Street North
Oakdale, MN 55128
Tele: 651.770.8448
www.eorinc.com

**PRIOR LAKE
SPRING LAKE**
WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

STATE PROJECT NO. --- CITY PROJECT NO. ---

TITLE SHEET

SHEET 01 OF 10 SHEETS

GENERAL SITE WORK NOTES

1. VERIFY HORIZONTAL LOCATION AND ELEVATION WHERE A CONNECTION TO EXISTING PAVEMENT, STRUCTURE, PIPE OR OTHER SITE FEATURE IS TO BE MADE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM THE PLANS.
2. REFERENCE TO MN/DOT SPECIFICATIONS SHALL MEAN DIVISIONS II AND III OF THE 2018 SPECIFICATIONS FOR CONSTRUCTION.
3. SITE ACCESS IS ONLY OFF SCOTT COUNTY ROAD 10. CONSTRUCTION PARKING IS ONLY ALLOWED WITHIN LANE CLOSURE OR ALONG FIELD ROAD. NO PARKING ALLOWED ON ROAD SHOULDER OUTSIDE LANE CLOSURE/SHIFT.
4. SEE RESTORATION PLAN FOR VEGETATION RESTORATION REQUIREMENTS.
5. TOPOGRAPHIC SURVEY BY EOR, INC.
6. A CONSTRUCTION STAGING PLAN SHALL BE PREPARED AND SUBMITTED BY THE CONTRACTOR FOR REVIEW BY THE PROJECT ENGINEER AND CITY. NO STORAGE OF EQUIPMENT OR MATERIALS IS ALLOWED WITHIN RIGHT OF WAY.
7. ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, JANUARY 2014. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE ENGINEER AND SCOTT COUNTY FOR APPROVAL.
8. ALL CONSTRUCTION WORK SHALL BE COMPLETED WITHIN CITY APPROVED WORKING HOURS.
9. PROPOSED WORK MUST BE IN COMPLIANCE WITH THE PLSLWD AND SCOTT COUNTY PERMITS. CONTRACTOR IS EXPECTED TO OBTAIN ANY ADDITIONAL REQUIRED PERMITS.
10. A PRE-CONSTRUCTION MEETING WILL BE REQUIRED WITH WATERSHED STAFF PRIOR TO ANY MOBILIZATION OF CONSTRUCTION EQUIPMENT OR MATERIAL.

GENERAL UTILITY NOTES

1. CONTRACTOR SHALL CONTACT 'GOPHER STATE ONE CALL' WITHIN TWO WORKING DAYS PRIOR TO EXCAVATION/CONSTRUCTION FOR UTILITY LOCATIONS. TWIN CITIES METRO AREA: 651-454-0002 OR TOLL-FREE: 1-800-252-1166.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND INVERTS, SHOWN OR NOT SHOWN. ANY DISCREPANCY BETWEEN PLANS AND FIELD CONDITIONS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
3. ALL UTILITY WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, COUNTY AND STATE SPECIFICATIONS.
4. UTILITY TRENCHES SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698.78 OR AASHTO T-99) FROM THE PIPE ZONE TO WITHIN THREE FEET OF THE GROUND SURFACE AND 100% STANDARD PROCTOR IN THE UPPER THREE FEET. BERM SHALL BE COMPACTED TO 98% STANDARD PROCTOR MAXIMUM DRY DENSITY. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING TESTING AND RELAYING RESULTS TO ENGINEER.
5. FIELD ADJUST ALL CASTINGS TO MATCH FINAL GRADES.
6. CONTRACTOR SHALL NOTIFY SCOTT COUNTY HIGHWAY DEPARTMENT 72 HOURS IN ADVANCE OF WORKING WITHIN THE EXISTING RIGHT OF WAY.

GRADING & EROSION CONTROL NOTES

1. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO START OF SITE GRADING. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ADDITIONAL HORIZONTAL AND VERTICAL CONTROL BEYOND THE INITIAL BENCHMARKS SET BY THE ENGINEER.
3. INSTALL PERIMETER EROSION CONTROL MEASURES BEFORE BEGINNING SITE GRADING ACTIVITIES. SOME EROSION CONTROL SUCH AS SEDIMENT CONTROL LOGS AND TEMPORARY SEDIMENT PONDS MAY BE INSTALLED AS GRADING OCCURS IN THE SPECIFIC AREA. MAINTAIN EROSION CONTROLS THROUGHOUT THE GRADING PROCESS AND REMOVE WHEN APPROVED BY THE CITY AND WATERSHED.
4. CONTRACTOR TO ADHERE TO ALL CITY, COUNTY AND WATERSHED PERMIT REQUIREMENTS, INCLUDING THE REQUIREMENT TO MINIMIZE THE AREA DISTURBED BY GRADING AT ANY GIVEN TIME AND TO COMPLETE TURF RESTORATION WITHIN THE TIME REQUIRED BY THE PERMIT AFTER COMPLETION OF GRADING OF AN AREA.
5. ALL EXPOSED SOIL AREAS WITHIN 100 FEET OF A WATER OF THE STATE OR ANY STORMWATER CONVEYANCE SYSTEM WHICH IS CONNECTED TO A WATER OF THE STATE MUST BE STABILIZED WITHIN 24 HOURS OR AS DIRECTED BY THE ENGINEER.
6. ALL CONSTRUCTION ENTRANCES SHALL BE SURFACED WITH CRUSHED ROCK (OR APPROVED EQUAL) ACROSS FULL WIDTH FROM ENTRANCE POINT TO 50 FEET INTO THE CONSTRUCTION ZONE. SEE DETAIL.
7. WHERE NECESSARY, INLET PROTECTION IS TO BE USED DURING CONSTRUCTION.
8. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH CITY, COUNTY AND WATERSHED DISTRICT PERMITS.
9. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES, INCLUDING THE REMOVAL OF ACCUMULATED SILT IN FRONT OF SILT FENCES, SEDIMENT CONTROL LOGS, ETC. DURING THE DURATION OF THE CONSTRUCTION.
10. MAINTAIN EXISTING EROSION CONTROL. RE-ESTABLISH ANY EXISTING EROSION CONTROL DISTURBED BY CONSTRUCTION.
11. CONTRACTOR SHALL PROVIDE ADDITIONAL TEMPORARY EROSION CONTROL MEASURES AS REQUIRED FOR CONSTRUCTION.
12. ANY EXCESS SEDIMENT IN PROPOSED BASINS SHALL BE REMOVED BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO EXISTING STREETS AND PAVED AREAS WITHIN 24 HOURS OF NOTICE. SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
14. IF BLOWING DUST BECOMES A NUISANCE, THE CONTRACTOR SHALL APPLY WATER FROM A TANK TRUCK TO ALL CONSTRUCTION AREAS. SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
15. SWEEP ADJACENT STREETS IN ACCORDANCE WITH COUNTY REQUIREMENTS.
16. INSPECT EROSION CONTROL DEVICES AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. IMMEDIATELY REPAIR FAILED OR FAILING EROSION CONTROL DEVICES.
17. SEDIMENT REMOVAL - SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT.
18. ANY SEDIMENT REMAINING IN PLACE AFTER THE EROSION CONTROL DEVICE IS NO LONGER REQUIRED SHALL BE GRADED TO CONFORM WITH THE EXISTING GRADE, PREPARED, AND SEEDED WITH THE APPROPRIATE SEED MIX AS DIRECTED BY THE WATERSHED. THIS SHALL BE INCIDENTAL TO THE CONTRACT.
19. SUITABLE GRADING MATERIAL SHALL CONSIST OF ALL SOIL ENCOUNTERED ON THE SITE WITH EXCEPTION OF TOPSOIL, DEBRIS, ORGANIC MATERIAL AND OTHER UNSTABLE MATERIAL. STOCKPILE TOPSOIL AND GRANULAR FILL AT LOCATIONS DIRECTED BY CONTRACTOR. SUITABLE MATERIAL FOR THE BERM SHALL BE AS DETAILED IN THESE PLANS, THE GEOTECHNICAL REPORT AND THE SPECIAL PROVISIONS.
20. EXISTING GRANULAR MATERIALS SHALL BE SEGREGATED AND STOCKPILED FOR REUSE ON-SITE.
21. CONTRACTOR SHALL STRIP, STOCKPILE AND RE-SPREAD EXISTING ON-SITE TOPSOIL TO PROVIDE A UNIFORM THICKNESS OF AT LEAST 6 INCHES ON ALL DISTURBED AREAS TO BE SEEDED.
22. SUBGRADE EXCAVATION SHALL BE BACKFILLED IMMEDIATELY AFTER EXCAVATION TO HELP OFFSET ANY STABILITY PROBLEMS DUE TO WATER SEEPAGE OR STEEP SLOPES. WHEN PLACING NEW SURFACE MATERIAL ADJACENT TO EXISTING PAVEMENT, THE EXCAVATION SHALL BE BACKFILLED PROMPTLY TO AVOID UNDERMINING OF THE EXISTING PAVEMENT.
23. GRADES SHOWN ARE FINISHED GRADES, CONTRACTOR SHALL ROUGH GRADE TO SUBGRADE ELEVATION, LEAVE SITE READY FOR SUBBASE.

GRADING & EROSION CONTROL NOTES (CONT)

1. FINAL GRADING TOLERANCES ARE ±0.1 FEET OF PLAN GRADES, UNLESS NOTED OTHERWISE.
2. ALL EXCESS MATERIAL, BITUMINOUS SURFACING, CONCRETE ITEMS, ANY ABANDONED UTILITY ITEMS, AND OTHER UNSTABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OFF THE CONSTRUCTION SITE. DISPOSAL SHALL BE DONE IN A MANNER THAT MEETS ALL APPLICABLE REGULATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR GRADING AND SLOPING THE FINISHED GROUND SURFACE TO PROVIDE SMOOTH & UNIFORM SLOPES, WHICH PROVIDE POSITIVE DRAINAGE AND PREVENT PONDING IN LOWER AREAS. CONTACT ENGINEER IF FIELD ADJUSTMENTS TO GRADING PLANS ARE REQUIRED.
4. SLOPES AT 3:1 OR STEEPER, AND/OR WHERE INDICATED ON THE PLANS SHALL BE SEEDED AND HAVE AN EROSION CONTROL BLANKET INSTALLED OR MAY BE HYDROSEEDED WITH TACKIFIER MULCH. CONTRACTOR SHALL FOLLOW RESTORATION PLAN.

EROSION CONTROL ALLOWANCE NOTES

1. AN EROSION CONTROL ALLOWANCE HAS BEEN PROVIDED FOR ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES FOR THIS PROJECT. THIS ALLOWANCE IS FOR ITEMS ABOVE AND BEYOND THE MEASURES LISTED IN THE BID TAB OR AS SHOWN ON THE CONTRACT DOCUMENTS. PLEASE READ THE FOLLOWING FOR INFORMATION REGARDING THE ALLOWANCE:
2. THE CONTRACTOR SHALL SUBMIT IN WRITING ADDITIONAL MEASURES, INCLUDING, BUT NOT LIMITED TO TYPE, LOCATION, AND REASON FOR SAID MEASURES, AND SHALL NOT BE IMPLEMENTED WITHOUT PRIOR WRITTEN AUTHORIZATION BY ENGINEER. SUCH MEASURES MUST BE ABOVE AND BEYOND THOSE SPECIFIED IN THE CONTRACT DOCUMENTS. ANY MEASURES INSTALLED PRIOR TO ENGINEER APPROVAL WILL NOT RECEIVE PAYMENT.
3. MEASUREMENT AND PAYMENT OF ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE AS SPECIFIED IN CONTRACT DOCUMENTS, AND UNIT PRICES SHALL BE THE SAME FOR ITEMS INCLUDED IN THE BID TAB. ADDITIONAL ITEMS NOT INCLUDED IN THE BID TAB SHALL BE NEGOTIATED FOR UNIT PRICE PRIOR TO WORK COMMENCING. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BRING TO THE ENGINEER'S ATTENTION ADDITIONAL ITEMS FOR INCLUSION UNDER THE ALLOWANCE.
4. ADDITIONAL MEASURES NOT ALLOWED FOR APPROVAL UNDER THIS ALLOWANCE INCLUDE TEMPORARY EROSION & SEDIMENT CONTROL BASINS, INCLUDING, BUT NOT LIMITED TO EXCAVATION, EROSION & SEDIMENT CONTROL, OUTLET STRUCTURES, DEWATERING, AND REMOVAL OF SAID BASINS AND STRUCTURES. SUCH TEMPORARY BASINS SHALL BE CONSIDERED INCIDENTAL TO COMMON EXCAVATION, WITH NO ADDITIONAL PAYMENT MADE FOR CONSTRUCTION, MAINTENANCE, OR REMOVAL OF SAID BASINS.
5. PAYMENT OF THE ESC ALLOWANCE SHALL BE MADE BASED ON A PERCENTAGE OF THE ALLOWANCE TOTAL AMOUNT DIVIDED BY THE TOTAL COST FOR A SPECIFIC WORK ITEM.

STORM SEWER NOTES

1. STORM SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH MNDOT 2501-2511 SPECIFICATIONS.
2. STORM SEWER SHALL BE AS SPECIFIED.
3. CONCRETE MANHOLES SHALL BE PRECAST REINFORCED CONCRETE IN ACCORDANCE WITH ASTM C478. CASTING SHALL BE NEENAH R-1733. MANHOLES SHALL HAVE A MINIMUM OF 2 AND A MAXIMUM OF 4 ADJUSTMENT RINGS.
4. PIPE LENGTHS ON THE PLAN ARE FROM CENTER TO CENTER OF STRUCTURES.
5. APPLY FLEX-SEAL TO ALL JOINTS, SEAMS, RINGS, MORTAR, ETC. PER THE MANUFACTURER'S RECOMMENDATIONS.

GENERAL LANDSCAPE NOTES

1. CONTRACTOR SHALL INSPECT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS RELATING TO THE NATURE AND SCOPE OF WORK.
2. CONTRACTOR SHALL VERIFY PLAN LAYOUT AND BRING TO THE ATTENTION OF THE ENGINEER DISCREPANCIES WHICH MAY COMPROMISE THE DESIGN OR INTENT OF THE LAYOUT.
3. CONTRACTOR SHALL ASSURE COMPLIANCE WITH APPLICABLE CODES AND REGULATIONS GOVERNING THE WORK AND MATERIALS SUPPLIED.
4. CONTRACTOR SHALL PROTECT EXISTING ROADS, TRAILS, TREES, AND SITE ELEMENTS DURING CONSTRUCTION OPERATIONS. DAMAGE TO SAME SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
5. CONTRACTOR SHALL REVIEW THE SITE FOR DEFICIENCIES IN SITE CONDITIONS WHICH MIGHT NEGATIVELY AFFECT PLANT ESTABLISHMENT, SURVIVAL OR WARRANTY. UNDESIRABLE SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BEGINNING OF WORK.
6. CONTRACTOR IS RESPONSIBLE FOR ONGOING MAINTENANCE OF NEWLY INSTALLED MATERIALS UNTIL TIME OF SUBSTANTIAL COMPLETION. REPAIR OF ACTS OF VANDALISM OR DAMAGE WHICH MAY OCCUR PRIOR TO SUBSTANTIAL COMPLETION SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR.
7. EXISTING TREES OR SIGNIFICANT SHRUB MASSINGS FOUND ON SITE SHALL BE PROTECTED AND SAVED UNLESS NOTED TO BE REMOVED OR ARE LOCATED IN AN AREA TO BE GRADED. QUESTIONS REGARDING EXISTING PLANT MATERIAL SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO REMOVAL.

SITE DEMOLITION & REMOVAL NOTES

1. ALL VEGETATION REMOVAL INCLUDING CATTAILS, SOD, WINDFALL/DEADFALL, TREES, AND/OR BRUSH REMOVAL SHALL BE CONSIDERED INCIDENTAL TO CLEARING AND GRUBBING.

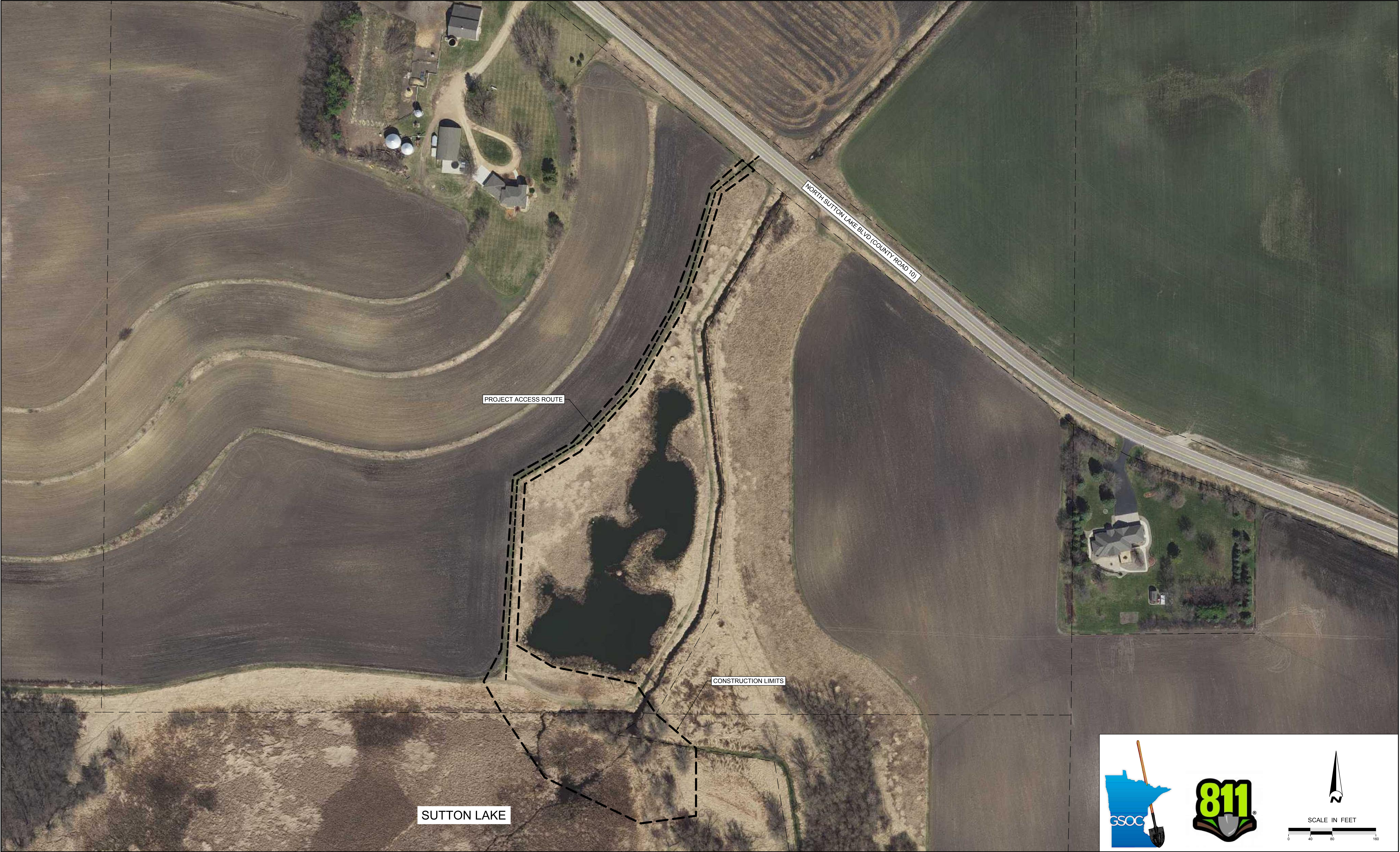
SEEDING NOTES

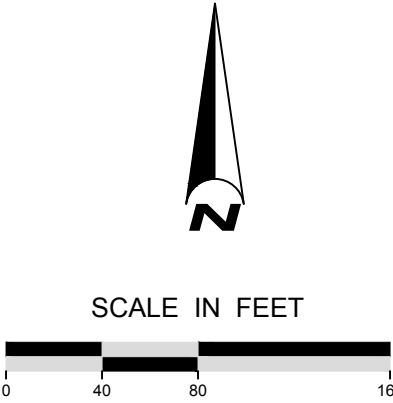


1. SEEDING SHALL FOLLOW MNDOT SEEDING MANUAL 2014 EDITION.
2. SEED SHALL BE LOCAL ORIGIN AND WILD ECOTYPE. SEED ORIGIN SHALL BE CERTIFIED BY THE MN CROP IMPROVEMENT ASSOCIATION. LOCAL ORIGIN SHALL MEAN WITHIN 175 MILES OF PROJECT SITE. PROVIDE MCIA DOCUMENTATION TO ENGINEER PRIOR TO SEEDING.
3. SOW SEED MIXES ON DISTURBED AREAS AFTER ALL GRADING AND CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
4. ACCEPTABLE SEEDING DATES ARE APRIL 15 - JULY 20 IN THE SPRING, OR SEPTEMBER 20 - OCTOBER 20 IN THE FALL. DORMANT SEEDING IS ALLOWED WITH PERMISSION AND COORDINATION WITH THE ENGINEER.
6. HYDROSEED 50% OF SEED MIX WITH TRACER PRIOR TO APPLICATION OF BONDED FIBER MATRIX. APPLY THE OTHER 50% OF SEED WITHIN THE BONDED FIBER MATRIX.

SEED ESTABLISHMENT NOTES

1. ESTABLISHMENT PERIOD COMMENCES UPON ACCEPTANCE OF SEEDING (ADEQUATE COVER CROP GERMINATION AND COVERAGE >80% OF DISTURBED AREAS) AND RUNS FOR 2 YEARS FROM THIS DATE.
2. MONITOR THE SITE MONTHLY DURING THIS PERIOD TO DETECT AREAS OF WEED COLONIZATION. CUT AND REMOVE ALL NOXIOUS WEEDS (AS DEFINED BY THE MN DEPARTMENT OF AGRICULTURE) AS SOON AS DETECTED. DO NOT ALLOW WEED SEEDS TO SET.
3. DURING THE FIRST GROWING SEASON CUT THE ENTIRE SEEDED AREA WITH A STRING TRIMMER OR SCYTHE TO A HEIGHT OF 6-8" EVERY 30 DAYS UNTIL SEPTEMBER 30TH.
4. IF AREAS OF BARE GROUND PERSIST AFTER FIRST GROWING SEASON RESEED PER PLAN.
5. DURING THE SECOND GROWING SEASON CUT THE ENTIRE SEEDED AREA WITH A STRING TRIMMER OR SCYTHE TO A HEIGHT OF 6-8" ONCE IN MID-JUNE AND ONCE IN MID-AUGUST.

Item No.	Item	Estimated Quantity	Units
1	MOBILIZATION	1	LS
2	CLEARING & GRUBBING	1	LS
3	DEWATERING (BYPASS: INSTALL & REMOVE)	1	LS
4	EXCAVATION & HAUL OFFSITE (EXCAVATED SPOILS)	2217	CY
5	EXCAVATION & REUSE ONSITE SOILS FOR EMBANKMENT	315	CY
6	IMPORT & EMBANKMENT	913	CY
7	GALVANIZED STEEL SHEETPILE WEIR (56' WIDTH)	821	SF
8	24" STEEL APRON	3	EA
9	TRASH GUARD FOR 24" PIPE APRON	1	EA
10	AGRI-DRAIN ANTI-SEEPAGE COLLAR - ASC03 (3' X 3')	2	EA
11	AGRI-DRAIN ANTI-SEEPAGE COLLAR - ASC05 (5' X 5')	1	EA
12	CLEMSON BEAVER POND LEVELER (MATERIALS & INSTALL)	2	EA
13	10" PVC PIPE	94	LF
14	24" CSP STORM SEWER	116	LF
15	48" AGRI-DRAIN CONTROL STRUCTURE W/ HAALA GRATE	2	EA
16	RIPRAP, CLASS 3 & GEOTEXTILE FABRIC, TYPE IV	153	CY
17	TRAFFIC CONTROL	1	LS
18	STABILIZED CONSTRUCTION EXIT	1	EA
19	EROSION CONTROL SUPERVISOR	1	LS
20	SILT FENCE	1465	LF
21	FLOTATION SILT CURTAIN	40	LF
22	SEDIMENT CONTROL LOG TYPE WOOD FIBER	570	LF
23	TEMPORARY EROSION CONTROL ALLOWANCE	1	ALLOW
24	EROSION CONTROL BLANKET - CAT. 3N-WOOD	1000	SY
25	SEEDING	2.3	AC
26	SEED, MNDOT MIXTURE 34-181 (EMERGENT WETLAND) @ 5 LB / ACRE	7	LB
27	SEED, MNDOT MIXTURE 34-271 (WET MEADOW SOUTH & WEST) @ 12 LB / ACRE	7	LB
28	HYDRAULIC BONDED FIBER MATRIX	5950	LB





6			
5			
4			
3	10/03/2019	KDC	DRAFT BID PLANS - NOT FOR CONSTRUCTION
2	04/15/2019	KDC	70% DRAFT PLANS - NOT FOR CONSTRUCTION
1	03/21/2019	KDC	60% DRAFT PLANS - NOT FOR CONSTRUCTION
NO	DATE	BY	REVISION

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KYLE D. CRAWFORD, P.E.
DATE: 10/03/2019

LICENSE # 54906

SUBMISSION DATE: 10/03/2019	
DESIGN BY KDC	DRAWN BY KDC
EOR PROJECT NO. 00758-0114	

EOR Emmons & Olivier
Resources, Inc.
7030 6th Street North
Oakdale, MN 55128
Tele: 651.770.8448
www.eorinc.com

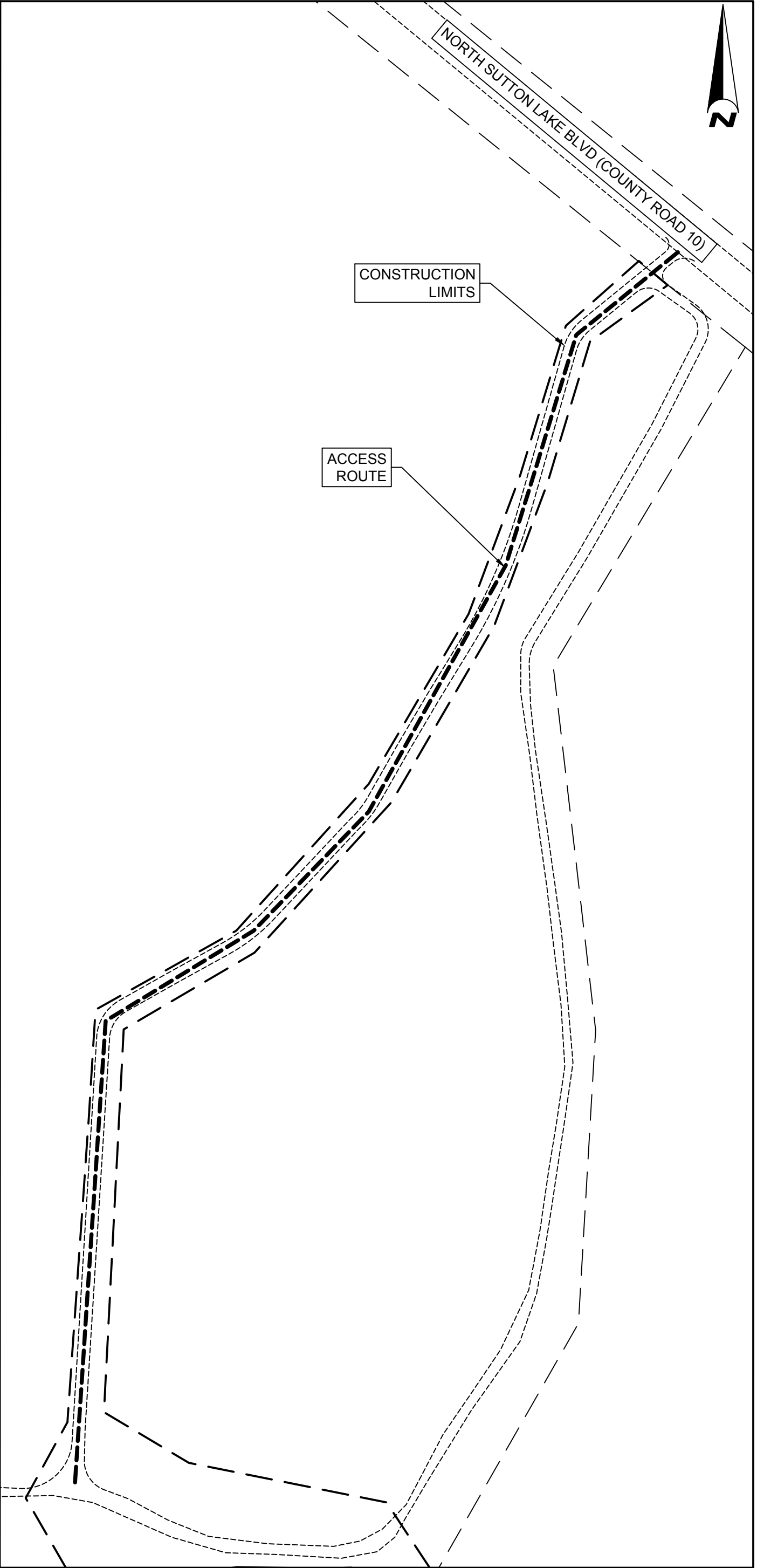
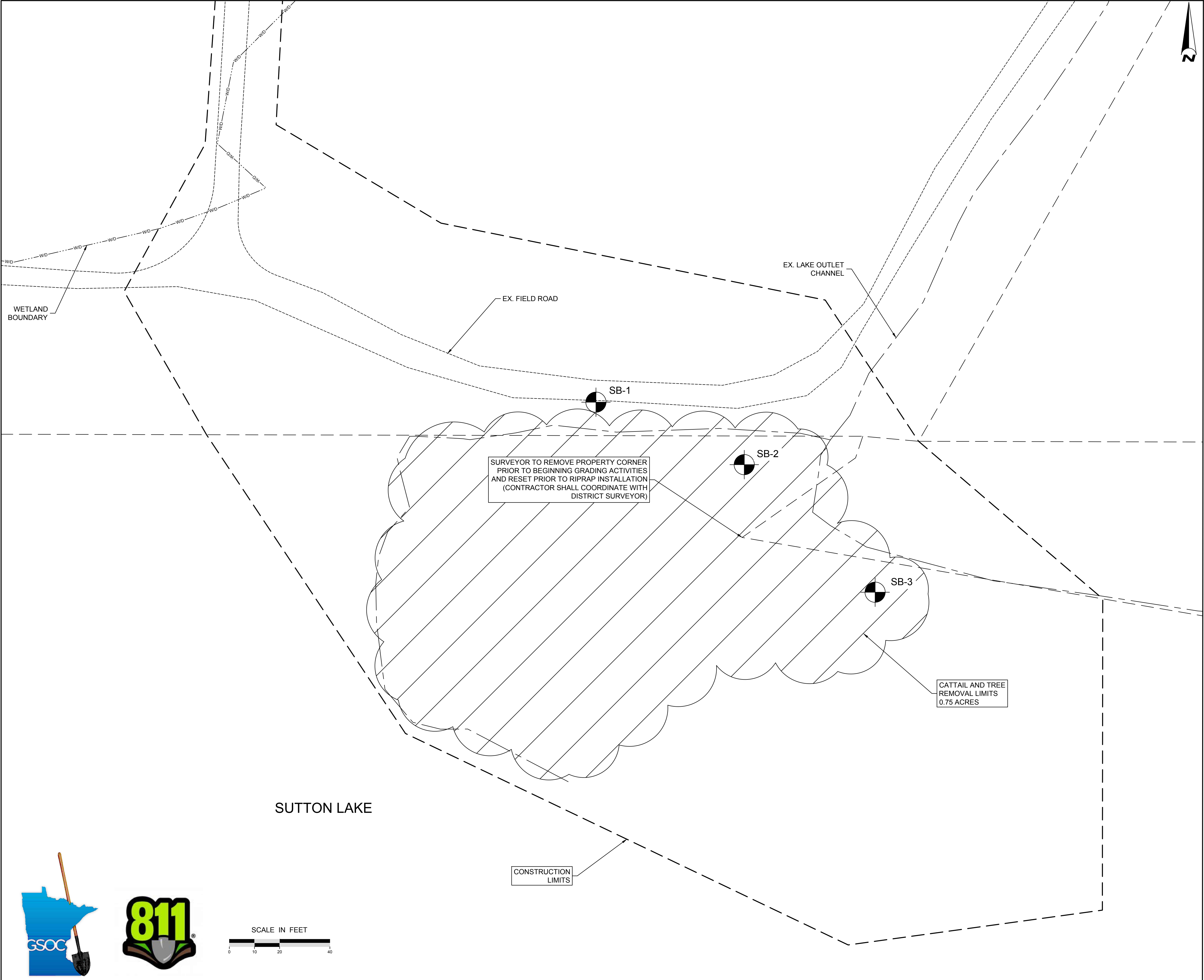
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SPRING LAKE
WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

STATE PROJECT NO. --- CITY PROJECT NO. ---

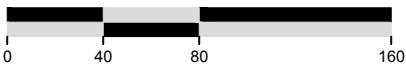
PROJECT OVERVIEW

SHEET 03 OF 10 SHEETS



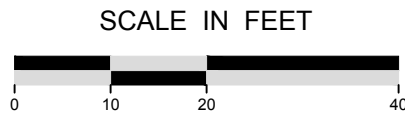
ACCESS ROAD INSET

SCALE IN FEET



NOTES:

1. CATTAIL AND TREE REMOVAL SHALL BE PAID FOR AS CLEARING AND GRUBBING.



SUTTON LAKE

CONSTRUCTION
LIMITS

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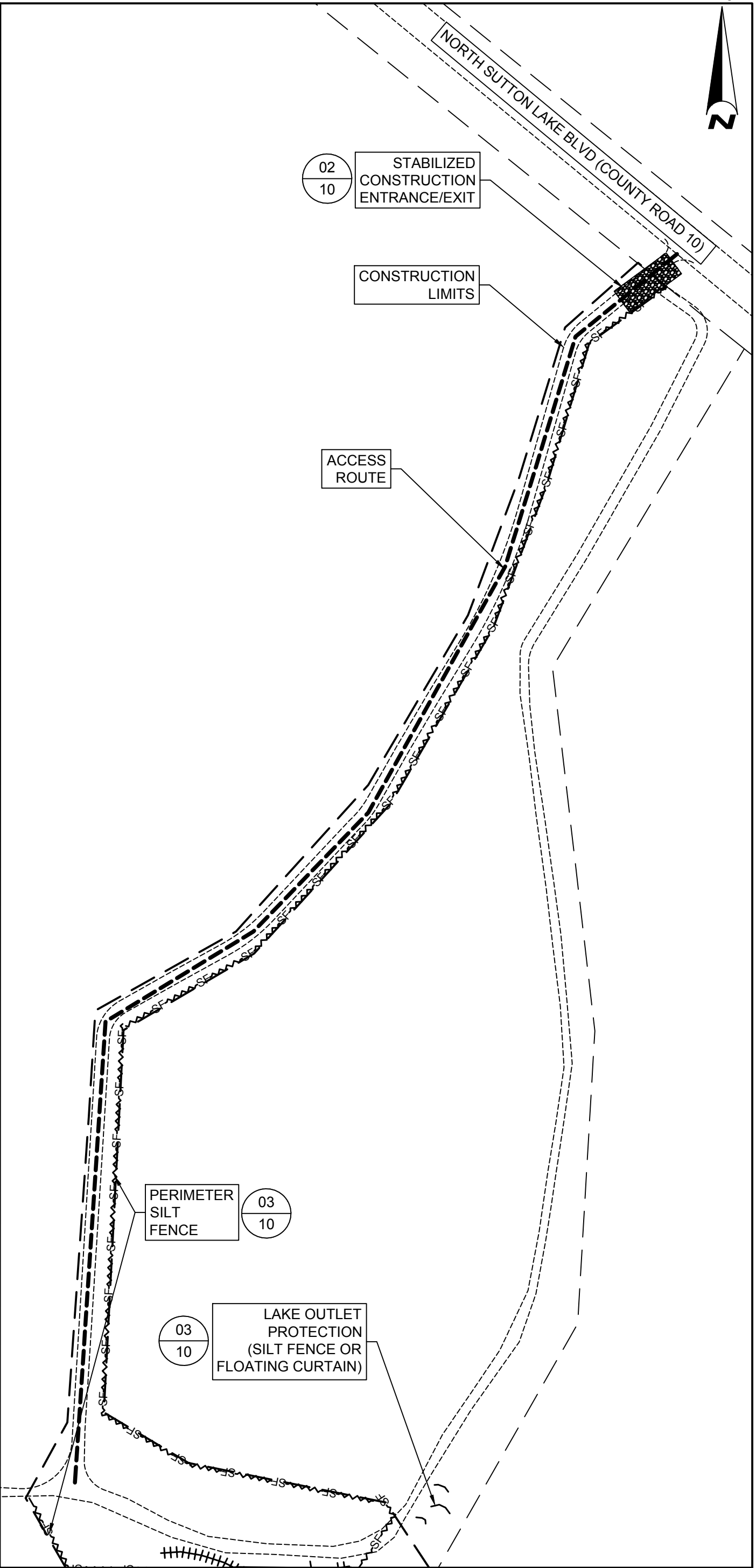
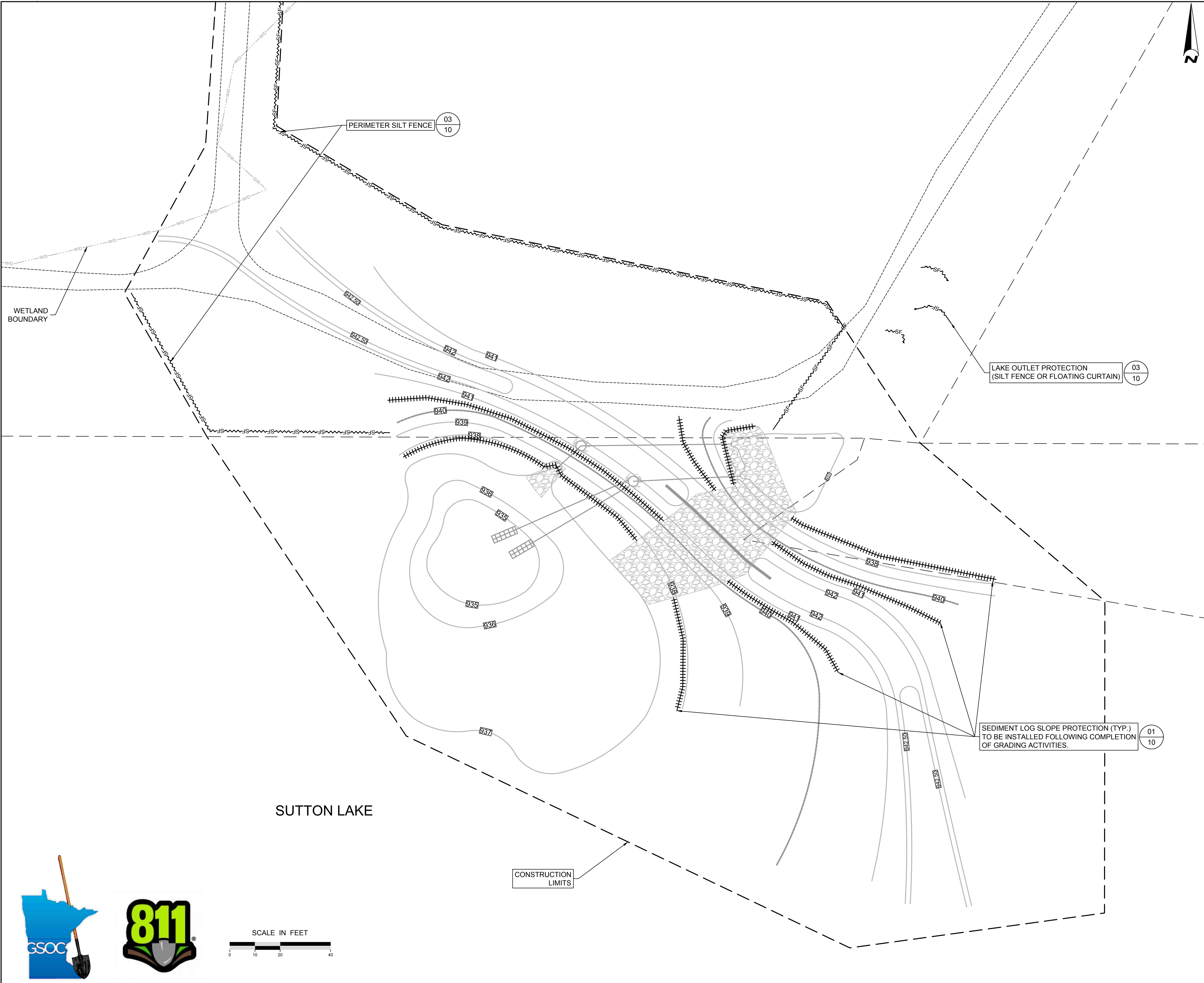
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WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

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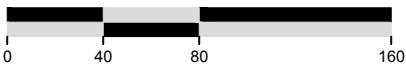
EXISTING CONDITIONS & REMOVALS PLAN

SHEET 04 OF 10 SHEETS



ACCESS ROAD INSET

SCALE IN FEET



NOTES:

1. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE IN PLACE PRIOR TO BEGINNING GRADING ACTIVITIES.



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WATERSHED DISTRICT

**SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA**

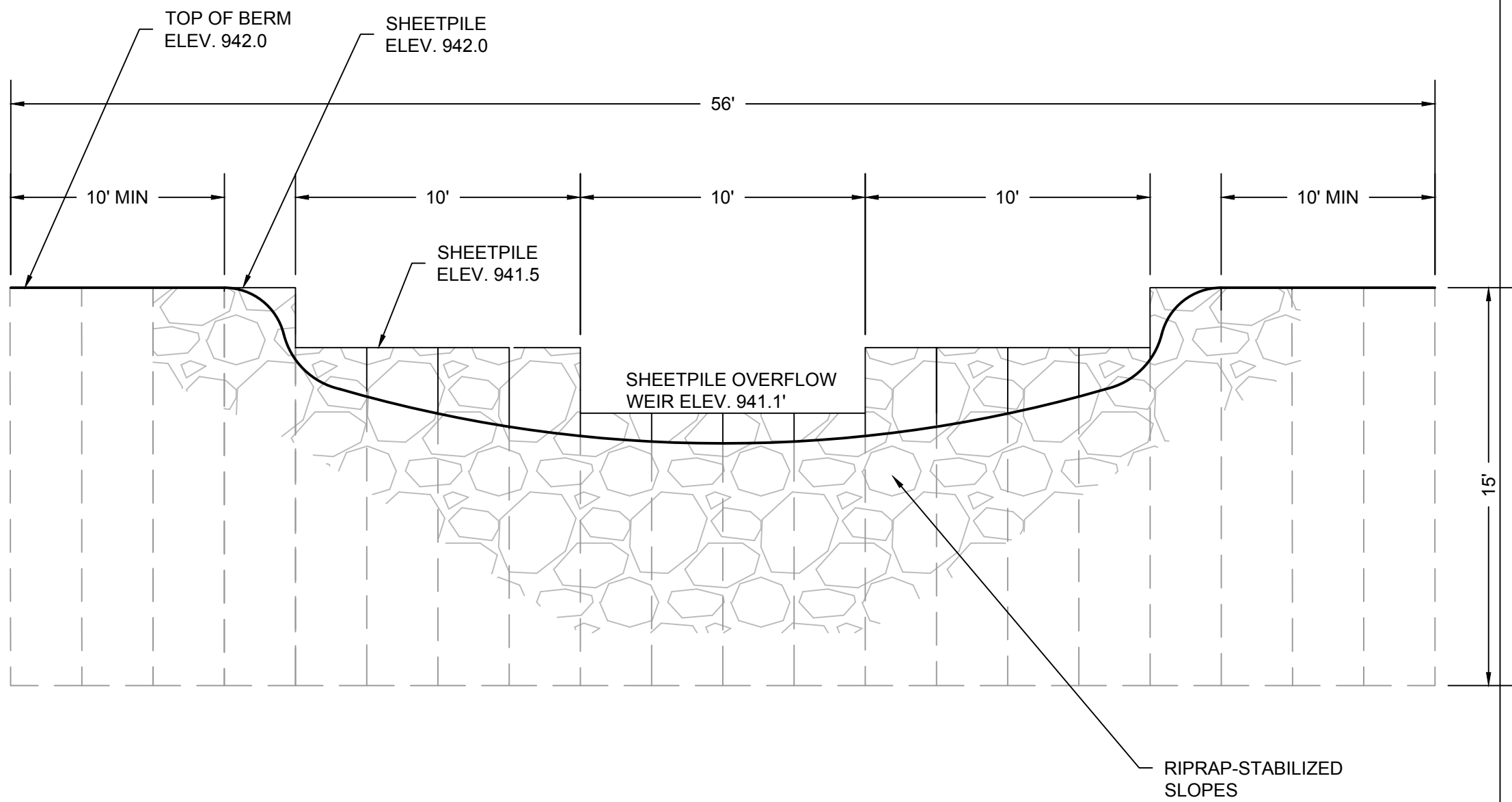
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EROSION AND SEDIMENT CONTROL PLAN

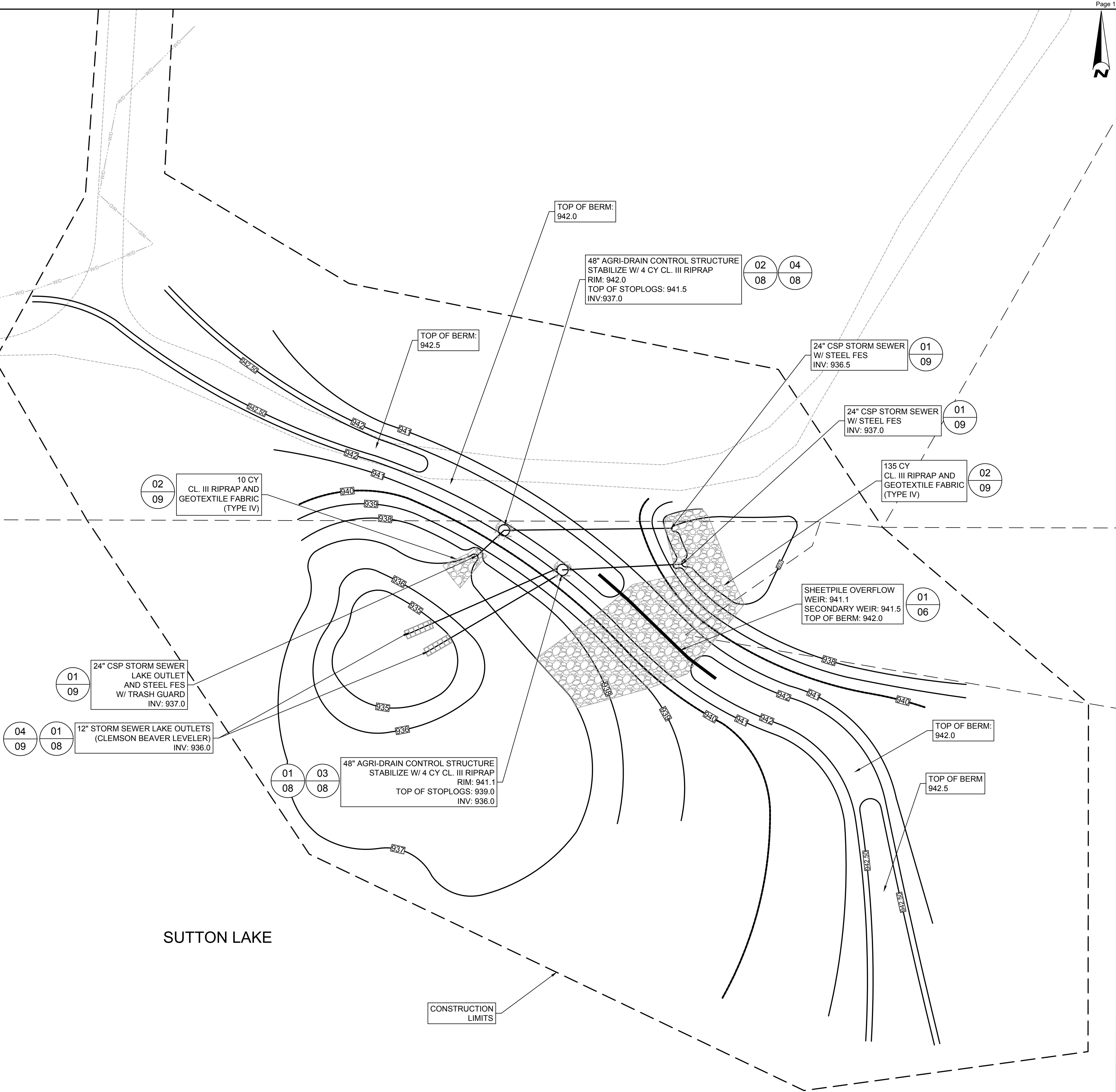
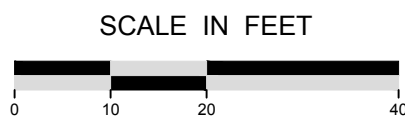
SHEET 05 OF 10 SHEETS

NOTE:

CONTRACTOR SHALL REFER TO NORTHERN TECHNOLOGIES INC.
GEOTECHNICAL REPORT DATED 09/01/18 FOR GUIDANCE ON SUBCUT
DEPTH AND AREA, AND PROJECT CONSTRUCTION REQUIREMENTS.



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06 SHEETPILE WEIR
NOT TO SCALE



Plot Date: 10/03/2019
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User: J. Blum
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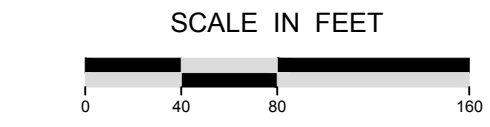
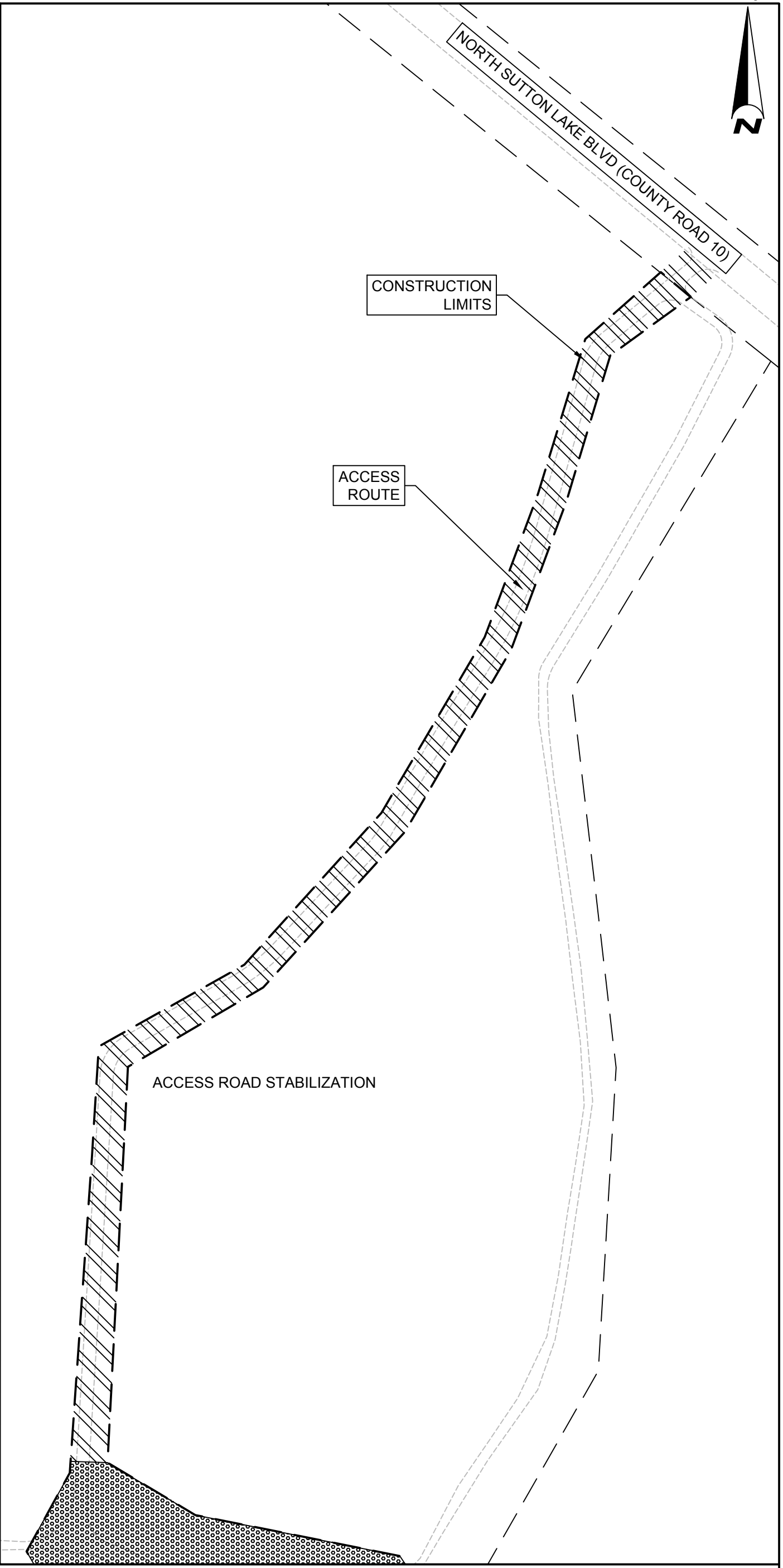
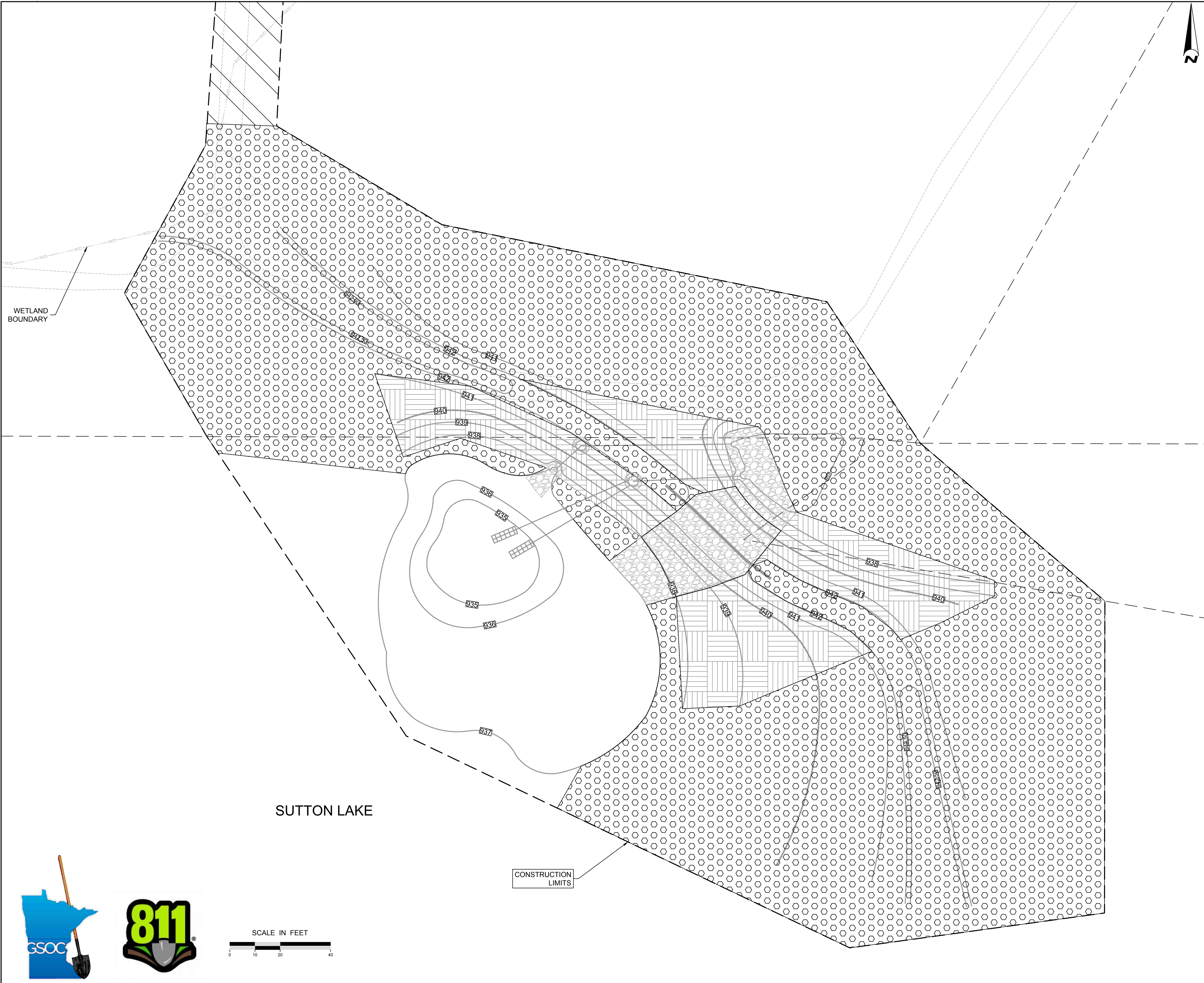
**PRIOR LAKE
SPRING LAKE**
WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

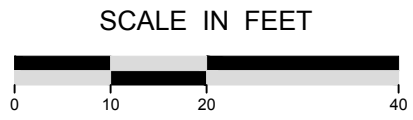
STATE PROJECT NO. --- CITY PROJECT NO. ---

GRADING AND DRAINAGE PLAN

SHEET 06 OF 10 SHEETS



- CL. III RIPRAP w/ GEOTEXTILE FABRIC TYPE IV
- MNDOT MIX 34-181 w/ EROSION CONTROL BLANKET (CAT - 3N)
- MNDOT MIX 34-181 w/ BONDED FIBER MATRIX
- MNDOT MIX 34-271 w/ BONDED FIBER MATRIX



6			
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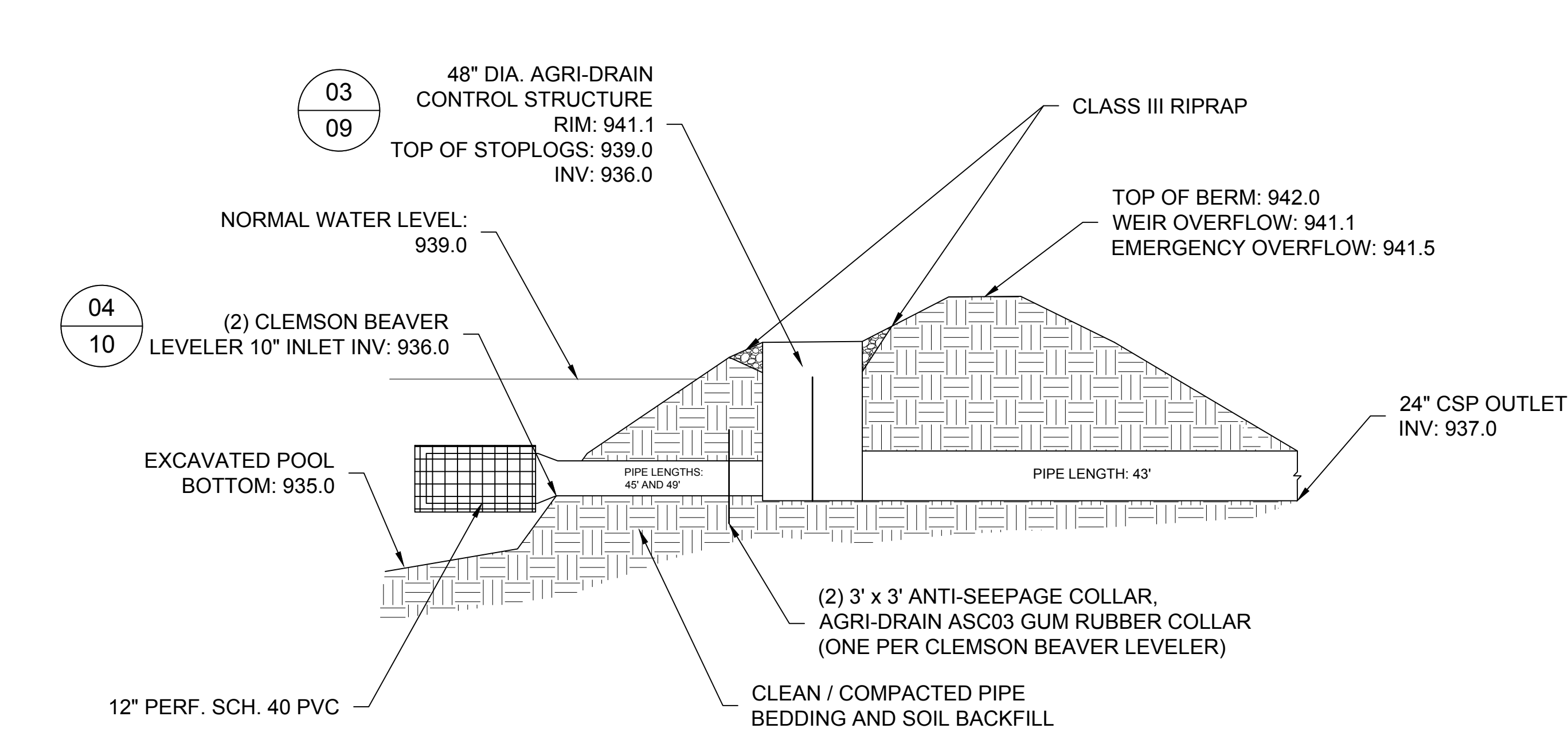
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WATERSHED DISTRICT**

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RESTORATION PLAN

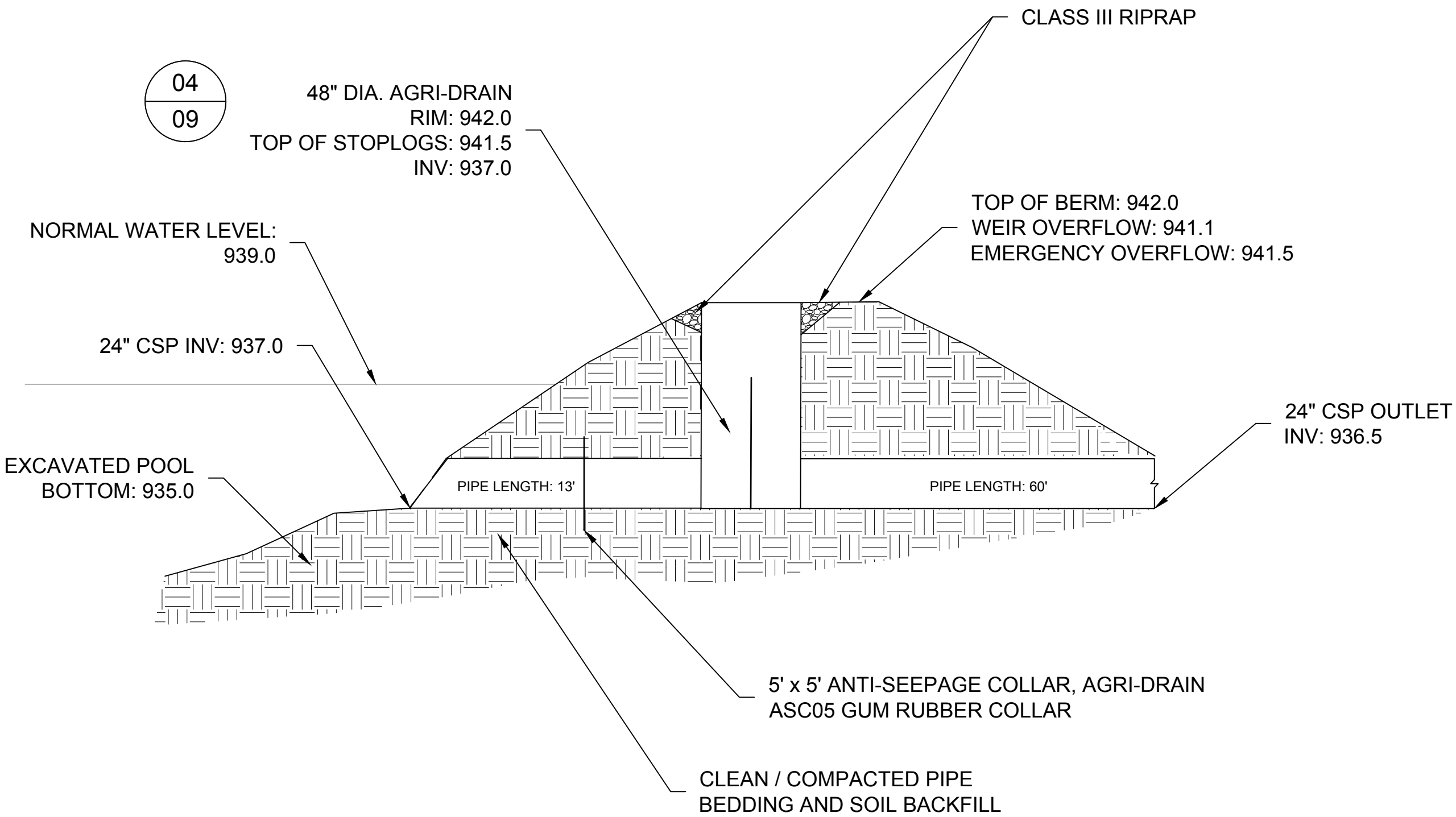
SHEET 07 OF 10 SHEETS



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PRIMARY OUTLET

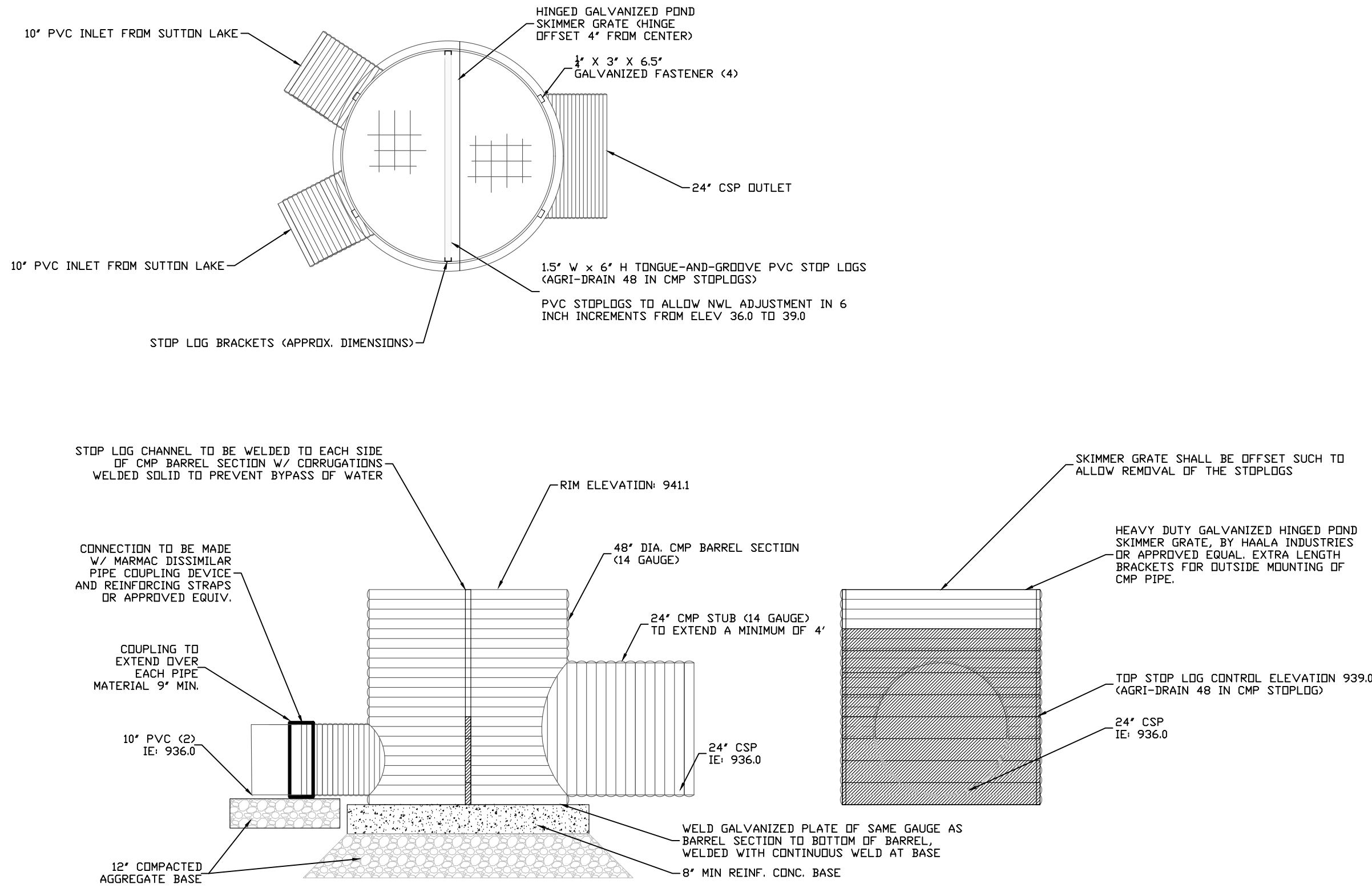
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DRAWDOWN OUTLET

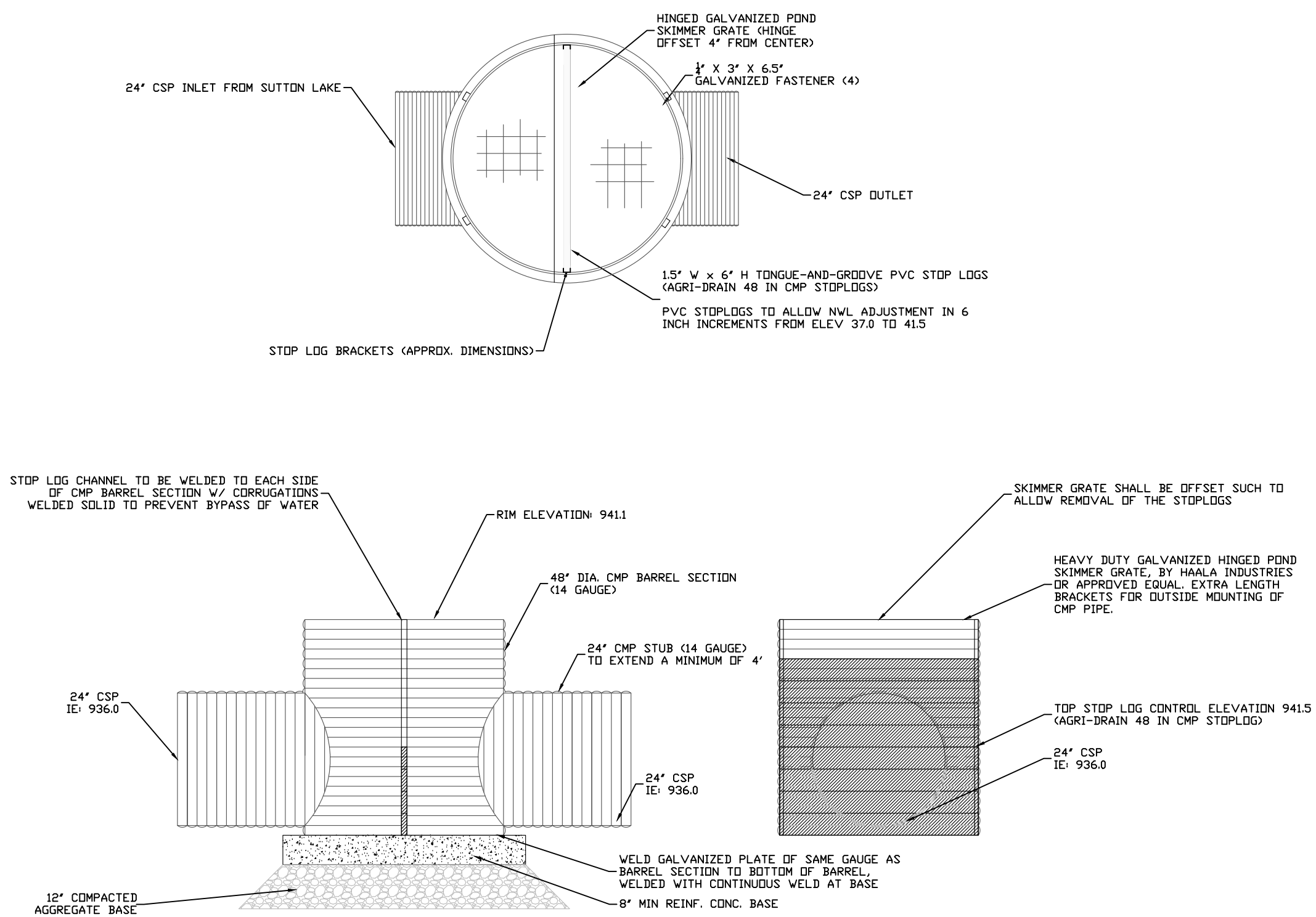
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03
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AGRI-DRAIN OUTLET STRUCTURE 01 (NOT TO SCALE)

(NOT TO SCALE)



04
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AGRI-DRAIN OUTLET STRUCTURE (NOT TO SCALE)

(NOT TO SCALE)

Plot Date: 10/03/2019
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EOR
water ecology community

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7030 6th Street North
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Tele: 651.770.8448
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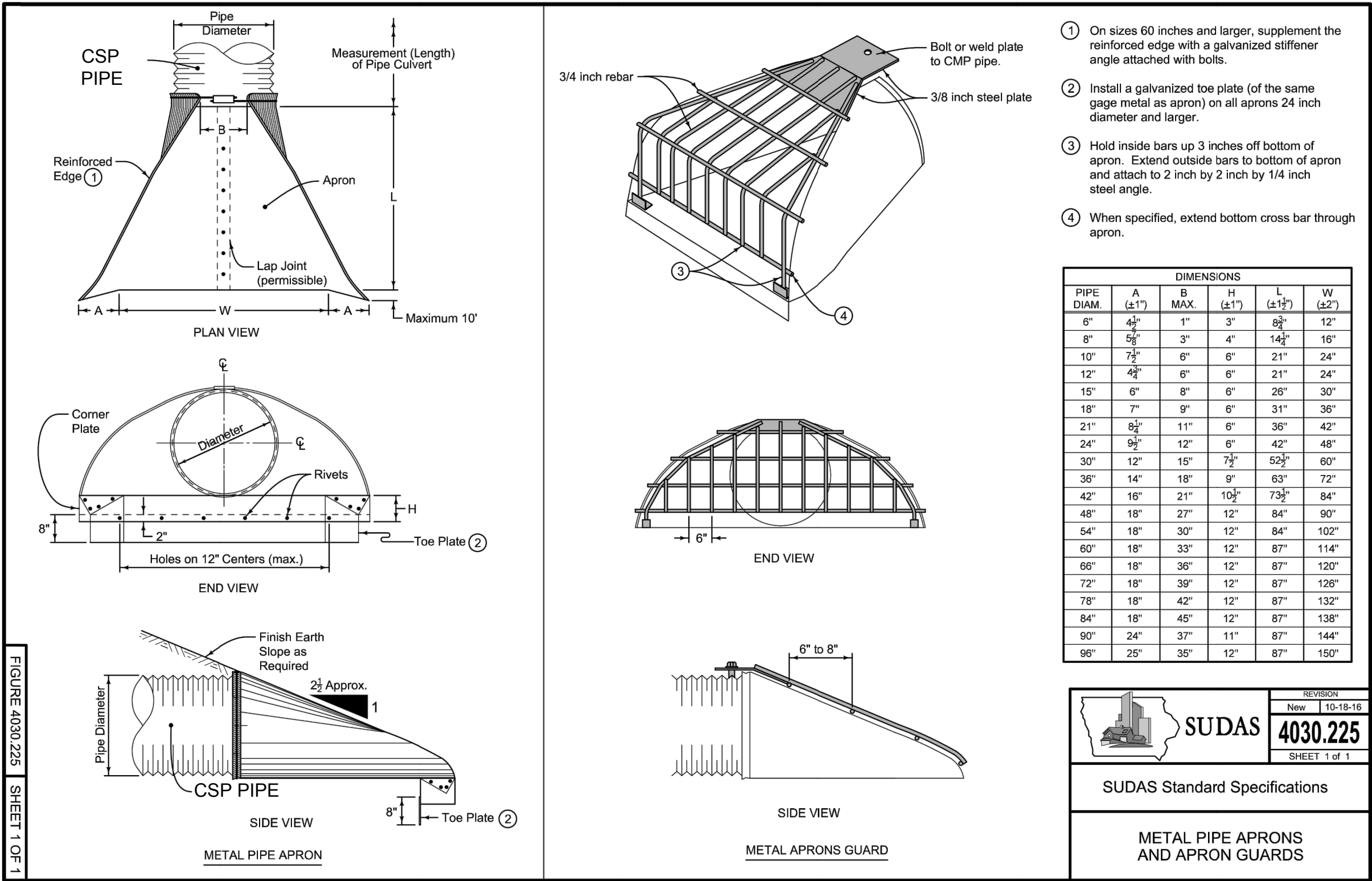
PRIOR LAKE SPRING LAKE
WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

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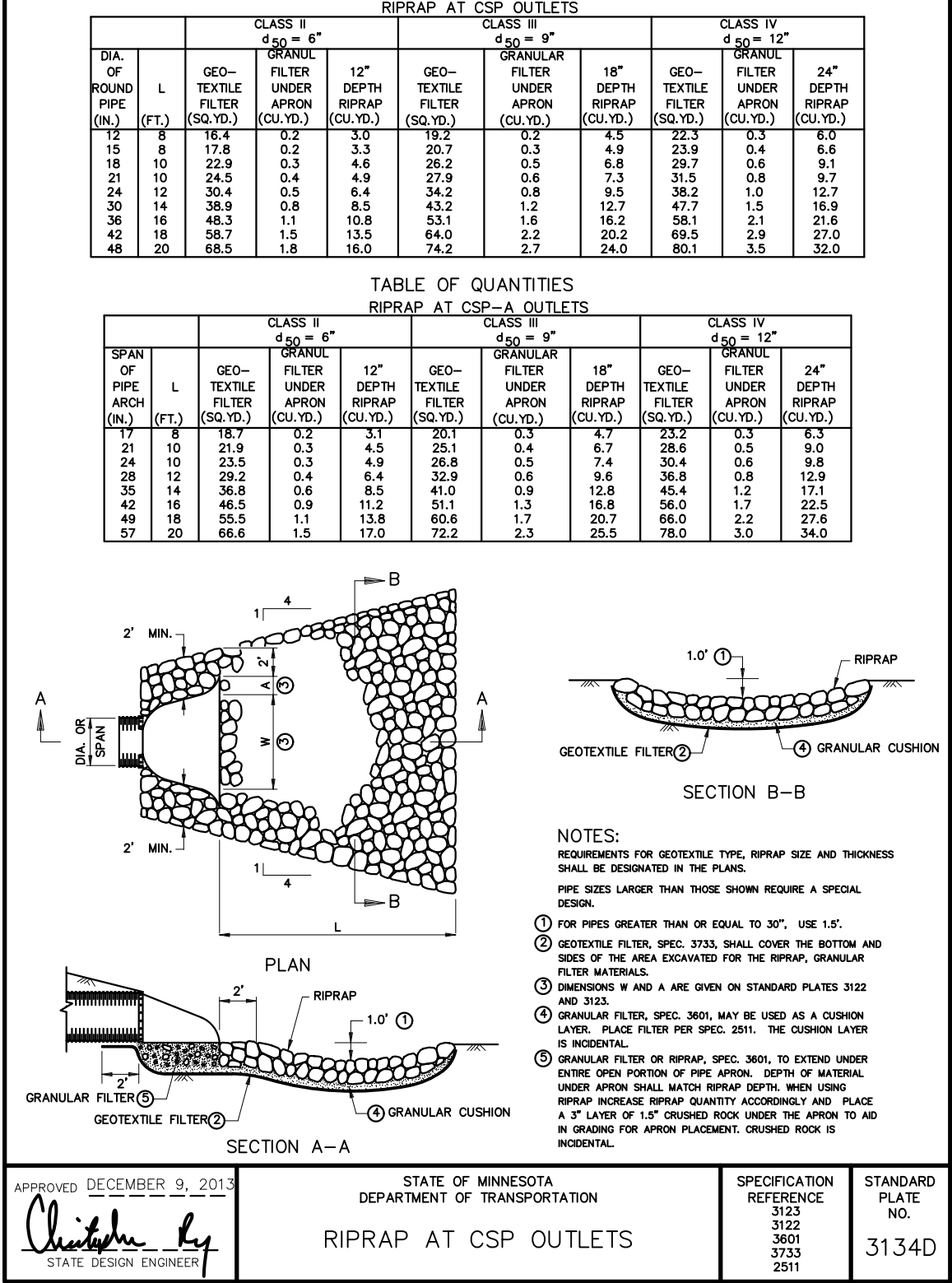
DETAIL SHEET I

SHEET 08 OF 10 SHEETS



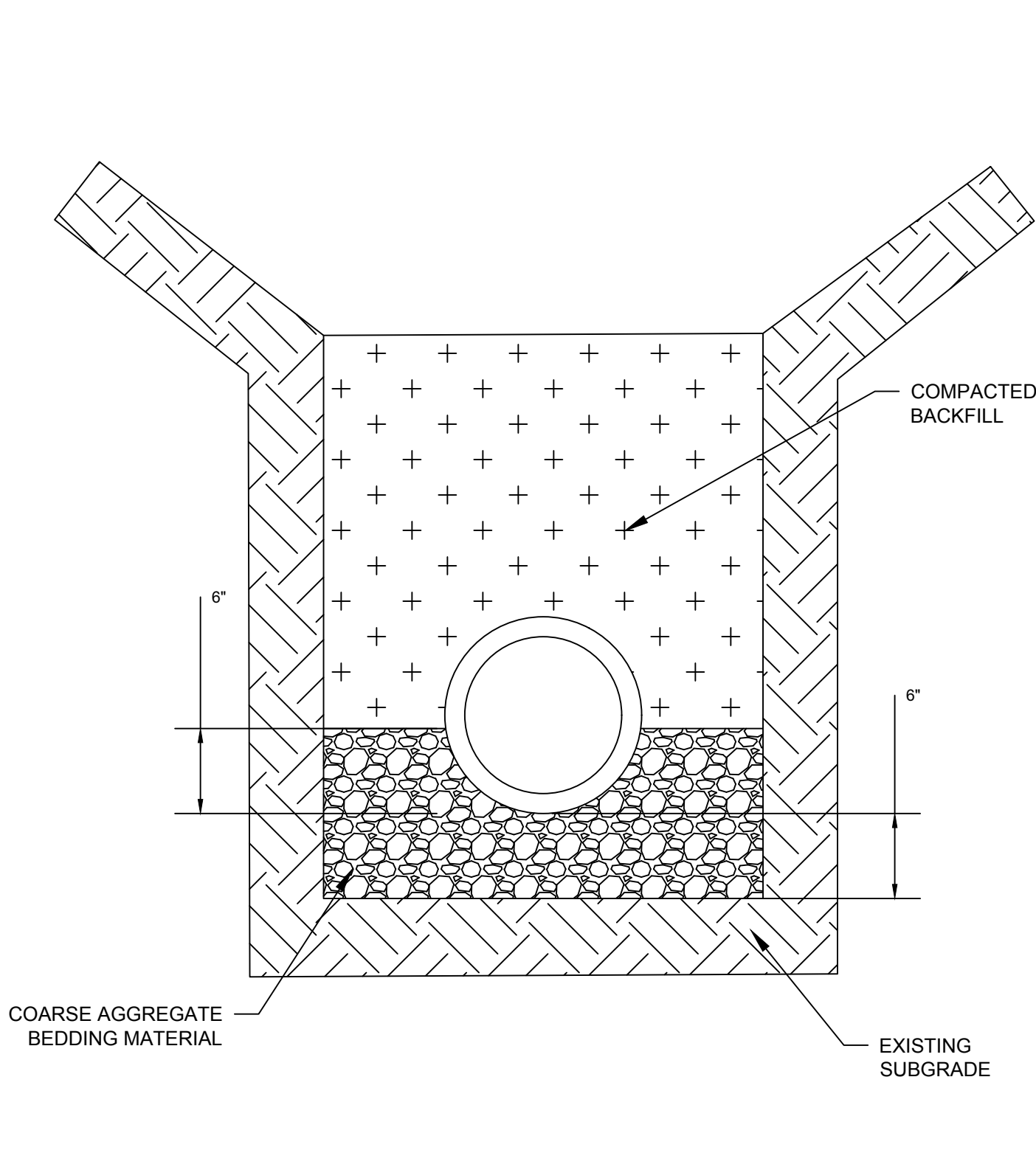
01 STEEL PIPE APRON

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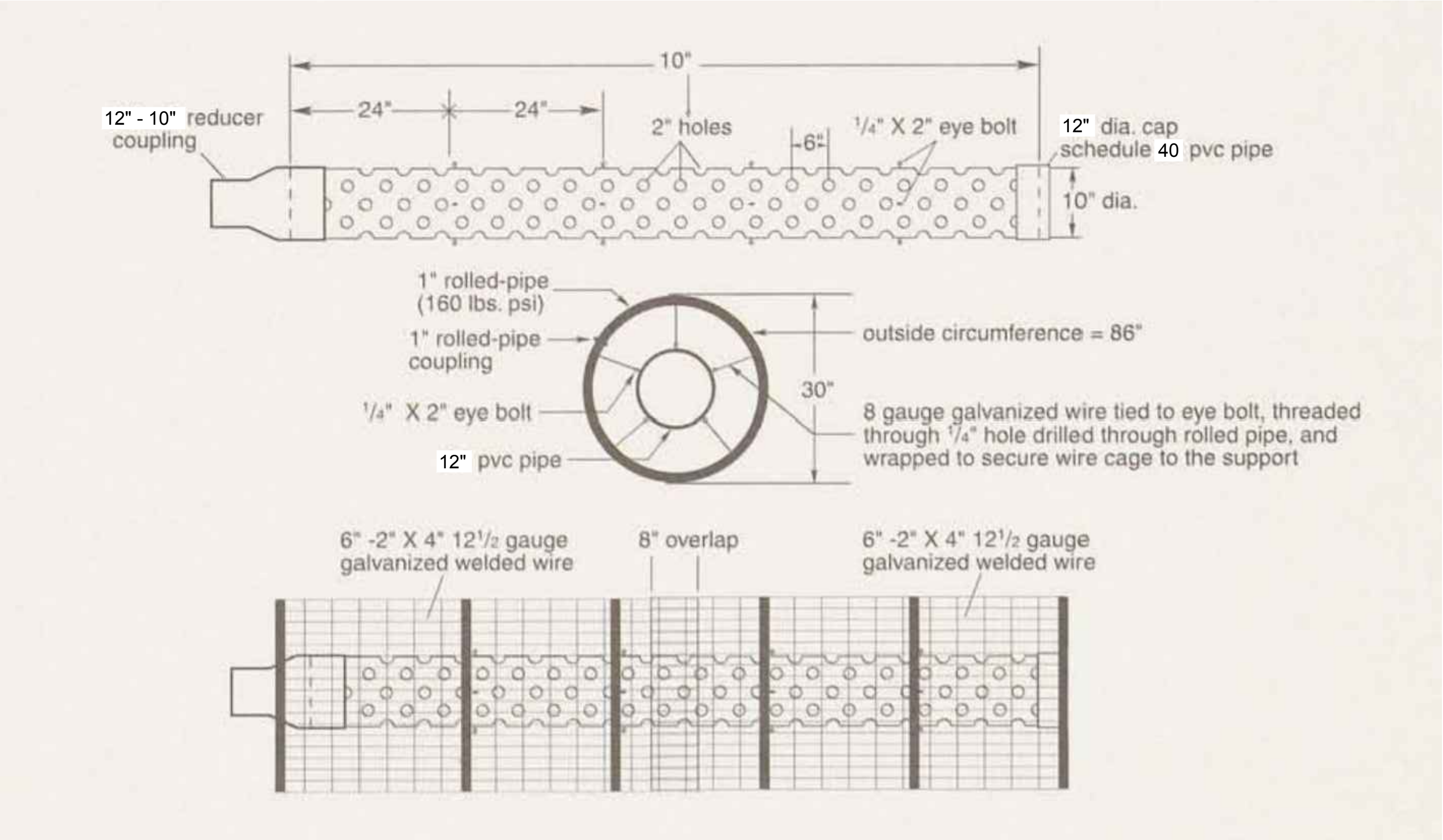
02 RIPRAP APRON

(NOT TO SCALE)



03 PIPE BEDDING

(NOT TO SCALE)



04 CLEMSON BEAVER LEVELER

(NOT TO SCALE)

MATERIALS LIST FOR INTAKE DEVICE	
QUANTITY	MATERIAL
1	10' SECTION, 12" DIA. PVC PIPE (SCHEDULE 40)
1	PVC CAP FOR 12" DIA. PVC PIPE (SCHEDULE 40)
1	12" - 10" PVC PIPE REDUCER (SCHEDULE 40)
6	86" SECTIONS, 1" DIA. PLASTIC ROLL PIPE (WATER PIPE)
6	1" NYLON COUPLINGS FOR ROLL PIPE
30	1/4" X 2" GALVANIZED EYEBOLTS
30	1/4" GALVANIZED NUTS
30	1/4" GALVANIZED FLAT WASHERS
30	1/4" GALVANIZED LOCK WASHERS
30	16" SECTIONS, 8 GA. GALVANIZED WIRE (MEDIUM HARDNESS)
2	96" SECTIONS, 2" X 4" 12 GA. GALVANIZED WELDED WIRE
	"C" FASTENERS OR HOG RINGS

NOTE:

CONTRACTOR SHALL FOLLOW GUIDELINES FOR CONSTRUCTING CLEMSON BEAVER LEVELERS AS LAID OUT IN MNDNR DOCUMENT (PROVIDED IN SPECIFICATIONS)

NO	DATE	BY	REVISION
6			
5			
4			
3	10/03/2019	KDC	DRAFT BID PLANS - NOT FOR CONSTRUCTION
2	04/15/2019	KDC	70% DRAFT PLANS - NOT FOR CONSTRUCTION
1	03/21/2019	KDC	60% DRAFT PLANS - NOT FOR CONSTRUCTION

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.

KYLE D. CRAWFORD, P.E.
DATE: 10/03/2019 LICENSE # 54906

SUBMISSION DATE:
10/03/2019

DESIGN BY
KDC DRAWN BY
KDC

EOR PROJECT NO.
00758-0114

EOR Emmons & Olivier
Resources, Inc.
7030 6th Street North
Oakdale, MN 55128
Tele: 651.770.8448
www.eorinc.com

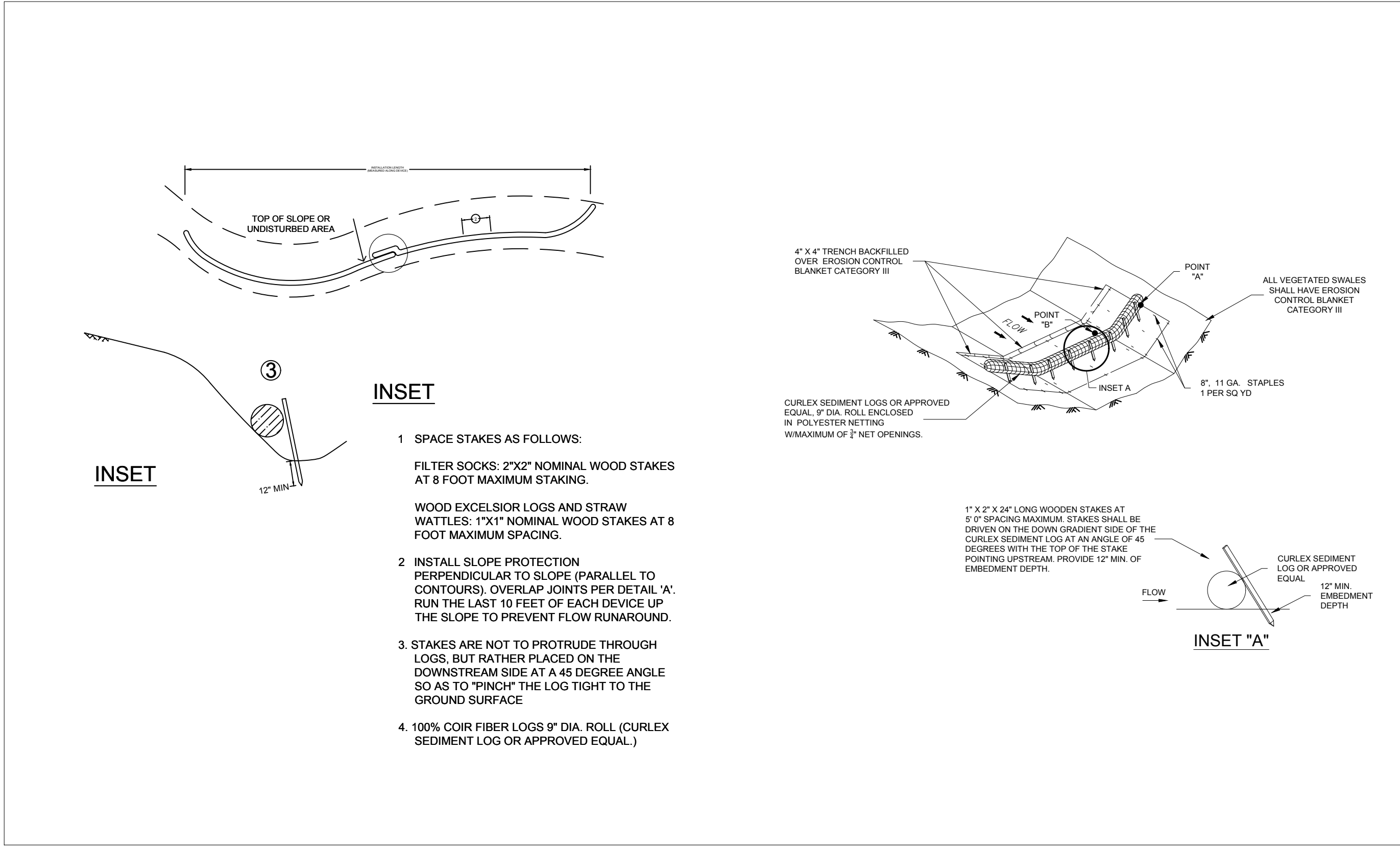
**PRIOR LAKE
SPRING LAKE**
WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

STATE PROJECT NO. --- CITY PROJECT NO. ---

DETAIL SHEET II

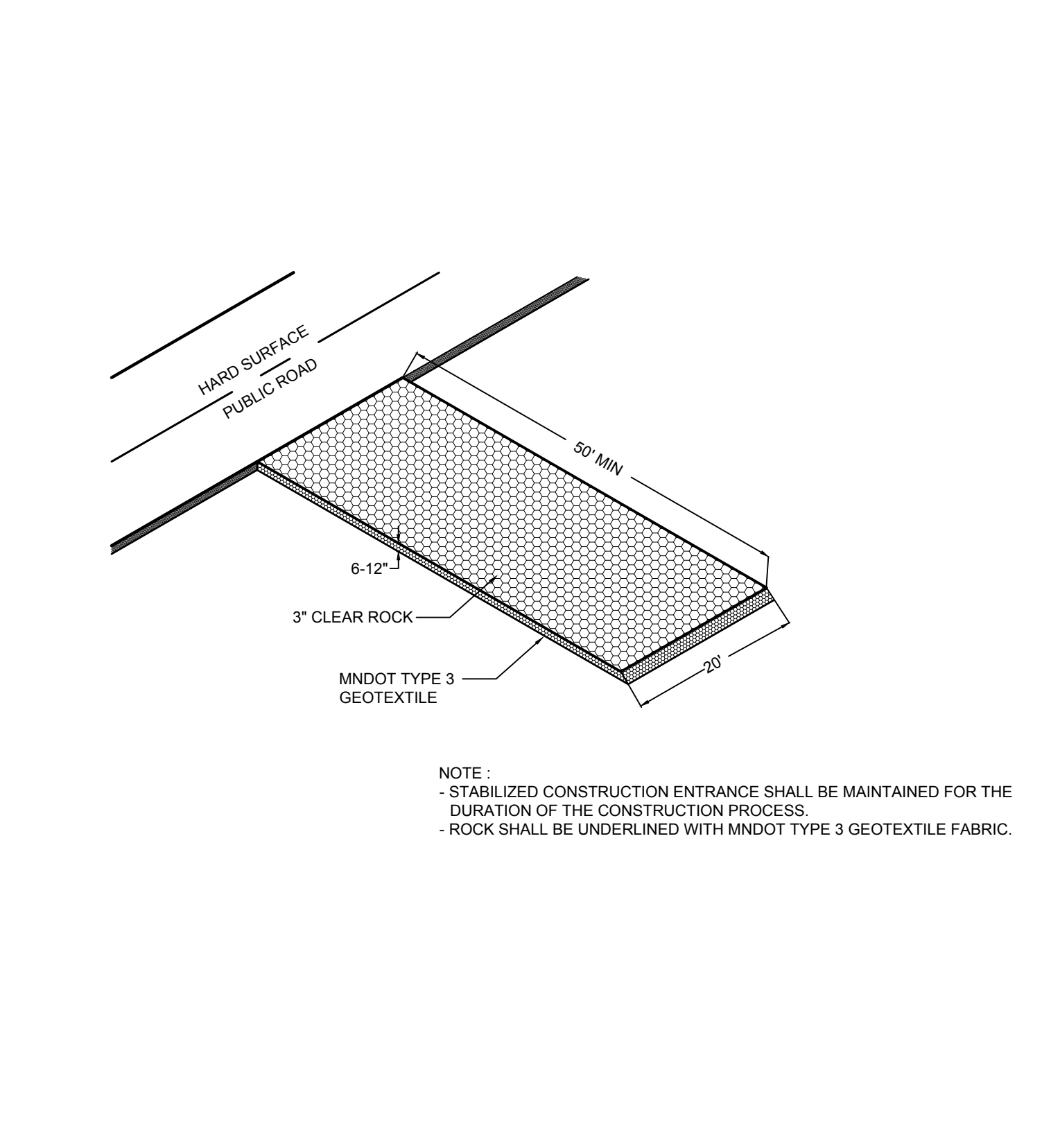
SHEET 09 OF 10 SHEETS



01
10

SEDIMENT LOG

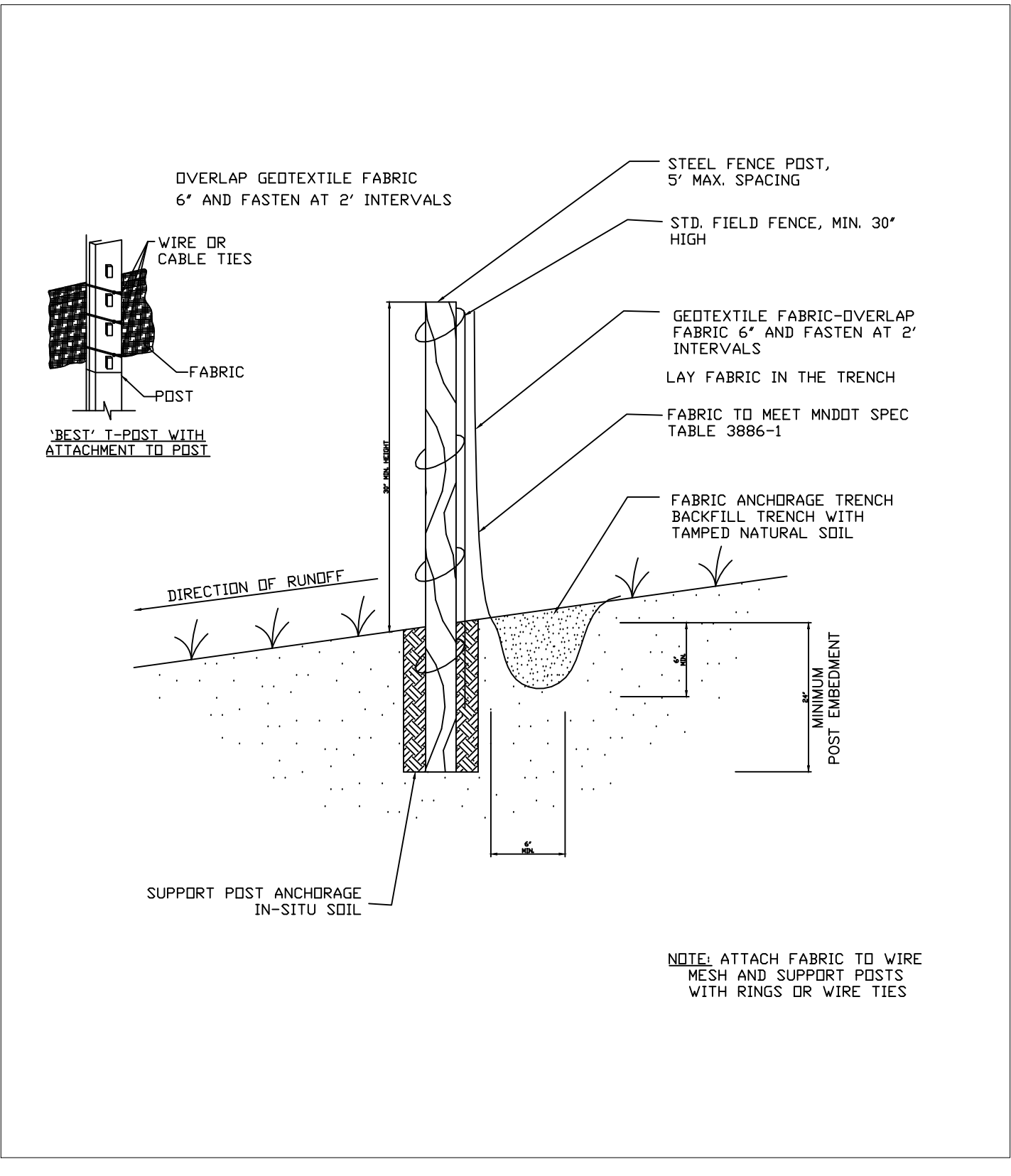
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02
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STABILIZED CONSTRUCTION ENTRANCE/EXIT

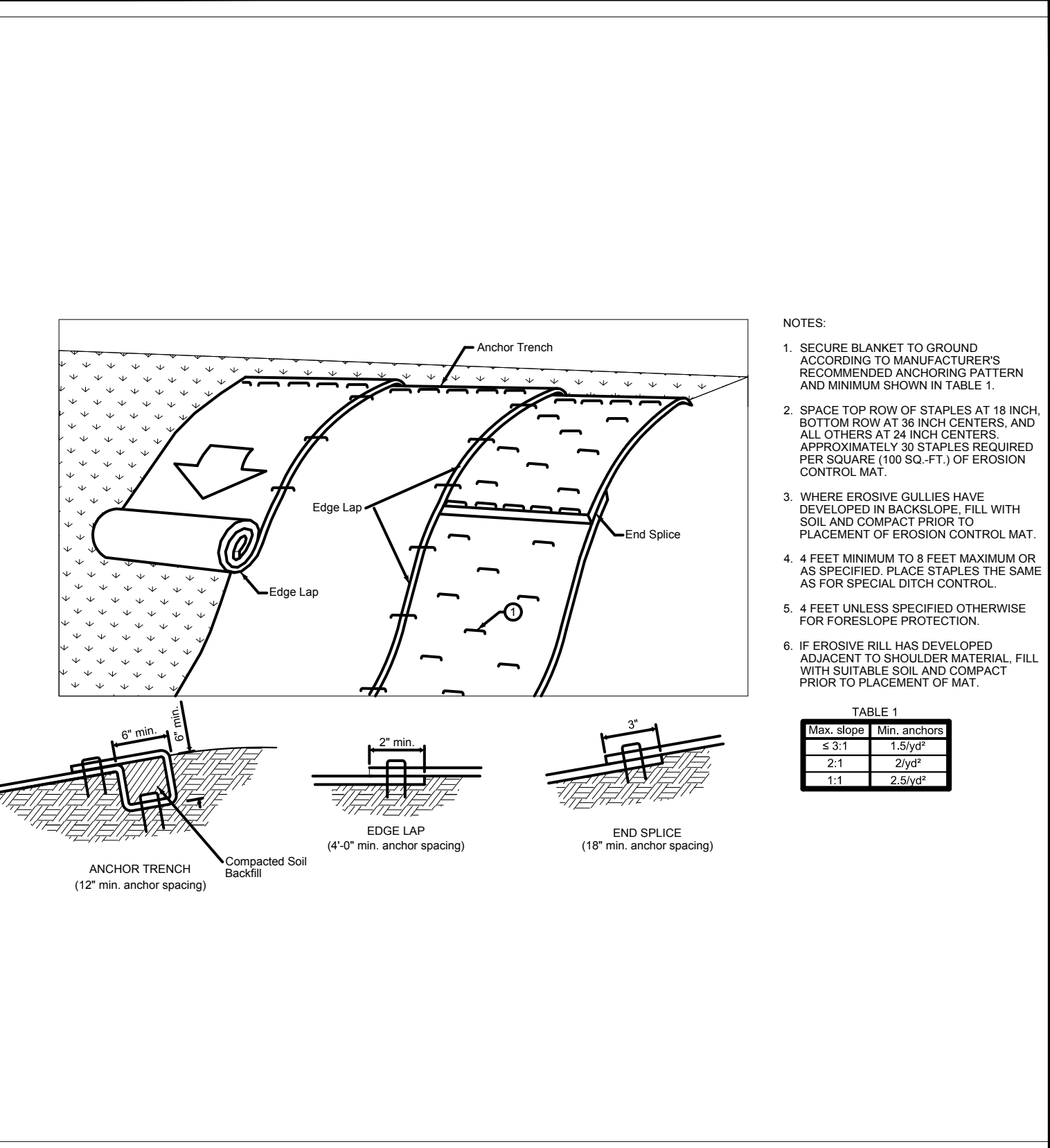
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03
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SILT FENCE

(NOT TO SCALE)



04
10

EROSION CONTROL BLANKET

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Plot Date: 10/03/2019
Drawing Name: W000759_PLS.WD0114_Sutton_Lake_Outlet_Design09_GN16_ProjectName.dwg759_114_CD_PLAN.dwg
Xref: 2-Base.dwg

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.

KYLE D. CRAWFORD, P.E.
DATE: 10/03/2019 LICENSE # 54906

SUBMISSION DATE:
10/03/2019

DESIGN BY
KDC DRAWN BY
KDC

EOR PROJECT NO.
00758-0114

EOR
water ecology community

Emmons & Olivier Resources, Inc.
7030 6th Street North
Oakdale, MN 55128
Tele: 651.770.8448
www.eorinc.com

PRIOR LAKE SPRING LAKE
WATERSHED DISTRICT

SUTTON LAKE OUTLET RETROFIT
JORDAN, SCOTT COUNTY, MINNESOTA

STATE PROJECT NO. --- CITY PROJECT NO. ---

DETAIL SHEET III

SHEET 10 OF 10 SHEETS

ENGINEER'S OPINION OF PROBABLE PROJECT COST

Sutton Lake Outlet Retrofit

PREPARED BY EMMONS & OLIVIER RESOURCES, INC.

JOB NO. 00758-0114

REVISED: Thursday, October 03, 2019

Item No.	MNDOT Spec.	Item	Estimated Quantity	Units	Unit Price	Total Price
1	2021.501	MOBILIZATION	1	LS	\$ 29,000.00	\$ 29,000.00
2	2101.501	CLEARING & GRUBBING	1	LS	\$ 10,000.00	\$ 10,000.00
3	2105.601	DEWATERING (BYPASS: INSTALL & REMOVE)	1	LS	\$ 6,000.00	\$ 6,000.00
4	2106.507	EXCAVATION & HAUL OFFSITE (EXCAVATED SPOILS)	2217	CY	\$ 20.00	\$ 44,340.00
5	2106.507	EXCAVATION & REUSE ONSITE SOILS FOR EMBANKMENT	315	CY	\$ 10.00	\$ 3,150.00
6	2106.507	IMPORT & EMBANKMENT	913	CY	\$ 30.00	\$ 27,390.00
7	2452.618	GALVANIZED STEEL SHEETPILE WEIR (56' WIDTH)	821	SF	\$ 45.00	\$ 36,945.00
8	2501.502	24" STEEL APRON	3	EA	\$ 1,200.00	\$ 3,600.00
9	2501.602	TRASH GUARD FOR 24" PIPE APRON	1	EA	\$ 750.00	\$ 750.00
10	2501.602	AGRI-DRAIN ANTI-SEEPAGE COLLAR - ASC03 (3' X 3')	2	EA	\$ 750.00	\$ 1,500.00
11	2501.602	AGRI-DRAIN ANTI-SEEPAGE COLLAR - ASC05 (5' X 5')	1	EA	\$ 1,000.00	\$ 1,000.00
12	2501.602	CLEMSON BEAVER POND LEVELER (MATERIALS & INSTALL)	2	EA	\$ 2,000.00	\$ 4,000.00
13	2502.503	10" PVC PIPE	94	LF	\$ 50.00	\$ 4,700.00
14	2503.503	24" CSP STORM SEWER	116	LF	\$ 80.00	\$ 9,280.00
15	2506.602	48" AGRI-DRAIN CONTROL STRUCTURE W/ HAALA GRATE	2	EA	\$ 8,000.00	\$ 16,000.00
16	2511.507	RIPRAP, CLASS 3 & GEOTEXTILE FABRIC, TYPE IV	153	CY	\$ 125.00	\$ 19,125.00
17	2563.601	TRAFFIC CONTROL	1	LS	\$ 20,000.00	\$ 20,000.00
18	2573.501	STABILIZED CONSTRUCTION EXIT	1	EA	\$ 2,000.00	\$ 2,000.00
19	2573.501	EROSION CONTROL SUPERVISOR	1	LS	\$ 5,000.00	\$ 5,000.00
20	2573.503	SILT FENCE	1465	LF	\$ 4.00	\$ 5,860.00
21	2573.503	FLOTATION SILT CURTAIN	40	LF	\$ 50.00	\$ 2,000.00
22	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER	570	LF	\$ 5.00	\$ 2,850.00
23	2573.601	TEMPORARY EROSION CONTROL ALLOWANCE	1	ALLOW	\$ 10,000.00	\$ 10,000.00
24	2575.504	EROSION CONTROL BLANKET - CAT. 3N-WOOD	1000	SY	\$ 2.25	\$ 2,250.00
25	2575.505	SEEDING	2.3	AC	\$ 3,000.00	\$ 6,900.00
26	2575.508	SEED, MNDOT MIXTURE 34-181 (EMERGENT WETLAND) @ 5 LB / ACRE	7	LB	\$ 475.00	\$ 3,325.00
27	2575.508	SEED, MNDOT MIXTURE 34-271 (WET MEADOW SOUTH & WEST) @ 12 LB / ACRE	7	LB	\$ 200.00	\$ 1,400.00
28	2575.508	HYDRAULIC BONDED FIBER MATRIX	5950	LB	\$ 1.00	\$ 5,950.00
CONSTRUCTION SUBTOTAL:						\$ 284,315.00
			10%	CONSTRUCTION CONTINGENCY	\$ 28,431.50	
CONSTRUCTION TOTAL						\$ 312,746.50
ESTIMATED ACCURACY RANGE***			-5%	\$ (15,637.33)		\$ 297,109.18
			5%	\$ 15,637.33		\$ 328,383.83

***This Final Design-level (Class 1, 50 to 10% design completion per ASTM E 2516-06) cost estimate is based on bid-level designs, alignments, quantities and unit prices. Costs will minimally change with further clarifications. 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 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 -5% to +5%.** 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.

PARAMETERS FOR ACCURACY

ESTIMATE CLASS	LEVEL OF PROJECT DEFINITION (EXPRESSED AS % OF COMPLETE DEFINITION)	ACCURACY RANGE	APPLICABLE ACCURACY RANGE (%)
5	0% TO 2%	-20% TO -30%	
		+30% TO +50%	
4	1% TO 15%	-10% TO -20%	
		+20% TO +30%	
3	10% TO 40%	-5% TO -15%	
		+10% TO +20%	
2	30% TO 70%	-5% TO -10%	
		+5% TO +15%	
1	50% TO 100%	-3% TO -5%	-5%
		+3% TO +10%	5%
***THIS PROJECT PHASE			

PARAMETERS FOR CONSTRUCTION CONTINGENCY

PHASE OF PROJECT	PERCENTAGE ENGINEERING COMPLETED	APPLICABLE CONSTRUCTION CONTINGENCY PERCENTAGE (%)
FUNDING, SCOPE AND BUDGET	0 TO 5%	30.00%
SCHEMATIC DESIGN	5% TO 15%	25.00%
PRELIMINARY	15% TO 60%	30.00%
FINAL	60% TO 100%	10.00%
CONSTRUCTION	100%	5.00%
***THIS PROJECT PHASE		

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

MEMORANDUM

Date: October 8, 2019

To: Board of Managers

From: Diane Lynch, District Administrator

RE: Health Care Savings Plan approval

Background

The Health Care Savings Plan is an individual, tax-free account that allows public employees to invest money in a medical savings account while employed. EMPLOYEES INVEST THEIR OWN MONEY ONLY. THE DISTRICT WILL NOT BE CONTRIBUTING.

The Plan funds can be used after employees leave public service and can be used reimburse out-of-pocket medical expenses. All employees must participate to set the Plan up.

In order to set up a plan, the Managers need to approve it.

Recommended Action

Staff requests the Manager approve the District setting up a Health Care Savings Plan by approving the following language recommended by the Minnesota State Retirement System:

Prior Lake-Spring Lake Watershed District employees are eligible to participate in the Minnesota Post Employment Health Care Savings Plan (HCSP) established under Minnesota Statutes, section 352.98 (Minn. Supp. 2001) and as outlined in the Minnesota State Retirement system's Trust and Plan Documents. All funds collected by the employer on behalf of the employee will be deposited into the employee's post-employment health care savings plan account.

Employees shall contribute an ongoing percent of pay as described below:

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

Employees with 0-3 years of service shall contribute 0% of pay.

Employees with 3-5 years of service shall contribute .5% of pay.

Employees with 5 or more years of service shall contribute 1% of pay.

Employees who are eligible for the Minnesota State Retirement System shall contribute 50% of their remaining Paid Time Off (PTO) upon termination of employment.

Upon an employee's death, contributions can no longer be made to the Health Care Savings Plan.

PRIOR LAKE - SPRING LAKE

WATERSHED DISTRICT

MEMORANDUM

TO: BOARD OF MANAGERS
FROM: MAGGIE KARSCHNIA, WATER RESOURCES PROJECT MANAGER
SUBJECT: INTEGRATED PEST MANAGEMENT PLAN FOR COMMON CARP: 2019 UPDATE
DATE: OCTOBER 3, 2019

BACKGROUND

With the understanding that common carp play a role in the decline of water quality within the Prior Lake Spring Lake Watershed, the Board first approved the District's Integrated Pest Management (IPM) Plan for Common Carp on May 9, 2017 which was subsequently updated on May 8, 2018. The IPM Plan supports the District's water quality goals established for individual waterbodies throughout the watershed, as well as the goals of the 2011 Upper Prior and Spring lake TMDL.

The IPM Plan is intended to be a living document, using adaptive management that may develop new management strategies and plan goals through data collection and analysis. As new information and techniques are acquired, current approaches, data collection efforts, and prioritization may change. The IPM plan should be reviewed annually to provide updates to identified goals and action items and potentially add or modify goals as data collection may dictates.

UPDATING THE MANAGEMENT PLAN

The PLSLWD Carp IPM has been developed as a guidance document for the management of common carp populations within the Prior Lake Spring Lake Watershed. With the 2019 annual update to the IPM Plan, District staff received initial comments and feedback from the Board of Managers on proposed carp management techniques and timeline for implementing the next steps over the coming year at its June meeting. Those comments have been incorporated to the attached latest draft, including the Accelerated Carp Management Strategies.

REQUESTED ACTION:

Based on feedback and/or questions on the IPM, PLSLWD staff is requesting one of the following two actions:

- 1) The Board will make a motion to approve the 2019 IPM Plan for Common Carp be as written.
- 2) The Board direct staff to make changes to the plan which will be updated and brought to the Board for approval at its November meeting.



PRIOR LAKE - SPRING LAKE
WATERSHED DISTRICT

2019 Integrated Pest Management Plan (IPM Plan) FOR COMMON CARP

PREPARED BY:

Tony Havranek, Senior Environmental Scientist, WSB

Mary Newman, Environmental Scientist, WSB

Maggie Karschnia, Project Manager, PLSLWD

wsb



Integrated Pest Management Plan (IPM) For Common Carp

Updated and approved by the PLSLWD Board of Managers on:

_____, **2019**

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APPENDICES 25

APPENDIX A – 2018 CLEAN WATER PARTNERSHIP GRANT FINAL REPORT

APPENDIX B – ARCTIC LAKE FISHERIES ASSESSMENT 2017

APPENDIX C – FERRIC CHLORIDE WEIR IMPROVEMENTS SITE PLANS

APPENDIX D – NORTHWOODS CARP BARRIER SITE PLANS

PART 1 - INTRODUCTION

Common carp (*Cyprinus carpio*), a non-native fish originating in the Caspian region of Eurasia, are the most widely distributed nuisance fish in the United States (Nico et al., 2012). Carp can have direct and indirect negative effects on water quality by uprooting submergent and emergent aquatic vegetation and by releasing phosphorous sequestered in lake sediments. The phosphorus is then available to free floating algae and can lead to an increase in total phosphorous and Chlorophyll-a concentrations in the lake and to a decrease in water clarity. By removing the carp from the system, both the phosphorus within the carp carcass and the amount that would typically be excreted will be completely removed, while also abating the release of phosphorus created by foraging behavior.

Spring Lake, as well as Pike Lake, Upper Prior Lake, and portions of County Ditch 13 are listed on the MPCA's impaired waters list due to excess nutrients. These impairments limit recreational opportunities as well as waterfowl habitat, native aquatic vegetation abundance, and native game fish populations (MPCA Impaired Waters Viewer, 2018). As most of the waterbodies within the PLSLWD are connected, improvements to the impaired waters will also have benefits downstream.

This plan uses integrated pest management (IPM) principles to effectively manage the common carp populations. IPM involves the use of targeted carp removals and barriers, as well as monitoring environmental parameters that can inhibit or promote carp population growth within the waterbodies. Adaptive management will use data that is collected on the carp population with respect to population and biomass estimates as well as migration routes and winter aggregation locations.

This IPM plan is intended to be a living document; using adaptive management that may develop new management strategies and plan goals through data collection and analysis. As new data is collected and analyzed, current approaches, data collection efforts, and prioritization may change. This IPM aims to mitigate the effect that common carp are having on the load of excess nutrients to these lakes, and protect those that are currently meeting water quality standards.

PART 2 - WATERSHED OVERVIEW

Located within Scott County, the PLSLWD lies in the Minnesota River Basin in the southwestern portion of the Twin Cities metropolitan area, and covers roughly 42 square miles of land area with over 2,500 acres of open water (Figure 1). Spring Lake, Upper Prior Lake and Lower Prior Lakes are the largest waterbodies within the PLSLWD and provide boating, fishing and other recreational opportunities. Spring Lake is connected by a natural channel to Upper Prior Lake which discharges to Lower Prior Lake

which then outlets through a channel to the Minnesota River. All three lakes receive intense recreational pressure year-round and are important recreational resources to the Twin Cities metro area.

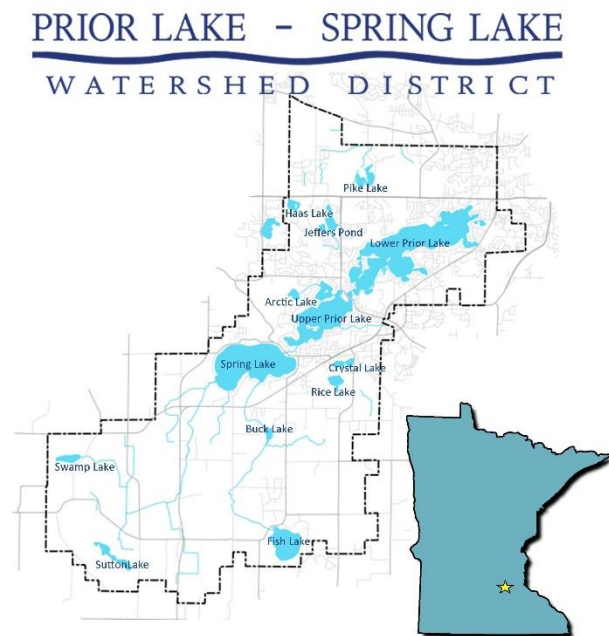


Figure 1. PLSLWD Location Map

The protection and restoration of Spring and Prior Lakes are high priorities for the PLSLWD and are considered Priority Lakes by the Metropolitan Council for their high regional recreation value. A DNR public boat landing is located on each of the lakes, in addition to winter access points. Sand Point, a swimming beach on the north shore of Lower Prior Lake, boasts as much as 48,000 visitors each year. Open water activities on the lakes include fishing, boating, paddling, water skiing, jet skiing, sailing, wake boarding, and swimming. During the winter when the lake is ice-covered, recreational activities include snowmobiling, ice fishing, skating, and cross-country skiing.

Since 1970, the PLSLWD has strived to conserve, protect, and manage the water resources within the PLSLWD and have implemented a variety of projects aimed to improve water quality.

The aerial map in **Figure 2** shows some of the landuses and highlights the waterbodies and wetland areas that carp may be present and/or use as spawning areas. **Figure 3** shows the topography throughout the watershed and some of the hydrological connections that carp might use to travel between waterbodies.

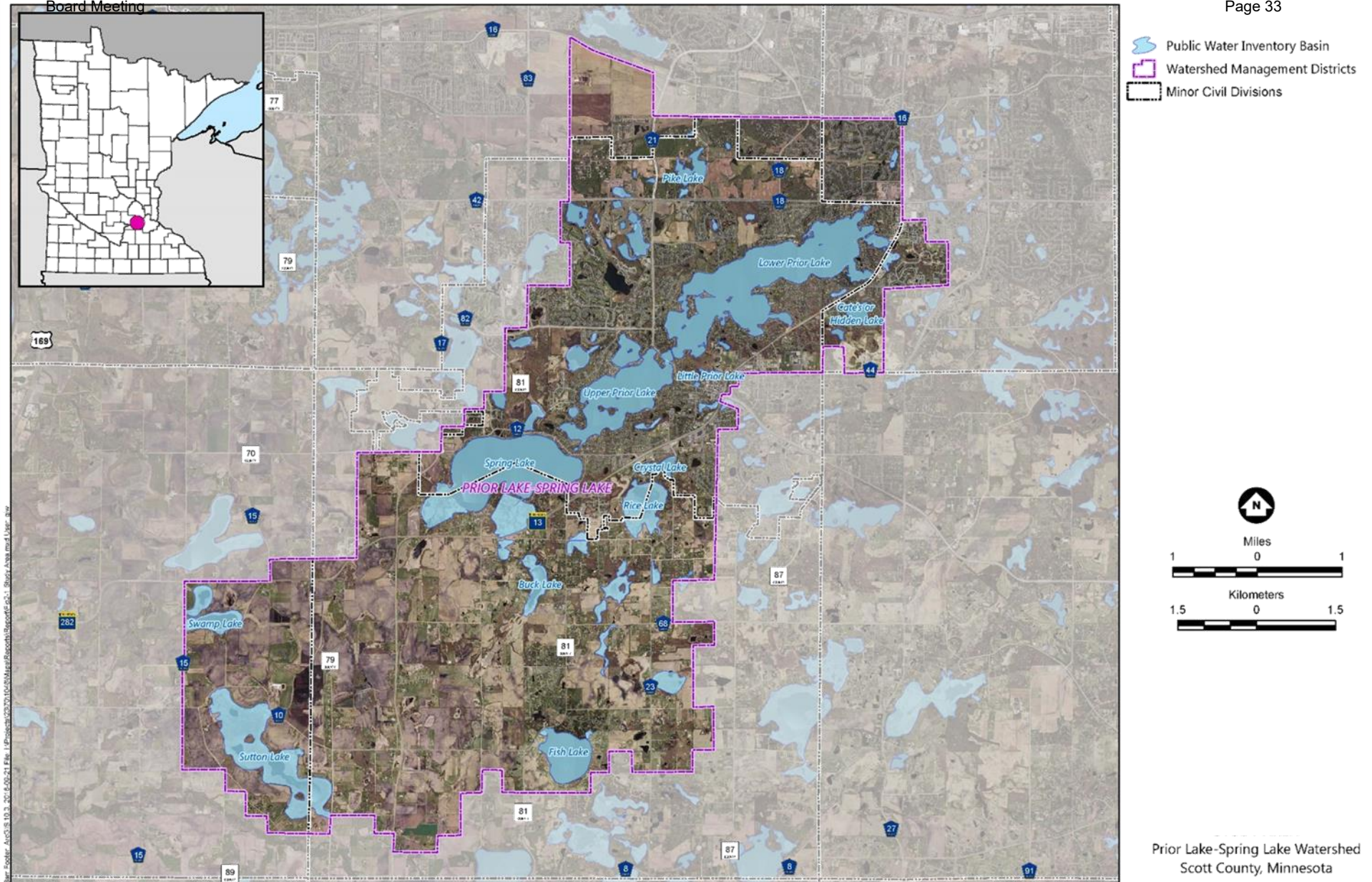


Figure 2. Watershed Overview Map

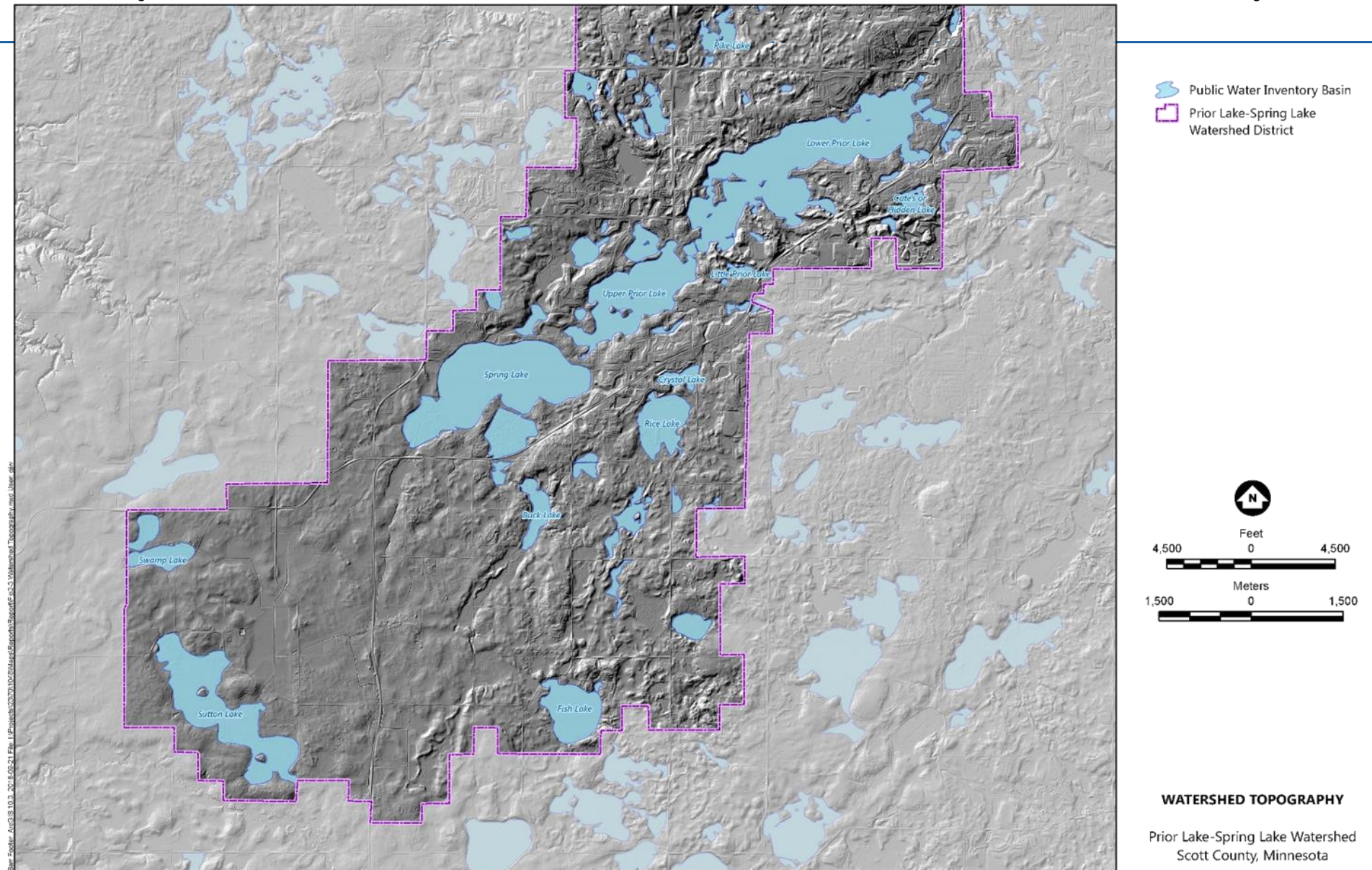


Figure 3. Topographic Map

PART 3 - CARP MANAGEMENT WATERBODIES

3.1 CARP MANAGEMENT LAKES

While there are 14 lakes within the PLSLWD, this IPM Plan is focused only on those eight connected waterbodies that are known carp migration routes and/or are suspected to contain common carp as shown in Figure 4 below (Fish, Buck, Spring, Arctic, Upper Prior, Lower Prior, Jeffers Pond & Pike Lakes). An overview of each carp management lake is listed below .

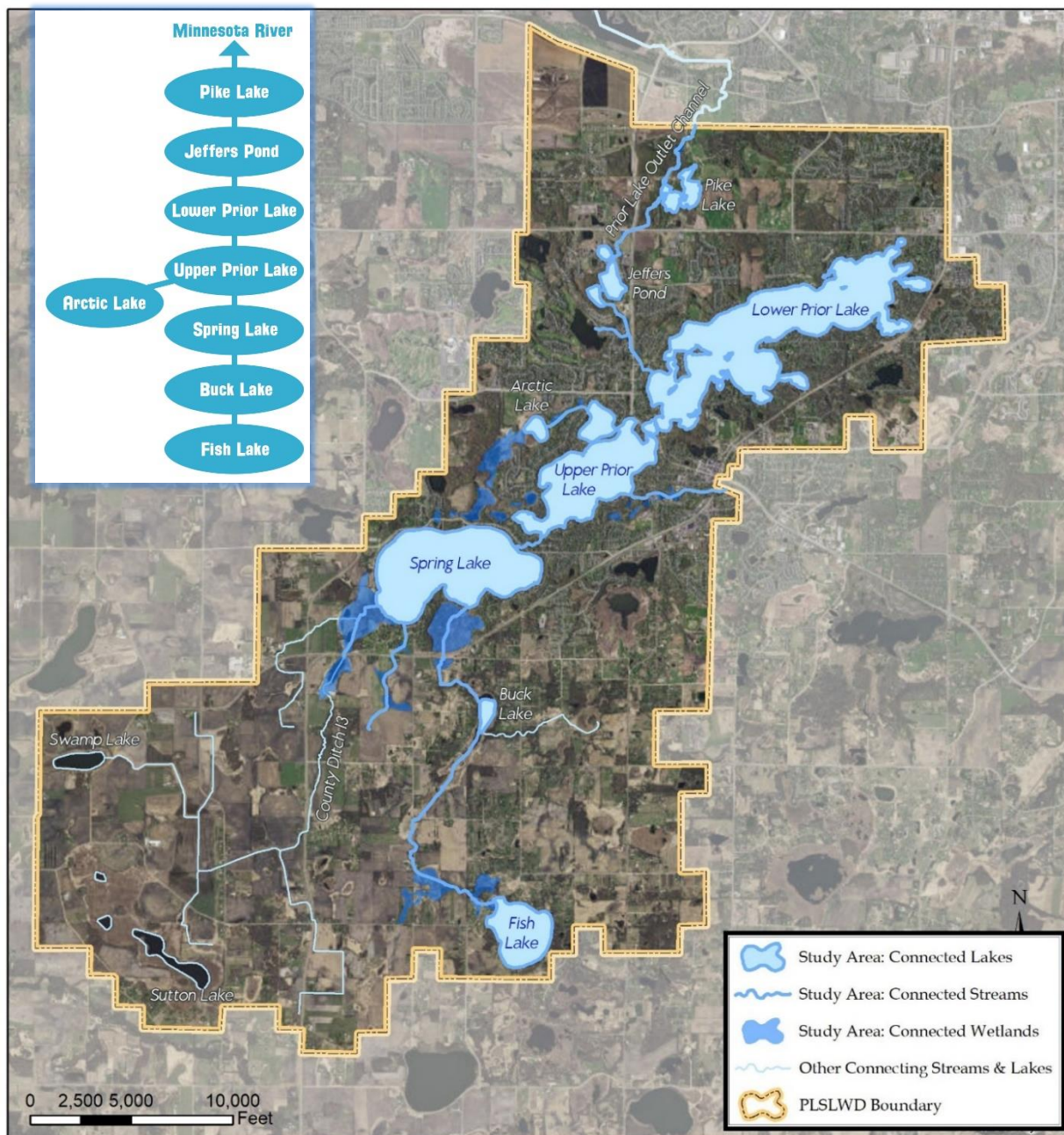


Figure 4. Carp Management Lakes

3.2 FISH LAKE

Fish Lake is a relatively small lake found in the upper watershed. Fish Lake is approximately 173 acres, has an average depth of 14 feet, and a maximum depth of 28 feet. Roughly 74 acres or 43% of the lake is considered littoral. Fish Lake is a seepage lake-outflow, meaning that there is no direct inflow to Fish Lake; rather, the hydrologic contribution is from watershed runoff and groundwater which then flows out of Fish Lake to the north towards Buck Lake.

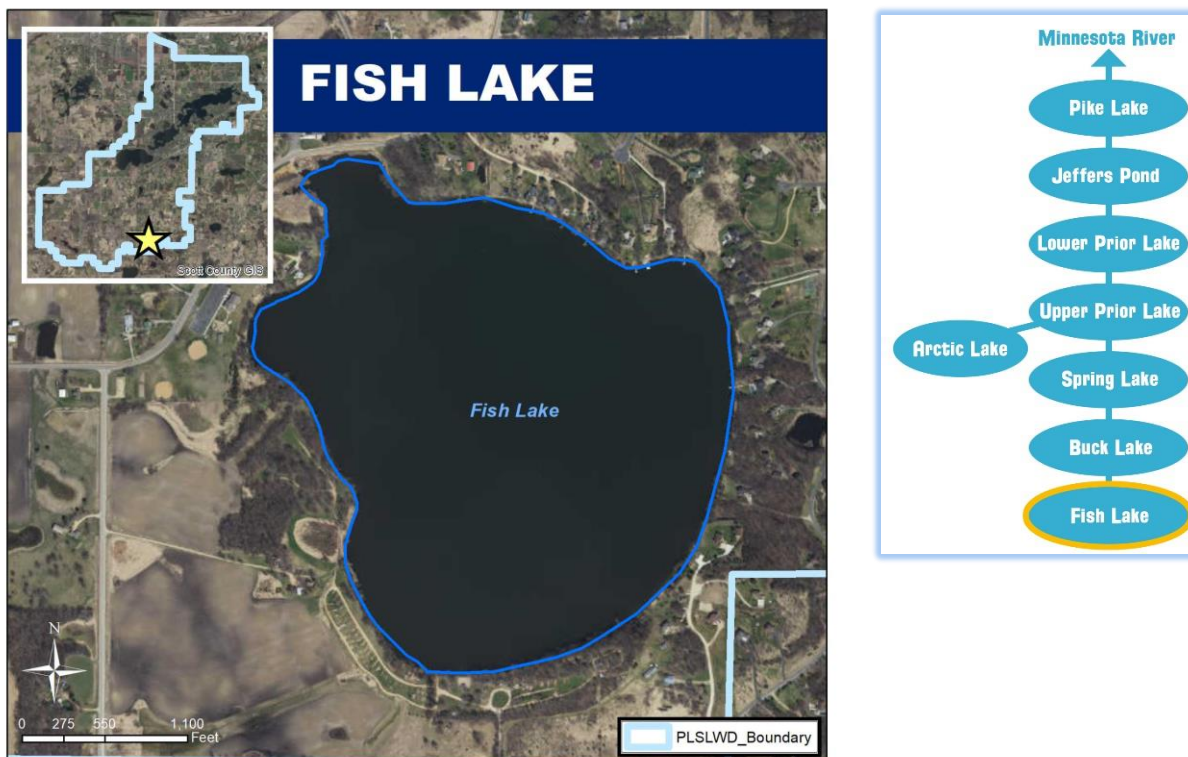


Figure 5. Fish Lake Map

INTERNAL LOADING

Fish Lake appears to be heavily impacted by internal loading. The 2006 Fish Lake Sustainable Lake Management Plan identifies an internal load ranging from 111 to 488 kg/yr (244 to 1,075 pounds/yr). The methodology used to derive this estimate is derived from a Canfield-Bachmann model. These models identify internal loading from anoxic release, hypolimnetic mass balance, and fall turnover; no analysis was done to determine the contribution from curly-leaf pondweed (CLP) senescence or from the foraging behavior of rough fish.

FISHERIES ASSESSMENT

A potential source of internal loading is from rough fish bioturbation. MN DNR fishery survey data from 2014 shows that carp and bullhead are present in Fish Lake. LaMarra (1975) identified an internal loading rate of 1.07 mg P/m²/day based on a carp density of 200 kg/ha. A very preliminary fish survey was conducted in fall of 2019 on Fish Lake and showed carp biomass at 85.7 +/- 69.2.

3.3 BUCK LAKE

Buck Lake is a small lake (23 acres) located downstream of Fish Lake in the upper watershed. The maximum depth is 9 feet; no numerical average depth given but average depth is noted as shallow. It is assumed, based on maximum depth that the entire lake is littoral. Buck Lake receives water from the connecting channel to Fish Lake and from the watershed to the East. Buck Lake then outflows to the north through a large wetland complex to Spring Lake.

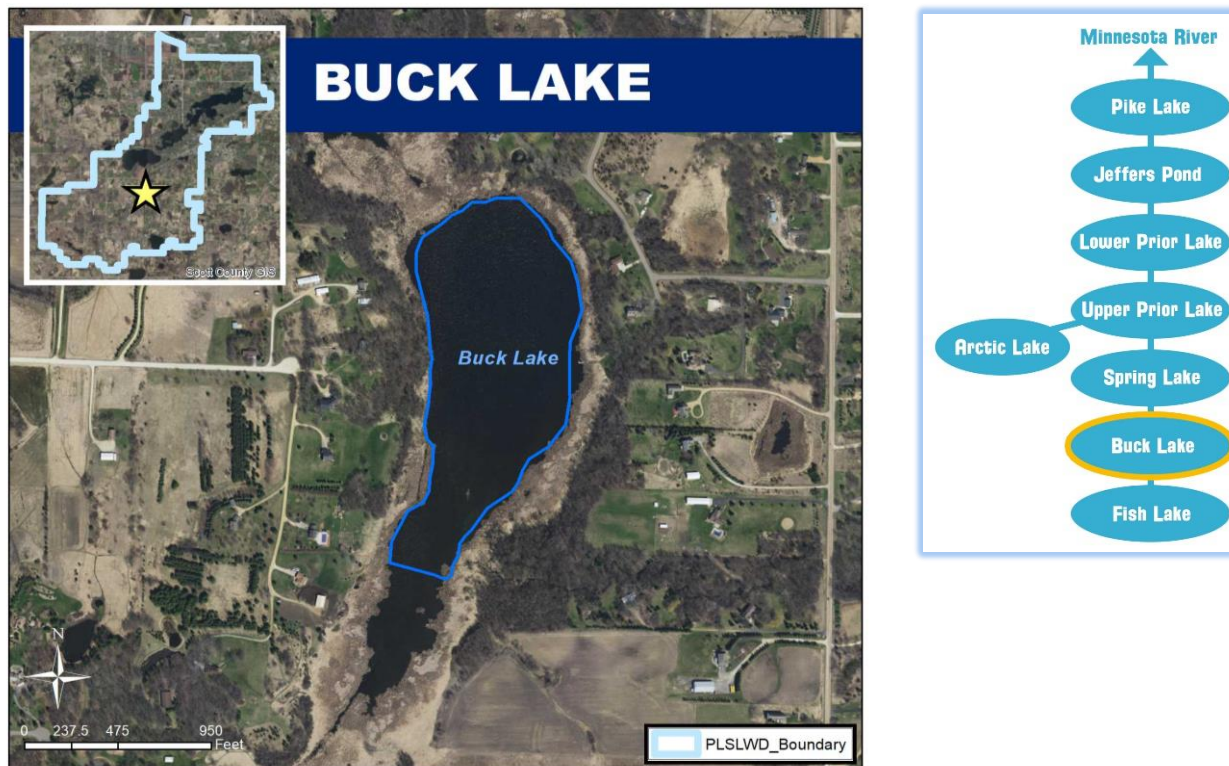


Figure 6. Buck Lake Map

INTERNAL LOADING

The watershed to lake ratio for Buck lake is quite high: ~837:1, which may result in a large amount of phosphorus loading to Buck Lake from the surrounding watershed. The average TP concentration for Buck Lake between 2014 and 2017 was 112.56 µg/l (almost twice the state standard).

While not specifically assessed, anoxic conditions within Buck Lake may be contributing to the phosphorus load through anoxic release within sediments. No assessment has been completed on the sediments in the Buck Lake basin to determine the sediment release rate of TP.

FISHERIES ASSESSMENT

Very preliminary survey data from fall 2019 indicates that carp have low populations on Buck Lake. The widespread presence of aquatic vegetation in Buck Lake also may hint at a low density of rough fish presence in the lake. Typically, lakes that support high rough fish density, are incapable of supporting dense or widely-distributed aquatic vegetation.

3.4 SPRING LAKE

Spring Lake is the second largest basin in the PLSLWD. The maximum depth is 34 feet with an average depth of 18 feet. Roughly half (49% or 290 acres) is identified as the littoral area. The watershed is quite large (12,340 acres) with a watershed to lake ratio of 20:1, which is a moderate ratio.

Spring Lake has three (3) major inflows located primarily on its southern and western sides. The 12/17 wetland on the northwest side of the lake also contributes to the overall water budget. County Ditch 13 provides the largest contribution to external load. Spring Lake outlets on its eastern side via a small channel which connects to Upper Prior Lake.

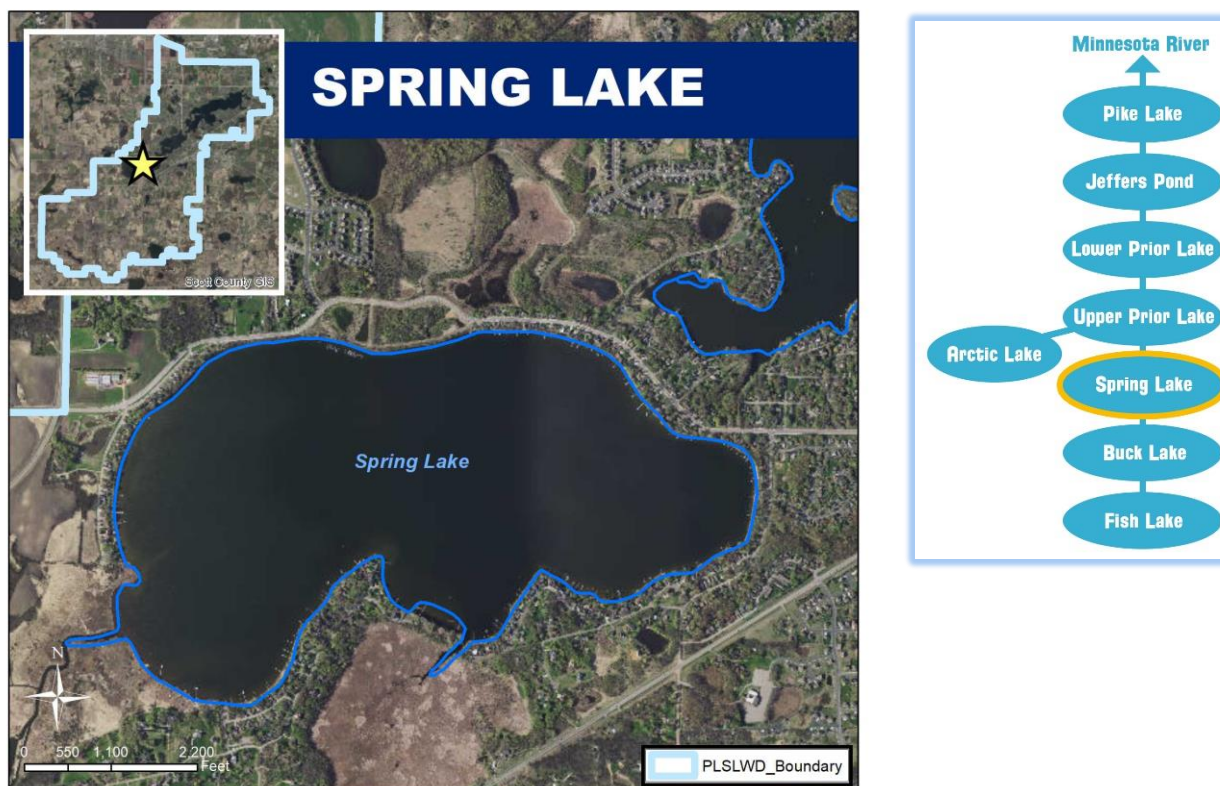


Figure 7. Spring Lake Map

INTERNAL LOADING

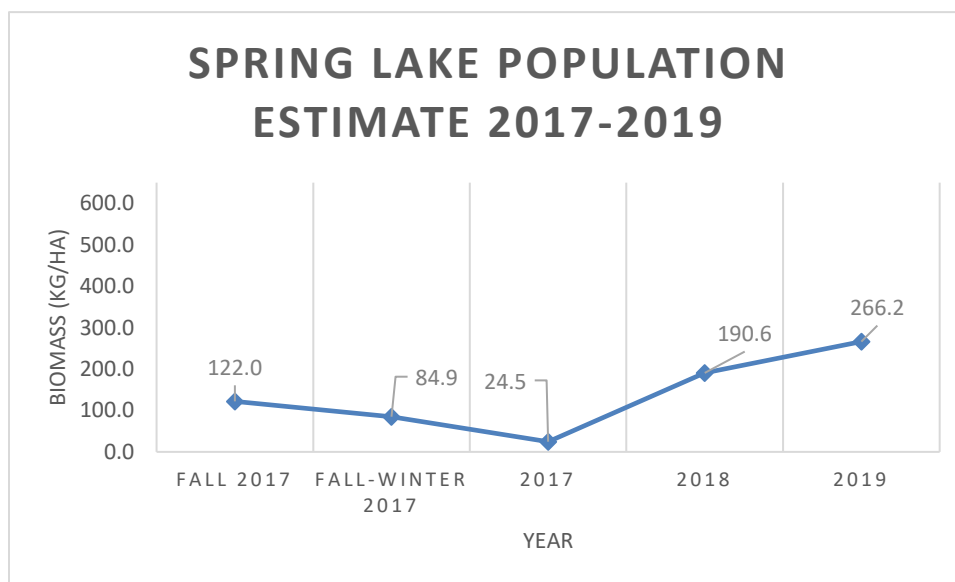
Internal loading constitutes the bulk of the total phosphorus load to Spring Lake at 5,161 lbs/year or 49%. Internal loading may be from anoxic sediment release of phosphorus, senescence of aquatic vegetation during the growing season, and overabundant rough fish. The 2012 TMDL attributed the entire internal load to anoxic release; however subsequent fisheries surveys documented elevated carp biomass which may be heavily influencing the internal phosphorus load and subsequently, water quality in Spring Lake.

FISHERIES ASSESSMENT

Past surveys show elevated carp biomass in Spring Lake, which is influencing internal loading. In winter 2012, the PLSLWD marked 1,752 adult carp by inserting floy tags in the dorsal area. The carp were initially captured using a commercial fishing crew that deployed a seine net around a winter

aggregation of common carp. The carp were captured, measured for length and weight, tagged, and released. An attempt was made to recapture the carp in 2013, but was unsuccessful.

Past surveys show elevated carp biomass in Spring Lake, which is influencing internal loading. A 2014 study completed by St. Mary's University using a catch per unit effort (CPUE) model showed that carp biomass in Spring Lake was 343.5 kg/ha. A subsequent survey completed in 2016 by WSB showed 122.5 kg/ha using the CPUE method and 84.7 kg/ha using a mark-recapture methodology. Using this abundance estimate and LaMarra's estimation of calculating loading due to an abundance of rough fish, nearly 2.37 pounds of phosphorus per day were being added to Spring Lake. This number equates to an estimated loading rate of over 866 pounds of phosphorus per year caused by the overabundance of common carp.



PAST CARP MANAGEMENT EFFORTS

Carp in Spring Lake were netted and inspected for marks on January 30, 2017 as part of a recapture and removal event capturing 2,577 individual carp, an estimated 59.9 kg/ha of carp biomass resulting in a reduction of 615.5 pounds of phosphorus per year. Using the ratio of marked to unmarked carp, WSB calculated a pre-removal population estimate of $3,623 \pm 1,167$ individual carp in Spring Lake. Using a 5.6 kg average weight, Spring Lake carp biomass was calculated at 84.9 ± 27.3 kg/ha, close to the ecological threshold value of 100 kg/ha and well above the value of 30 kg/ha that PLSLWD has identified as a biomass goal. Biomass calculated after removal is estimated to be $24.5 \text{ kg/ha} \pm 7.9$.

3.5 ARCTIC LAKE

Arctic Lake is 33 acres in size with a maximum depth of 30 feet and an average depth of 9.5 feet. Arctic Lake flows into Upper Prior Lake, entering a large shallow bay on the north side of the lake through a man-made channel. Arctic Lake's watershed is 507 acres resulting in a 15:1 watershed to lake ratio, which is relatively small. Most of the watershed (56%) is composed of wetlands and woodlands with the remaining portions of the watershed composed of residential, prairie, water, open space, and cropland.



Figure 8. Arctic Lake Map

INTERNAL LOADING

Sediment release rates from sediment coring was not available at the time the 2013 diagnostic report was drafted. However, HDR attempted quantify the internal load from anoxic sediment release using a mass balance approach. Results of this analysis showed that annual loading ranged from 177-327 lbs TP/year.

FISHERIES ASSESSMENT

Carp have been documented in multiple fish surveys completed in 2012, 2014, 2017, and 2018. The 2012 survey utilized standard and mini trap nets to determine assemblage and size structure. Small carp (9.5-13") were captured in trap nets which indicates recruitment and suggests that Arctic Lake was functioning as a nursery. The 2014 electrofishing survey determined that the carp biomass density was 264.5 kg/ha and found numerous young of the year carp.

A carp mark-recapture population and biomass estimate were completed in 2017. Survey data shows that the carp biomass for Arctic Lake was 462.6 kg/ha, with juvenile carp dominating the biomass (336.9 kg/ha) and adults making up a smaller portion of the biomass (125.7 kg/ha). Note

that a carp barrier was installed in 2016 at the connection to Upper Prior from Arctic, which may have prevented migration out of Arctic to Upper Prior, resulting in higher biomass than in 2014.

PAST CARP MANAGEMENT EFFORTS

The In 2017 to 2018, an estimated 398 kg/ha of carp biomass was removed from Arctic Lake resulting in a reduction of 230 pounds of phosphorus per year. The monitoring of the recruitment rates of young carp to the system is likely to continue through the partnership these groups formed in 2013 and the actual effects of this removal on the phosphorus concentrations will be monitored by regular sampling throughout the growing months (May-September) of each year.

	CARP BIOMASS ESTIMATE (KG/HA)	PHOSPHORUS LOADING RATE (LBS/YEAR)
BEFORE REMOVAL	460.0	265
AFTER REMOVAL	62.0	35
REDUCTION AMOUNT	-398.0	-230

3.6 UPPER PRIOR LAKE

Upper Prior Lake is 416 acres in size with a maximum depth of 43 feet and an average depth of 10 feet. The littoral zone covers 329 acres or 79% of the basin. The lake receives water from Spring and Arctic Lakes as well as from a small drainage area on the east side of the lake. The watershed is 16,038 acres resulting in a watershed ratio of 38:1, which is large considering that most of the watershed is urban and agriculture, like Spring Lake.

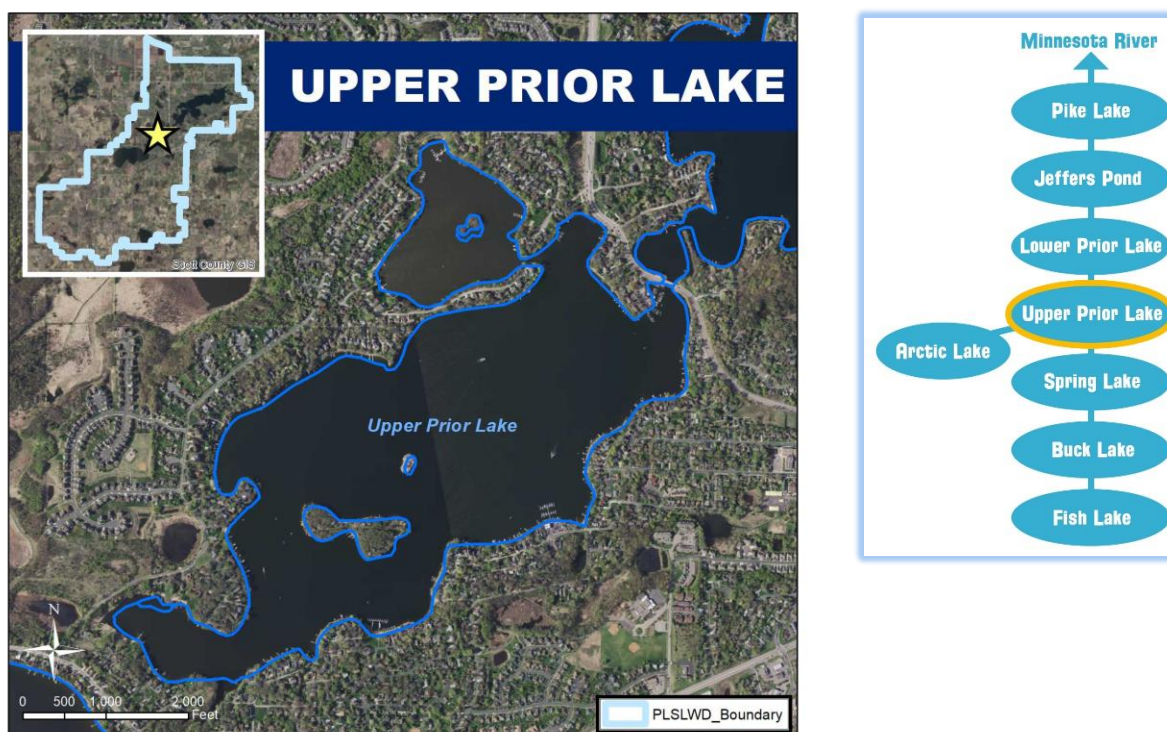


Figure 9. Upper Prior Lake Map

INTERNAL LOADING

The internal load of Upper Prior is a major cause of water quality impairment in Upper Prior Lake. The 2012 TMDL indicates that 50% of the total phosphorus budget comes from internal loading. The TMDL assigns the entire internal load to anoxic sediment release; however, Upper Prior supports elevated carp biomass which may contribute and/or exacerbate internal loading.

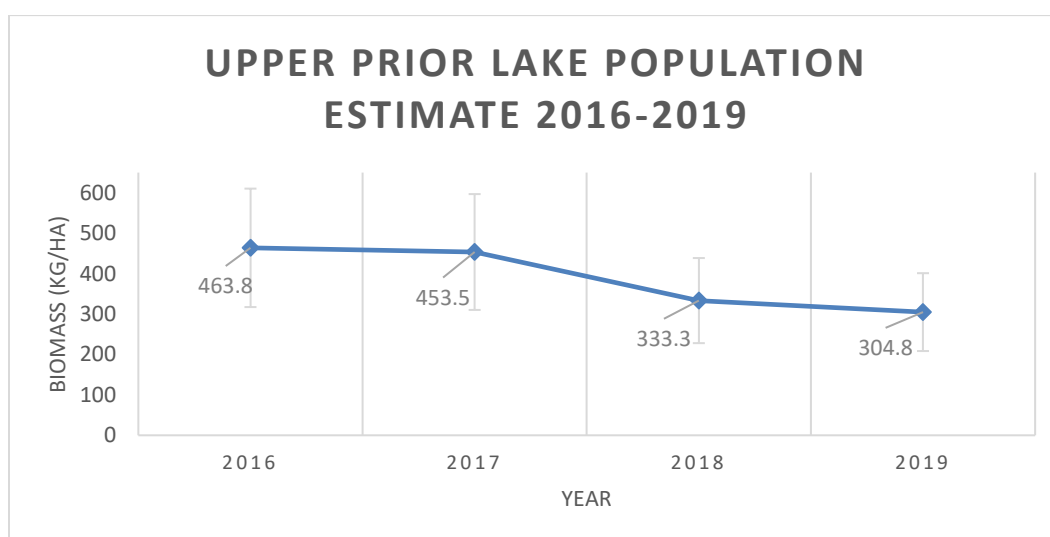
With upstream alum treatment of Spring Lake to reduce internal nutrient loading, lower concentrations of phosphorus are reaching Upper Prior Lake. However, past studies have indicated that there is still an internal reservoir of phosphorus in Upper Prior Lake that continues to hinder the improvement of water quality in the lake.

FISHERIES ASSESSMENT

A number of carp were marked with a right pelvic and pectoral fin clip, radio tags, and passive integrated transponder (PIT) tags in 2015 and 2016 in Upper Prior Lake. A mark-recapture estimate was calculated using the total number of fin clips and radiotags captured.

The biomass estimate as a result of this mark-recapture event was $13,840 \pm 3,664$ individuals in Upper Prior Lake before the removal. Using a 6 kg average weight, Upper Prior Lake biomass was calculated at $531.3 \text{ kg/ha} \pm 140.6$, a biomass well above the 30 kg/ha biomass goal identified by the PLSLWD.

Using LaMarra's estimation of loading due to an abundance of rough fish, nearly 10.54 pounds of phosphorus per day were being added to Upper Prior Lake as a result of this elevated population. This number equates to a loading rate of over 3,840 pounds of phosphorus per year caused by the overabundance of common carp.



PAST CARP MANAGEMENT EFFORTS

In the fall and winter of 2017-18, an estimated 113 kg/ha of carp biomass were removed from Upper Prior Lake resulting in a reduction of 845.8 pounds of phosphorus per year.

	CARP BIOMASS ESTIMATE (KG/HA)	PHOSPHORUS LOADING RATE (LBS/YEAR)
BEFORE REMOVAL	531.0 kg/ha ± 140.6	3,847.6
AFTER REMOVAL	418.0 ± 136.9	3,028.8
REDUCTION AMOUNT	-113.0	-845.8

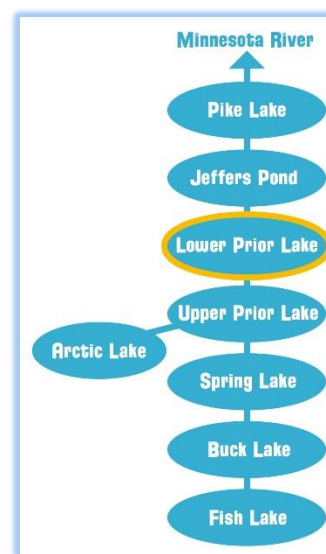
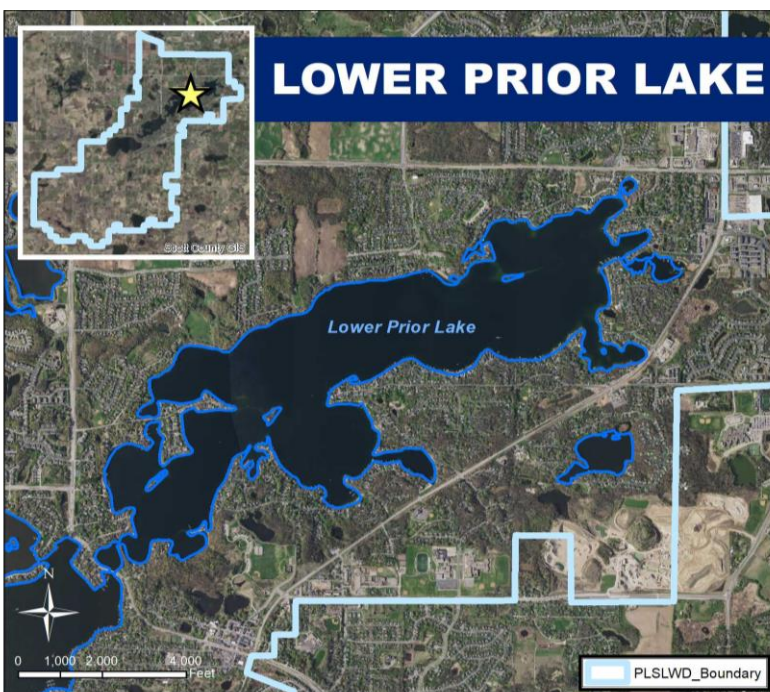
In the spring of 2019, two seine nettings and one electrofishing effort were completed in Crystal/Mud Bay, removing a total of 10,000 pounds of carp from Upper Prior Lake.

The monitoring of the recruitment rates of young carp to the system is continuing on a yearly basis and the actual effects of this removal on the phosphorus concentrations will be monitored by regular sampling throughout the growing months (May-September) of each year.

3.7 LOWER PRIOR LAKE

Lower Prior Lake is the largest basin in the watershed at 940 acres. It has a maximum depth of 56 feet and an average depth of 13 feet; roughly 39% of the lake or 373 acres is in the littoral zone.

Water flows into Lower Prior from Upper Prior under the County Highway 21 Bridge and is the only major inflow; the remaining hydrology is derived from direct drainage from adjacent upland areas. The lake's outlet is the Prior Lake Outlet Channel (PLOC) located along the western portion of the lake. The watershed of Lower Prior is 18,904 acres, resulting in a moderately sized 20:1 watershed to lake ratio.



INTERNAL LOADING

The 2013 Diagnostic report discusses internal loading from sediment release as a possible source of loading but does not quantify the potential loading from this source.

FISHERIES ASSESSMENT

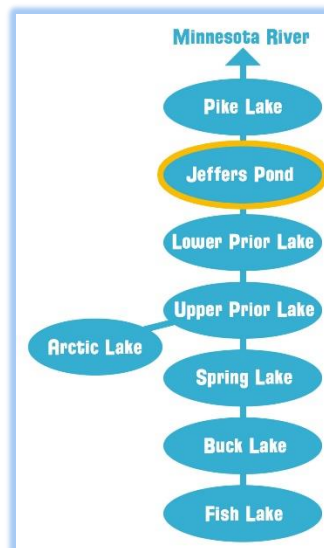
Carp are present in Lower Prior Lake and may travel freely between Lower Prior and Upper Prior Lakes through the existing connection under Eagle Creek Avenue. However, a biomass estimate completed in 2016 using a catch per unit effort (CPUE) model indicates that the annual load from carp is 158 lbs TP/year. Based on this, carp are not a significant source of phosphorus to Lower Prior Lake.

3.8 JEFFERS POND

Jeffers Pond is located downstream of Lower Prior along the PLOC. Jeffers Pond is divided into two basins (East and West Jeffers) separated by a narrow land bridge. The PLOC flows into the south side of West Jeffers and flows out on the north side of East Jeffers. The basins are connected by a series of cascading streams. Jeffers is 39 acres in size with a maximum depth of 70 feet (no average depth listed, and the total acreage includes both basins).



Figure 11. Jeffers Pond Map



INTERNAL LOADING

No diagnostic study has been completed to determine the phosphorus load (internal or external) to Jeffers Pond, nor is there any water quality data available to determine the impairment status of Jeffers Pond.

FISHERIES ASSESSMENT

No water quality or fisheries information is available for Jeffers Pond; however anecdotal information suggests that carp are present in Jeffers Pond.

3.9 PIKE LAKE

Pike Lake is the downstream-most basin in the watershed; located along the PLOC at the northern end or bottom of the watershed. Pike is 50 acres in size with a maximum depth of 9 feet and an average depth of 7 feet, resulting in the entire basin being littoral. The west side of Pike Lake is part of the PLOC and receives constant flow through the system. The east side of Pike Lake is more stagnant and receives runoff from the nearby feedlot and agricultural lands across the road to the east, creating a contrast in water quality compared to the west side

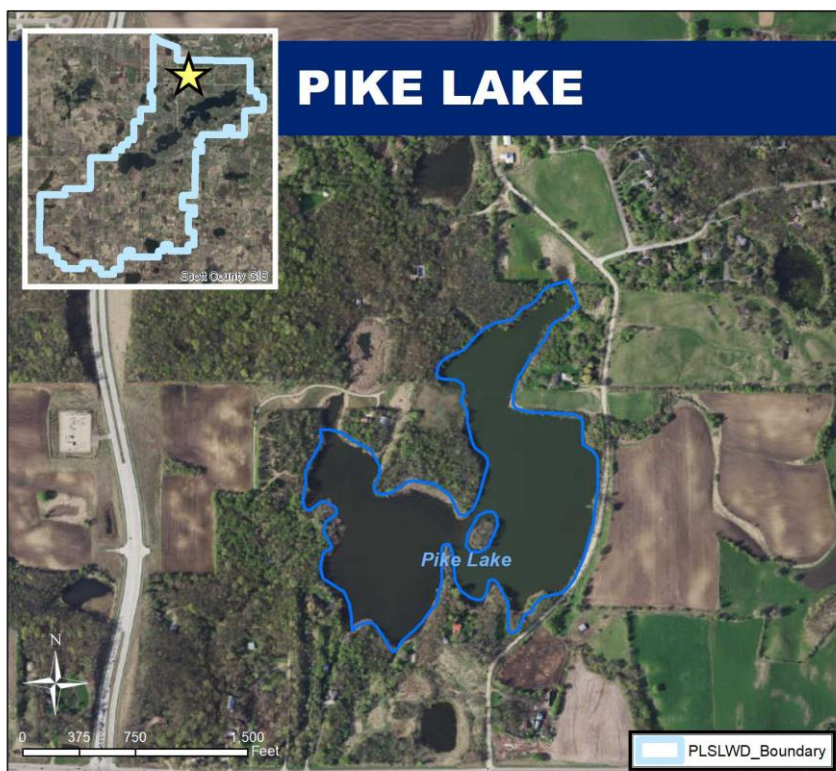
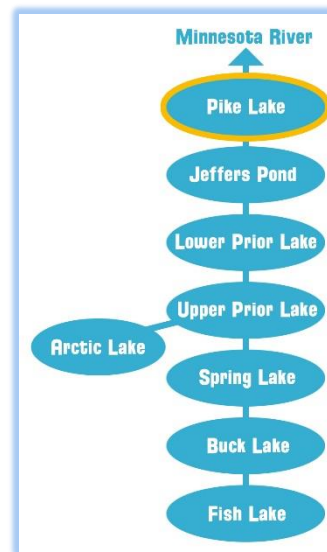


Figure 12. Pike Lake Map



INTERNAL LOADING

Based on available water quality data, Pike Lake is listed as impaired for nutrients. However, no TMDL or diagnostic study has been completed.

A sediment study to determine sediment release rates of phosphorus was completed by the Science Museum of MN in 2013. This study determined a lake-wide sediment release rate of 12.93 mg P/m²/day but did not calculate a total load. Based on the release rate and lake size, the total load to Pike Lake from internal release of phosphorus from sediment under anoxic conditions is 1,825 pounds P/year.

FISHERIES ASSESSMENT

One fish survey was conducted in Pike Lake in 1978 by the MN DNR which only found black bullhead, yellow perch and no AIS. However, anecdotal evidence and observations made by District staff over the past decade conclude that common carp are present at potentially nuisance levels in this waterbody. No management actions have been taken to assess the status of the fishery or control of common carp at this time. A TMDL is in progress that is anticipated to help direct any potential management of carp for this lake.

PART 4 - CARP MANAGEMENT GOALS

Through this IPM Plan, the District has developed a holistic approach to carp management, treating the entire connected watershed system as a whole. While it is the long-term goal of the District to see all of its lakes reach the water quality goal of 30 kg/ha of carp, the lakes must be prioritized and management focused to address the most imperative concerns first. As carp management information on the lakes and new techniques are always changing, this IPM Plan will address three-year goals.

4.1 PRIORITY LAKES

While it is the District's long-term goal to maintain carp populations below the water quality management level on all waterbodies, this IPM Plan prioritizes those lakes that receive the most public use and those that are most affected by poor water quality, as well as their associated waterbodies that may harbor or support carp recruitment.

The three lakes in the PLSLWD with public access are listed below with highest public use listed first:

- 1) Lower Prior Lake
- 2) Upper Prior Lake
- 3) Spring Lake
- 4) Fish Lake

A review of Minnesota Pollution Control Agency's website on December 18, 2018 shows the list of impaired waters located within the PLSLWD below in Table 3-1. Of these lakes, only Spring and Upper Prior have approved total maximum daily load (TMDL) reports and an associated TMDL implementation plan completed. Pike Lake and Fish Lake TMDL reports are currently in-progress.

Table 1. List of Impaired Waters in PLSLWD

WATER BODY	YEAR LISTED	AFFECTED USE	POLLUTANT OR STRESSOR
Fish Lake	2002	Aquatic recreation	Nutrient/eutrophication biological indicators
	2006	Aquatic consumption	Mercury in fish tissue
Lower Prior Lake	2002	Aquatic consumption	Mercury in fish tissue
	2018 (draft)	Aquatic life	Fishes bioassessments
Pike Lake	2002	Aquatic Recreation	Nutrient/eutrophication biological indicators
Spring Lake	1998	Aquatic Consumption	Mercury in fish tissue
	2002	Aquatic Recreation	Nutrient/eutrophication biological indicators
	2018 (draft)	Aquatic life	Fishes bioassessments
Upper Prior Lake	2002	Aquatic Consumption	Mercury in fish tissue
	2002	Aquatic Recreation	Nutrient/eutrophication biological indicators

As they receive some of the highest public use and are currently on the *state's impaired waters list*, the District has established the following two lakes as its **#1 carp management priority**:

- Upper Prior Lake
- Spring Lake

4.2 THREE-YEAR GOALS

It is anticipated in the next three year timeframe that the District will achieve the following:

- 1) Carp management goal of 30 kg/ha or less on Upper Prior Lake.
- 2) Carp management goal of 30 kg/ha or less on Spring Lake.
- 3) Spawning areas to Upper Prior and Spring Lakes effectively blocked with barriers to prevent recruitment.
- 4) Baseline information of fisheries, carp migration routes, aggregation areas, spawning locations sufficiently documented throughout the carp management lakes.

As a shorter-term goal, the District will be aiming to have both Upper Prior Lake and Spring Lake to management levels by *the end of 2020*. In order to sufficiently manage these two waterbodies, all connected waterbodies that support carp recruitment to these lakes will also be managed.

PART 5 - IPM STRATEGIES

For years after the introduction of carp in the United States, various government agencies and other entities attempted to manage and mitigate carp populations simply through large-effort mass removals without quantifying the amount of carp before or after these efforts. Without baseline carp population information, this management method proved to be ineffective as managers were not able to quantify the extent of the invasion and did not know when they were “done”. Carp often recolonized waterbodies since a long-term approach was not implemented, and spawning areas remained open and available. This management approach was largely abandoned in the late 1900s due to its lack of success.

Ideas and strategies have since been adapted from management practices being used in Australia (Diggle et al., 2012) and by studying movement and behavior patterns of carp in the Upper Midwest. In the early-2000s the University of Minnesota Aquatic Invasive Species Research Center (MAISRC) instituted research to develop a sustainable approach to effectively mitigating and controlling common carp in the United States. This research showed that by addressing different life stages and developing an understanding of the entire system or watershed sustainable carp control could be possible.

Basic biological concepts can be applied to carp management parallel to controlling other invasive and terrestrial and aquatic invasive species. The diagram below illustrates considerations to be made in the development of a carp IPM (Figure 13). A carp IPM should be specific to the system in which it is to be applied. While some methods may not be applicable to all systems, the approach is adaptable.



Figure 13. Integrated Pest Management (IPM) Strategies

Existing qualitative and quantitative data show that applying data collection, physical removal, biological control, barrier technology, followed by regular monitoring and education to the PLSLWD may result in achieving successful management of carp to mitigate their deleterious effects on the system.

5.1 DATA GATHERING & ANALYSIS

Before implementation of management activities such as removal and barrier technology, the extent of the problem needs to be addressed. This can be defined as:

- 1) How many carp are in the system?
 - Population estimates
 - Removal amount calculations
 - Setting goals
- 2) Where and when do carp travel and aggregate in the system?
 - Document migration routes between waterbodies
 - Aid in successful removals
- 3) What basins are the carp using to spawn?
 - Identify potential locations for carp barriers
 - Use to locate potential spawning trap locations (removals)

5.1.1 DATA COLLECTION TOOLS & TECHNIQUES

COLLECTING CARP:

Seines. Commerical fishermen use long mesh nets that hang vertically in the water with floats along the top and weights along the bottom. They are typically used to surround fish in an area and pulled through the water and along the lake bottom to crib up the carp in a shallow area for removal. Seine netting is very effective but limited to areas where carp aggregate and are snag free.

Electrofishing. An electric field is generated between anodes and cathodes placed in the water. The current causes muscle contraction and temporary paralysis in fish, and most species will float to the surface where they can then be netted. Stunned fish usually recover quickly when the power is switched off. Unfortunately, fish in deep water are not often captured, so this technique is best used in shallower areas near the shore. Different electrofishing methods (eg backpack, bank-mounted and boat, including electroseining) are used depending on local site conditions.

Gill Netting. Mesh net panels are placed vertically in the water to entangle fish. The net has a rope along the top with floats attached and another rope along the bottom with weights attached. The mesh of a gill net is uniform in size and shape and the netting is large enough for a fish to fit its head through, but not its body, trapping them in place.

Fyke Nets. Collapsible, cone-shaped trap nets, held open by hoops. Leader net panels or wings guide fish towards the trap entrance. Due to their size and placement in shallow locations, fyke nets are effective for catching smaller carp.

Trap Nets. Mesh fish traps that have net guide walls leading fish into aggregation chambers. These are usually set in shallow water, and style and size can vary. The District is working on developing two specialized trap nets for netting during spawning season: the Push Trap Net that will include a one-way trap door panel on the opening, and the Newman Trap Net that will include multiple-staged guidance walls and openings for enhanced entrapment, both of which will be placed at carp spawning migratory routes.

Box Traps. The bait is located within a mesh trap that lays flat on the bottom of the lake, but quickly forms into a box when lifted to trap the carp inside. Carp are typically baited at the box trap location for several days until a large grouping forms. While a baited box trap catches fewer fish, it holds an advantage over a seine net because the carp are much less likely to escape.

TRACKING CARP:

Passive Integrated Transponder (PIT) Tags. PIT tags act as a lifetime barcode for an individual carp and when scanned are as reliable as a fingerprint (Gibbons & Andrews 2004). The tag is usually between 10 and 14 mm long and 2 mm in diameter. PIT tags are injected with a needle or inserted by surgical incision under the skin of the fish. PIT tags are dormant until activated; they therefore do not require any internal source of power throughout their lifespan. To activate the tag, a low-frequency radio signal is emitted by a scanning device that generates a close-range electromagnetic field. The tag then sends a unique alpha-numeric code back to the reader (Keck 1994). Scanners are available as handheld, portable, battery-powered models and as stationary, automated receiver devices that are used for automated scanning. PIT tag receivers are strategically placed in suspected carp migratory routes to determine movement behaviors in those channels.

Radio-Tags. A radio-tag consists of a 2.5 inch long cylinder which is surgically inserted inside the body of the carp with a foot long antenna extending outside of its body. Unlike PIT tags, radio-tagged fish can be located manually and tracked in real-time with an antennae from a boat or from on top of the ice in winter. Radio-tags implanted in the carp should last for about three years, providing the District with key information about where the carp gather to overwinter and where they go to spawn. Each radio tag has a unique frequency, which can be picked up from up to a mile away with the tracking antennae device.

Fin Clips / Plastic Tags. In order to determine population estimates, carp are sometimes marked with a unique fin clip for the waterbody (e.g. right dorsal fin, pectoral fin) which does not harm the fish but leaves an identifiable marker. In other studies, carp have been marked with plastic tags that are inserted into the body of the fish and are similar-looking to retail clothing tags.



Figure 14. Plastic Tag

POPULATION ESTIMATES:

Mark-Recapture Estimate. To complete a mark-recapture estimate of abundance, captured carp will be marked with a unique mark (e.g. a fin clip, a plastic tag, a PIT tag, or a radio-tag), measured for length and weight, and released back into the basin that they were captured. Subsequent surveys will note the ratio of marked to un-marked fish and a population estimate will begin to develop using this method of estimation. This method assumes that marked carp are redistributed with the unmarked population, meaning that sufficient time (upwards of one-week) must be given between the date of marking a carp to the recapture event (Chapman, 1951). It also assumes that no emigration or immigration of the species occurs in the lake during the survey period. This method of estimation will be evaluated throughout the project period in case one or more of these assumptions is being violated.



Figure 15. Measuring carp

Catch Per Unit Effort (CPUE) Survey. CPUE boat electrofishing surveys can be used to estimate carp abundance and to predict the density of adult common carp in some cases (Bajer, 2012). These surveys are completed in the late summer to early fall and over the span



Figure 16. CPUE Survey

of one to two months. Ideally, up to three (3) separate electrofishing surveys in each lake are conducted to establish an average CPUE. Surveys will consist of at least three (3) 20-minute transects that cover shoreline and littoral zones that are suitable habitat for carp. Time spent, number of carp captured, and length and weight data are recorded. A population and biomass estimate of common carp are then calculated using this data in a CPUE model developed for using the protocol and gear described and reflects the population at the time of the survey (Bajer et

al., 2012). An average of multiple surveys aims to develop a more robust estimate over a larger span of time.

5.1.2 CARP ABUNDANCE

OBJECTIVE 5.1.2A: Establish baseline abundance estimates for each of the carp management waterbodies in the PLSLWD.

For this plan, the abundance of carp is defined as the number of individuals and the amount of biomass present within each waterbody reported in kilograms per hectare. To determine the abundance of carp within the system, two methods have been deployed: a mark recapture population estimate and an electrofishing catch per unit effort (CPUE) model. The protocol used for these methods of estimation are described above. Current population estimates include:

Table 2. Carp Biomass & Phosphorus Loading

	CARP BIOMASS ESTIMATE (KG/HA)	PHOSPHORUS LOADING RATE (LBS/YEAR)
Spring Lake*	24.5 kg/ha ± 7.9	250.5
Upper Prior Lake*	418.0 ± 136.9	3,028.8
Arctic Lake	462.6 kg/ha ± 365.3	-
Buck Lake	unknown	unknown
Fish Lake	85.7 +/- 69.2	-
Jeffers Pond	unknown	unknown
Lower Prior Lake	9.4 kg/ha	-
Pike Lake	unknown	unknown

*** Carp Management Priority Lakes**

Action Item 5.1.2a - Develop abundance estimates for the remaining carp management lakes in Prior Lake Spring Lake Watershed that could have a potential impact on the two priority lakes and/ or upcoming TMDL lakes (Buck, Fish, Jeffers Pond, and Pike).

No data for carp abundance exists for the lakes identified above. This prevents PLSLWD staff from understanding the potential impact of carp on the water quality and ecological integrity of these waterbodies.

Action Item 5.1.2b – Develop a baseline understanding of recruitment patterns in waterbodies that connect to the PLSLWD main basins (Geis wetland, Northwood Pond, 12/17 Wetland, and others where adult movement is detected).

Although spawning observations can suggest areas for recruitment, the strength of these recruitment events is not known without sampling using nets or electrofishing in these basins. To help determine priority waterbodies to block movement to or from, it is recommended that steps be taken to sample basins suspected for recruitment. Radio-tags and PIT tags can be used to help document springtime movement by adults and basins can guide sampling decisions.

OBJECTIVE 5.1.2B: Track changes in carp abundance on managed lakes

As the PLSLWD implements carp management activities (removal, barriers, etc.), it will be important to monitor changes in carp abundance on these lakes to determine if these efforts are successful in suppression of carp population post-management or if adjustments to existing strategies or new strategies are necessary. See Part 3 for specific information on current populations of individual lakes.

Action Item 5.1.2c - Continue to collect & track abundance data on Spring and Upper Prior Lakes.

The PLSLWD began a focused effort on carp biomass removal as part of this long-term plan in 2017. An effort to track changes in the Spring Lake and Upper Prior Lake carp populations should continue throughout the lifetime of the project as additional biomass removal activities are completed for each lake identified in the plan. This activity can be practically achieved by conducting a series of boat electrofishing CPUE surveys in the fall and continued tracking of mark-recapture.

5.1.3 CARP SPATIAL USAGE

Determining how carp use the system is critical to the development of the carp IPM plan. Understanding movement patterns will allow PLSLWD staff to identify potential nursery sites, migration routes, and wintering areas where carp may be vulnerable to large scale biomass removal or blockage to movement to limit recruitment (Bajer, 2011).

To track movement, the PLSLWD has deployed several high frequency radio tags (Judas fish) as well as passive integrated transponder (PIT) tags with three (3) PIT tag monitoring stations. PLSLWD and WSB staff actively tracked radio-tags using a 3-element Yagi antennae in 2015 through the winter of 2018. Survey frequency was greatest during the spring spawning period (once/week) and during the winter aggregation period when ice conditions were safe enough for foot travel (once/week). The remainder of the year, radio telemetry surveys were completed on an infrequent and irregular basis.

The District has also acquired two stationary cameras to be placed at strategic locations to confirm carp migration routes and/or aggregations of carp during spawning season. These cameras are set up wirelessly and transmit real-time information so that staff can move quickly to coordinate carp removals at optimal times.

OBJECTIVE 5.1.3A: Identify carp aggregations on Spring Lake and Upper Prior Lake

Winter-time telemetry surveys and past studies have proven that carp tend to aggregate together in large groups during this season (Johnsen, 1977; Penne, 2008). This phenomenon

allows for these aggregations to be targeted for removal using under ice netting techniques, thus the identification of carp wintering areas on Spring Lake and Upper Prior Lake was determined to be a main objective in the 2015 carp management project.

Radio-tagged carp have been periodically monitored since 2015 to identify winter carp aggregation areas that could be targeted for carp biomass removal. Two (2) distinct sites were identified both of which commercial fishermen have been able to pull a seine net through.

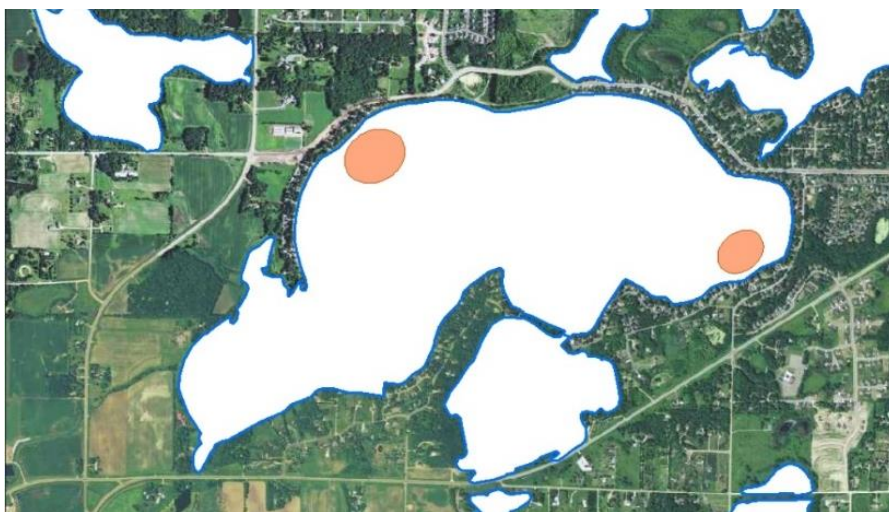


Figure 17. Identified Spring Lake Carp Aggregation Areas

Three full winters of telemetry data are available to identify winter aggregation areas on Upper Prior Lake and four (4) distinct sites have been identified where carp tend to aggregate, mainly in the winter. Locations 1-3 depicted on Figure 6 have been successfully seined, but location 4 has a significant presence of rocks on the lake bottom and is not suitable for netting.

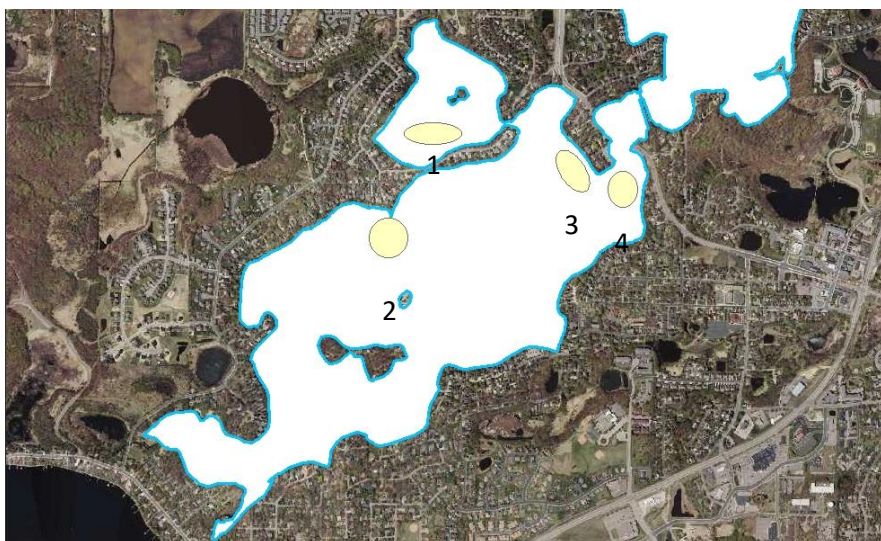


Figure 18. 2016-2019 Upper Prior Lake Carp Aggregation Areas.

Radio-tags will continued to be tracked, mapped and documented to identify new and continued areas that carp are congregating on Upper Prior and Spring Lakes.

Action Item 5.1.3 – Visually monitor carp at spawning areas to identify aggregations at connections to Spring and Prior Lakes.

Using staff, volunteers, and stationary cameras, monitor the locations at or near Upper Prior or Spring Lakes that are suitable for small-scale carp removals when fish begin aggregating in the spring. This information will be used to coordinate electrofishing, gill-netting, or seine netting carp removals with consultants and/or commercial fishermen.

OBJECTIVE 5.1.3B: Map migration routes throughout the carp management lakes system and identify connected nursery sites for Upper Prior and Spring Lakes.

Migration routes that allow access to shallow basins that carp exploit for use as nursery sites are the support mechanism for carp recruitment in those systems where carp spawn outside the main basins. Carp have evolved to seek out these sites since hard winters in Minnesota periodically freeze shallow basins resulting in winter-kill of most or all fish species. Absence of predator species, such as bluegill sunfish, greatly increase the chance for survival of carp eggs and larvae. Radio-tags and passive integrated transponder (PIT) tags and stationary receivers are currently being used to track the movement of carp each season (Appendix C).

Using the same radio-tags used in the Judas fish technique to find carp winter aggregations, carp movement out of the Spring Lake and Upper Prior Lake system is being studied using this technology. Several apparent surface connections exist on Spring Lake and Upper Prior Lake and in some cases, anecdotal information suggests that carp are using a connection even though no radio-tags have been detected moving. In response to this, the PLSLWD initiated a study using Passive Integrated Transponder (PIT) tags and three (3) unmanned receivers/loggers placed in streams to detect movement and quantify the extent of movement in locations of highest priority. Two additional PIT tag receivers will be implemented in 2020.

The following table provides information on current and future PIT tags and radio-tags:

	CURRENT ACTIVE PIT TAGS	2020 PIT TAGS	2021 PIT TAGS
Spring Lake	156	50	
Upper Prior Lake	230		
Arctic Lake	26	25	
Geis Wetland	114		
Fish Lake	0	50	
Pike Lake	0	50	

	CURRENT ACTIVE RADIO-TAGS	2020 RADIO-TAGS	2021 RADIO-TAGS
Spring Lake		5	5
Upper Prior Lake	12	5	5
Fish Lake		5	

In 2020, more fish will be tagged in Spring Lake, Arctic Lake, Fish Lake and Pike Lake with PIT tags to detect movement into or out of them. Small PIT tags (12 mm) should be purchased to implant into carp young of the year in case they are captured. PIT tag stations will be strategically placed in 2020 to better understand the migration between the systems (see map below), and adjusted in 2021.

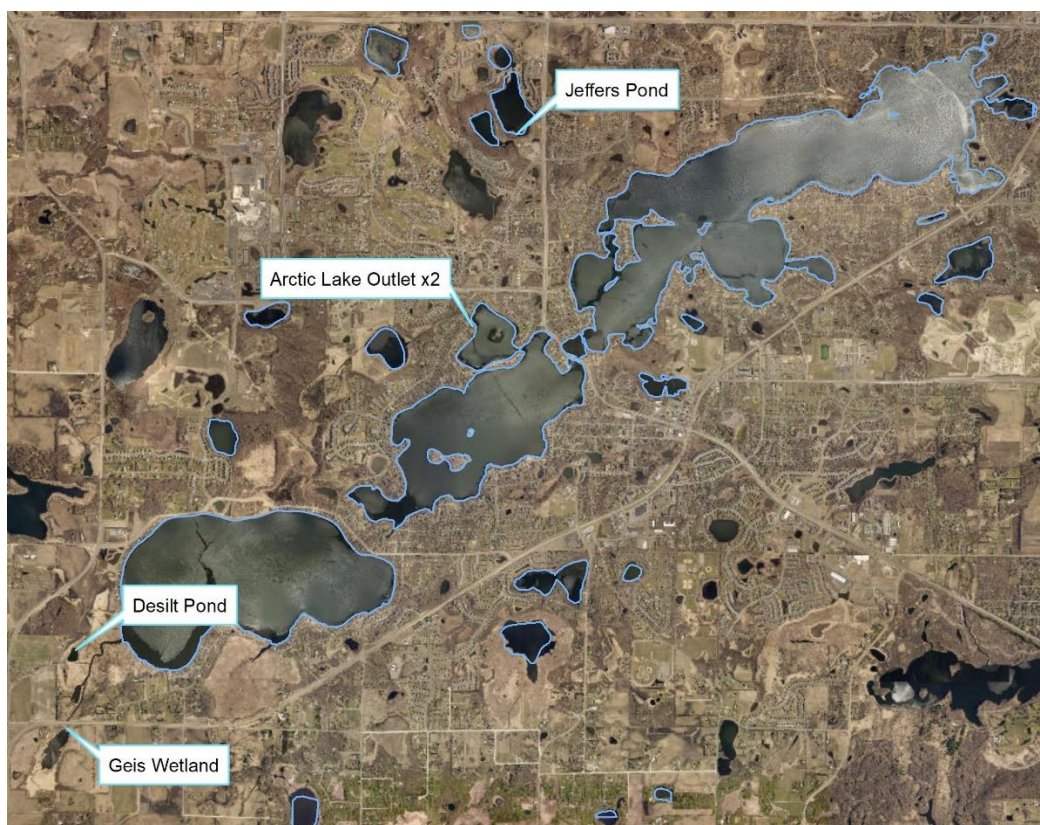


Figure 19. PIT tag receiver locations planned for 2020.

Tagged carp are suspected to have traveled between Upper Prior Lake and Arctic Lake after the barrier was installed in 2016. Additional PIT tags in Arctic will help confirm or deny whether or not carp are finding another way to travel between the two waterbodies.

PIT tag stations at the desilt pond and the Geis wetland will help the District verify if these barriers are sufficiently working to prevent carp migration during spawning.

5.2 PHYSICAL REMOVAL

Quantifying the carp population in terms of biomass density and number of individual carp, provides a basis for determining the level of removal necessary to achieve water quality and ecological restoration goals. As described in section 3.1, previous studies demonstrate that carp biomass densities of 100 kg/ha are ecologically damaging. To effectively manage carp below this threshold, an initial reduction to a density of 30 kg/ha has been recommended. By managing at a lower level, early detection of potential recruitment events may provide managers an opportunity to address the increase in carp population and biomass before it returns to a damaging level.

5.2.1 CARP REMOVAL GOALS

OBJECTIVE 5.2.1: *Reduce carp biomass to and sustainably manage carp biomass at 30 kg/ha in lakes within the PLSLWD.*

Multiple methods may be employed to physically remove carp biomass (see Section 3.1 Data Collection). These may include seines, electrofishing, gill netting, trap netting, box nets, fish traps, in-stream removal techniques. Seine netting may be the most effective and efficient method for removal if carp effectively aggregate and the lake is free of obstructions on the bottom, the lake contours are not too steep, and substrates are not too flocculent.

Action Item 5.2.1: Continue carp biomass removal on Upper Prior Lake and Spring Lake and their connected waterbodies that are recruiting to the lakes to reduce and maintain carp populations to at or below 30 kg/ha.

5.2.2 ACCELERATED CARP MANAGEMENT STRATEGIES

OBJECTIVE 5.2.2: *Develop alternative or innovative methodologies/techniques to improve or facilitate removal of carp biomass on waterbodies where carp may not aggregate, where obstructions prevent traditional removal operations, or where telemetry/PIT tag data suggest carp may be vulnerable.*

In many instances carp may become aggregated, but cannot be removed in the aggregation area due to obstructions on the bottom or along the shoreline. By developing alternative removal methodology, the PLSLWD will be able to expedite carp biomass removal and in some instances, make removal possible. By developing these techniques, the PLSLWD may be able to assist other water resource management entities in addressing carp management; especially in areas where traditional methods are difficult to employ.

The unified method may provide opportunity to enhance carp removal efforts by concentrating carp using underwater speakers; essentially using sound to herd carp to a specific location or drive them from undesirable removal locations.

Action item 5.2.2a: *Build, deploy, and test the unified method using radio telemetry and underwater sonar to observe response of carp to underwater sound.*

Herding Carp. Staff from WSB have been in contact with Illinois DNR and United States Geological Survey staff to gain a better understanding of the components and costs of such a system. The system consists of an MP3 player wired to underwater speakers and an amplifier to “pump” sound near an aggregation to drive them into nets or herd them to an area of the waterbody that is conducive to netting. This could be especially effective in an area like the northeast corner of Upper Prior Lake where rock obstructions exist near Knotty Oar Marina.

Training Carp. The District will also test the effectiveness of training carp using sound and bait. Multiple studies have shown that carp can be trained within two weeks of consistent noise and rewards and will remember this training for as long as 4-5 months afterwards. If the District can train carp to come to a location when they hear a specific noise, this could be used to create or enhance opportunities for carp removal efforts (seines, box traps, etc.).

Action item 5.2.2b: *Purchase seine net for the District specifically for Upper Prior Lake.*

There has been some hesitancy by commercial fishing crews to commit resources to netting Upper Prior Lake due to the presence of aquatic invasive species, (Eurasian watermilfoil, curly leaf pondweed, and zebra mussels) and the requirement to decontaminate nets and associated equipment. Based on weather, the decontamination period may be up to 21 days, meaning that commercial crews may not have gear to net other high priority lakes/projects. The purchase of a seine net by the District for use by commercial fishermen should mitigate this obstacle by providing a net that could be properly decontaminated or used repeatedly in the same waterbody while not restricting the fishing crews’ ability to continuously net in other waters.

Action item 5.2.2c: *Develop and deploy innovative carp trap nets that take advantage of spawning behaviors and migratory routes.*

Many locations on connections to Upper Prior and Spring Lakes have been identified as spawning migration routes. The District can exploit carp’s spawning migrations by setting up traps at these connections.

Newman Cage. This design is similar to a baited box net, but rather than having to “trigger” the net by pulling up the sides to capture the carp, this net provides constant capture of carp when set. Carp swim into the trap and cannot escape. Below is an approximate version:

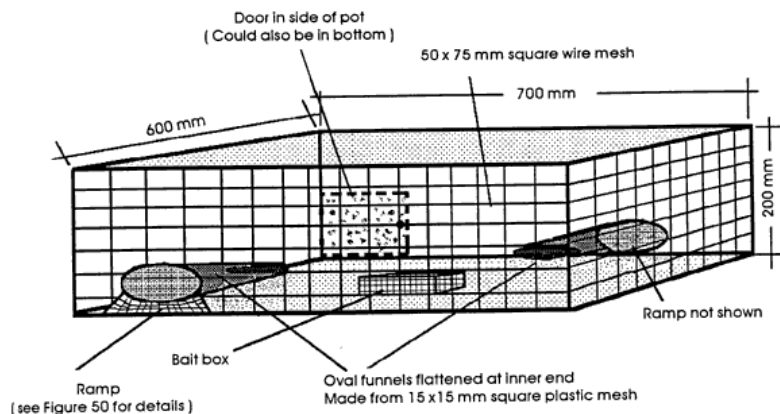


Figure 20. Newman cage reference example.

Push Trap. This trap takes advantage of the migratory behavior of carp as well as their propensity to “push” through barriers and is modeled conceptually on a design described in detail by Thwaites (2015). Initial laboratory results indicate that the push trap was successful in capturing 91% of adult carp in the experiment.

The design incorporates a row of stainless steel fingers mounted on a crossbar and set at angles that allow carp to push through and swim upstream into a collection basin. The rotating fingers are similar to those mounted at the ferric chloride weir, which rotate on a fixed cylinder. The fingers are set at a height that allow for the forward or upstream movement of the fingers that “open” the trap, but the fingers cannot swing back to allow carp to exit the trap.

Baited Box Trap. With assistance from volunteers, the District will use corn to bait carp in desired removal areas where a box trap has been set. Once a sufficient aggregation has been consistently feeding on the corn, staff will deploy the trap while carp feed in the darkness hours, raising the net walls of the box trap. Carp would then be “corralled” and pulled into a boat. Multiple traps can be set and raised simultaneously in several sites around the lake system.

5.3 BIOLOGICAL CONTROL

Research completed by the MAISRC showed that bluegill sunfish are the main predator of carp by preying on the eggs and larvae of carp young of year. Carp actively seek out nursery sites that are devoid of these predator fish or proliferate in lakes where bluegill abundance is low. A robust panfish and gamefish population may act as biological control and compliments the other IPM strategies (Weber et al., 2012). These predator fish are necessary to prevent carp recruitment after a significant portion of the carp biomass has been removed or to keep carp from establishing in lakes.

Larger gamefish may also prey upon carp young of the year, but that relationship is not as well documented. Also, carp growth rates are quite accelerated compared to other fish species. By the second growing season (age 1) carp may be > 12 inches, reducing the likelihood that piscivorous fish species will be able to prey upon them.

In 2017, the PLSLWD partnered with the University of Minnesota as part of a graduate research project to assess the effectiveness of using bluegill sunfish as biocontrol for common carp (Poole, 2018). The eastern basin at the 12/17 wetland restoration site was one of four study basins in the Twin Cities metro area used and stocked with both spawning carp and adult bluegill to measure the effective rate of bluegill predation on carp eggs. The results from the study indicate that bluegill predation had a major effect on the abundance of post-larval carp. In the 12/17 wetland study basin, there 0% recruitment of carp following the study period.

OBJECTIVE 5.3.1: *Manage lakes within the PLSLWD to support a robust gamefish and/or panfish population to effectively control carp as part of the IPM.*

MN DNR fisheries data is available for both Upper Prior, Lower Prior, Spring, and Fish Lakes and two (2) studies have been completed on Arctic Lake. The remaining lakes in the watershed have not been assessed. Existing data for these lakes show a variety of fish assemblages and abundances.

Action Item 5.3.1a - *Analyze existing fisheries data to identify trends and determine typical fishery conditions.*

An analysis of all existing fisheries data will provide insights into each of the fisheries where such data is available, identify data gaps, and determine if the fishery is functioning to biologically control carp where necessary. Habitat improvements and other restorative efforts may be identified through this effort as well as waterbodies that may need additional survey work where minimal data is available.

Action Item 5.3.1b - *Complete baseline fisheries assessment for waterbodies that do not have existing fishery data within the PLSLWD to determine the status of the fishery.*

Several lakes listed in section 3.1.1 do not have fishery data available. These lakes may be functioning as carp nurseries, gamefish nurseries, or providing some other benefit to the system. To fully develop the biological control component and reduce or eliminate carp recruitment, a thorough understanding of how all the waterbodies within the watershed act as a system will be necessary.

Baseline fishery assessment may be completed using a variety of methodologies including electrofishing and netting. Data collected during these assessments can be compared to existing fisheries data from Action Item 3.3.1 to prioritize where potential improvements could be made or what areas should be protected.

Action Item 5.3.1c – *Stock bluegills as needed in carp nursery locations connected to Upper Prior and Spring Lakes to prevent recruitment.*

Stock existing nursery site at the Geis wetland with 4-6" bluegill in spring before carp migration and spawning. Winter dissolved oxygen measurements show elevated oxygen levels (7 ppm), which is high enough to support winter survival. It is unknown if the habitat is sufficient to support bluegill recruitment, but stocked bluegill should survive based on measured dissolved oxygen levels. Based on recommended stocking rates, the Geis wetland will be stocked with 2,500 bluegills to reach the rate of 500 bluegill/surface acre. Other nursery locations will also be analyzed for potential bluegill stocking.

5.4 BARRIERS

Barriers can be an incredibly effective component of a carp IPM. Barriers may be employed to protect sensitive areas from the destructive foraging behavior of carp or prevent carp from exploiting migration routes to disrupt recruitment. Barrier placement should be balanced with the potential need for fish passage with respect to native gamefish. Placement of barriers is supported by the implementation of movement monitoring as described in section 3.1.2.

Existing carp barriers were placed throughout the Upper Prior and Spring Lake connections based on documented carp migratory information and include the following locations:

- Arctic Lake Outlet
- 12/17 Wetland (west side of Spring Lake)
- FeCl Weir (south of Spring Lake on Ditch 13)
- Desilt Pond (south of Spring Lake at Ditch 13 outlet)

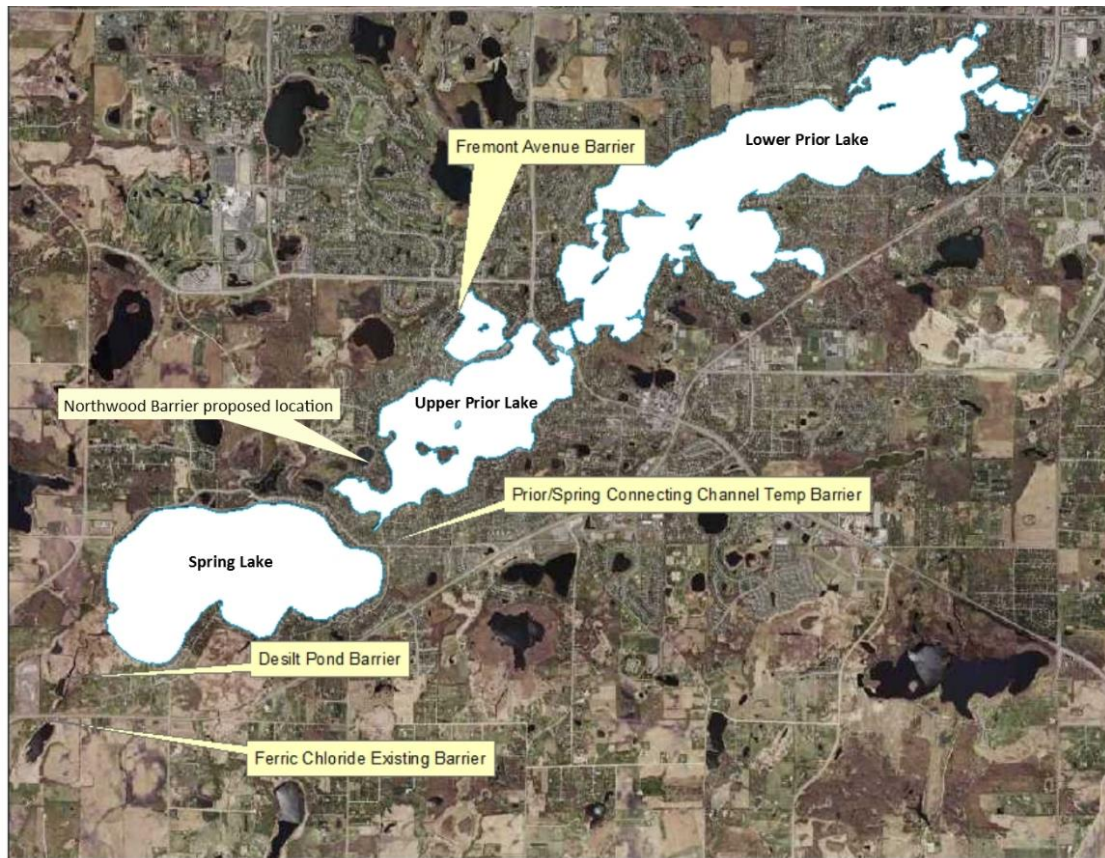


Figure 21. Barrier locations within the PLSLWD, including installed and proposed barrier sites.

OBJECTIVE 5.4.1: *Install new barriers within carp migration routes documented using PIT or radio tag technology or identified through fishery assessments.*

There is currently one new barrier (Northwood barrier) in plans for construction and an update to the existing FeCl Weir barrier. The District is investing other potential barrier locations including two wetland connections on the west side of Spring Lake and one wetland connection on Upper Prior Lake.

Action Item 5.4.1 - Upgrade FeCl barrier.

Modification plans have been finalized to repair and improve the design of the existing weir in consultation with PLSLWD staff. The new design is similar to the existing structure, but includes longer fingers that form a ramp and require carp to swim longer distances upstream outside of the water column. The new design also makes cleaning and removal of rebar fingers more simple and easy. Updated design plans are included in Appendix D.



Figure 22. Ferric Chloride outflow.

Action Item 5.4.1 – Install Northwood wetland barrier.

In the spring of 2017, one radio-tagged carp, originally tagged in Upper Prior Lake, was found to have migrated into the Northwood wetland. Upon inspection, splashing and movement of common carp was observed (spawning behavior). A simple barrier has been designed and will be constructed and installed in the fall of 2019 in an existing water control structure (Figure 13).

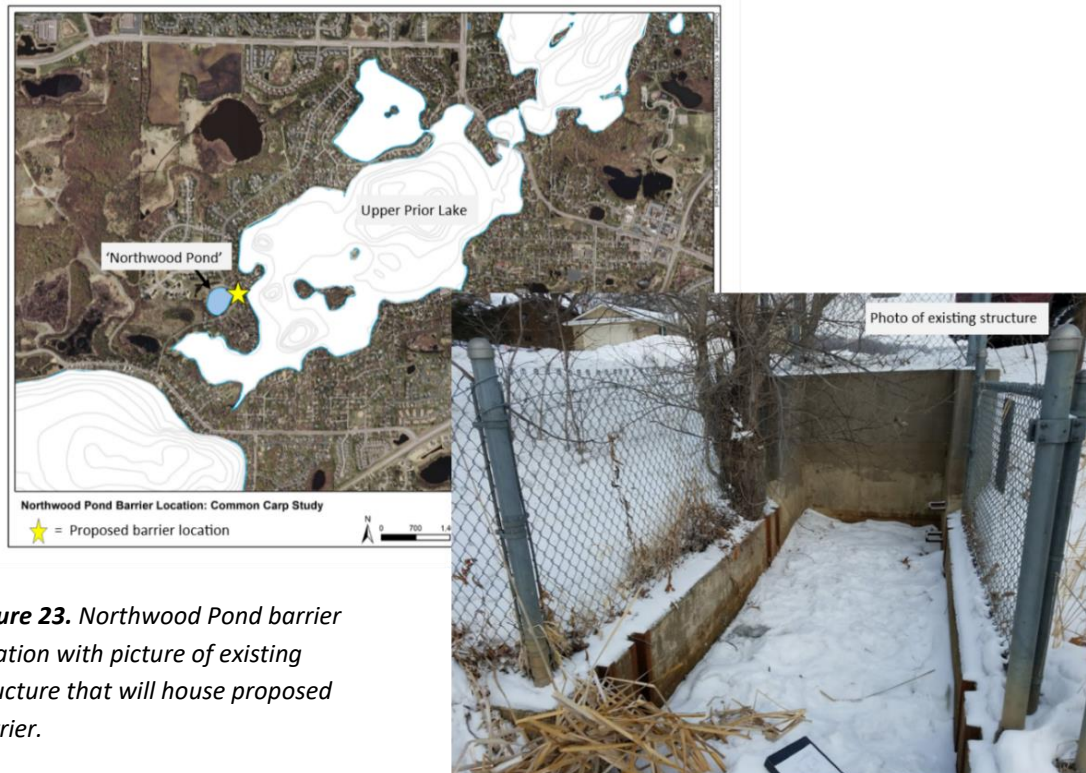


Figure 23. Northwood Pond barrier location with picture of existing structure that will house proposed barrier.

Action Item 5.4.2 - Continue to track carp movement with PIT and radio tags to identify other potential barrier sites along migration routes.

Annual surveys will be necessary to continue in order to capture the potential for additional migration routes as long term hydrologic cycles and other environmental influence and trigger carp movement. To document these movements, PLSLWD will continue monitoring radio-tags and PIT tags to site additional barrier sites.

5.5 EDUCATION

As with other long term restoration efforts, building public support through education and information sharing is critical in continuing the project from year to year and seeing it through until completion. In addition, creating stewards that work to further and foster restoration efforts rather than counteract those efforts promotes lasting efforts beyond initial project implementation.

OBJECTIVE 5.5.1: *Provide educational opportunities on aquatic invasive species (carp) to citizens within the watershed.*

The PLSLWD can create environmental stewards by educating youth about what aquatic invasive species (AIS) are, the impacts those species have on our natural environment, and what they can do to prevent or mitigate those effects.

Action Item 5.5.1 - *Continue to engage local youth through classroom interactions and hands on field exercises.*

PLSLWD staff and WSB scientists have visited four local classrooms as part of its carp management efforts in 2015-2017. Each visit involved a presentation on AIS with a focus on carp, hands on telemetry exercise, and an invasive species conceptual game. As part of its current grant programs, the District will continue these education efforts through 2021.

Action Item 5.5.2 – *Provide information to the public regarding carp management and grant programs through interactive website updates and through presentations to local groups, such as the lake associations.*

PLSLWD staff will continue to update its website with current information on the carp project. The District will also present information on the project to the Prior Lake Association, the Spring Lake Association, the District's CAC and to other groups as requested.

OBJECTIVE 5.5.2: *Develop citizen scientists to aid in collecting additional data on carp populations within the watershed and assisting with removals.*

As part of a long-term effort, the PLSLWD can engage its citizenry to assist with data collection through a program similar to the Citizen Assisting Monitoring Program (CAMP). Interested citizens can provide important observations and data that can inform this plan and management activities.

Action Item 5.5.4 - *Train citizen scientists to assist with baited box traps and training carp.*

Train citizen scientists to assist District efforts with carp removals. This could include regularly baiting carp with corn at desired locations or assisting with training carp with noise. There also may be opportunities where citizen scientists can assist in the carp removals on the lakes.

PART 6 - CARP MANAGEMENT SCHEDULE

The following table includes the carp activities anticipated for 2019-2021 in order to achieve the goals identified in Part 4.

			Spring 2019			Summer 2019			Fall 2019			Winter 2020			Spring 2020			Summer 2020			Fall 2020			Winter 2021			Spring 2021			Summer 2021			Fall 2021		
TASK	START	END	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Carp Tracking & Project Development																																			
Implant carp with PIT tags & Radiotags	Mar 2010	May 2021																																	
Install/monitor PIT tag reader stations	Apr 2019	Sep 2021																																	
Track PIT tags across waterbodies	Apr 2019	Dec 2021																																	
Update GIS location information & online maps	Apr 2019	Dec 2021																																	
Install stationary cameras at strategic locations	Sep 2019	Dec 2021																																	
Use underwater camera for tracking carp	Sep 2019	Dec 2021																																	
Purchase boat for tracking and removing carp	Oct 2020	Oct 2020																																	
Analysis: identify aggregation areas, migration routes and population status	Jun 2019	Dec 2021																																	
Carp Barriers																																			
Identify strategic locations for carp barriers	Oct 2019	Oct 2021																																	
Site analysis & design of barriers	Dec 2019	Mar 2021																																	
Install Northwood Barrier	Sep 2019	Nov 2019																																	
Install FeCl Barrier Redesign	Sep 2019	Nov 2019																																	
Install Barriers #2 & 3 (Location TBD)	Apr 2020	May 2021																																	
Install temporary barrier at Spring Lake Outlet	Apr 2020	Jul 2020																																	
Carp Removals																																			
Spring Lake carp removals	Nov 2019	Apr 2021																																	
Upper Prior Lake carp removals	Mar 2019	Apr 2021																																	
Geis wetland carp removals	Apr 2019	Oct 2021																																	
Pike Lake carp removals	Apr 2020	Oct 2021																																	
Purchase seine net for Upper Prior Lake	Oct 2020	Nov 2020																																	
Deploy Newman Cage in Geis wetland	Apr 2020	Jun 2021																																	
Deploy Push Trap in desilt pond	Apr 2020	Jun 2021																																	
Stock bluegills in Geis wetland	Apr 2020	May 2021																																	
Box Trap removals with volunteers	Apr 2020	Sep 2021																																	
Purchase additional speaker for herding/training carp	Jan 2020	Jan 2020																																	
Carp removals in other waterbodies (TBD)	Nov 2020	Dec 2021																																	
Education & Outreach																																			
Outreach mailings	Apr 2019	May 2020																																	
Lake Association meetings/presentations	Apr 2020	Jun 2021																																	
Update website with current information	Jan 2019	Dec 2021																																	
Educational activities with local schools	Sep 2019	May 2021																																	
Update IPM Plan																																			
Annually update plan to include new information	Sep 2019	Oct 2021																																	

Note: The above Carp Management Schedule includes work funded by a 319 Grant, a BWSR Watershed Based Funding Grant, and the PLSLWD District Levy.

PART 7 - SUMMARY

With the understanding that common carp play a role in the decline of water quality within the PLSLWD and with the knowledge that they are present, the goals and action items established in this plan will aid the PLSLWD in accomplishing its primary goal of managing and preserving the water resources across the watershed.

This plan is intended to be a living document; using adaptive management that may develop new management strategies and plan goals through data collection and analysis. As new data is collected and analyzed, current approaches, data collection efforts, and prioritization may change. The PLSLWD Carp IPM should be reviewed annually to provide updates to identified goals and action items and potentially add or modify goals as data collection may dictates. This plan incorporates an adaptive management approach. As data is collected and analyzed it will be used to inform the plan and possibly develop new objectives or approaches.

The PLSLWD Carp IPM has been developed as a guidance document for the management of common carp populations within the Prior Lake Spring Lake Watershed District. The PLSLWD Carp IPM supports the goals of the 2011 Upper Prior and Spring lake TMDL and goals established for individual waterbodies throughout the watershed.

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APPENDIX A

2018 CLEAN WATER PARTNERSHIP GRANT FINAL REPORT



Final Report Format

Clean Water Partnership Projects

Doc Type: Reporting/Final Report

Grant project summary

Project title: Carp Management in Spring Lake & Prior Lake (Contract number: 93193)
Organization (Grantee): Prior Lake-Spring Lake Watershed District (PLSLWD)
Project start date: 06/08/2015 Project end date: 06/30/2018 Report submittal date: 07/31/2018
Grantee contact name: Maggie Karschnia Title: Water Resources Project Manager
Address: 4646 Dakota Street SE
City: Prior Lake State: MN Zip: 55372
Phone number: 952-447-9808 Fax: _____ Email: mkarschnia@plslwd.org
Basin (Red, Minnesota, St. Croix, etc.)
/Watershed & 8 digit HUC:: Lower Mississippi River Watershed (07020012) County: Scott

Project type (check one):

- ☒ Clean Water Partnership
- ☐ Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development
- ☐ 319 Implementation
- ☐ 319 Demonstration, Education, Research
- ☐ TMDL/WRAPS Implementation

Grant funding

Final grant amount: \$67,323.00 Final total project costs: \$147,851.62
Matching funds: Final cash: \$64,743.22 Final in-kind: \$15,785.90 Final Loan: \$-0-
MPCA project manager: Chris Zadak

Executive summary of project (300 words or less)

Problem

In 2002, Spring & Upper Prior Lakes were listed on Minnesota's 303(d) List of Impaired Waters for nutrient/eutrophication biological indicators, and do not currently meet two of the three state eutrophication standards. Common carp management has been identified as a way to significantly reduce estimated P loading.

Waterbody improved

The goal accomplished with this project was to improve the water quality of Spring, Upper Prior, and Lower Prior Lakes by decreasing total phosphorus concentrations through the use of integrated pest management to effectively manage the common carp populations. Activities completed include:

- 1) Tracking carp to identify spawning grounds, migration routes, and aggregations areas
- 2) Installing barriers to prevent carp from accessing spawning areas
- 3) Removing a significant population of the carp to reduce internal loading
- 4) Create an integrated pest management plan for carp to guide future management

Project highlights

Partners in completing the projects were the City of Prior Lake, the Prior Lake Association and the Spring Lake Association. The City owns the property where the Northwoods carp barrier was designed; the PLA helped with outreach, and the SLA contributed funding to purchase a YSI attenuator for staff and volunteers to monitor carp.

Results

This grant project resulted in the successful completion of the following:

- Carp tracking: Thirty (30) carp were implanted with radio-tags which were tracked throughout the lakes to identify spawning grounds, migration routes, and aggregations areas.
- Removal efforts: Three successful seine events lead to the removal of approximately 32,000 pounds of carp from Spring Lake and 37,000 pounds of carp from Upper Prior Lake.
- Carp barriers: Based on information gained from tracking, five potential carp barrier locations were identified. Barriers were installed at three locations during the course of the project and design work was completed for two additional barriers.
- Community engagement: The lake associations and City staff actively participated in tracking and removals. This project gained a lot of attention from the local paper and through social media.

Partnerships (Name all partners and indicate relationship to project)

- City of Prior Lake:
 - Landowner for two of the carp barriers
 - City staff participated in carp events.
- Prior Lake Association:
 - Members volunteered boat and time for carp tracking
 - Volunteers attended carp seine events
 - Helped promote carp program on social media and through newsletter
- Spring Lake Association:
 - Contributed funding for a YSI antennae for volunteers and staff to track carp
 - Participated at carp events
 - Helped promote carp program through annual newsletter

Pictures

Go to <https://photos.app.goo.gl/qZS1Jd42PM5x43ZL7> to download photos of project.

Carp Tagging Event video here: https://www.youtube.com/watch?v=9heN0t_p4b4

Carp seine video here: <https://www.youtube.com/watch?v=DUjbRKGr084>

Body of main report

Section I – Work plan review

The following is a summary of work completed per objective and task for this grant project (as shown in italics):

Objective 1: Track movement and population of carp

Task A: Employ tracking methods on captured adult carp

Captured and surgically implanted 30 adult carp in Spring and Upper Prior Lake with high frequency radio transmitters to track migration routes and identify potential aggregation areas. In addition, all remaining carp captured as part of the radio-tagging efforts and those re-released during seine events were fin clipped and to complete a mark/recapture population estimate during seining efforts.

Task B: Identify migration routes and aggregation areas of carp

Completed site visits to the lakes and their connecting waterways to track the movement and aggregation of the carp population in preparation for seining efforts and to identify effective locations for carp barriers. Carp were also tracked post barrier installation to determine the effectiveness of the barriers.

Task C: Estimate carp population & biomass removal amount

Completed a count of the carp captured during seining efforts to generate a population estimate, combining the information with a weight and length subsample to obtain a biomass estimate.

Deliverables: *Carp location data and maps, calculated number of individuals and biomass of carp removal*

Objective 2: Remove a portion of carp population

Task A: Complete carp removal efforts

Coordinated carp removals through three successful seine events (two on Upper Prior Lake, one on Spring Lake). Completed test seines in new areas where the lake bottom condition was unknown and removed some obstructions.

Deliverables: *Calculated estimation of carp population and biomass removal amount*

Objective 3: Install carp barriers at strategic locations

Task A: Identify strategic locations for carp barriers

Using information gained from telemetry surveys, five strategic locations were identified for carp barriers that will inhibit carp recruitment.

Task B: Installation of carp barriers

Two carp barriers were installed during the course of the project, and design work for two additional barriers was completed. One location that was identified as a strategic barrier location was already getting a barrier installed through a separate grant.

Deliverables: *Installed two carp barriers and developed designs for two barriers to be installed in the future.*

Objective 4: Community outreach

Task A: Engage local community

Designed and maintained a [web page](#) on the PLSLWD website that communicates the project's use of integrated pest management to control the carp population and how this improves the water quality of Spring and Prior Lakes, also displaying [current locations](#) of radio tagged carp to keep community engaged/interested.

PLSLWD and the consultant presented information about the program to local school groups at both public and private schools. The carp tagging events were advertised and over 20 people were in attendance. A District Tour focused on carp projects had 24 people in attendance.

Task B: Lake Association meeting presentation

PLSLWD and the consultant presented information at a Prior Lake Association meeting about the project's use of integrated pest management and how these activities improve the water quality of Spring and Prior Lakes.

Deliverables: *Web page, Presentations*

Objective 5: Project Administration & Management

Task A: Develop a Project Work Plan

Developed a work plan that created a road map for the work that took place as part of this project.

Task B: Complete and submit semi-annual and final grant reports to MPCA.

Submit semi-annual reports and the final project report, along with supporting materials to the MPCA.

Task C: Project Coordination

District staff and the consultant coordinated together and with local partners to complete the objectives of the project and to obtain the required permits.

Deliverables: Work plan and semi-annual reports, necessary permits, integrated pest management plan

Section II – Grant results

- **Measurements:** Please describe your evaluation plan and its results.

Population Estimates:

- Spring Lake:

The baseline abundance estimate for Spring Lake was 84.9 kg/ha \pm 27.3. After the removal event on January 30, 2017, an updated biomass estimate for Spring Lake has been reported at 24.5 kg/ha \pm 7.9 or a population estimate of 1,046 \pm 337 individual carp remaining. These numbers reflect a reduction of nearly 70% of the carp population in this one removal event and puts the biomass at a level that should not greatly affect the ecological integrity of the lake and surpasses PLSLWD's goal of 30 kg/ha in Spring Lake.

- Upper Prior Lake:

The baseline abundance estimate for Upper Prior Lake was 531.3 kg/ha \pm 140.6. After the removal event on January 18, 2018 the updated biomass estimate for Upper Prior Lake has been reported at 418.5 kg/ha \pm 110.8 or a population estimate of 10,902 \pm 2,886 individual carp remaining. These numbers reflect a reduction of nearly 20% of the carp population in the removal event on January 18, 2018.

- Lower Prior Lake:

Carp biomass sampled in Lower Prior is well below the PLSLWD's goal of 30 kg/ha. While carp can move freely between Upper Prior and Lower Prior, radio telemetry suggest that carp do not move into Lower Prior often and stay near the western end when they do. In addition, electrofishing CPUE estimates are low for Lower Prior where two (2) electrofishing surveys completed in fall 2016, resulted in total catches of 2 and 0 individual carp.

Biomass Removals:

	Lake Size (ha)	ORIGINAL Calculated Carp Density (kg/ha)	RESULTED Calculated Carp Density (kg/ha)	Annual Load Reduction (lbs of P)
Spring Lake	237.55	84.7	24.5	615.52
Upper Prior Lake	168.35	531	418	818.80
Lower Prior Lake	380.40	9.7	9.7	0.00

Total calculated annual load reduction in Spring Lake and Upper Prior Lake: 1,434.32 lbs of phosphorus

- **Products:**

Presentations:

- Presentation to Local Schools: <https://www.plslwd.org/wp-content/uploads/2018/07/2015-Carp-Presentation-for-School-Classrooms.pptx>

Fact Sheets and Flyers:

- Carp Marking Event Flyer: <https://www.plslwd.org/wp-content/uploads/2018/07/Carp-Marking-Event.pdf>
- Carp Tagging Event Flyer: <https://www.plslwd.org/wp-content/uploads/2018/07/Carp-Tagging-Event.pdf>
- Name the Fish! Flyer: <https://www.plslwd.org/wp-content/uploads/2018/07/Name-the-Fish.pdf>
- Carp Management Program Fact Sheet: <https://www.plslwd.org/wp-content/uploads/2018/07/Carp-Management-Program-Fact-Sheet.pdf>
- Carp Seine Event Flyer: <https://www.plslwd.org/wp-content/uploads/2018/07/Carp-Seine-Event-Flyer.pdf>

Carp Barrier Design Plans:

- Northwood Carp Barrier: https://www.plslwd.org/wp-content/uploads/2018/07/03032-010-BARRIER-DESIGN_Proposed.pdf

- Drum-style Carp Barrier: https://www.plslwd.org/wp-content/uploads/2018/07/ProjectSchematic_withMap_DrumBarrier.pdf

Plans and Reports:

- June 2016 Project Status Update: https://www.plslwd.org/wp-content/uploads/2018/07/WSB-Carp-Management_SpringandPriorLakes_June2016Report.pdf
- December 2017 Project Status Update: https://www.plslwd.org/wp-content/uploads/2018/07/Carp-Mngmt_PLSLWD_December2017_Report_Final.pdf
- 2018 Carp Integrated Pest Management Plan: https://www.plslwd.org/wp-content/uploads/2018/07/2018_PLSLWD_CarpIPM_Final-approved.pdf

Articles:

- Scott County SCENE September 2015: https://www.plslwd.org/wp-content/uploads/2018/07/SceneSept-2015-Article_Stirring-Up-Trouble.pdf
- Prior Lake American Article November 4, 2015: https://www.plslwd.org/wp-content/uploads/2018/07/PLA-Article-11_4_15.pdf
- Spring Lake Association Newsletter April 2016: https://www.plslwd.org/wp-content/uploads/2018/07/Spring-Lake-Association-Newsletter_April-2016.pdf
- Prior Lake American February 11, 2017: <https://www.plslwd.org/wp-content/uploads/2018/07/PLA-Article-2017-02-11.pdf>
- Prior Lake Association Newsletter Spring 2017: https://www.plslwd.org/wp-content/uploads/2018/07/Prior-Lake-American_2017-Spring.pdf
- Spring Lake Association Newsletter Spring 2017: https://www.plslwd.org/wp-content/uploads/2018/07/SLA-Article-2017_Spring.pdf
- Prior Lake American January 20, 2018: <https://www.plslwd.org/wp-content/uploads/2018/07/PLA-Article-2018-01-20.pdf>
- Prior Lake American January 27, 2018: <https://www.plslwd.org/wp-content/uploads/2018/07/PLA-Article-2018-01-27.pdf>

- **Public outreach and education:**

Presentations: School classroom presentations were completed on 11/12/15 and 04/28/16 at local private and public schools, reaching approximately 120 students total. A presentation was also given to the Prior Lake Association meeting on October 26th, 2017 where there were approximately 30 people in attendance.

Outreach materials: The carp tagging, marking, and removal events were highly publicized as much as possible. A contact list was created for distribution of materials and information as events were scheduled, which included contacts from the Prior Lake Association and the Spring Lake Association. Once the carp were netted during seining efforts, the public was invited to come and view the carp, and also to help sort, weigh, and tally the carp during the removals. A website was created that highlights the project and provides a map of current locations of carp across the lakes, based on radio-tag information.

- **Long-term results:**

This project not only helped to dramatically reduce the internal loading in Upper Prior Lake and Spring Lake, it also provided population information so that PLSLWD can build long-term goals. The Spring Lake carp population is now at a manageable level. Carp barrier locations have been identified and some have been installed or will be installed shortly, preventing carp recruitment. Based on information gathered, an integrated pest management plan has been developed that will help guide carp management efforts for PLSLWD moving forward. The PLSLWD has documentation of accomplishments from this project, as well as a clear road map for next steps. Partnerships with the lake associations and the City have helped build public support for the program into the future.

Section III – Final Expenditures

See attached spreadsheet for itemized project budget and expenditures.

APPENDIX B

ARCTIC LAKE FISHERIES ASSESSMENT 2017



Fisheries Assessment

Arctic Lake (DOW #700085)

Scott County, Minnesota

June 2017

Prepared for:
Shakopee Mdewakanton
Sioux Community

Prepared by:
Tony Havranek & Mary Headrick
WSB and Associates, Inc.
477 Temperance Street
St. Paul, MN 55101



WSB Project No. 010071-000

Arctic Lake Fisheries Assessment June 2017

INTRODUCTION

Arctic Lake

Arctic lake is roughly a 8 hectare (20 acre) basin located on Shakopee Mdewakenton Sioux Community (SMSC) Land in Scott County, Minnesota. A nearly five-hundred acre subwatershed drains to this basin and is shed further downstream into Upper Prior Lake. Water within the Prior Lake Spring Lake Watershed District (PLSLWD) continues to drain north through a combination of underground and day-lighted streams to the Minnesota River. Throughout this system of interconnected lakes and wetlands, common carp *Cyprinus carpio* (carp) populations have been identified and assessments indicate they are at elevated levels in some basins, including Arctic Lake and Upper Prior Lake.

Common carp have the potential to be ecologically damaging in waterways where their population is elevated above 100 kg/ha (Bajer, 2013). Water quality declines as phosphorus enters the system at elevated levels and plant habitat declines due primarily due to turbidity caused by bioturbation and the excretion of waste associated with carp bottom feeding habits. Elevated phosphorus levels and a decline in aquatic vegetation allows for elevated levels of algae in the system and reduces aesthetic value and habitat used by zooplankton and a variety of native fish species.

Current development in the vicinity of Arctic Lake has established a subdivision of homes to the north whose occupants will be utilizing the lake for fishing and recreational opportunities. Management objectives have been identified by the SMSC and PLSLWD to foster improvements in water quality to support native game fish populations. Native game fish species that have been identified as a priority by the Natural Resource group at SMSC are Largemouth Bass and Bluegill Sunfish since they are currently present in the lake and have the potential to do well and provide for a productive recreational fishing opportunities.

A barrier structure was place on the culvert connecting the outlet stream of Arctic Lake and Upper Prior Lake in the spring of 2016 in a preemptive attempt by the PLSLWD to block the movement of carp between these two basins. A greater carp management project is currently being implemented in a subset of basins within the PLSLWD and population estimates are being developed and removal of some biomass has taken place in both Spring Lake and Upper Prior Lake. The cooperation and dedication between SMSC and PLSLWD to control the carp population will help both entities to reach overall management goals.

In 2014 Arctic Lake was surveyed with an electrofishing boat using a catch per unit effort model (CPUE) by researchers at Saint Mary's University of Minnesota. This survey suggested an elevated level of carp within the basin as adult estimates exceeded 250 kg/ha. It should be noted that a population estimate on young of the year carp was not calculated; however, a catch rate of approximately 698 young of the year carp per hour has been reported. This number is well above the average catch rate and suggests recruitment that could contribute to elevated levels of carp in this basin and other basins connected to Arctic Lake.

In early 2015 (open water period), the PLSLWD commissioned an attempt to remove carp from Arctic Lake using a commercial fishing crew. The commercial crew used a seine net (approximately 1,200 feet long and 20 feet deep). No radio tagged fish or sonar were available for guiding removal attempts, rather the netting was completed by “blindly” deploying the net around the lake shoreline. Four (4) carp were captured and removed during this netting attempt. It is unknown as to whether carp were present in small numbers or if carp evaded the net along the east/southeast side of the lake or deep water areas where the net did not extend to the bottom.

METHODOLOGY

An estimate of fish abundance is critical for addressing the potential for management activities in Arctic Lake. To do this, WSB conducted boat electrofishing surveys to develop a population estimate on common carp and a catch per unit effort index for largemouth bass, and bluegill sunfish. Carp population estimates were developed using a catch per unit effort (CPUE) model. A mark and recapture method was also attempted to estimate population for both carp and largemouth bass. These standard methods for estimating population can be compared to MN DNR standard surveys on similar type lakes so that a normal range can be established and methods can be repeated to gather relative abundance of fish present and be able to compare it to see changes over time.

In the span of three weeks, two (2) surveys were conducted to allow for mixing of marked fish before a recapture event to estimate populations, the first was on June 1, 2017, and the second event was on June 21, 2017. Transect times, electroshock boat settings, transect routes, type of event, survey crew participants, environmental conditions, and fish species with length and weight measurements were recorded and used to report CPUE.

Mark/Recapture (Species, gear, pros/cons)

Assumptions include: 1) the initial sample is representative of the entire population; 2) all animals taken in the initial sample are marked and the marks are lasting throughout sampling period; 3) marked fish are released and become distributed randomly in the population; and 4) marking does not affect the probability of survival or recapture. By using Chapman’s modifications to the Peterson’s estimate, it is also assumed that there is no emigration, immigration, or death/birth during the sampling period. Chapman’s modifications provides a more accurate estimate when the number of recaptures is small. In addition to using Chapman’s modifications, a poisson table was used to represent the variance in our data set and is reported as a range.

CPUE (Species, gear, pros/cons)

Catch per unit effort is reported for all fish species and is a function of catch rate and time spent. All species have been reported in this way so that numbers can be compared to statewide averages in catch rates reported by the Minnesota DNR. However, in the case of common carp, a model that was developed by researchers at the University of Minnesota has been used and compared to a known value of 100 kg/ha that has been shown to be a threshold to which common carp are known to be damaging to the ecosystem.

RESULTS

Large Mouth Bass

Using a mark/recapture estimate a population estimate for Large Mouth Bass has been developed. On June 1, 2017, thirty-seven largemouth bass were marked with a right pelvic fin clip and on July 21, 2017 twenty-five largemouth bass were captured and examined for marks. During the recapture event on June 21, 2017, one (1) largemouth bass was recaptured with a right pelvic fin clip and the remaining 23 captured were marked with a right pelvic fin clip to be used in future estimates if pursued. It should be noted that one (1) largemouth bass was determined to be a mortality and is not counted towards newly marked fish during this run. The mark-recapture estimate is 37.2 kg/ha. Using the Poisson values of 0.1 and 5.6 a range of values to represent the variance is reported as 91.7 to 550.0 kg/ha

CPUE estimates for largemouth bass are not as reliable a method for estimating abundance since it can misrepresent abundance due to the event-event and lake-lake variability in catch rates (Hangsleben et al.) To reduce this variability, the Minnesota Department of Natural Resources conducts electrofishing surveys for largemouth bass at night and multiple gear types are used to estimate abundance. For the limited scope and budget of this project period, CPUE estimates were calculated from a daytime survey and are used for a rough comparison and estimate for Arctic Lake. In Arctic Lake, catch rates between events was 66.1 catch/hour on June 1 and on June 21 there were 36.8 catch/hour (Table 1).

Data is reported similarly to the way the MN DNR reports standard boat electrofishing catch rates for Largemouth Bass (Table 1). Included in this table are catch rates per hour and length data from lakes surveyed by the MN DNR West Metro office in May of 2017. A comparison of catch rates in Arctic lake to catch rates in nearby waterbodies gives WSB confidence that Arctic Lake has a good baseline in bass population.

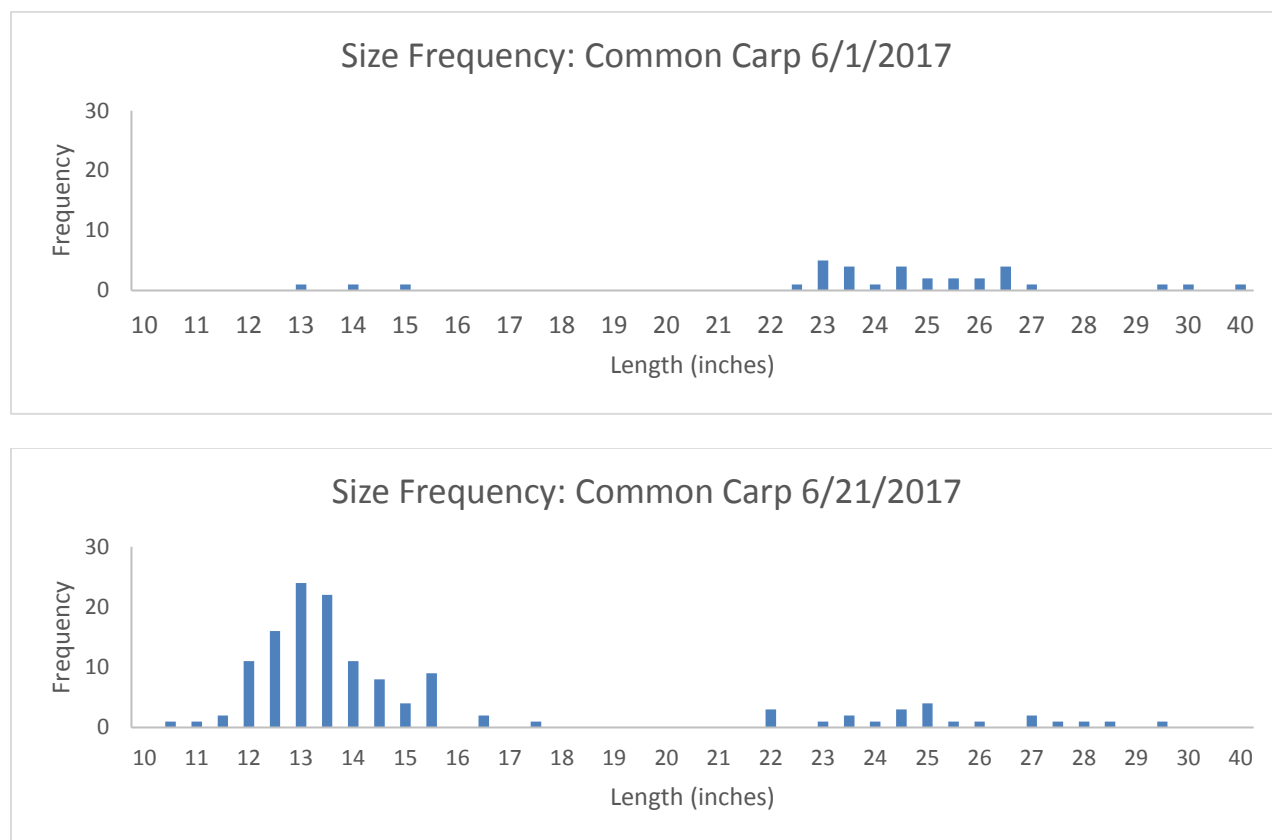
Table 1.

MN DNR West Metro: Spring 2017 Standard Electrofishing Surveys – Nighttime				
Lake (County) / Date	Species	Number per hour	Average length (in) / % over 15 inches	Max length (in)
Ann (Carver) 5/10/17	LMB	31	14.8 / 62%	22.1
Bavaria (Carver) 5/12/17	LMB	72	13.1 / 43%	20.4
Bryant (Hennepin) 5/18/17	LMB	48	10.6 / 14%	19.5
Hydes (Carver) 5/19/17	LMB	49	11.0 / 17%	19.1
Parkers (Hennepin) 5/11/17	LMB	52	14.7 / 57%	19.0
Sarah (Hennepin) 5/22/17	LMB	52	11.6 / 18%	19.7
WSB: Spring 2017 Electrofishing Survey - Daytime				
Lake (County) / Date	Species	Number per hour	Average length (in) / % over 15 inches	Max Length (in)
Arctic (Scott) 6/1/2017	LMB	66.1	12.1 / 27%	19.0
Arctic (Scott) 6/21/2017	LMB	36.8	10.8 / 24%	17.0

Common Carp

A mark-recapture estimate was also attempted for Common Carp. On June 1, 2017, thirty-two common carp were marked with a right pelvic fin clip and on July 21, 2017, a total of 239 were captured and examined for marks. During the recapture event on June 21, 2017, one (1) common carp was recaptured with a fin clip. Using the Chapman modification to the Peterson method, an estimate of 3,960 individual carp or 312 kg/ha was calculated and variance to this equation using a Poisson Distribution ranges from 94 kg/ha to 566 kg/ha. These estimates are being reported but should only be used as a rough guideline since a change in catch rates and size structure occurred over the two sampling events and this indicates a violation of the first assumption that the initial sample is representative of the entire population (Figure 1).

Figure 1.



Catch per unit effort estimates have been calculated using an electrofishing model developed specifically for common carp. CPUE was calculated for each transect using the catch rate and weights of fish specific to each transect and then averaged to report biomass estimates (Table 2). Each transect estimate is listed in Table 2 for all carp captured, for carp smaller than 20 inches, and for carp 20 inches and larger. The overall biomass estimate for carp present in Arctic Lake was 543.8 kg/ha, 277.5 kg/ha for the smaller fish, and 251.6 kg/ha for the larger fish. These numbers all represent a very high biomass of carp present in Arctic Lake. All carp captured in the recapture run on June 21 were terminated and removed from the system representing a reduction in biomass of approximately 36 kg/ha. This biomass was calculated using average weight of all fish captured on June 21.

Table 2.

Date	Species	Carp CPUE	Carp Length
6/1/2017	Common Carp	281.2	All
6/1/2017	Common Carp	266.6	Greater than 20 inches
6/1/2017	Common Carp	8.9	Less than 20 inches
6/21/2017	Common Carp	806.3	All
6/21/2017	Common Carp	236.7	Greater than 20 inches
6/21/2017	Common Carp	546.1	Less than 20 inches
6/1 & 21/2017	Common Carp	543.8	All
6/1 & 21/2017	Common Carp	251.6	Greater than 20 inches
6/1 & 21/2017	Common Carp	277.5	Less than 20 inches

Bluegill Sunfish

On both sampling dates, CPUE parameters were collected on bluegill sunfish and are reported in catch per hour (table 3).

Table 3

Date	Species	Catch/hour	Avg Length/ % over 15 inches	Max Length	Mark/Recap Estimate (kg/ha)*
6/1/2017	Largemouth Bass	66.1	12.1 / 27%	19.0	n/a
6/21/2017	Largemouth Bass	36.8	10.8 / 24%	17.0	37.2
Average	Largemouth Bass	51.5	n/a	n/a	n/a
			Avg Length / % over 19 inches		
6/1/2017	Common Carp	16.7	24.0 / 94%	30.6	n/a
6/21/2017	Common Carp	158.7	UK / 2%	29.1	311.5
Average	Common Carp	87.7	n/a	n/a	n/a
			Avg Length / % over 7 inches		
6/1/2017	Bluegill Sunfish	88.9	6.3 / n/a		n/a
6/21/2017	Bluegill Sunfish	150	6.5 / n/a		n/a
Average	Bluegill Sunfish	119.5	n/a	n/a	n/a

*Mark/recapture estimates are not to be relied upon to make management decisions since a desirable recapture rate of at least 3-4 fish was not achieved and some systematic statistical error likely to exist.

Discussion

With recapture rates being only one (1) for both largemouth bass and carp, it is likely that some systematic statistical bias in the population estimate exists. Ideally, at least 3-4 recaptures would be achieved to strengthen this estimate (Lockwood, 2000). Before removal efforts are pursued, it is recommended that additional efforts to mark a greater number of fish are employed so that a better estimate can be achieved in following capture events. This will reduce the statistical bias by increasing the probability of more marked fish being captured.

Due to sampling and environmental variabilities, the June 21 survey produced a larger proportion of small (< 15 inches) carp and a follow-up mark-recapture study should be explored to estimate the population of this cohort of common carp. This phenomenon also indicates that a representative sample was not captured in the electrofishing run on June 1 and the first assumption of running a mark-recapture estimate has been violated. In order to achieve a more reliable mark-recapture estimate, additional marking runs should be pursued and it is recommended that a larger portion of the population be marked with a unique fin clip before a recapture event is conducted.

Results and Recommendations

Survey results suggest that the population of common carp in Arctic Lake is elevated beyond the level that is known to be damaging in a system. Management of this invasive species has the potential to improve water quality and increase desirable fish habitat in Arctic Lake and should be pursued in order to meet SMSC management goals of providing a productive and aesthetically pleasing neighborhood fishing pond for residents.

According to our survey results, removal of nearly 3,600 kilograms of carp from Arctic Lake would bring the biomass down to the threshold level of 100 kg/ha. It is suggested that more marks be employed in the system before a removal effort so that more estimates can be run on the population to alleviate statistical errors and better estimate expected removal rates.

The connection between Arctic and Upper Prior Lake has been monitored periodically by WSB staff in 2016-17 in association with an ongoing common carp project being implemented by the Prior Lake Spring Lake Watershed District. Observations of carp in the stream and wetland between these basins in early June, 2016 suggest movement from Arctic or Upper Prior Lake. With the addition of a barrier on the culvert at the bottom of the outlet channel of Arctic Lake, it is assumed that there is now limited immigration or emigration of adult carp from Upper Prior Lake. However, movement of carp downstream from Arctic into this small wetland complex could contribute to the population of carp in Arctic and should be monitored.

As removal efforts are pursued, the wetland area downstream of Arctic lake as well as the wetland area north of Arctic Lake should be monitored to ensure no spawning activity is successful at recruiting fish back into the system. If it appears that this wetland is contributing to overall population in Arctic Lake, a deterrent to movement should be considered at these locations. Monitoring could include young of the year sampling that would require back pack electrofishing and/or trap net sampling in the stream reach and basin in the fall time when eggs would be hatched and carp were large enough to capture. Growth rates of remaining fish in the basin should be monitored since an increased availability of food resources in response to removal can promote growth.

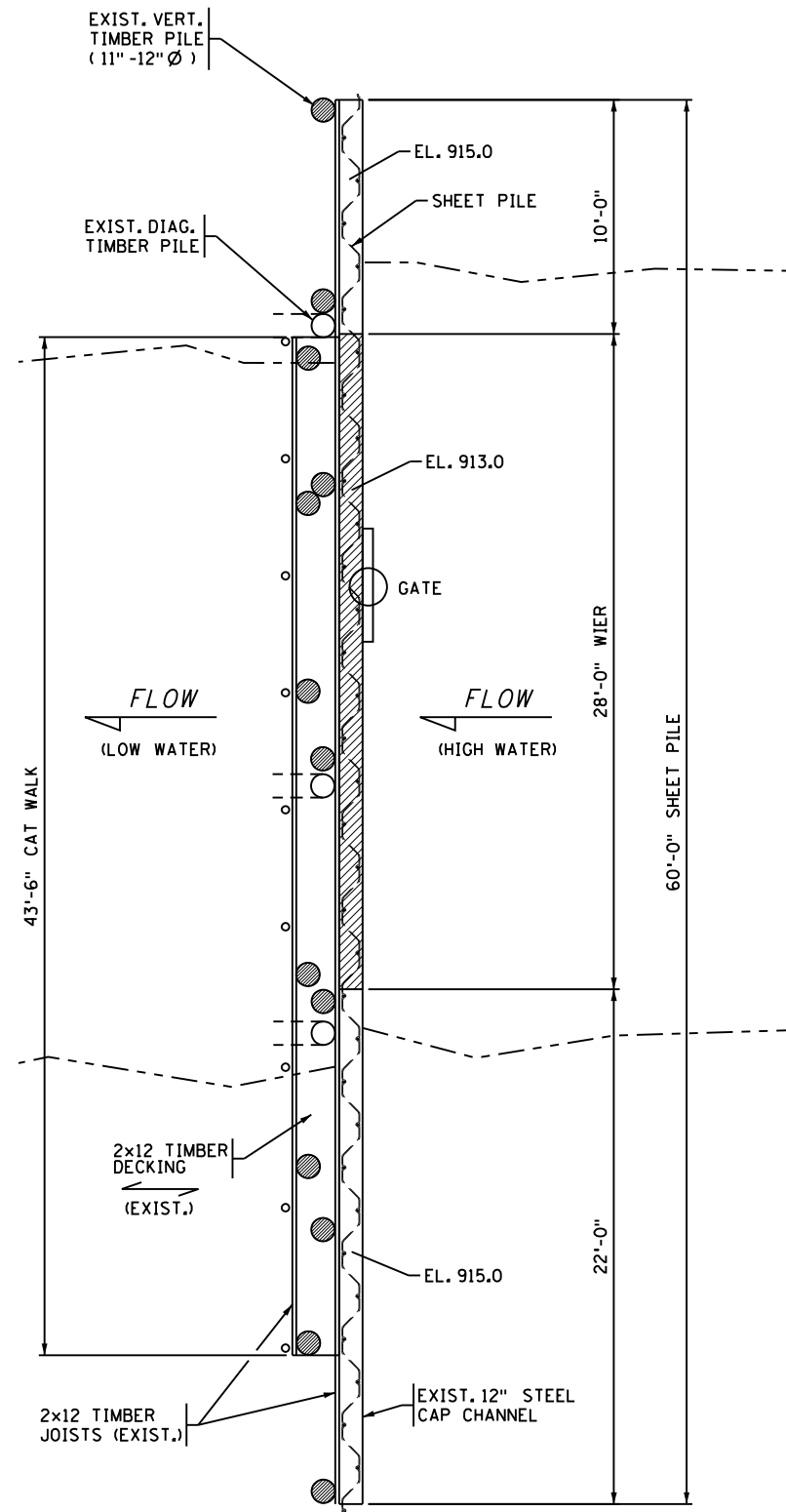
Both largemouth bass and bluegill sunfish are not a migratory species so it is expected that the limited connection with Upper Prior Basin should have little effect on these populations. As restoration efforts progress, it will be important to monitor the size structure in Arctic Lake. If few predators exist in the basin it is likely that the bluegill sunfish will be stunted in size due to the number of young that survive in each season. Subsequent sampling should follow a similar survey methodologies as described in this report to ensure that comparisons to catch rates and length/size frequencies to monitor successes.

Sources:

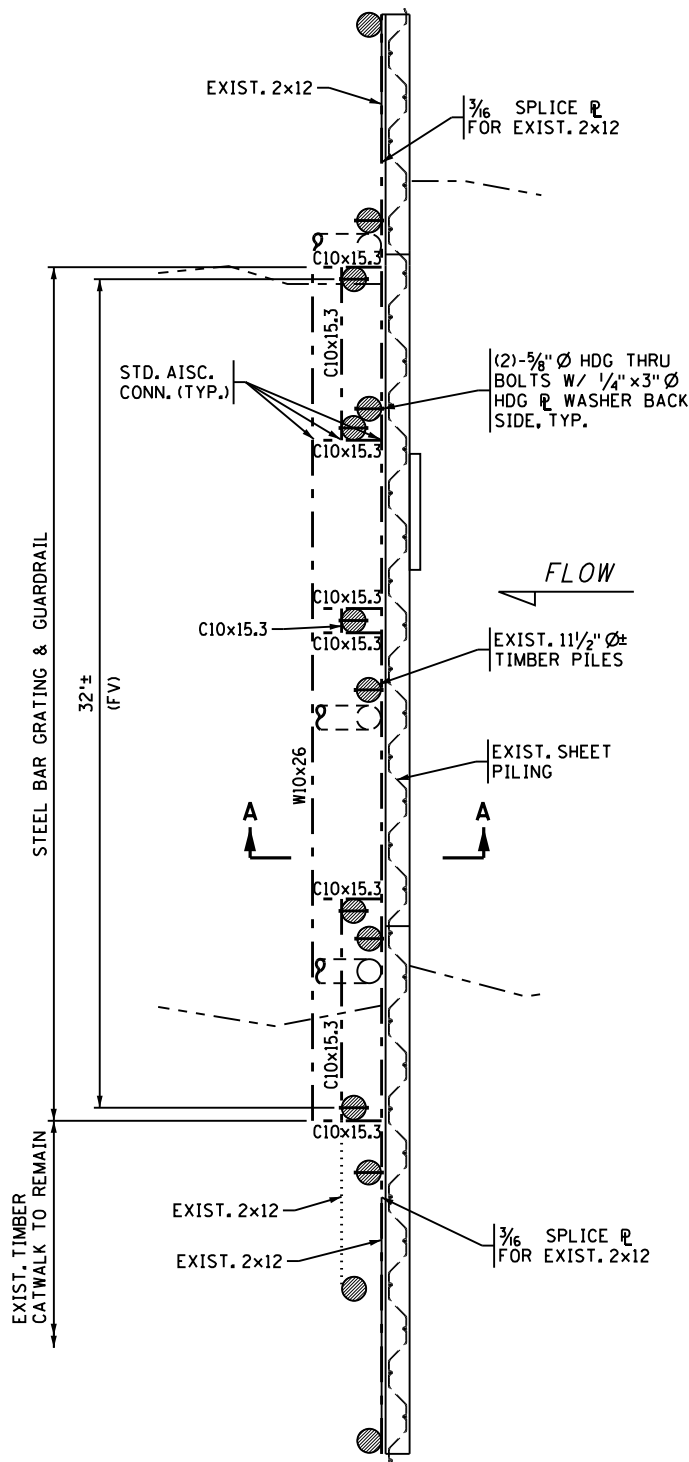
- Bajer, P.G., and P.W. Sorensen. 2012. Using Boat Electrofishing to Estimate the Abundance of Invasive Common Carp in Small Midwestern Lakes. *North American Journal of Fisheries Management* 32: 817-822.
- Bajer, P.G., G. Sullivan, and P.W. Sorensen. 2009. Effects of a rapidly increasing population of common carp on vegetative cover and waterfowl in a recently restored shallow lake. *Hydrobiologia* 632: 235-245.
- Morgan, D. K. and B. J. Hicks. 2013. A metabolic theory of ecology applied to temperature and mass dependence of N and P excretion by common carp. *Hydrobiologia* 713:135-145.
- Lockwood, Roger N and J.C. Schneider. 2000. Stream fish population estimates by mark-and-recapture and depletion methods. Chapter 7 *in* Schneider, James C (ed) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

APPENDIX C

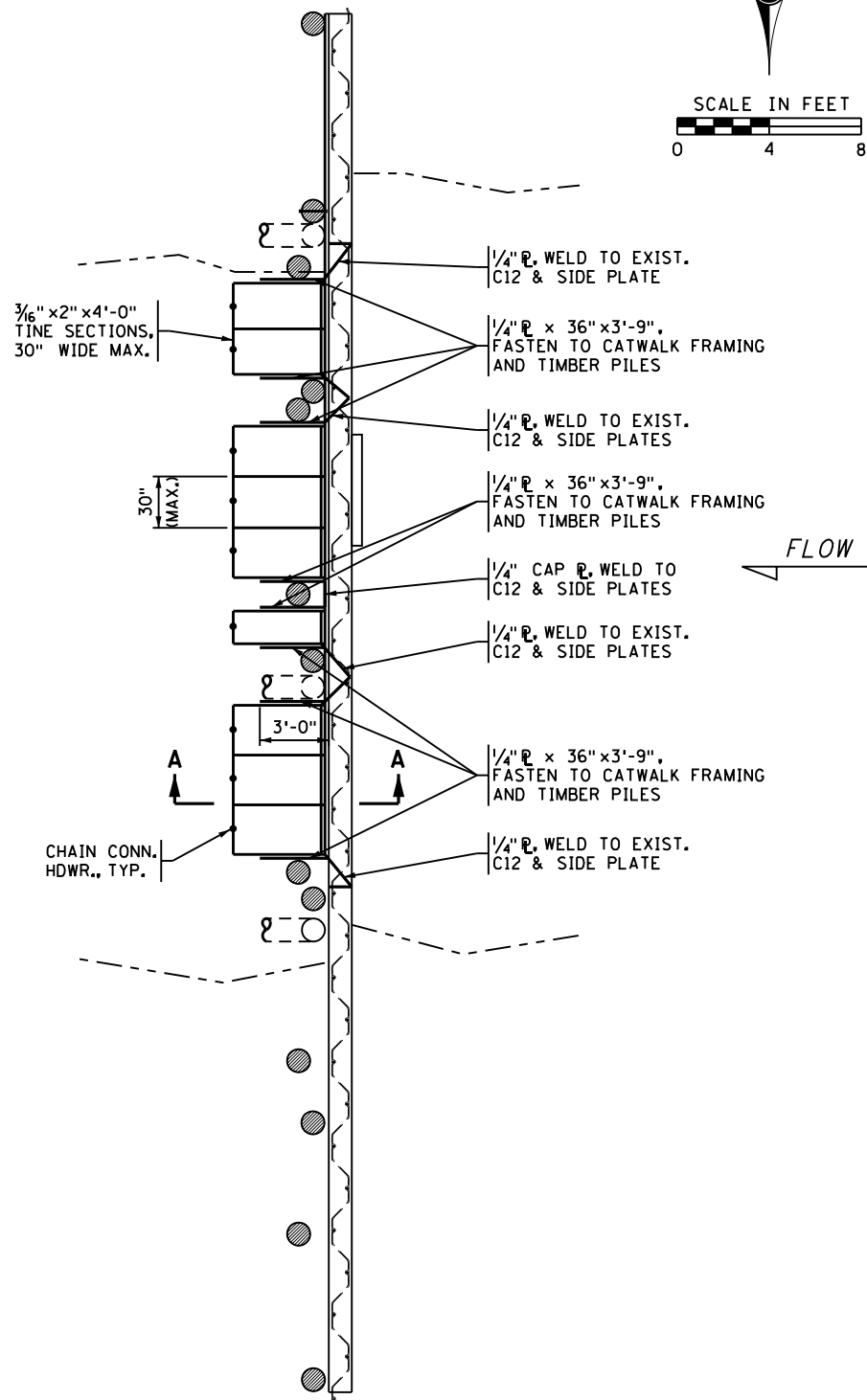
FERRIC CHLORIDE WEIR IMPROVEMENTS SITE PLANS



EXISTING PLAN



CATWALK FRAMING PLAN

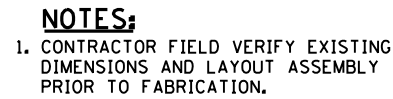


FISH BARRIER PLAN

NOTES:

1. CONTRACTOR FIELD VERIFY ALL TIMBER PILE LOCATIONS PRIOR TO FABRICATION.
2. DEMOLISH EXISTING TIMBER CATWALK AS SHOWN.

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.	
SCALE	AS NOTED
PLAN BY:	DESIGN BY:
CHECKED BY:	DRS
PROJECT NO.	XXX
RECORD COPY BY:	DATE:
SIGNATURE: _____ LICENSED PROFESSIONAL ENGINEER: DEAN R. SMITH DATE: _____ LIC. NO.: 42362	
CARP BARRIER FACILITY IMPROVEMENTS PROJECT PRIOR LAKE MINNESOTA	
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VERT BAR SPACING SLEEVE

PROJECT NUMBER 011235-000	DETAILS	SHEET S-02 of S-04
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LIBERTY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: _____ LICENSED PROFESSIONAL ENGINEER DEAN R. SMITH

DATE: 10/01/2011 LIC. No. 42362

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A. DESIGN DATA

1. DESIGN CODES

- (ALL LATEST EDITIONS UNLESS NOTED)

- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

- AMERICAN WELDING SOCIETY (AWS)

- INTERNATIONAL BUILDING CODE (IBC) '12

- LOCAL BUILDING CODE AMENDMENTS
2. DESIGN STRESSES

- STRUCTURAL STEEL (ASTM A992)

- STRUCTURAL PLATES, CHANNELS AND ANGLES (ASTM A37)

- STRUCTURAL TUBING (ASTM A500, GRADE B)

- STRUCTURAL PIPE (ASTM A53, GRADE B)

Fy 50,000 PSI

Fy 36,000 PSI

Fy 46,000 PSI

Fy 35,000 PSI
3. DESIGN LIVE LOADS

- CATWALK

40 PSF

B. SPECIAL INSPECTIONS

1. SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH IBC SECTION 1704 FOR THE FOLLOWING PORTIONS OF CONSTRUCTION:
- a. FABRICATORS, EXCEPT WHEN FABRICATOR MAINTAINS ONGOING INSPECTIONS BY AN APPROVED INDEPENDENT INSPECTION OR QUALITY CONTROL AGENCY.

b. STEEL CONSTRUCTION (AS DETAILED IN TABLE 1704.3)

C. GENERAL INFORMATION

1. STRUCTURAL WORK PERFORMED IN BID PACKAGE INCLUDES: DEMOLITION, FISH BARRIER, CATWALK STRUCTURE.

D. DEMOLITION & ERECTION

1. COORDINATE ALL DEMOLITION WORK WITH CONTRACTOR(S) RESPONSIBLE FOR CONSTRUCTION WORK.
2. CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING AND SHORING FOR STRUCTURE STABILITY DURING DEMOLITION AND ERECTION AND UNTIL ALL STRUCTURAL ELEMENTS ARE PLUMB AND SECURED.

E. UNDERGROUND UTILITIES

1. CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY-TO-STRUCTURE CONFLICTS.

G. STEEL CATWALK SRTUCTURE

1. STEEL ERECTOR SHALL PROVIDE THE NECESSARY BRACING FOR STRUCTURE STABILITY DURING ERECTION AND UNTIL ALL STEEL IS PLUMB AND SECURED.
2. HOT DIP GALVANIZE ALL STEEL MEMBERS.
3. TOUCH UP WELDS AND OTHERWISE DAMAGED COATING WITH 3-COATS OF COLD GALVANIZED PAINT. GALVANIZE ALL BOLTS EXPOSED TO WEATHER.
4. ALL WELDS ARE FILLET WELDS UNLESS OTHERWISE NOTED.
5. MINIMUM FILLET WELD SIZE IS THE SMALLER THICKNESS OF THE TWO PIECES BEING JOINED LESS 1/16".
6. WELD A MINIMUM OF 50% OF THE LENGTH OF ALL CONTACT SURFACES, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
7. PROVIDE WELDER CERTIFICATION INFORMATION APPLICABLE TO THE WELDING TO BE PERFORMED FOR EACH WELDER (BOTH SHOP AND FIELD WELDS).
8. CATWALK GRATING TO CONSIST OF PREFABRICATED STEEL BAR GRATING PANELS. BEARING BARS ARE TO BE 1" x 3/16" AT 1-3/16" C.C. SERRATED SURFACE. PROVIDE MANUFACTURER'S SUBMITTAL AND SAFE LIVE LOAD INFORMATION PRIOR TO ORDERING GRATING. MIN. SAFE LIVE LOAD IS 40 PSF UNIFORM LOAD WITH LESS THAN 1/4" DEFLECTION AT THE DESIGN SPANS.
9. GRIND SMOOTH ALL SHARP EDGES.

H. ABBREVIATIONS

- BOT = BOTTOM

CL = CENTER LINE

CJ = CONSTRUCTION JOINT

CJT = CONTROL JOINT

CONCR = CONCRETE

DBE = DECK BEARING ELEVATION

DWGS = DRAWINGS

DWLS = DOWELS

EF = EACH FACE

EW = EACH WAY

EXP = EXPANSION

FFE = FINISHED FLOOR ELEVATION

FS = FAR SIDE

HK = HOOK

HSC = HEADED SHEAR CONNECTORS

IF = INSIDE FACE

JT = JOINT

MIN = MINIMUM

MAX = MAXIMUM

MK = MARK

NS = NEAR SIDE

OC = ON CENTER

OF = OUTSIDE FACE

PC = PILE CAP

P/T = POST TENSION

R = RADIUS

REQ'D = REQUIRED

SOG = SLAB-ON-GRADE

SPA = SPACE, SPACES, SPACED

STL = STEEL

TBE = TOP OF BEAM ELEVATION

TFE = TOP OF FOOTING ELEVATION

TPCE = TOP OF PILE CAP ELEVATION

TPE = TOP OF PARAPET ELEVATION

TSE = TOP OF SLAB ELEVATION

TWE = TOP OF WALL ELEVATION

TYP = TYPICAL

UNO = UNLESS NOTED OTHERWISE

VIF = VERIFY IN FIELD

WL = WIND LOAD

WP = WORK POINT

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SIGNER: _____

LICENSED PROFESSIONAL ENGINEER

SEAN R. SMITH

DATE: 10/01/2019

LIC. NO. 42362

SCALE: _____

AS NOTED

DESIGN BY: _____

PLAN BY: _____

SMH

CHECKED BY: _____

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DATE: _____

EXPLANATION: _____

PROJECT NUMBER 011235-000

STRUCTURAL NOTES

SHEET S-03 of S-04

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**CARP BARRIER
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PRIOR LAKE MINNESOTA**

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SIGNED: _____ LICENSED PROFESSIONAL ENGINEER BEAM R. SMITH
 DATE: 10/10/2008 LIC. No. 42362

PROJECT NO.	DATE	EXPLANATION
SCALE	AS NOTED	
PLAN BY:	DESIGN BY:	
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CHECKED BY:	PROJECT NO.	
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APPENDIX D

NORTHWOODS CARP BARRIER SITE PLANS

SCALE: #####
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PLAN BY: ###
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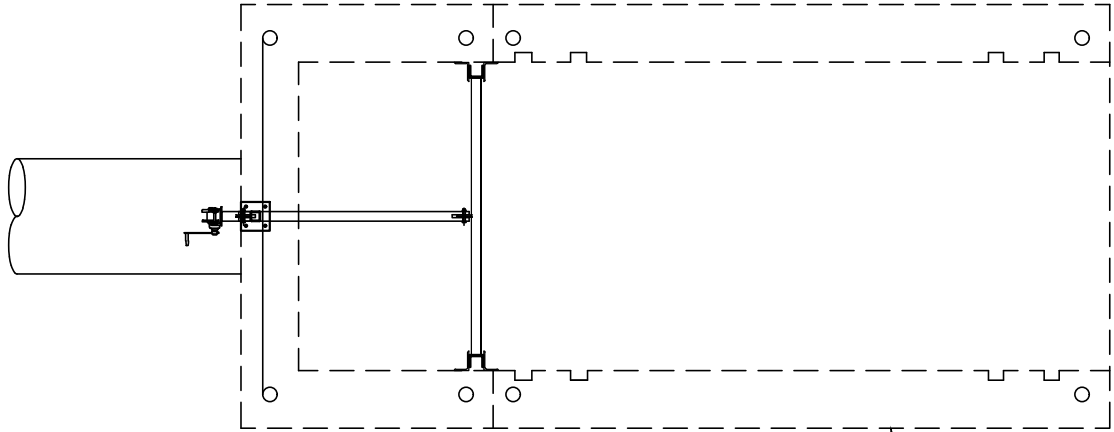
REVISIONS	
NO.	DESCRIPTION

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.

DATE: ##### LIC. NO: ###

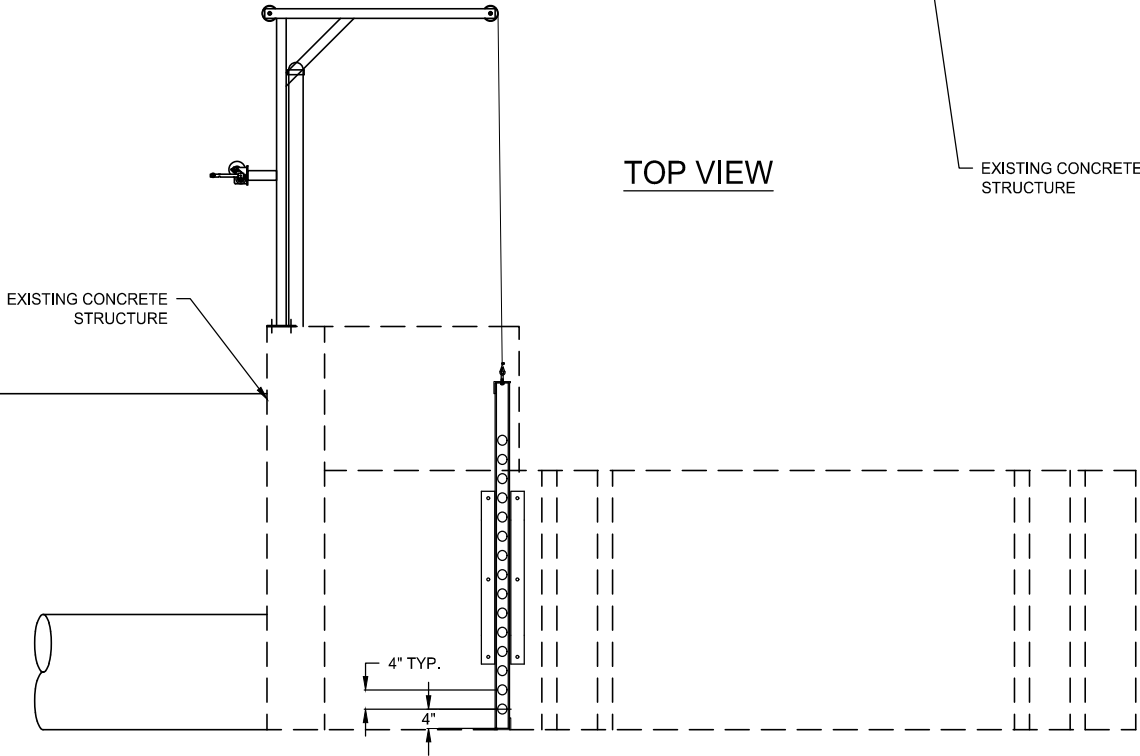
NORTHWOODS (PLSLWD)
BARRIER DESIGN

BARRIER AND
BARRIER LIFT

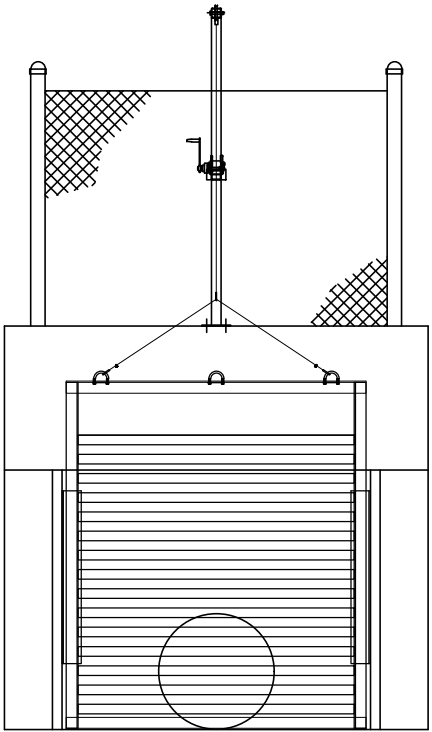


TOP VIEW

EXISTING CONCRETE
STRUCTURE



SIDE VIEW



FRONT VIEW



WSB PROJECT NO.:
03032-010

SCALE: #####
DESIGN BY: ###
PLAN BY: ###
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REVISIONS	
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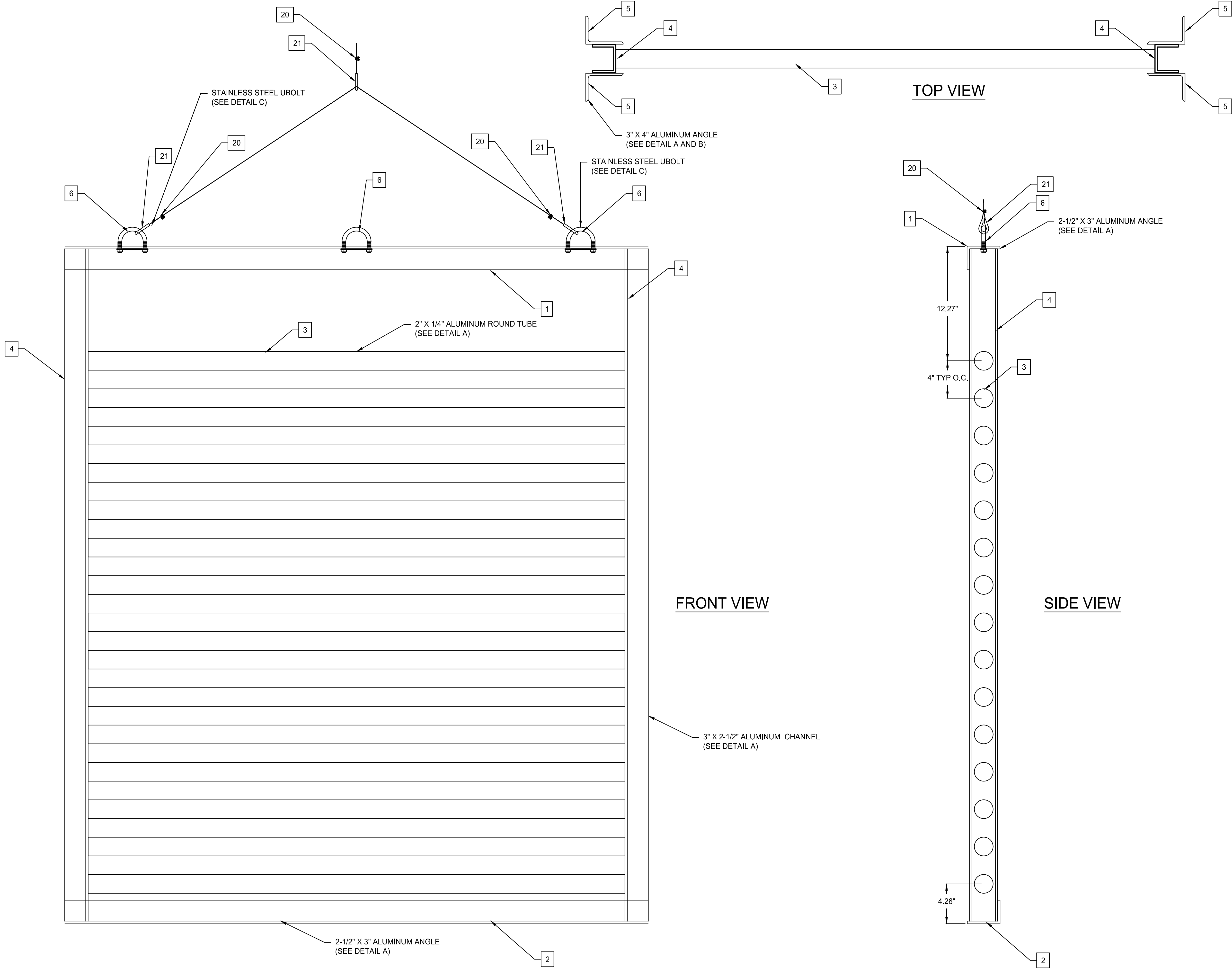
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OR REPORT WAS PREPARED BY ME OR UNDER MY
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LICENSED PROFESSIONAL ENGINEER UNDER THE
LAWS OF THE STATE OF MINNESOTA.

DATE: #####
LIC. NO: ###
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NORTHWOODS (PLSLWD)
BARRIER DESIGN

BARRIER

SHEET
2



SCALE: #####
DESIGN BY: ###
PLAN BY: ###
CHECK BY: ###

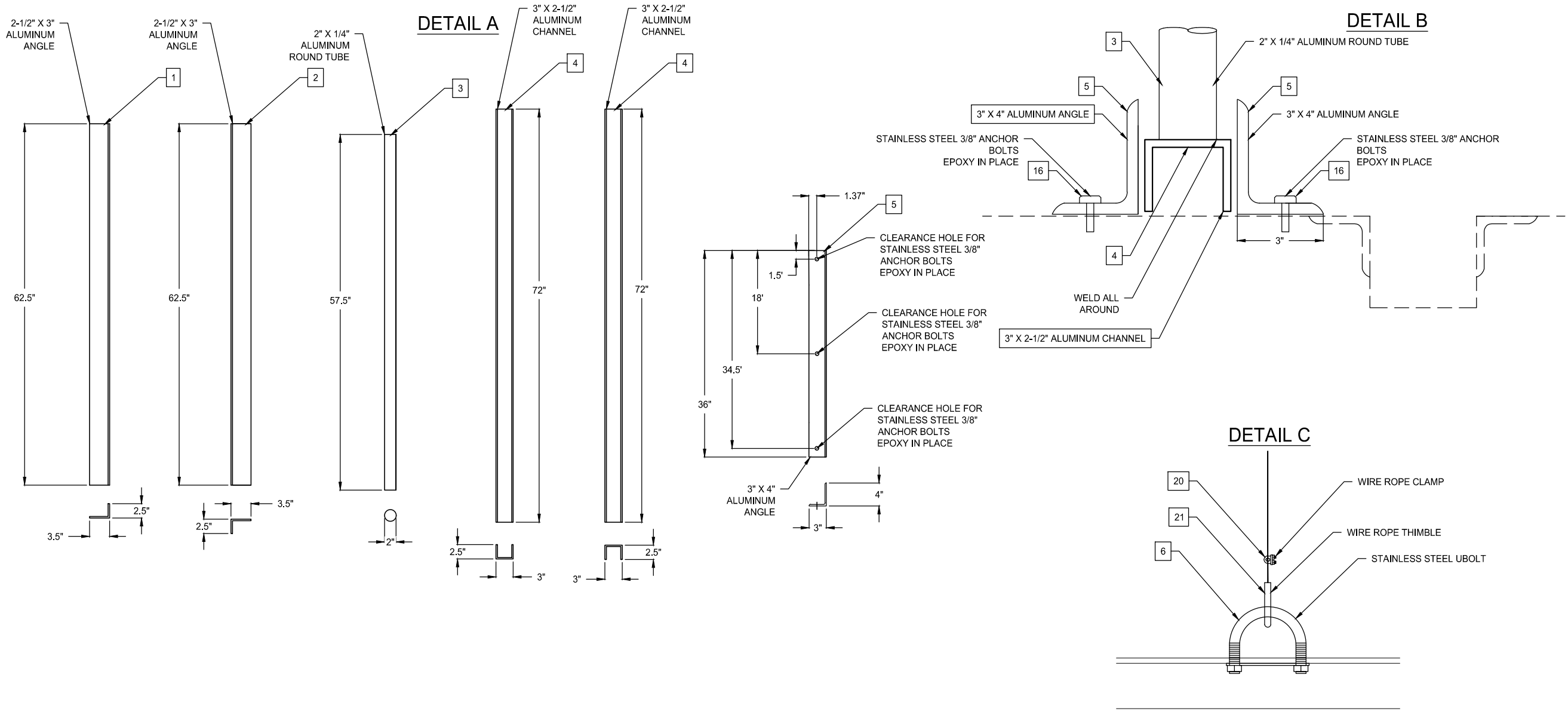
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DATE: ##### LIC. NO: ###

NORTHWOODS (PLSLWD)
BARRIER DESIGN

BARRIER PARTS
AND DETAILS



REVISIONS	
NO.	DESCRIPTION

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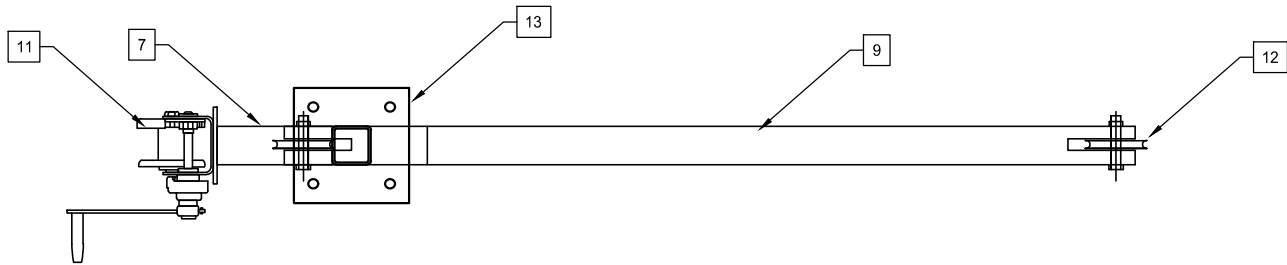
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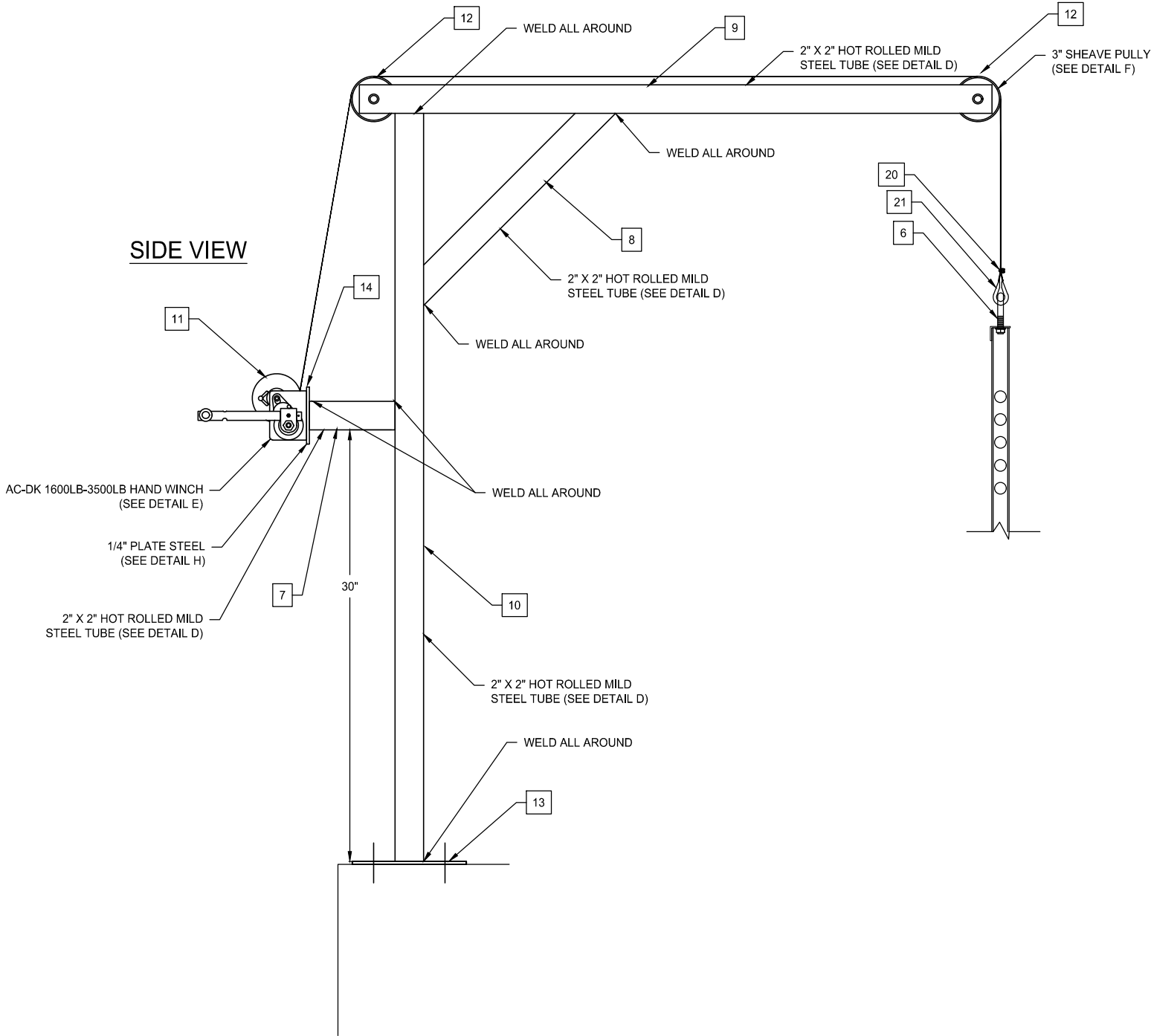
NORTHWOODS (PLSLWD)
BARRIER DESIGN

BARRIER CRANE

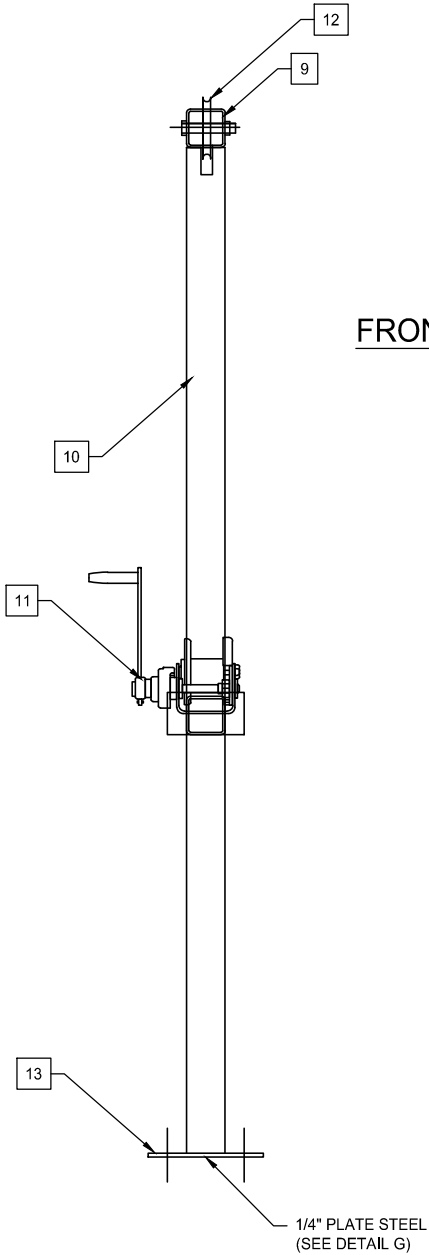
TOP VIEW



SIDE VIEW



FRONT VIEW



REVISIONS	
NO.	DESCRIPTION

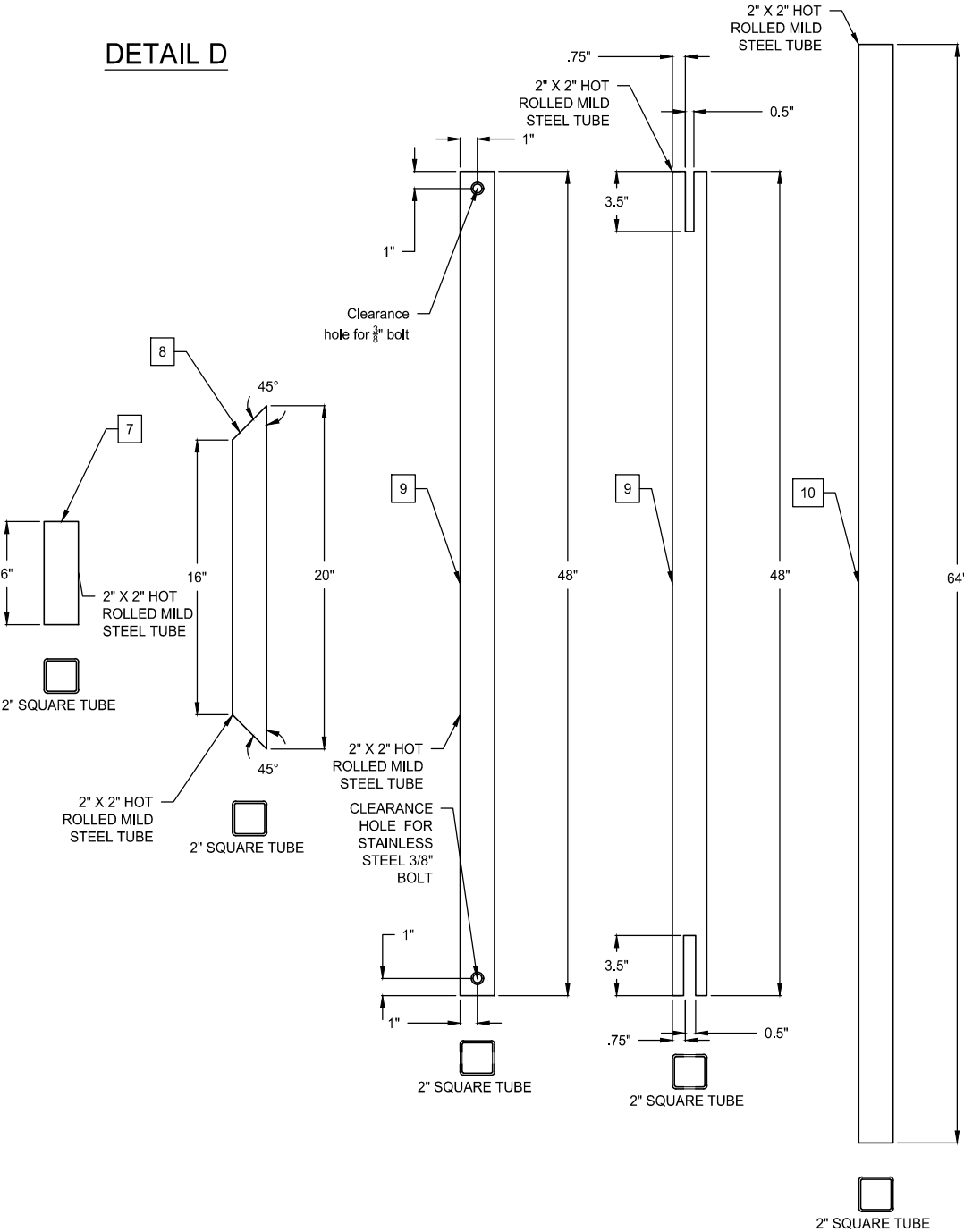
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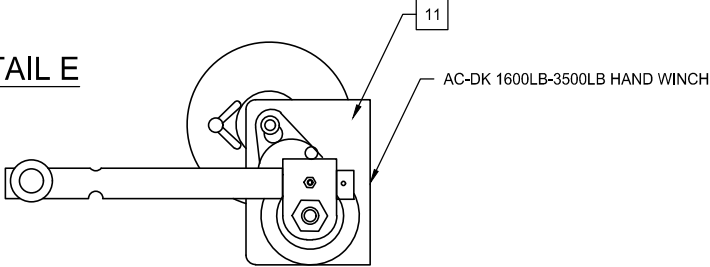
NORTHWOODS (PLSLWD)
BARRIER DESIGN

BARRIER LIFT
PARTS AND
DETAILS

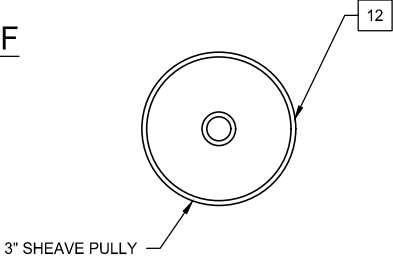
DETAIL D



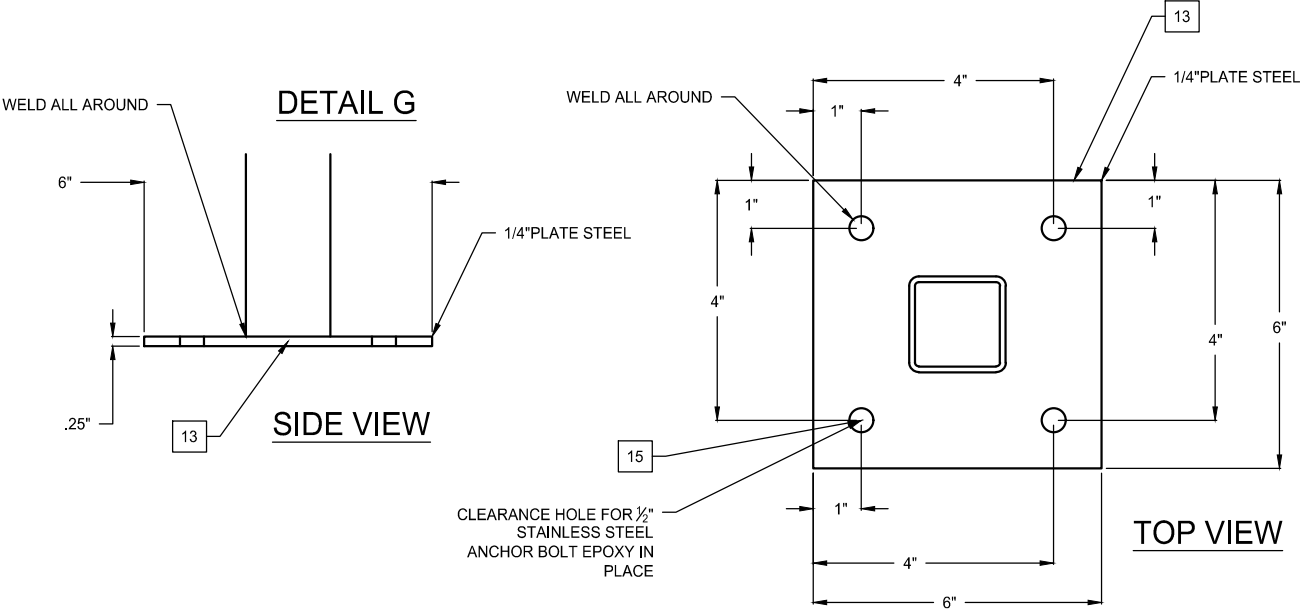
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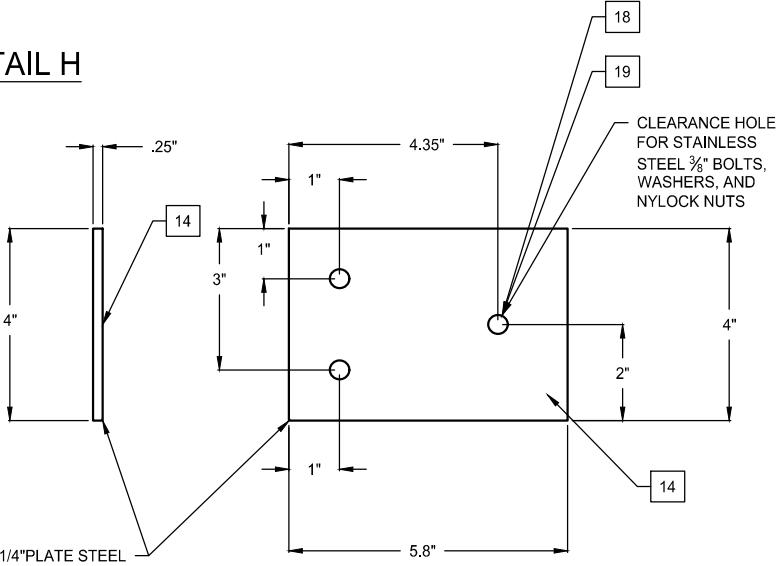
DETAIL F



DETAIL G



DETAIL H



WSB PROJECT NO.:
03032-010

SCALE:#####

DESIGN BY:###

PLAN BY:###

CHECK BY:###

REVISIONS

NO.	DATE	DESCRIPTION

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#####

DATE: ##### LIC. NO: ###

NORTHWOODS (PLSLWD)
BARRIER DESIGN

PARTS

SHEET
6

ITEM	QTY	SIZE	DESCRIPTION
1	1	62 1/2"	2-1/2" X 3" alumimum angle
2	1	62 1/2"	2-1/2" X 3" alumimum angle
3	15	57 1/2"	2" X 1/4" aluminum round tube
4	2	72"	3" X 2-1/2" aluminum channel
5	4	36"	3" X 4" aluminum angle
6	3	2" X 1-1 /2" X 3/8"	stainless seel ubolt with plate and nuts
7	1	6"	2" X 2" hot rolled mild steel suare tube
8	1	20"	2" X 2" hot rolled mild steel suare tube
9	1	48"	2" X 2" hot rolled mild steel suare tube
10	1	64"	2" X 2" hot rolled mild steel suare tube
11	1		AC-DK 1600 lb- 3500 lb hand winch w/ 3/16" 55 wire rope
12	2	3" diam.	3" sheave pully for 3/16" cable diam.
13	1	6" X 6"	1/4" plate steel
14	1	5.8" X 4"	1/4" plate steel
15	4	1/2" X 2 "	stainless steel concrete anchor bolts
16	12	3/8" X 2"	stainless steel concrete anchor bolts
17	3	3/8" X 1"	stainless steel bolts
18	3	3/8"	stainless steel nylock nuts
19	6	3/8"	stainless steel washers
20	4	3/16"	wire rope clamps
21	4	3/16"	wire rope thimbles
22	1		high strength concrete anchor epoxy

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

WORKSHOP MEETING MINUTES

Tuesday, September 10, 2019

Prior Lake City Hall

Members Present: Curt Hennes, Bruce Loney, Charlie Howley, Fred Corrigan & Mike Myser

Staff Present: Diane Lynch, District Administrator; Jeff Anderson, District Technician and Maggie Karschnia, Project Manager

Others Present: Glenn Kelly, Spring Lake Township Board; Jim Fitzsimmons, SWCD Board of Supervisors; Dave Beer, Scott County Board of Supervisors; Troy Kuphal, SWCD; Chris Shadow, HG&K; Annette Thompson, Prior Lake City Council and Carl Almer, EOR.

The meeting was called to order by President Mike Myser at 4:30 p.m. The meeting was reconvened at 7:25 p.m.

2020 Budget

The Board reviewed the final budget and levy draft. The Board recognizes that the levy can go down; has to be set finally in December and the budget can be changed. The Board asked staff for additional information on the WISKI software and the boat the District would like to purchase.

Rules Draft Final Discussion

Carl Almer reviewed and answered questions about the final draft the Board will vote on at the Regular Board meeting.

Draft WRMP Strategies and Implementation Activities

Carl Almer reviewed the draft Plan and managers made revisions. The meeting was reconvened to complete the review.

Emerging Issues

The SWCD/WMO are hosting a tour of their projects on September 24 and invited the managers. The District is organizing a tour of the Upper Watershed and the managers approved hiring a bus to aid in the route.

The meeting adjourned at 5:45 p.m. and reconvened at 7:20 p.m. The continued meeting adjourned at 8:30 p.m.

PRIOR LAKE – SPRING LAKE

WATERSHED DISTRICT

REGULAR MEETING MINUTES

Tuesday, September 10, 2019

Prior Lake City Hall

6:00 PM

Members Present: Fred Corrigan, Curt Hennes, Charlie Howley, Mike Myser & Bruce Loney

Staff & Consultants Present: Diane Lynch, District Administrator
Maggie Karschnia, Water Resources Project Manager
Jeff Anderson, Water Resource Technician
Carl Almer, EOR, District Engineer

Others Present: Troy Kuphal, Scott SWCD
Jim Fitzsimmons, SWCD

- **CALL TO ORDER/PLEDGE OF ALLEGIANCE:** Meeting called to order by President Myser at 6:01 PM.
- **2.0 PUBLIC COMMENT:** None
- **3.0 APPROVAL OF AGENDA:**
Manager Corrigan moved to approve the agenda. Second by Manager Hennes. All ayes. Motion passed 5-0.

Public Hearing – 2020 PRELIMINARY LEVY

Manager Corrigan moved to approve Resolution 19-336, Certifying the 2020 Administrative and Metropolitan Water Management Tax Levy. Second by Manager Hennes. All ayes. Motion passed 5-0.

OTHER OLD/NEW BUSINESS

- **4.1 PROGRAMS & PROJECT UPDATES**
Staff gave updates on current and ongoing District projects and activities. Focusing on Water Quality, Upper Subwatershed Storage and AIS.
- **4.2 COST SHARE PROJECT – JAIME VONBANK**
Manager Corrigan moved to delay a decision for 12 months, pending more information. Second by Manager Hennes. All ayes. Motion passed 5-0.

- **4.3 SWCD SECOND QUARTER REPORT**

Troy Kuphal, SWCD reviewed the second quarter invoice. Discussion Only. No vote taken.

- **4.4 RULES DRAFT SUBMITTAL FOR COMMENT**

Manager Loney moved to submit the draft rules for comment. Second by Manager Hennes. All ayes. Motion passed 5-0.

- **4.5 RESOLUTION 19-335 TO EXTEND CURRENT WATER RESOURCES MANAGEMENT PLAN DATE**

Manager Hennes moved to approve Resolution 19-335, Watershed District Request to the MN Board of Soil and Water Resources for Water Resources Management Plan 2010-2019 Extension. Second by Manager Corrigan. All ayes. Motion passed 5-0.

- **5.0 APPROVAL OF CONSENT AGENDA**

Manager Corrigan moved to approve the consent agenda. Second by Manager Hennes. All ayes. Motion passed 5-0.

- **6.0 TREASURER REPORT/FINANCIAL REPORT**

Manager Howley gave updates on current financial reporting.

- **7.0 MANAGER PRESENTATIONS ON WATERSHED RELATED ITEMS**

Managers gave updates on liaison meetings and other related items. Discussion only, no vote taken.

- **8.0 UPCOMING MEETINGS/EVENTS**

- CAC Meeting Tuesday, September 24, 2019, 6:30 PM
- Upper Watershed Tour - TBD

ADJOURNMENT

Manager Hennes moved to adjourn meeting. Second by Manager Howley. All ayes. Motion passed 5-0. Meeting adjourned at 7:04 PM.

Bruce Loney, Secretary

PRIOR LAKE - SPRING LAKE

WATERSHED DISTRICT

Citizen Advisory Committee

Tuesday September 24, 2019

6:30-8:00 p.m.

Prior Lake City Hall

4646 Dakota Street SE Prior Lake, MN 55372

Attendees:

- **CAC Members present:** Steve P., Elizabeth S., Jim W., Woody S., Adam F. Marianne B., Christian M., Jerry M., Larry R. Roger W. Jim G.
 - **Others present:** Water Resources Outreach Specialist: Kathryn K-M, Board Member: Curt H., Board Secretary: Bruce L. District Staff Director, Diane L. Prior Lake Association, John T., Water Resources Specialist: Jaime R.
 - **Special Guest:** Jennie Skancke, DNR Area Hydrologist
-
- I. Call meeting to order 6:27 pm – President Steve Pany
 - II. Agenda-additions-Approval of Agenda & July meeting minutes.
 - a. Approved minutes.
 - b. Approved agenda.
 - III. Election of Officers – Nominations/votes
 - a. Chair- Christian M
 - b. Vice Chair- Marianne B
 - c. Secretary- Kim S
 - IV. Watershed District Projects update / Discussion topics
 - a. DNR Presentation. Jennie Skancke, Area Hydrologist
 - i. Low flow gate discussion
 - 1. Established many years ago
 - 2. Much study around how much water could be sent out
 - 3. Prior Lake is a 'closed' basin
 - 4. Lowering the OHW (Ordinary High Water) is/was the purpose.
 - 5. Rules dictate that the low flow gate cannot go lower than 1.5 below the OHW.
 - 6. DNR cannot grant lowering it further as the statutes do not allow it.
 - 7. The District's Management Plan allows opening the low flow gate to 902 in certain months of the year, based upon certain conditions.
 - 8. Another issue brought in to discussion was the Spring Lake outlet and its operation.
 - a. The County owns the weir on Spring Lake.
 - b. OHW on Spring Lake is 912.8
 - c. Most of the outlets are not operated by any organization
 - d. Water is publicly-owned and the land underneath is privately owned.
 - 9. Hypothetically, new development should not send water to the lakes, the water should go into holding ponds.
 - 10. Dropping the water level is not allowed under current state law. Landowners around Prior Lake would have to agree. The District would need to go to Legislature as well, to change the law.
 - 11. Rules do not distinguish between temporary changes.

PRIOR LAKE - SPRING LAKE WATERSHED DISTRICT

12. Other measures for low-lying homes should be considered before lowering a basin.
13. It takes a very long time for the evidence to change the lake 'normals'.
14. OHW looks at established trees (6" or more in diameter) or markers on shorelines etc.
15. City can restrict the boats to the shoreline etc. to protect erosion vs. dropping the lake levels.
16. Another form can be educating the shoreline owners on what type of shoreline restoration is beneficial to prevent erosion.
17. When upstream land goes into a transition, it is a good time to purchase storage easements.
18. Spring Lake Ridge development – no marina issue any longer.
 - a. Future of the marsh; fill is prohibited
 - b. Developers can do a voluntary environmental impact assessment.
- b. Lakefront Days booth – review
 - i. It rained again this year.
 - ii. There was a lot of interest.
- c. WD 50th year anniversary update.
 - i. No plans yet, volunteers will be needed
- d. Proposed project: Shoreline stabilization/path to beach. Boat landing to Sand Point beach.
 - i. Rugged terrain, many boats
 - ii. Possible project to restore/stabilize this area. Will need to be planned and scheduled.
 - iii. City may have interest in this project. Diane will ask Pete who may own this.
- e. Water Resources Management Plan update.
 - i. Accelerated carp control strategies update.
 - ii. Major format change (for the better) has pushed the delivery from the end of this year.
 - iii. November may provide an update to the CAC.
 - iv. Carp are being bated to encourage schooling for future seining.
- f. Next CAC meeting: October 31
 - i. Preference is to avoid Halloween, so Diane will look to see if the meeting room is available the Tuesday before.
- V. Comments, suggestions, questions.
 - a. Buckthorn removal with some leaf raking at The Woods at the Wild on October 27.
 - b. District Tour is Oct 7th from 3-6pm – upper watershed tour (via bus is in planning).
 - c. Marianne commented how nice the Fish Lake Park looked as a result of a project completed a few years ago and the Clean-up that was done there.
 - d. Lake Association has a benefit 6-9pm Charlie's on Thursday, 9/26
- VI. Adjourned 7:57pm

PLSLWD: Our mission is to manage and preserve the water resources of the Prior Lake-Spring Lake Watershed District to the best of our ability using input from our communities, sound engineering practices, and our ability to efficiently fund beneficial projects which transcend political jurisdictions.

CAC: The Prior Lake-Spring Lake Watershed District Citizen Advisory Committee (CAC) consists of residents who provide input and recommendations to the Board on projects, reports, prioritization and act as the primary interface for the Board to address the current issues of concern of the local citizens

Projects: ferric chloride treatment facility, alum treatments, carp seining, carp management program, carp mapping, carp contests, carp barriers, easement enforcement, permits, 12/17 wetland, Lower Prior Lake protection program, outlet channel, outlet channel repair, invasive aquatic plant control, NW Spring Lake shore project, lake and stream water monitoring, flood reduction plan, Farm Led-

PRIOR LAKE - SPRING LAKE

WATERSHED DISTRICT

Council, partnerships with other agencies, workshops, project cost share, Water Quality Improvement Award, Fish Point Park, Raymond Park, Indian Ridge Park, Sand Point Beach Project, Watzl's Beach shoreline restoration.

10/8/2019
Prior Lake Spring Lake Watershed District
Claims list for Invoice Payments due for the prior month

Managers will consider approving this claims list - Staff payroll and Manager per diems have already been paid via ADP.
After the managers vote, two Managers will sign checks within three days of the meeting for approve claims.
Then, staff will US mail checks (written on the Klein Bank) to the claims list parties.
Staff will request that all vendors provide information on their invoices to fit into the categories below

UPDATED 10/3/2019

Vendor	Invoice	Description	Amount
1. Watershed District Projects (excluding staff payroll)			
Applied Ecological Services	54034	Vegetation Maintenance	1,472.50
Applied Ecological Services	54165	Vegetation Maintenance	380.00
EOR	00758-0019	Sutton Lake Outlet Modification	16,439.18
EOR	00758-0019	PIPP Redwing Ave	42.25
EOR	00758-0019	District Monitoring Program	156.25
EOR	00758-0019	PIPP Fairlawn Shores Drainage	1,140.75
EOR	00758-0018	General Engineering	1,670.75
EOR	00758-0015	Permitting	1,325.50
EOR	00758-0018	District Plan Update	5,283.08
EOR	00758-0019	Rule Revisions	422.50
Gopher State One Call	9091309	Line Tickets	20.00
Hach Company	11406152	Monitoring Equipment	124.56
Landbridge Ecological	2975	Permit #05.15	2,400.00
Metropolitan Council	1101097	Lab Analysis	1,043.00
MN Native Landscapes	21864	Fairlawn Shores	220.00
MN Native Landscapes	20626	Fairlawn Shores	220.00
MN Native Landscapes	20622	Indian Ridge	200.00
MN Native Landscapes	21862	Indian Ridge	200.00
MN Native Landscapes	21863	Indian Ridge	200.00
MN Native Landscapes	21865	Fairlawn Shores	220.00
RMB	470683	Water Sample Analysis	280.00
RMB	467519	Water Sample Analysis	353.00
RMB	459351	Water Sample Analysis	40.00
RMB	460692	Water Sample Analysis	595.00
RMB	464175	Water Sample Analysis	280.00
RMB	464511	Water Sample Analysis	660.00
RMB	466585	Water Sample Analysis	420.00
RMB	467476	Water Sample Analysis	765.00
Smith Partners	40862	Permitting	338.40
Xcel Energy	651532626	August	18.31
Subtotal			36,930.03
2. Outlet Channel - JPA/MOA (excluding staff payroll)			
Applied Ecological Services, Inc.	54163	Channel Vegetation Maintenance	2,640.00
EOR	00758-0039	PLOC Engineering Assistance	126.75
EOR	00758-0129	2019 PLOC Veg Stability Inspection	4,237.49
HG & K		September	250.00
Subtotal			7,254.24
3. Payroll, Office and Overhead			
ADP Manager Per Diems		Already Paid	1,587.81
ADP Staff Payroll		Already Paid	19,132.62
ADP Taxes & Benefits		Already Paid	12,751.41
Connexus Credit Union		Health Savings Account	173.07
H SA Bank		Health Savings Account	173.07
HG & K		September	992.50
League of MN Cities	40000547	Work Comp Adjustment (Audit)	746.00
Metro Sales	1437178	Copy Machine Contract	110.60
NCPERS		Life Insurance	80.00
Optum Bank	95-737992	Health Savings Account	45.00
PC Force	202409	IT Support	75.00
Smith Partners	40784	General Admin & Legal	337.50
VISA		Septmber Charges	3,486.34
Subtotal			39,690.92
4. Debt repayment and interest			
Northland Trust Services		Principal	
Northland Trust Services		Interest	
Northland Trust Services		Agent Fee	
Subtotal			0.00

TOTAL

83,875.19

X _____

X _____

PRIOR LAKE – SPRING LAKE WATERSHED DISTRICT

MEMORANDUM

TO: PLSLWD BOARD OF MANAGERS
FROM: MAGGIE KARSCHNIA, WATER RESOURCES PROJECT MANAGER
SUBJECT: FERRIC CHLORIDE WEIR IMPROVEMENT PROJECT
DATE: OCTOBER 3, 2019

BACKGROUND

The fish barrier at the FeCl weir has been in disrepair for several years. The tines that were designed and installed on the weir have since broken as shown in the photograph below.



In addition, there has been safety concerns along the catwalk on top of the weir. These features will also be updated in order to improve safety for staff and visitors to the FeCl weir site.

District staff have worked with WSB scientists and engineers to develop modification plans to repair and improve the design of the existing weir. The new design is similar to the existing structure, but includes longer fingers that form a ramp and require carp to swim longer distances upstream outside of the water column. These designs will make cleaning and removal of rebar fingers more simple and easy. The plans have been reviewed by EOR. Updated design plans are included in the attached contract.

QUOTE REVIEW

PLSLWD received a total of two quotes for the FeCl Weir Fish Barrier Re-Design Project which is summarized in the table below.

<u>COMPANY</u>	<u>QUOTE AMOUNT</u>
Sierra Metals	\$55,000.⁰⁰
Benson Metals, Inc.	\$30,517.⁵⁶

REVIEW OF QUOTES

As shown in the above table, Benson Metals provided the lowest bid which was well below the engineer's estimate for the project. While the District has not worked with Benson Metals before, references for the contractor indicate that they are reputable.

RECOMMENDATION

At this time, staff recommends the Board authorize the District Administrator to sign a contract with Benson Metals, Inc. for the FeCl Weir Fish Barrier Re-Design Project for the quoted amount of \$30,517.56.

**AGREEMENT BETWEEN
PRIOR LAKE SPRING LAKE WATERSHED DISTRICT
and BENSON METALS, INC.**

FERRIC CHLORIDE WEIR IMPROVEMENT PROJECT

This agreement is entered into by the Prior Lake Spring Lake Watershed District, a public body with powers set forth at Minnesota Statutes chapters 103B and 103D (PLSLWD), and Benson Metals, Inc., a private Minnesota corporation (CONTRACTOR). This agreement also confers certain benefits on the WSB & Associates. (ENGINEER). In consideration of the terms and conditions set forth herein, including the obligations of mutual consideration, the sufficiency of which is hereby acknowledged, PLSLWD and CONTRACTOR agree as follows:

1. Scope of Work

CONTRACTOR will procure & furnish materials to: install a catwalk structure and carp barrier at an existing weir site, and perform all associated work in accordance with the engineering plans and technical specifications attached hereto as Exhibit A (hereinafter, the Work) and the Contract Documents listed below. The Work will be completed in accordance with the Contract Documents, which consist of the following:

Field directives, change orders and work change directives;

Notice to proceed;

This contract;

Exhibit A – Engineering Plans and technical specifications titled “Carp Barrier Facility Improvements Project”; and

Exhibit B - CONTRACTOR’s completed quote form.

In the event of apparent conflict between terms in Contract Documents, interpretive priority will be given to the documents in the order in which they are listed above. CONTRACTOR will furnish all materials, machinery, equipment, tools, labor and expertise needed to complete the Work. PLSLWD, at its discretion, in writing may at any time suspend work or amend the contract to delete any task or portion thereof. Authorized work by CONTRACTOR on a task deleted or modified by PLSLWD will be compensated in accordance with the terms of this contract generally and paragraph 5 specifically.

2. Independent Contractor

CONTRACTOR is an independent contractor under this agreement. CONTRACTOR will select the means, method and manner of performing the Work. Nothing herein contained is intended or should be construed to constitute CONTRACTOR as the agent, representative or employee of the PLSLWD in any manner. Personnel performing the Work on behalf of CONTRACTOR will not be considered employees of the PLSLWD and will not be entitled to any compensation, rights or benefits of any kind from the PLSLWD.

3. Subcontract and Assignment

CONTRACTOR will not assign, subcontract or transfer any obligation or interest in this agreement or any of the Work without the written consent of the PLSLWD and pursuant to any conditions included in that consent. PLSLWD consent to any subcontracting does not relieve CONTRACTOR of its responsibility to PLSLWD to perform the Work or any part thereof, nor in any respect affect its warranty, insurance, indemnification, duty to defend or agreement to hold harmless with respect to the Work.

4. Warranty and Indemnification

CONTRACTOR warrants that it will perform the Work in a proper, workmanlike and good quality manner and that all materials and labor will be in strict conformity in every respect with the Contract Documents. CONTRACTOR warrants the completed Work for one year from the date PLSLWD determines the Work to be complete. CONTRACTOR warrants that it has examined the site to the extent necessary to agree to the price of the Work and accepts any increased cost resulting from changes to the Work in response to site conditions that were foreseeable.

CONTRACTOR will defend, indemnify and hold harmless PLSLWD and ENGINEER, their officers, board members, employees and agents from: (a) CONTRACTOR's negligent or otherwise wrongful act or omission, or breach of a specific contractual duty; or (b) a subcontractor's negligent or otherwise wrongful act or omission, or breach of a specific contractual duty owed by CONTRACTOR to PLSLWD. For any claim subject to indemnification under this paragraph by an employee of CONTRACTOR or a subcontractor, the indemnification obligation is not limited by a limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or a subcontractor under workers' compensation acts, disability acts or other employee benefit acts.

5. Compensation

PLSLWD will compensate the CONTRACTOR on a progress payments basis for completed work. Payment will be on a unit price basis in accordance with CONTRACTOR's quote

sheet attached and incorporated as Exhibit B hereto. Invoices will be submitted monthly for work performed during the preceding month. PLSLWD will pay for undisputed work within 45 days of receipt of invoice. Payment for materials and structures will be due only once they are incorporated into the Work. The PLSLWD may retain up to five percent of each progress payment until certification of project completion.

In accordance with Minnesota Statutes section 471.425, subdivision 4a, CONTRACTOR will pay any subcontractor within 10 days of CONTRACTOR's receipt of payment from PLSLWD for undisputed services provided by the subcontractor. CONTRACTOR will pay interest of 1½ percent per month or any part of a month to a subcontractor on any undisputed amount not paid on time to the subcontractor. The minimum monthly interest penalty payment for an unpaid balance of \$100 or more is \$10. For an unpaid balance of less than \$100, CONTRACTOR will pay the actual penalty due to the subcontractor.

6. Compliance with Laws; Site Control

CONTRACTOR will comply with the laws and requirements of all federal, state, local and other governmental units in connection with performing the Work. CONTRACTOR will procure all licenses, permits and other rights and approvals required for the Work.

Construction limits for the Work, and access routes to those areas, lie on public and private land in which the PLSLWD holds necessary rights by easement or agreement with the landowner. CONTRACTOR is responsible to conform its work to the terms of such easements and agreements and may obtain or review them by request to the PLSLWD either before or after quote submittal. CONTRACTOR will comply with all local requirements as to traffic, staging, site ingress and egress, work hours and site "neatness".

CONTRACTOR is responsible for site conditions relating to worker and public safety, cleanliness and environmental protection and in all other respects. CONTRACTOR will report to Gopher State One Call before any excavation in accordance with Minnesota Statutes Chapter 216 as may be applicable to the Work and is responsible to identify and protect all structures and utilities, whether above or below ground, and for any damage or injury resulting from the failure to do so. CONTRACTOR will not injure or destroy any shrub or tree on site except as agreed to by PLSLWD in writing. CONTRACTOR shall restore all disturbed areas to preconstruction condition.

In its performance of the Work, CONTRACTOR will ensure that no person is excluded from full employment rights or participation in or the benefits of any program, service or activity on the ground of race, color, creed, religion, age, sex, disability, marital status, sexual orientation, public assistance status or national origin; and no person who is protected by applicable federal or state laws, rules or regulations against discrimination otherwise will be subjected to discrimination.

7. Termination; Continuation of Obligations

This contract is in force until **December 31, 2019**, unless earlier terminated as set forth herein. PLSLWD may suspend or terminate this contract with or without cause by a written termination notice stating specifically what prior authorized or additional Work it requires CONTRACTOR to complete. If the contract is suspended or terminated for convenience, CONTRACTOR will be compensated for all authorized work completed, including reasonable costs for actions directed by PLSLWD to stabilize the site of the Work. If suspension or termination is for cause, CONTRACTOR will stabilize all disturbed work sites before vacating, without extra compensation. CONTRACTOR will be given a reasonable opportunity to cure before termination for cause.

It is understood and agreed that insurance obligations; warranties and obligations to defend, indemnify and hold harmless; and document-retention requirements survive the completion of the Work and the term of this contract.

8. Waiver

PLSLWD's failure to insist on CONTRACTOR's strict performance of any obligation, condition or provision of this contract, or to exercise any option, remedy or right herein, will not waive its rights in the future to do so. The waiver of either party on one or more occasion of any provision or obligation of this contract will not be construed as a waiver of any subsequent breach of the same provision or obligation, and the consent or approval by either party to or of any act by the other requiring consent or approval will not render unnecessary such party's consent or approval to any subsequent similar act by the other.

Notwithstanding any other term herein, the contract creates no rights in any third party, and PLSLWD waives no tort defense, immunity or liability limit with respect to CONTRACTOR or any third party.

9. Insurance

At all times during the term of this contract, CONTRACTOR will have and keep in force the following insurance coverages:

- A. General liability: \$1.5 million each occurrence and aggregate, covering CONTRACTOR's work and completed operations, on an occurrence basis.
- B. Automobile liability: combined single limit each occurrence coverage for bodily injury and property damage covering all vehicles on an occurrence basis, \$1.5 million.
- C. Workers' compensation: in accordance with legal requirements applicable to CONTRACTOR.

CONTRACTOR will not commence work until it has filed with PLSLWD a certificate of insurance clearly evidencing the required coverages and naming PLSLWD and ENGINEER as additional insureds for general liability, along with a copy of the additional insured endorsement establishing coverage for CONTRACTOR's work and completed operations as primary coverage on a noncontributory basis. The certificate will name PLSLWD as a holder and will state that PLSLWD will receive written notice before cancellation, nonrenewal or a change in the limit of any described policy under the same terms as CONTRACTOR.

10. Records

All documents and information obtained or generated by CONTRACTOR or a subcontractor in performing the Work, including hard and electronic copy, software, and in any other forms in which the materials are contained, documented or memorialized, are the property of PLSLWD.

PLSLWD may immediately inspect, copy or take possession of any such materials on written request to CONTRACTOR. CONTRACTOR may maintain a copy of any such materials at its expense.

Any document or information supplied to CONTRACTOR by PLSLWD or deriving from PLSLWD is given and accepted without representation or warranty including but not limited to a warranty of fitness, merchantability, accuracy or completeness. Absent PLSLWD written approval, CONTRACTOR will not use any such document or information other than for performance of the Work.

11. Data Practices; Confidentiality

If CONTRACTOR receives a request for data pursuant to the Data Practices Act, Minnesota Statutes chapter 13 (DPA), that may encompass data (as that term is defined in the DPA) CONTRACTOR possesses or has created as a result of this contract, CONTRACTOR will inform PLSLWD immediately and transmit a copy of the request. If the request is addressed to PLSLWD, CONTRACTOR will not provide any information or documents, but will direct the inquiry to PLSLWD. If the request is addressed to CONTRACTOR, CONTRACTOR will be responsible to determine whether it is legally required to respond to the request and otherwise what its legal obligations are, but will notify and consult with PLSLWD and its legal counsel before replying. Nothing in the preceding sentence supersedes CONTRACTOR's obligations under this contract with respect to protection of PLSLWD data, property rights in data or confidentiality. Nothing in this section constitutes a determination that CONTRACTOR is performing a governmental function within the meaning of Minnesota Statutes section 13.05, subdivision 11, or otherwise expands the applicability of the DPA beyond its scope under governing law.

12. Notices

Any written communication required under this agreement to be provided in writing will be directed to the other party as follows:

To PLSLWD:

Administrator

Prior Lake Spring Lake Watershed District

4646 Dakota Street SE

Prior Lake, MN 55372

To CONTRACTOR:

Brad Hendrickson

Benson Metals, Inc.

1300 Sibley Memorial Hwy

Mendota, MN 55150

Either of the above individuals may in writing designate another individual to receive communications under this agreement.

13. Choice of Law, Venue and Jurisdiction

This agreement will be construed under and governed by the laws of the State of Minnesota. Venue for any lawsuit regarding to this agreement shall lie in the courts of Scott County, State of Minnesota.

14. Completion of Work

The Work, except maintenance, must be certified by the CONTRACTOR as substantially complete for the purposes intended on or before **October 31, 2019**, and all complete and ready for final payment by **November 30, 2019**.

15. Whole Agreement

The entire agreement between the two parties is contained herein and this agreement supersedes all oral agreements and negotiations relating to the subject matter hereof. Any modification of this agreement is valid only when reduced to writing as an amendment to the agreement and signed by the parties hereto. The PLSLWD may amend this agreement only by action of the Board of Managers acting as a body.

IN WITNESS WHEREOF, intending to be legally bound, the parties hereto execute and deliver this agreement.

BENSON METALS, INC.

By _____

Its _____

Date _____

PRIOR LAKE SPRING LAKE WATERSHED DISTRICT

By _____

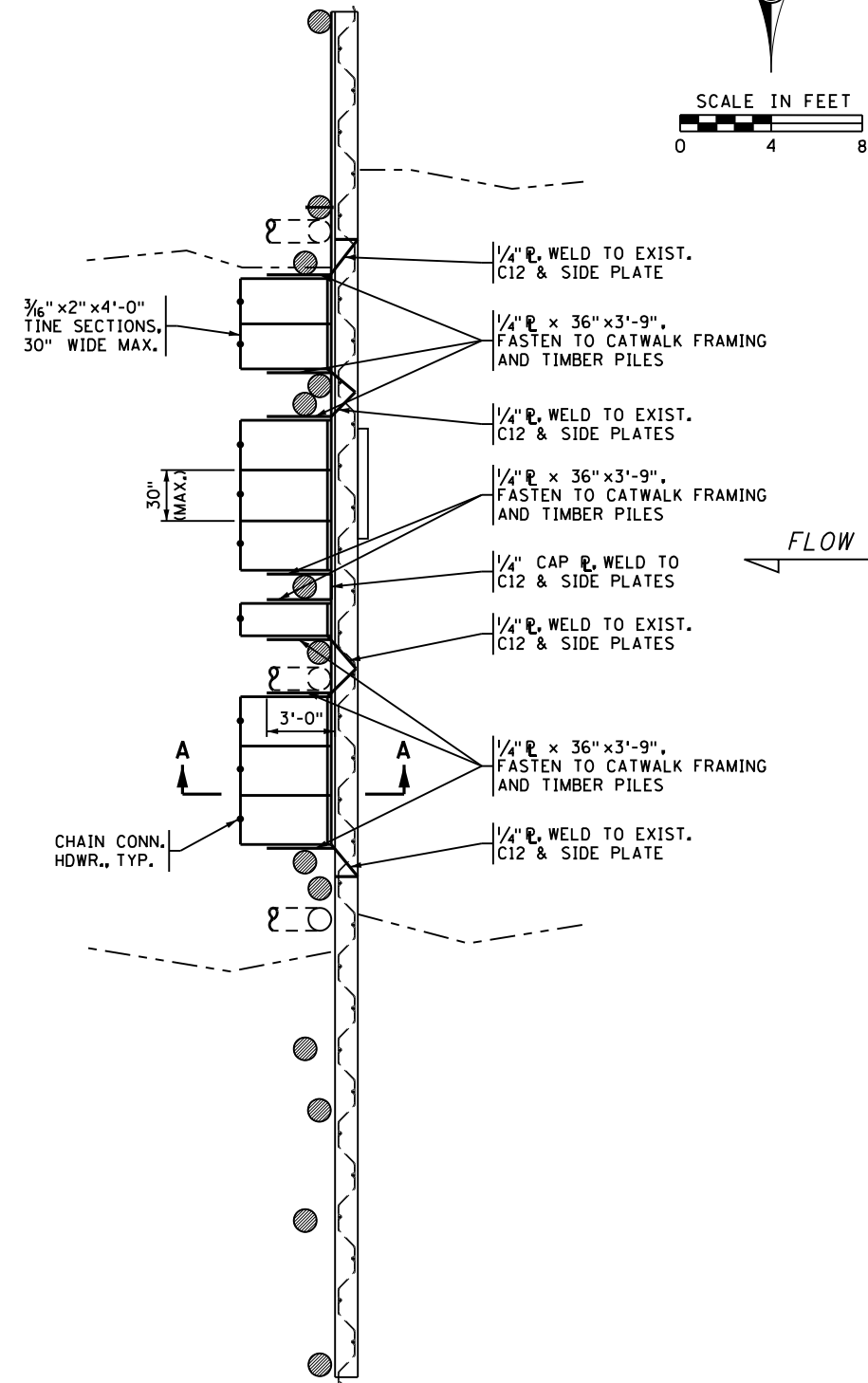
Diane Lynch

Its: District Administrator

Date: _____




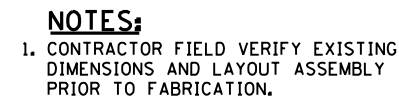
CATWALK FRAMING PLAN



FISH BARRIER PLAN

1. CONTRACTOR FIELD VERIFY ALL TIMBER PILE LOCATIONS PRIOR TO FABRICATION.
2. DEMOLISH EXISTING TIMBER CATWALK AS SHOWN.

<div> WSB & Associates, Inc.</div> <div>701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 www.wsbeng.com</div> <div>76564-4800 • Fax 763-541-7101 INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION</div>	<div>CARP BARRIER</div> <div>FACILITY IMPROVEMENTS PROJECT</div> <div>PRIOR LAKE MINNESOTA</div>	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.		SCALE _____ AS NOTED _____	REVISION NO. _____
		SIGNED: _____ LICENSED PROFESSIONAL ENGINEER DEAN K. SMITH DATE: <u>XXXX/XXXX</u> UIC No. <u>42362</u>	PLAN BY: SWH DESIGN BY: DRS CHECKED BY: PROJECT NO. XXX RECORD COPY BY: DATE: _____	_____	EXPLANATION: _____



VERT BAR SPACING SLEEVE

SHEET S-02 of S-04

WSB
Associates, Inc.

701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
www.wsbing.com

763-541-4800 • Fax 763-541-4700
INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION

1. DESIGN CODES
- (ALL LATEST EDITIONS UNLESS NOTED)
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
- AMERICAN WELDING SOCIETY (AWS)
- INTERNATIONAL BUILDING CODE (IBC) '12
- LOCAL BUILDING CODE AMENDMENTS

2. DESIGN STRESSES

- STRUCTURAL STEEL (ASTM A992)	Fy 50,000 PSI
- STRUCTURAL PLATES, CHANNELS AND ANGLES (ASTM A37)	Fy 36,000 PSI
- STRUCTURAL TUBING (ASTM A500, GRADE B)	Fy 46,000 PSI
- STRUCTURAL PIPE (ASTM A53, GRADE B)	Fy 35,000 PSI

3. DESIGN LIVE LOADS
- CATWALK 40 PSF

1. SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH IBC SECTION 1704 FOR THE FOLLOWING PORTIONS OF CONSTRUCTION:

- a. FABRICATORS, EXCEPT WHEN FABRICATOR MAINTAINS ONGOING INSPECTIONS BY AN APPROVED INDEPENDENT INSPECTION OR QUALITY CONTROL AGENCY.
- b. STEEL CONSTRUCTION (AS DETAILED IN TABLE 1704.3)

1. STRUCTURAL WORK PERFORMED IN BID PACKAGE INCLUDES: DEMOLITION, FISH BARRIER, CATWALK STRUCTURE.

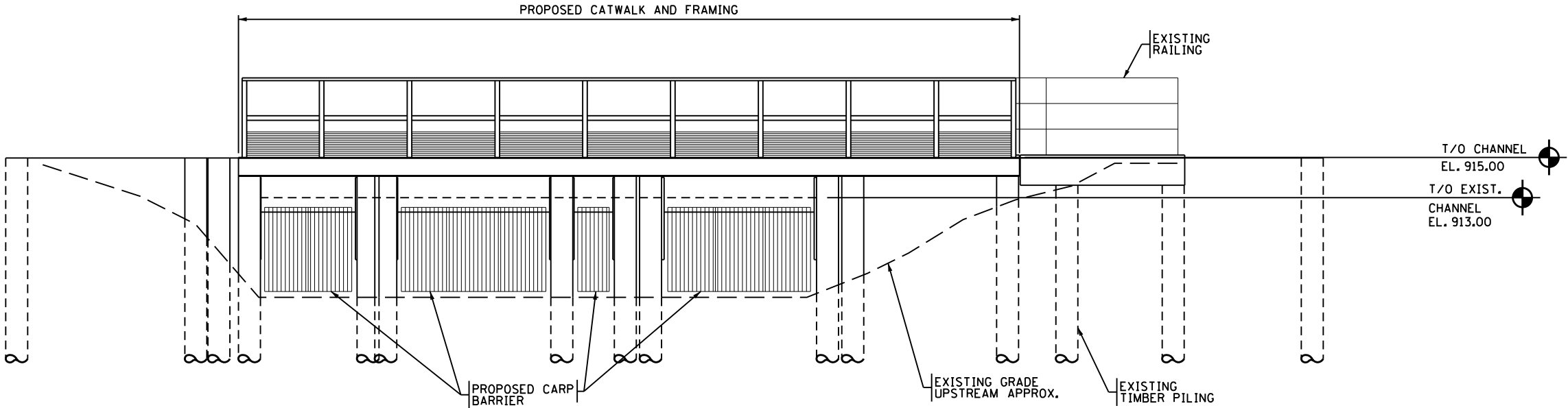
1. COORDINATE ALL DEMOLITION WORK WITH CONTRACTOR(S) RESPONSIBLE FOR CONSTRUCTION WORK.
2. CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING AND SHORING FOR STRUCTURE STABILITY DURING DEMOLITION AND ERECTION AND UNTIL ALL STRUCTURAL ELEMENTS ARE PLUMB AND SECURED.

1. CONTRACTOR SHALL IDENTIFY POTENTIAL UTILITY-TO-STRUCTURE CONFLICTS.

1. STEEL ERECTOR SHALL PROVIDE THE NECESSARY BRACING FOR STRUCTURE STABILITY DURING ERECTION AND UNTIL ALL STEEL IS PLUMB AND SECURED.
2. HOT DIP GALVANIZE ALL STEEL MEMBERS.
3. TOUCH UP WELDS AND OTHERWISE DAMAGED COATING WITH 3-COATS OF COLD GALVANIZED PAINT. GALVANIZE ALL BOLTS EXPOSED TO WEATHER.
4. ALL WELDS ARE FILLET WELDS UNLESS OTHERWISE NOTED.
5. MINIMUM FILLET WELD SIZE IS THE SMALLER THICKNESS OF THE TWO PIECES BEING JOINED LESS 1/16".
6. WELD A MINIMUM OF 50% OF THE LENGTH OF ALL CONTACT SURFACES. UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
7. PROVIDE WELDER CERTIFICATION INFORMATION APPLICABLE TO THE WELDING TO BE PERFORMED FOR EACH WELDER (BOTH SHOP AND FIELD WELDS).
8. CATWALK GRATING TO CONSIST OF PREFABRICATED STEEL BAR GRATING PANELS. BEARING BARS ARE TO BE 1" x 3/16" AT 1-3/16" C.C. SERRATED SURFACE. PROVIDE MANUFACTURER'S SUBMITTAL AND SAFE LIVE LOAD INFORMATION PRIOR TO ORDERING GRATING. MIN. SAFE LIVE LOAD IS 40 PSF UNIFORM LOAD WITH LESS THAN 1/4" DEFLECTION AT THE DESIGN SPANS.
9. GRIND SMOOTH ALL SHARP EDGES.

BOT = BOTTOM	HSC = HEADED SHEAR CONNECTORS	SPA = SPACE, SPACES, SPACED
CL = CENTER LINE	IF = INSIDE FACE	STL = STEEL
CJ = CONSTRUCTION JOINT	JT = JOINT	TBE = TOP OF BEAM ELEVATION
CJT = CONTROL JOINT	MIN = MINIMUM	TFE = TOP OF FOOTING ELEVATION
CONCR = CONCRETE	MAX = MAXIMUM	TPCE = TOP OF PILE CAP ELEVATION
DBE = DECK BEARING ELEVATION	MK = MARK	TPE = TOP OF PARAPET ELEVATION
DWGS = DRAWINGS	NS = NEAR SIDE	TSE = TOP OF SLAB ELEVATION
DWLS = DOWELS	OC = ON CENTER	TWE = TOP OF WALL ELEVATION
EF = EACH FACE	OF = OUTSIDE FACE	TYP = TYPICAL
EW = EACH WAY	PC = PILE CAP	UNO = UNLESS NOTED OTHERWISE
EXP = EXPANSION	P/T = POST TENSION	VIF = VERIFY IN FIELD
FFE = FINISHED FLOOR ELEVATION	R = RADIUS	WL = WIND LOAD
FS = FAR SIDE	REQ'D = REQUIRED	WP = WORK POINT
HK = HOOK	SOG = SLAB-ON-GRADE	

[illegible]



ELEVATION VIEW - LOOKING UPSTREAM

 701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 www.wsbeng.com 765-541-4001 • Fax 765-541-1701 INFRASTRUCTURE • ENGINEERING • PLANNING • CONSTRUCTION	CARP BARRIER FACILITY IMPROVEMENTS PROJECT PRIOR LAKE MINNESOTA		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. SIGNER: LICENSED PROFESSIONAL ENGINEER JEAN R. SMITH DATE: <u>10/01/2019</u> LIC. No. <u>4392</u>	
	SCALE	AS NOTED	REVISION NO.	EXPLANATION
	PLAN BY: SWH	DESIGN BY: DRS		
	CHECKED BY: XXX	PROJECT NO. -		
	RECORD COPY BY: -	DATE: -		



**Benson
Metals Inc.**

Date	Quote #
10/3/2019	000752

PROJECT MANAGER			TERMS	
MN			Net 30	
QTY	ITEM	DESCRIPTION	UNIT PRICE	TOTAL
1	GCW-0332	Galvanized Cat Walk Structure Constructed per CAD drawings provided 9-16-2019 1235 no. 1-4 Special notes: All Steel Galvanized, 3/8" Stainless Steel chain, Stainless Steel Fasteners, Serrated 1" x 3/16" bar grating banded edges. Delivered to Prior Lake Project. Estimated Lead time from approved drawing 3 weeks ***1/2 down on order*** Sales Tax Benson Metals Inc. requires a minimum of 1 copy of all current drawings with each order.	28,554.44 6.875%	28,554.44T 1,963.12
1/2 - Down on order			Total \$30,517.56	

Prices valid for 30 days from date of Quote.

PRIOR LAKE – SPRING LAKE

W A T E R S H E D D I S T R I C T

7.0 Manager Presentations

Managers will provide information on recent events they're attended on behalf of the District.