

**Project Name** | Library Lake SE Phase 2  
LPT80523

**Date** | 5.23.2024

**To / Contact info** | WI DNR

**Cc / Contact info** |

**From / Contact info** | EOR / Beaver Dam Lake Management District

**Regarding** | Grant Closeout Documentation

## Background

The Beaver Dam Lake Management District (BDLMD) received funds through grant LPT80523 to complete phase 2 improvements at Library Lake SE. These improvements included the addition of an iron-enhanced sand filter (IESF) and a rain garden to the plumbing and wet pond that were installed in 2022, through a previous grant.

In 2023 BDLMD hired EOR to complete the final design of the IESF and rain garden and administer a public bid process for the construction work. Pember Companies was hired (as the lowest responsible bidder) to install the stormwater features. Construction took place in the fall of 2023. Below is a summary of the work that was completed utilizing grant funds, and work that remains to be completed in summer 2024.

## Work Completed

- Finalized construction plans (see attached)
- Public bid process (see attached bid review letter)
- Construction of iron-enhanced sand filter and rain garden (see following photos)



Figure 1. IESF outlet installation, October 28, 2023



Figure 2. IESF drain tile installation, October 30, 2023



Figure 3. Rain garden inlet installation, November 9, 2023



Figure 4. Rain garden inlet installation, November 9, 2023



Figure 5. Library Lake SE aerial view, November 13, 2023



Figure 6. IESF at Library Lake SE, May 1, 2024

### **Remaining Work**

There is a small amount of remaining work to complete for Library Lake SE phase 2, in conjunction with work associated with Library Lake phase 3. This work will be completed through a change order with Pember Companies. This work includes investigation of an existing pipe in order to divert additional parking lot stormwater to the new stormwater system via pipe work funded by Library Lake phase 3.

<b>Project Name</b>	Library Lake Southeast Stormwater Improvements Phase 2	<b>Date</b>	August 3, 2023
<b>To / Contact info</b>	Board Members, BDLMD; Tom Schroeder, Board President		
<b>Cc / Contact info</b>	Jay Michels, CPESC, NGICP/IGICP, Project Manager		
<b>From / Contact info</b>	Derek R. Lash, PE, CPESC, Project Engineer		
<b>Regarding</b>	Review of Submitted Bids		

The purpose of this memorandum is to provide a review of the bids submitted for the Library Lake Southeast Stormwater Improvements Phase 2 project.

### Bid Summary

The Request for Bids was posted on QuestCDN VirtuBid™ virtual bidding platform on July 6, 2023. Bids were due on July 26, 2023, at 1:00 PM CST with the bids publicly open and read using Zoom video conferencing. In addition, the advertisement for bidding was advertised in the Cumberland Advocate on July 5<sup>th</sup> and 12<sup>th</sup>.

A total of three bids were received and the low bidder is Pember Companies, Inc., with a Base Bid of \$204,443.00. Review of the submitted bid packages was performed by Emmons & Olivier Resources, Inc. (EOR).

CONTRACTOR	BASE BID	RANK
Engineer's Estimate	\$200,308.00	N/A
Pember Companies, Inc.	\$204,443.00	1
DeSantis Excavating & Underground Utilities	\$209,545.00	2
LinnCo, Inc.	\$273,358.47	3

The BDLMD engineer has reviewed Pember Companies submitted bid and found that it complies in all respects with the submittal requirements. Pember Companies has extensive experience in general construction, concrete flatwork, curb & gutter, storm sewer, stormwater BMPs, and erosion control, which are all elements of this project. The engineer finds that Pember Companies is the lowest-priced responsible, responsive bidder.

### Recommendation

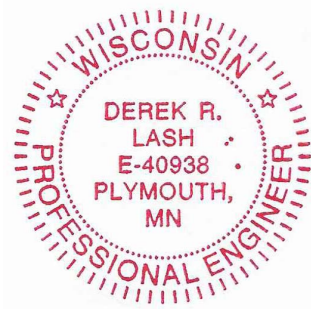
Following our review, we are recommending BDLMD award the contract to the low responsive, responsible bidder, Pember Companies, Inc.

# BEAVER DAM LAKE MANAGEMENT DISTRICT

ALL ELEVATIONS ARE IN  
NAVD 88 - DATUM

## LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS PHASE 2

CUMBERLAND, BARRON COUNTY, WISCONSIN



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WISCONSIN

*Derek R. Lash*

DEREK R. LASH  
REG. NO. 40938-6 DATE: 07/05/23  
MY LICENSE RENEWAL DATE IS 07/31/2024  
PAGES OR SHEETS COVERED BY THIS SEAL:  
ALL SHEETS

### LEGEND

FEATURE	EXISTING	PROPOSED
MINOR CONTOUR	---1246---	[1246]
MAJOR CONTOUR	---1245---	[1245]
EDGE OF BASIN	-----	-----
DELINEATED WETLAND	-----W/D-----	-----
GAS LINE	-----G-----	-----
BURIED ELECTRIC LINES	-----E-U-----	-----
OVERHEAD ELECTRIC	-----E-O-----	-----
WATER LINE	-----W-----	-----
EDGE OF PAVEMENT	-----	-----
TOP OF CURB	-----	-----
GUTTER	-----	-----
PROPERTY LINE	-----	-----
TREE		
BORING		
SANITARY SEWER LINE	-----	-----
SANITARY SEWER MANHOLE		
STORM SEWER PIPE	-----	-----
STORM SEWER MANHOLE BAFFLE		
BOLLARD		
UTILITY POLE		
GUY WIRE		
SILT FENCE		
SEDIMENT LOG		
INLET PROTECTION		
CONSTRUCTION LIMITS		

### DIGGERS HOTLINE

WISCONSIN STATUTE 182.0175 REQUIRES EVERY EXCAVATOR AND EVERYONE RESPONSIBLE FOR PLANNING NON-EMERGENCY EXCAVATIONS TO PROVIDE ADVANCE NOTICE OF AT LEAST **THREE** BUSINESS DAYS TO THE ONE CALL SYSTEM. SEE THE STATE STATUTE FOR THE DEFINITION OF EXCAVATION. DIGGERS HOTLINE NEEDS TO BE CONTACTED PRIOR TO EXCAVATION AND PLANNING AN EXCAVATION IN ORDER TO COMPLY WITH THE STATE STATUTE.

DIGGERS HOTLINE SHOULD ALSO BE USED TO OBTAIN INFORMATION ON SAFE WORKING CLEARANCES FROM OVERHEAD LINES. OSHA REQUIRES THAT YOU STAY AT LEAST 10 FEET AWAY FROM DISTRIBUTION LINES AND UP TO 16 FEET AWAY FROM TRANSMISSION LINES WITH EXCAVATORS, BACK-HOES, WHEEL LOADERS, DIGGER DERRICKS USED FOR AUGURING HOLES, AND SETTING POLES IN TELECOMMUNICATIONS AND ELECTRICAL WORK, ETC. THE 2010 OSHA CRANE STANDARD REQUIRES ADDITIONAL RESTRICTIONS FOR OTHER TYPES OF CRANES OR HOISTING DEVICES.

SEE THE EXCAVATOR'S GUIDE TO DIGGERS HOTLINE FOR ADDITIONAL INFORMATION.

CONTACTING DIGGERS HOTLINE

BY PHONE: DIGGERS HOTLINE IS AVAILABLE 24 HOURS A DAY, 7 DAYS A WEEK, 365 DAYS A YEAR BY CALLING THE THREE-DIGIT CODE 811 OR BY CALLING (800) 242-8511. TDD USERS MAY CALL (800) 542-2289.

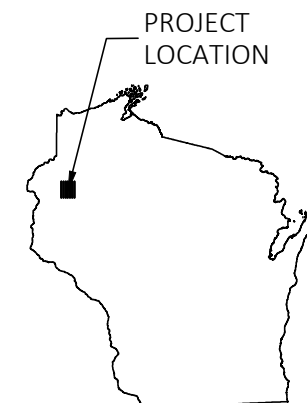
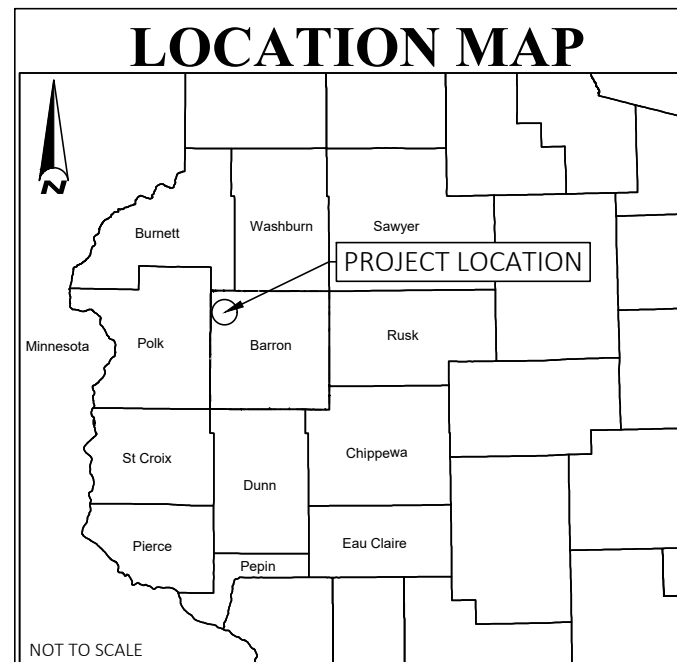
BY EMAIL: ON THE DIGGERS HOTLINE WEBSITE, [WWW.DIGGERSHOTLINE.COM](http://WWW.DIGGERSHOTLINE.COM), YOU CAN EMAIL LOCATE REQUESTS TO THE CALL CENTER. TO ACCESS THE ONLINE EMAIL FORM, GO TO DIGGERS HOTLINE WEBSITE, [WWW.DIGGERSHOTLINE.COM](http://WWW.DIGGERSHOTLINE.COM).

### 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 "CI/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.



Sheet Number	Sheet Title
01	TITLE SHEET
02	NOTES & ESTIMATED QUANTITIES
03	OVERVIEW & SOIL BORING PLAN
04	DRAINAGE AREA & SWPPP SITE PLAN
05	EXISTING CONDITIONS
06	EROSION & SEDIMENT CONTROL PLAN
07	DEMOLITION & REMOVALS PLAN
08	GRADING & DRAINAGE PLAN
09	STORM SEWER PLAN OVERVIEW
10	RESTORATION PLAN
11	DETAIL SHEET 1
12	DETAIL SHEET 2
13	DETAIL SHEET 3
14	DETAIL SHEET 4
15	DETAIL SHEET 5
16	DETAIL SHEET 6
17	DETAIL SHEET 7
18	DETAIL SHEET 8

\* THIS PLAN SET CONTAINS 18 PLAN SHEETS

### GOVERNING SPECIFICATIONS

THE DESIGN ADHERES TO NATURAL RESOURCE CONSERVATION SERVICE (NRSC) STANDARDS, AS WELL AS THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES (WDNR).

THE 2023 EDITION OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION (WISDOT) "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO WISCONSIN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

### CLIENT

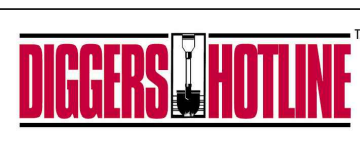
**BEAVER DAM LAKE MANAGEMENT DISTRICT**  
P.O. BOX 232 CUMBERLAND, WI 54829

### ENGINEER

EMMONS & OLIVIER RESOURCES, INC.  
1919 UNIVERSITY AVE W - SUITE 300  
ST. PAUL, MINNESOTA 55104  
TELEPHONE: (651) 770-8448  
FAX: (651) 770-2552  
eorinc.com

Plot Date: 07/05/2023  
Drawing Name: R:\Clients\_Phases\009000\_Beaver\_Dam\_Lake\_Asecc0037\_Library\_Lake\_SE\_Phase\_209\_GMS\dwg\Drawings\Sheets\TITLE SHEET.dwg  
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SUBMISSION DATE:  
6/23/2023

DESIGN BY DRAWN BY CHECKED BY  
KFA KFA DRL

EOR PROJECT NO.  
00909-0037

**EOR** Emmons & Olivier Resources, Inc.  
1919 University Ave W,  
Suite 300, St Paul, MN 55104  
water ecology community  
Tele: 651.770.8448  
www.eorinc.com

**BEAVER DAM LAKE MANAGEMENT DISTRICT**  
P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS PHASE 2  
CUMBERLAND, BARRON COUNTY, WISCONSIN

STATE PROJECT NO. #### CITY PROJECT NO. ####

TITLE SHEET

SHEET 1 OF 18 SHEETS

GENERAL SITE WORK NOTES

- 1. CONTRACTOR TO VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING ANY CONSTRUCTION BY CALLING DIGGERS HOTLINE 1-800-242-8511.
2. 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.
3. REFERENCE TO WISDOT SPECIFICATIONS SHALL MEAN THE CURRENT SPECIFICATIONS FOR CONSTRUCTION.
4. CONTRACTOR SHALL ADHERE TO ALL OF THE REQUIREMENTS OF THE CITY AND WISDOT RIGHT-OF-WAY PERMITS.

GENERAL UTILITY NOTES

- 1. CONTRACTOR SHALL CONTACT 'DIGGERS HOTLINE' (1-800-242-8511) AT LEAST THREE BUSINESS DAYS PRIOR TO EXCAVATION/CONSTRUCTION FOR UTILITY LOCATIONS.
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 THE CITY OF CUMBERLAND SPECIFICATIONS AND BUILDING PERMIT REQUIREMENTS.
4. CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING THE APPROPRIATE SEWER, WATER AND PLUMBING PERMITS FROM THE CITY OF CUMBERLAND.
5. 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.
6. FIELD ADJUST ALL CASTINGS TO MATCH FINAL GRADES.
7. CONNECTION TO THE EXISTING STORM SEWER REQUIRES INSPECTION BY THE CITY OF CUMBERLAND.
8. CONTRACTOR SHALL NOTIFY THE CITY OF CUMBERLAND 48 HOURS IN ADVANCE OF WORKING WITHIN THE EXISTING RIGHT OF WAY. CITY INSPECTORS MUST OBSERVE ALL WORK COMPLETED WITHIN THE EXISTING RIGHT OF WAY INCLUDING REMOVAL OF EXISTING BITUMINOUS PAVEMENT, EXCAVATION OF TRENCHES, PLACEMENT OF UTILITY CONNECTIONS TO EXISTING LINES, BACKFILLING AND PLACEMENT OF BITUMINOUS PAVEMENT OR CONCRETE APRONS, SIDEWALKS, AND CURB & GUTTER.

SITE REMOVAL NOTES

- 1. BITUMINOUS PAVEMENT REMOVALS ARE TO BE MADE TO A VERTICAL SAW CUT OR TO A NEAT MILLED EDGE IN ACCORDANCE WITH WISDOT SPECIFICATIONS.
2. CONCRETE PAVEMENT, SIDEWALK, CURB & GUTTER AND OTHER POURED CONCRETE ITEMS ARE TO BE REMOVED TO AN EXISTING EXPANSION OR CONTRACTION JOINT. SAW CUT AS NECESSARY FOR A NEAT EDGE OF REMOVAL.
3. SALVAGED SEWER CASTINGS AND MANHOLE SECTIONS SHALL BE CLEANED AND INSPECTED FOR DAMAGE PRIOR TO REINSTALLATION.
4. ALL REMOVAL ITEMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS SPECIFIED OTHERWISE AND SHALL BE DISPOSED OF OFF-SITE IN A MANNER MEETING ALL APPLICABLE REGULATIONS.

STORM SEWER NOTES

- 1. STORM SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH WISDOT SPECIFICATIONS.
2. STORM SEWER SHALL BE PRECAST REINFORCED CONCRETE. CASTING SHALL BE AS SPECIFIED ON THE PLANS OR APPROVED EQUAL.
3. MANHOLES SHALL BE PRECAST REINFORCED CONCRETE IN ACCORDANCE WITH WISDOT SPECIFICATIONS. MANHOLES SHALL HAVE A MINIMUM OF 2 ADJUSTMENT RINGS AND MORTAR AND A MAXIMUM OF 12" OF ADJUSTMENT RINGS AND MORTAR.
4. PIPE LENGTHS ON THE PLAN INCLUDE THE APRON SECTION.
5. STORM SEWER PIPE JOINTS SHALL BE TIED AS SPECIFIED ON THE PLANS.
6. THE CONTRACTOR WILL LOCATE THE MANHOLE STRUCTURE AS NECESSARY FROM REFERENCE POINTS. PIPE ALIGNMENTS ARE STAKED TO CENTER OF CASTING - CONTRACTOR WILL ADJUST THE ALIGNMENT TO FIT THE ACTUAL STRUCTURES INSTALLED.

GRADING & EROSION CONTROL NOTES

- 1. CONTRACTOR SHALL CONTACT 'DIGGERS HOTLINE' (1-800-242-8511) AT LEAST THREE BUSINESS DAYS PRIOR TO EXCAVATION/ CONSTRUCTION, FOR UTILITY LOCATIONS.
2. 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 ENGINEER OF ANY DISCREPANCIES OR VARIATIONS.
3. ENGINEER SHALL PROVIDE HORIZONTAL AND VERTICAL CONTROL BENCHMARKS. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL SAID HORIZONTAL AND VERTICAL CONTROL POINTS SET BY ENGINEER.
4. CONTRACTOR TO ADHERE TO ALL CITY, DNR, WISDOT AND WPDES PERMIT REQUIREMENTS, INCLUDING THE REQUIREMENT TO MINIMIZE THE AREA DISTURBED BY GRADING AT ANY GIVEN TIME AND TO COMPLETE VEGETATION RESTORATION WITHIN THE TIME REQUIRED BY THE PERMIT AFTER COMPLETION OF GRADING OF AN AREA AFTER FINAL GRADING OR STORM SEWER CONSTRUCTION.
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 AFTER FINAL GRADING OR STORM SEWER CONSTRUCTION.
6. ALL CONSTRUCTION ENTRANCES SHALL BE SURFACED WITH CRUSHED ROCK ACROSS FULL WIDTH FROM ENTRANCE POINT TO 50 FEET INTO THE CONSTRUCTION ZONE. SEE DETAIL.
7. INLET PROTECTION IS TO BE USED DURING CONSTRUCTION. SEE DETAIL.
8. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH CITY, COUNTY, AND STATE PERMITS.
9. CONTRACTOR SHALL PROVIDE ADDITIONAL TEMPORARY EROSION CONTROL MEASURES AS DIRECTED BY THE ENGINEER. INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
10. REMOVE ALL EROSION CONTROL MEASURES AFTER VEGETATION IS ESTABLISHED, AS DIRECTED BY THE ENGINEER. INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
11. THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO EXISTING STREETS AND PAVED AREAS, AS DIRECTED BY THE ENGINEER, INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
12. IF BLOWING DUST BECOMES A NUISANCE, THE CONTRACTOR SHALL APPLY WATER FROM A TANK TRUCK TO ALL CONSTRUCTION AREAS INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
13. SWEEP ADJACENT STREETS AS DIRECTED BY THE ENGINEER, INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
14. INSPECT EROSION CONTROL DEVICES ONCE PER WEEK OR AFTER EACH RAINFALL EVENT OF 0.50-INCHES OR GREATER AND AT LEAST DAILY DURING PROLONGED RAINFALL. IMMEDIATELY REPAIR FAILED OR FAILING EROSION CONTROL DEVICES.
15. SEDIMENT REMOVAL - SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.
16. 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 ENGINEER.
17. 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 ENGINEER.
18. EXISTING GRANULAR MATERIALS SHALL BE SEGREGATED AND STOCKPILED FOR REUSE ON-SITE.
19. CONTRACTOR SHALL STRIP, STOCKPILE AND RE-SPREAD EXISTING ON-SITE TOPSOIL TO PROVIDE A UNIFORM THICKNESS, MINIMUM 4", ON ALL DISTURBED AREAS TO BE SODDED OR SEEDED.
20. 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.
21. GRADES SHOWN ARE FINISHED GRADES, CONTRACTOR SHALL ROUGH GRADE TO SUBGRADE ELEVATIONS. SUBGRADE ELEVATIONS SHALL BE INSPECTED AND APPROVED PRIOR TO PLACEMENT OF FINISH MATERIALS.
22. FINAL GRADING TOLERANCES ARE ±0.1 FEET OF PLAN GRADES.
23. ALL EXCESS MATERIAL, BITUMINOUS SURFACING, CONCRETE ITEMS, ANY ABANDONED UTILITY ITEMS, AND OTHER UNSTABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS SPECIFIED OTHERWISE AND SHALL BE DISPOSED OF OFF-SITE IN A MANNER MEETING ALL APPLICABLE REGULATIONS.

Library Lake Southeast Stormwater Improvements
Engineering Standards
Prepared by EOR; October 30, 2020
Table with 4 columns: Item No, Description, Reference, and Value.

24. 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.

25. UNDER PAVEMENTS COMPACT THE UPPER THREE FEET OF SUBGRADE TO 100% STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT AND 95% STANDARD PROCTOR DENSITY BELOW THE UPPER THREE FEET OF SUBGRADE. OUTSIDE OF PAVEMENT AREAS COMPACT EMBANKMENTS TO 95% STANDARD PROCTOR DENSITY.

RESTORATION NOTES

- 1. TURF RESTORATION IS SEEDING IN ACCORDANCE WITH THE RESTORATION PLAN.

PERMITS

\*\*\*CONTRACTOR SHALL ADHERE TO ALL REQUIREMENTS OF ALL PERMITS SECURED BY CONTRACTOR OR BY OWNER.

1. CITY OF CUMBERLAND, RIGHT-OF-WAY

- A. FOR SITE ACCESS.
B. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A RIGHT-OF-WAY PERMIT / EASEMENT PERMIT FROM THE CITY.
C. CONTRACTOR SHALL PREPARE AND SUBMIT ALL APPLICATIONS AND OTHER PERMIT REQUIREMENTS IN ORDER TO SECURE THE PERMIT.
D. ANY COST INCURRED FOR OBTAINING THE PERMIT SHALL BE INCIDENTAL TO TRAFFIC CONTROL.

2. WISCONSIN DOT PERMIT TO WORK ON HIGHWAY RIGHT-OF-WAY

- A. FOR ACCESS TO STATE HIGHWAY 63 FOR HAULING EXCAVATED SOIL AND OTHER MATERIALS TO & FROM THE SITE.
B. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A RIGHT-OF-WAY PERMIT.
C. CONTRACTOR SHALL PREPARE AND SUBMIT ALL APPLICATIONS AND OTHER PERMIT REQUIREMENTS IN ORDER TO SECURE THE PERMIT.
D. ANY COST INCURRED FOR OBTAINING THE PERMIT SHALL BE INCIDENTAL TO TRAFFIC CONTROL.

3. WISCONSIN DNR WPDES PERMIT

- A. FOR CONSTRUCTION SITE STORM WATER.
B. OWNER HAS OBTAINED THIS PERMIT.

Base Bid
Table with 5 columns: Item No, Description, WISDOT Reference #, Unit, Quantity.

Bid Alternate 1: Rain Garden Inlet
Table with 5 columns: Item No, Description, WISDOT Reference #, Unit, Quantity.

Bid Alternate 2: Restoration
Table with 5 columns: Item No, Description, WISDOT Reference #, Unit, Quantity.

Plot Date: 07/05/2023
Drawing Name: A:Clients\_Phase\_209\_GNIS/ingDrawings/Sheets/NOTES & ESTIMATED QUANTITIES.dwg
User: Xieff

Revision table with columns: NO, DATE, BY, REVISION.



Submission and Design information table.

Emmons & Olivier Resources, Inc. logo and contact information.

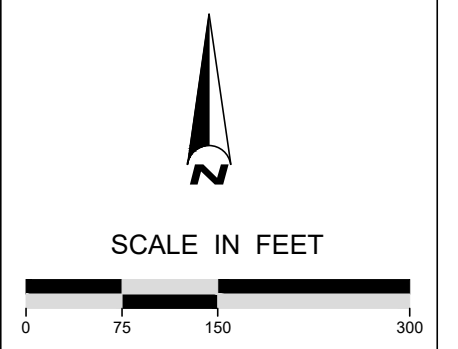
BEAVER DAM LAKE MANAGEMENT DISTRICT
P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS PHASE 2
CUMBERLAND, BARRON COUNTY, WISCONSIN

NOTES & ESTIMATED QUANTITIES
SHEET 2 OF 18 SHEETS



NOTE:  
FOR SOIL BORING INFORMATION  
AND LOGS, REFER TO THE REPORT  
BY AET PROJECT NO. 31-20717



Plot Date: 07/05/2023  
 Drawing Name: A:\Clients\_Phase000000\_Beaver\_Dam\_Lake\_Assoc0037\_Library\_Lake\_SE\_Phase\_209\_GNIS\dwg\Drawings\Streets\OVERVIEW & SOIL BORING PLAN.dwg  
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SUBMISSION DATE:  
6/23/2023  
 DESIGN BY DRAWN BY CHECKED BY  
KFA KFA DRL  
 EOR PROJECT NO.  
00909-0037

**EOE** Emmons & Olivier  
 Resources, Inc.  
 1919 University Ave W,  
 Suite 300, St Paul, MN 55104  
 water ecology  
 community  
 Tele: 651.770.8448  
 www.eorinc.com

**BEAVER DAM LAKE  
 MANAGEMENT DISTRICT**  
 P.O. BOX 232 CUMBERLAND, WI 54829

**LIBRARY LAKE SOUTHEAST STORMWATER  
 IMPROVEMENTS  
 PHASE 2**  
 CUMBERLAND, BARRON COUNTY, WISCONSIN  
 STATE PROJECT NO. #### CITY PROJECT NO. ####

**OVERVIEW & SOIL BORING PLAN**  
**SHEET 3 OF 18 SHEETS**



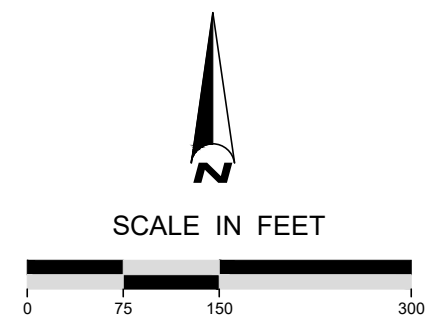


**NOTES:**

- CONTRACTOR SHALL WORK WITH THE ENGINEER TO MODIFY THIS SITE PLAN TO FULFILL THE REQUIREMENTS OF THE WISCONSIN DNR WPDES PERMIT FOR STORMWATER ASSOCIATED WITH LAND DISTURBING CONSTRUCTION ACTIVITY.
- CONTRACTOR SHALL IMPLEMENT POLLUTION PREVENTION MEASURES INCLUDING BUT NOT LIMITED TO: TEMPORARY SEDIMENTATION BASIN / TRAP & OUTLET DEVICE; STORAGE FACILITY FOR CHEMICALS, CEMENT, ETC.; SPILL PREVENTION & RESPONSE PROCEDURES. THESE ITEMS SHALL BE INCIDENTAL TO THE CONTRACT WITH NO ADDITIONAL COST TO THE OWNER.

**DRAINAGE AREA SUMMARY**

NAME	AREA (SQ-FT)
1S	64,634
2S	17,625
3S	58,113
4S	11,851
5S	68,533
6S	25,562
7S	46,438
8S	13,760
9S	29,210
10S	15,591
11S	11,802
12S	9,471
13S	9,513
14S	6,105
TOTAL	378,208



Plot Date: 07/05/2023  
 Drawing Name: R:\Clients\_Phase\009000900\_Beaver\_Dam\_Lake\_Assoc\0037\_Library\_Lake\_SE\_Phase\_2\09\_GNIS\dwg\Drawings\Streets\Drainage Area & SWPPP Site Plan.dwg  
 Xrefs:

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Know what's below. Call before you dig.

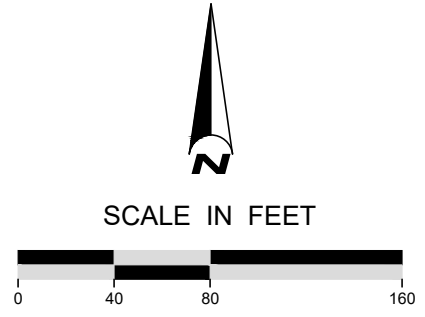
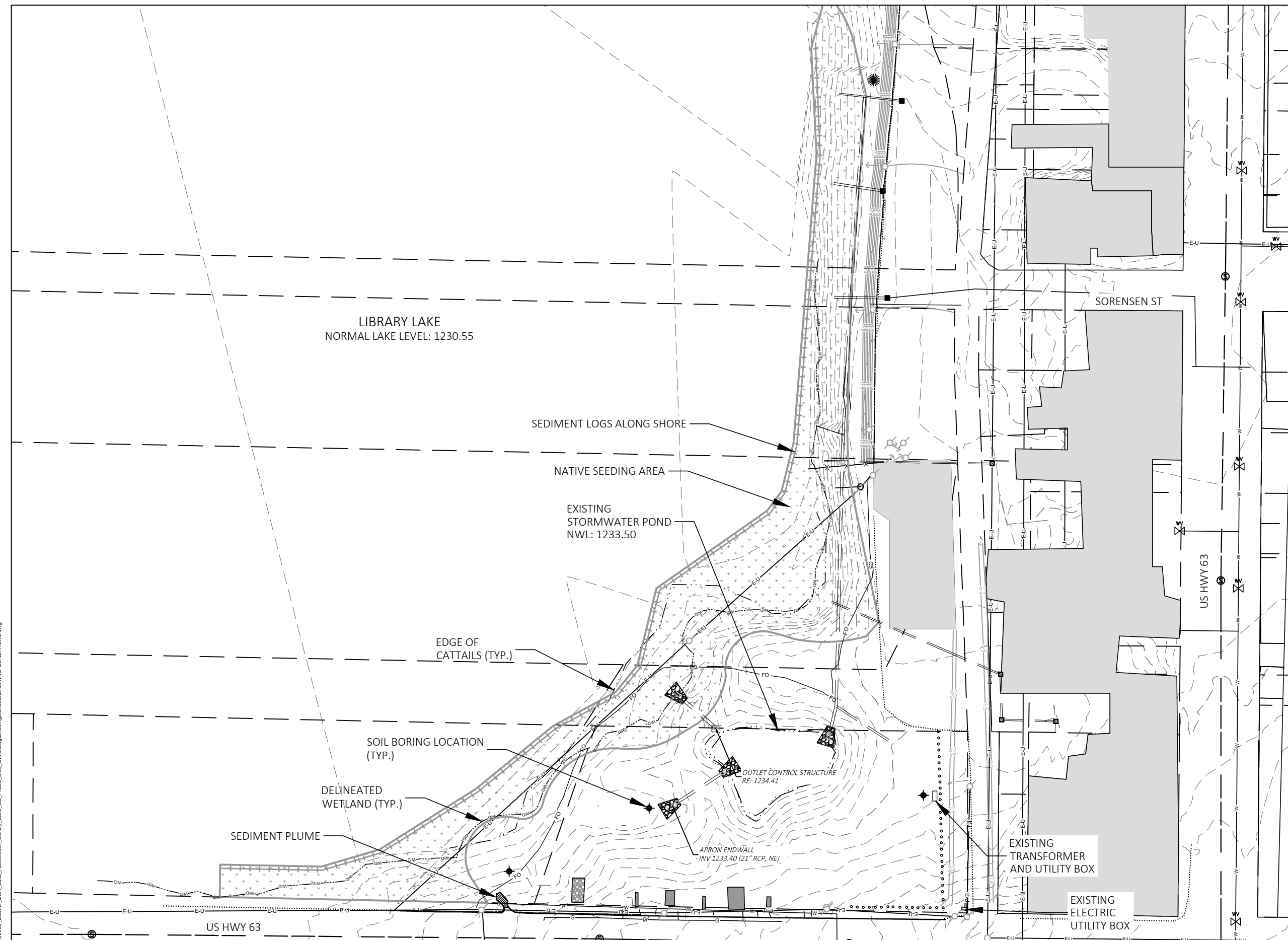
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 KFA KFA DRL  
 EOR PROJECT NO.  
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 Suite 300, St Paul, MN 55104  
 Tele: 651.770.8448  
 www.eorinc.com

**BEAVER DAM LAKE  
 MANAGEMENT DISTRICT**  
 P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER  
 IMPROVEMENTS  
 PHASE 2  
 CUMBERLAND, BARRON COUNTY, WISCONSIN  
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**DRAINAGE AREA & SWPPP SITE PLAN**  
 SHEET 4 OF 18 SHEETS



File Path: U:\05\07\23  
 On: C:\Users\kcc\OneDrive\Library\_Lake\_SE\_Phase\_2\09\_GNIS\dwg\Drawings\Sheets\EXISTING CONDITIONS.dwg  
 Xrefs: Existing Linework

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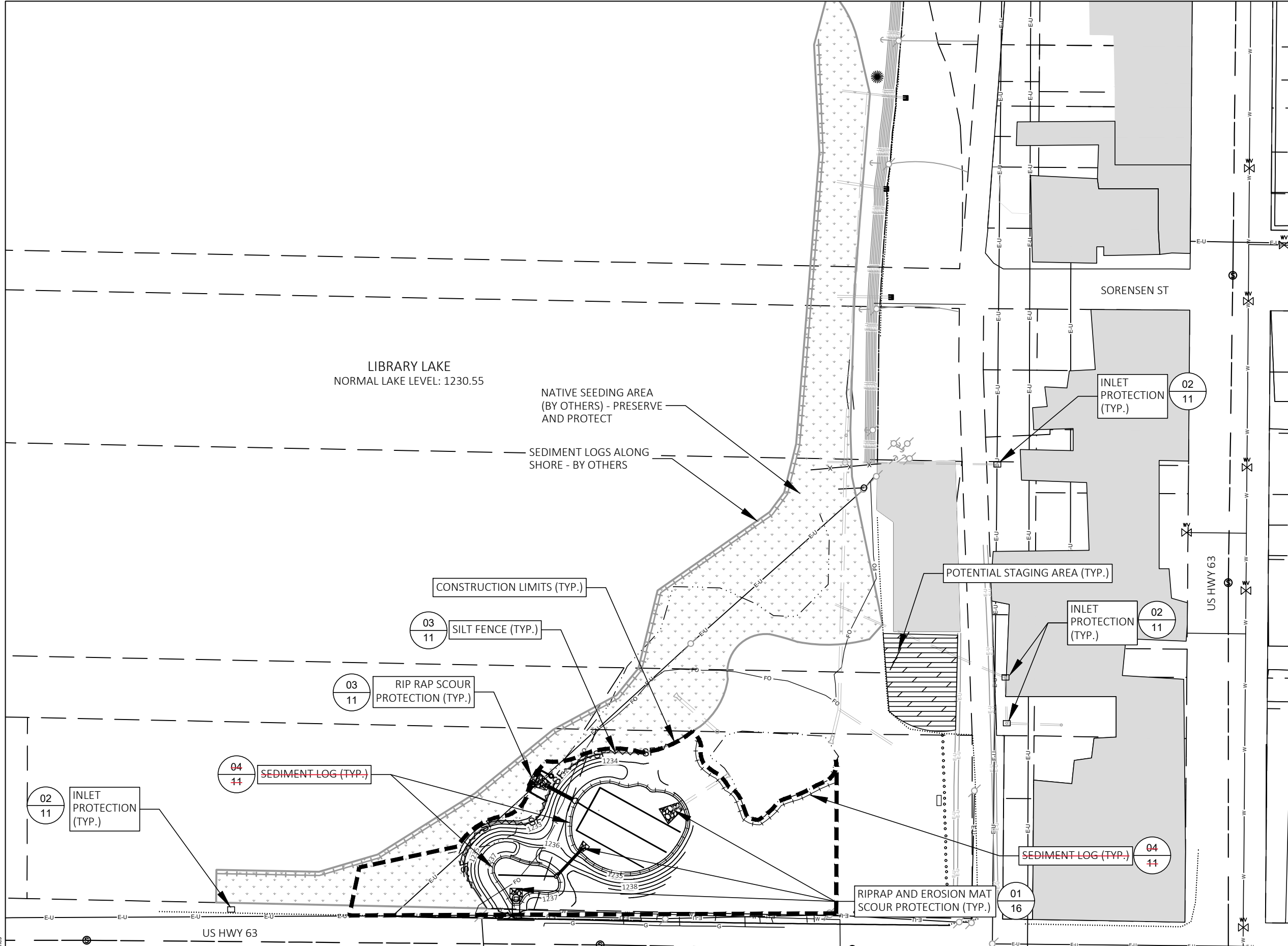
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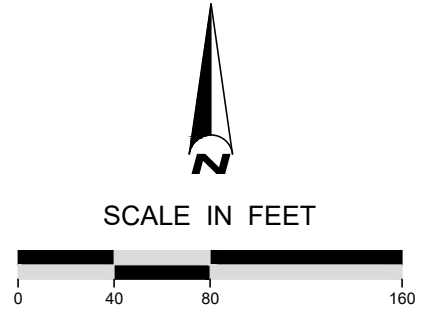
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 PHASE 2  
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EXISTING CONDITIONS  
 SHEET 5 OF 18 SHEETS




- NOTE:
1. CONTRACTOR TO PROVIDE LOCATION AND INSTALL TRACKING PAD AND INLET PROTECTION IN CITY PARKING LOT & ROADWAYS AND IN DOT HIGHWAY PRIOR TO GRADING ACTIVITIES. ENGINEER TO APPROVE.
  2. LOCATIONS SHOWN ON PLAN SHALL BE PROVIDED FOR GUIDANCE ONLY AND FINAL LOCATIONS SHOULD BE DETERMINED BY THE ENGINEER.
  3. CONTRACTOR SHALL PLACE OUTLET PROTECTION IN ALL APRON ENDWALLS DURING CONSTRUCTION TO MINIMIZE SEDIMENT DISCHARGE TO THE LAKE.
  4. CONTRACTOR SHALL PLACE INLET PROTECTION IN CATCH BASINS AS INDICATED AS A PRECAUTION. IF NO MATERIAL LEAVES THE SITE AND INLET PROTECTION IS NOT NEEDED, DEVICES WILL NOT BE PAID FOR. INSTALLING INLET PROTECTION DOES NOT ALLEVIATE THE CONTRACTOR FROM REMOVING TRACKED SOIL ONTO THE STREETS, PARKING LOTS, AND ADJACENT SIDEWALKS.
  5. EROSION CONTROL MATTING TO BE INSTALLED ON SLOPES ADJACENT TO STORMWATER BASINS A MINIMUM OF EIGHT (8) FEET WIDE OR ONE ROLL, WHICHEVER IS GREATER. SEE RESTORATION PLAN.
  6. ~~INSTALL SEDIMENT LOGS ON THE SOUTH BOUNDARY OF THE POND AS INDICATED.~~
  7. IN THE EVENT THE CONTRACTOR ELECTS TO ACCESS THE SITE FROM THE ALLEY THEY SHALL BE RESPONSIBLE FOR RECEIVING AUTHORIZATION FROM THE OWNER, INCLUDING ALL NECESSARY CITY PERMITS.
  8. ADDITIONAL EROSION & SEDIMENT CONTROL, AS WELL AS VEGETATION RESTORATION NECESSARY TO ACCESS THE SITE FROM THE ALLEY SHALL BE INCIDENTAL TO THE CONTRACT.



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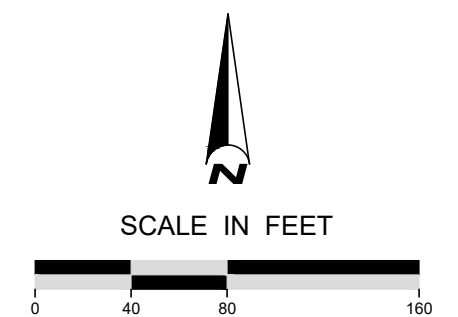
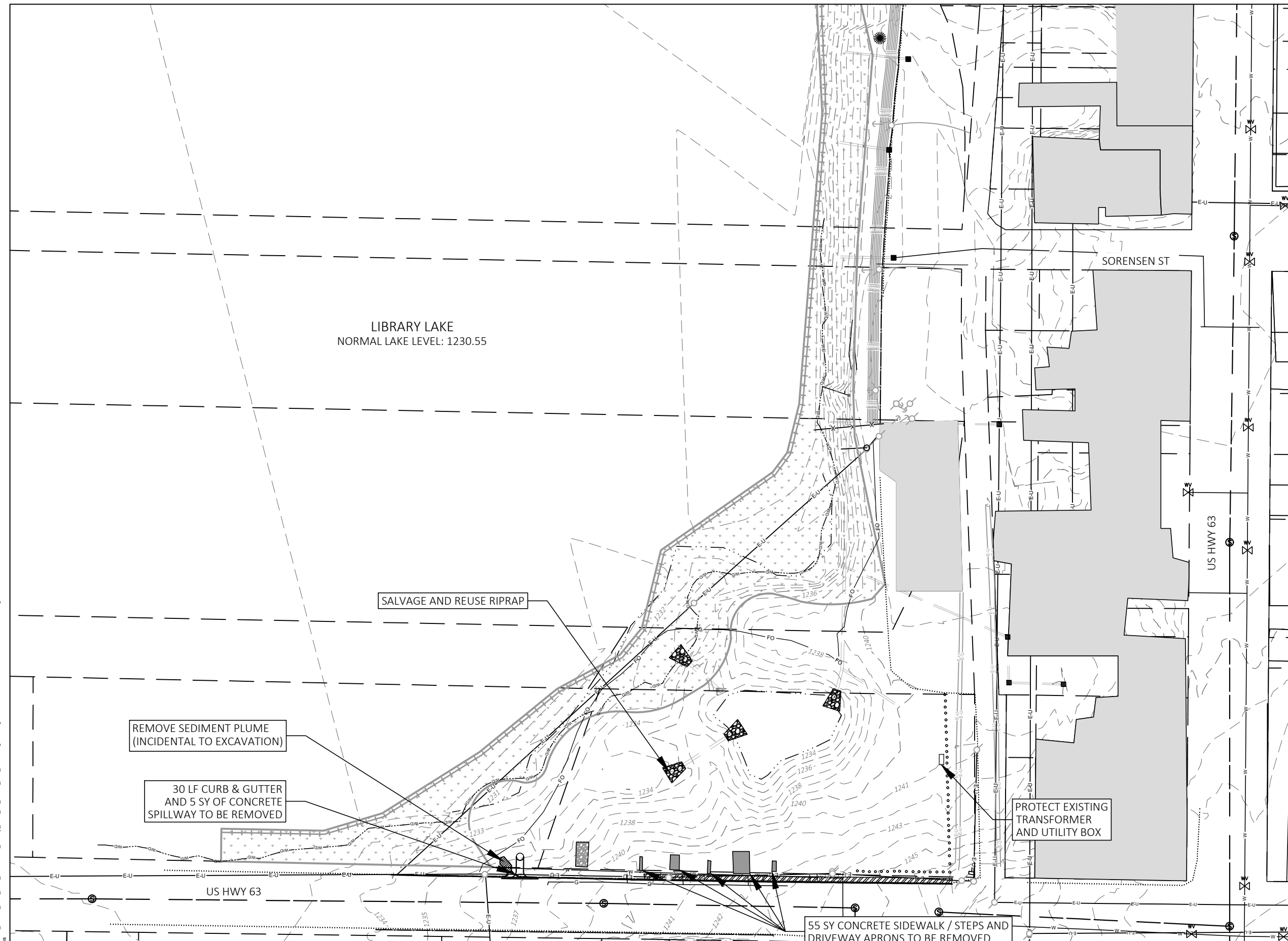
**LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS PHASE 2**

CUMBERLAND, BARRON COUNTY, WISCONSIN

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**EROSION & SEDIMENT CONTROL**

**SHEET 6 OF 18 SHEETS**



Plot Date: 07/05/2023  
 On: C:\Users\kfa\OneDrive\Documents\Drawings\Streets\DEMOLITION & REMOVALS PLAN.dwg  
 Xrefs: Existing Linework2, Edgelines

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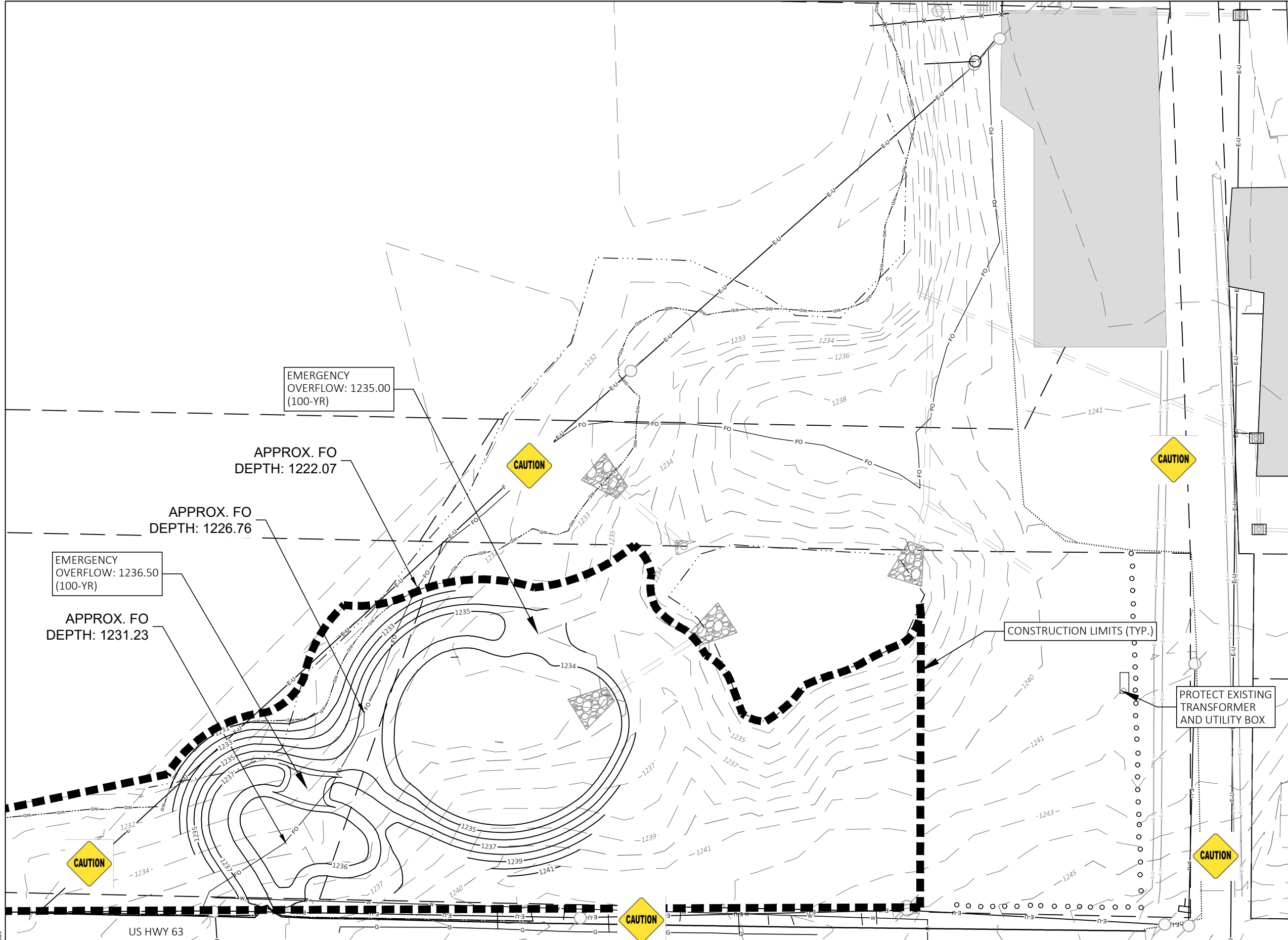
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**LIBRARY LAKE SOUTHEAST STORMWATER  
 IMPROVEMENTS  
 PHASE 2**  
 CUMBERLAND, BARRON COUNTY, WISCONSIN  
 STATE PROJECT NO. #### | CITY PROJECT NO. ###

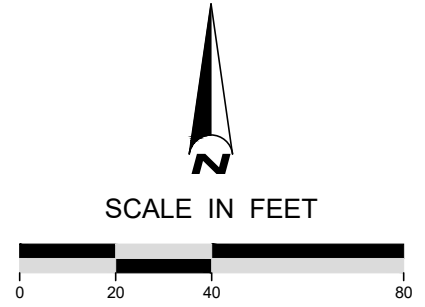
**DEMOLITION & REMOVALS PLAN**  
 SHEET 7 OF 18 SHEETS



CAUTION OVERHEAD /UNDERGROUND UTILITY CABLES



PROTECT EXISTING TRANSFORMER AND UTILITY BOX



Plot Date: 07/05/2023  
On: C:\Users\kcc\OneDrive\Documents\Projects\Phase2\_09\_GNIS\Gis\Drawings\Streets\Grading, Drainage, and Storm Sewer Plans.dwg  
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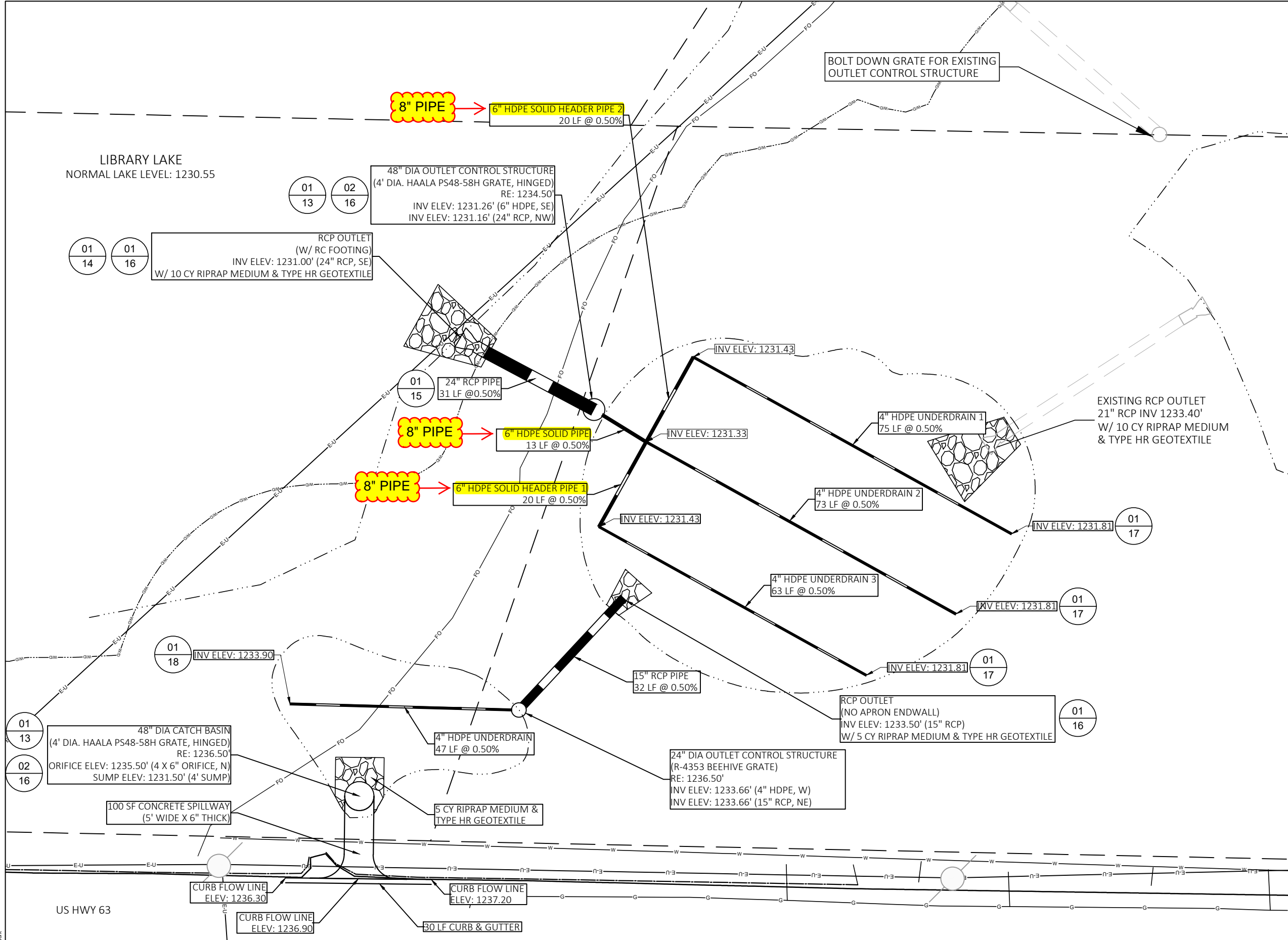
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LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS  
PHASE 2  
CUMBERLAND, BARRON COUNTY, WISCONSIN  
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GRADING & DRAINAGE PLAN  
SHEET 8 OF 18 SHEETS



LIBRARY LAKE  
NORMAL LAKE LEVEL: 1230.55

BOLT DOWN GRATE FOR EXISTING  
OUTLET CONTROL STRUCTURE

48" DIA OUTLET CONTROL STRUCTURE  
(4' DIA. HAALA PS48-58H GRATE, HINGED)  
RE: 1234.50'  
INV ELEV: 1231.26' (6" HDPE, SE)  
INV ELEV: 1231.16' (24" RCP, NW)

RCP OUTLET  
(W/ RC FOOTING)  
INV ELEV: 1231.00' (24" RCP, SE)  
W/ 10 CY RIPRAP MEDIUM & TYPE HR GEOTEXTILE

24" RCP PIPE  
31 LF @ 0.50%

8" PIPE → 6" HDPE SOLID PIPE  
13 LF @ 0.50%

8" PIPE → 6" HDPE SOLID HEADER PIPE 1  
20 LF @ 0.50%

6" HDPE SOLID PIPE  
13 LF @ 0.50%

6" HDPE SOLID HEADER PIPE 1  
20 LF @ 0.50%

4" HDPE UNDERDRAIN 1  
75 LF @ 0.50%

4" HDPE UNDERDRAIN 2  
73 LF @ 0.50%

4" HDPE UNDERDRAIN 3  
63 LF @ 0.50%

EXISTING RCP OUTLET  
21" RCP INV 1233.40'  
W/ 10 CY RIPRAP MEDIUM  
& TYPE HR GEOTEXTILE

RCP OUTLET  
(NO APRON ENDWALL)  
INV ELEV: 1233.50' (15" RCP)  
W/ 5 CY RIPRAP MEDIUM & TYPE HR GEOTEXTILE

24" DIA OUTLET CONTROL STRUCTURE  
(R-4353 BEEHIVE GRATE)  
RE: 1236.50'  
INV ELEV: 1233.66' (4" HDPE, W)  
INV ELEV: 1233.66' (15" RCP, NE)

4" HDPE UNDERDRAIN  
47 LF @ 0.50%

5 CY RIPRAP MEDIUM &  
TYPE HR GEOTEXTILE

48" DIA CATCH BASIN  
(4' DIA. HAALA PS48-58H GRATE, HINGED)  
RE: 1236.50'  
ORIFICE ELEV: 1235.50' (4 X 6" ORIFICE, N)  
SUMP ELEV: 1231.50' (4' SUMP)

100 SF CONCRETE SPILLWAY  
(5' WIDE X 6" THICK)

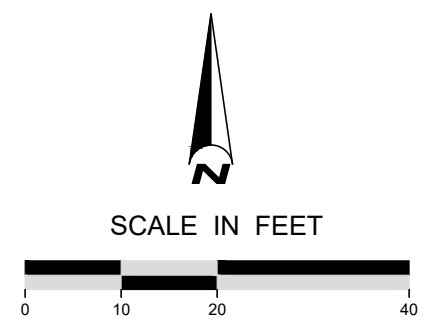
CURB FLOW LINE  
ELEV: 1236.30

CURB FLOW LINE  
ELEV: 1236.90

CURB FLOW LINE  
ELEV: 1237.20

30 LF CURB & GUTTER

US HWY 63



Plot Date: 07/05/2023  
 On: C:\Users\pfrank0009\OneDrive\Projects\Phase000900\Beaver\_Dam\_Lake\_Asecc0037\_Library\_Lake\_SE\_Phase\_209\_GNIS\sig\Drawings\StormSewer\GRADING, DRAINAGE, AND STORM SEWER PLANS.dwg  
 Xrefs: Edgeline2, Existing Linework

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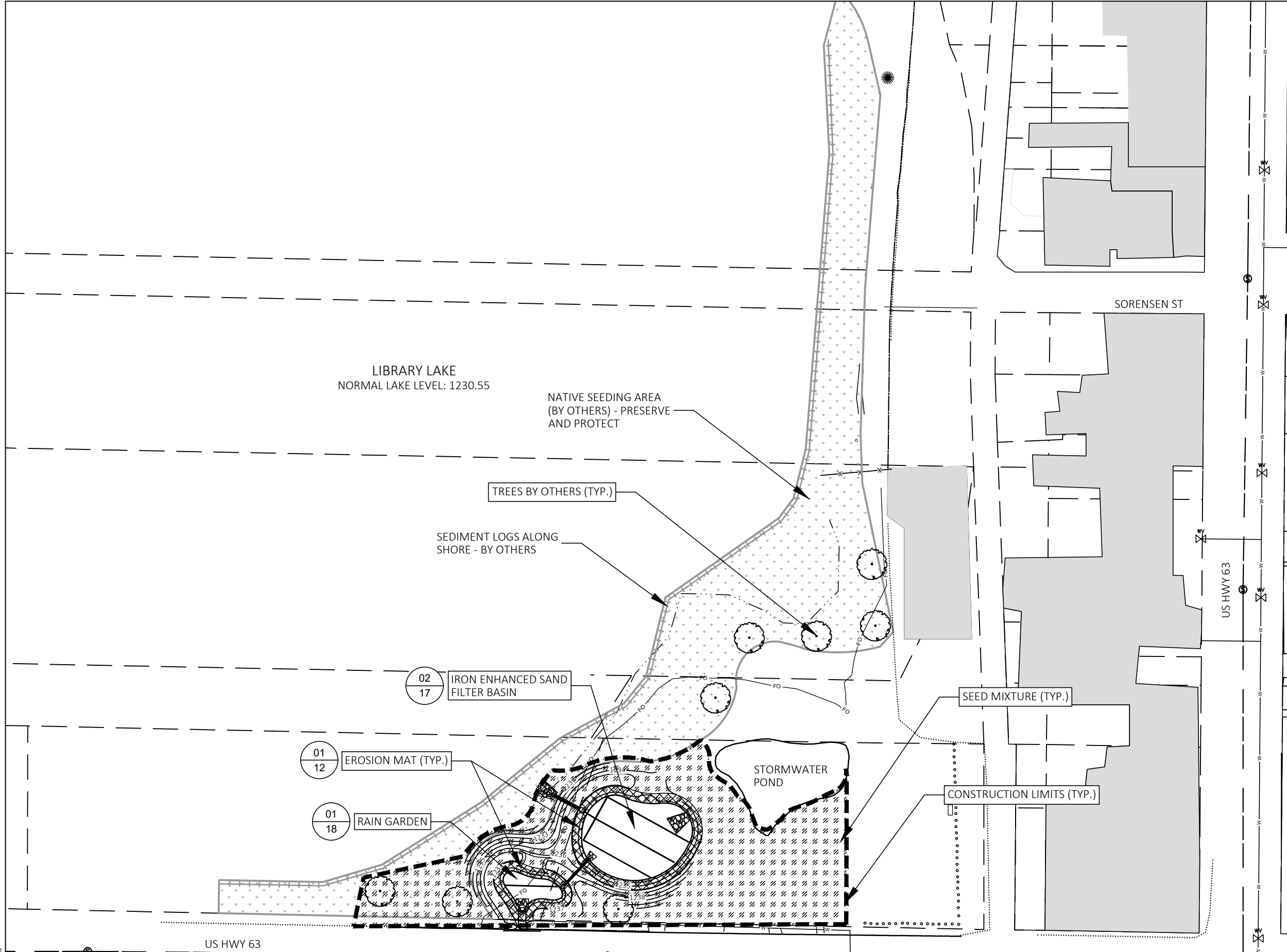
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LIBRARY LAKE SOUTHEAST STORMWATER  
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STORM SEWER PLAN  
SHEET 9 OF 18 SHEETS

- NOTE:
1. ENSURE A MINIMUM DEPTH OF 4 INCHES OF TOP SOIL SPREAD UNIFORMLY ACROSS ALL DISTURBED AREAS.
  2. ALL DISTURBED AREAS ARE TO BE SEEDED WITH:
    - A. WISDOT SEED MIXTURE NO. 70 AT A RATE OF 0.40 LBS PER 1000 SF OR 18 LBS PER ACRE
    - B. NURSE CROP SEED MIXTURE AT A RATE OF 0.80 LBS OER 1000 SQUARE FEET OR 35 LBS PER ACRE.
  3. APPLY SOIL STABILIZER TYPE A AT A MINIMUM RATE OF 3,500 LBS PER ACRE, OR AS SPECIFIED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER. SEE WDNR USE RESTRICTIONS FOR THE MAXIMUM APPLICATION RATE LBS PER ACRE.
  4. CONTRACTOR SHALL NOT BE PAID FOR ANY EROSION MAT IF IT IS NOT INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING BUT NOT LIMITED TO EDGE TRENCHING AND PROPER STAPLE INSTALLATION.
  5. INSTALL THREE (3) INCHES OF DOUBLE SHREDDED HARDWOOD MULCH TO THE RAIN GARDEN SURFACE. MULCH SHALL BE SUBSTANTIALLY FREE OF NOXIOUS WEED SEEDS AND OBJECTIONABLE FOREIGN MATERIAL. OBTAIN THE ENGINEER'S APPROVAL FOR THE TYPE OF MULCH USED.



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 Xrefs: Existing Linework.dwg

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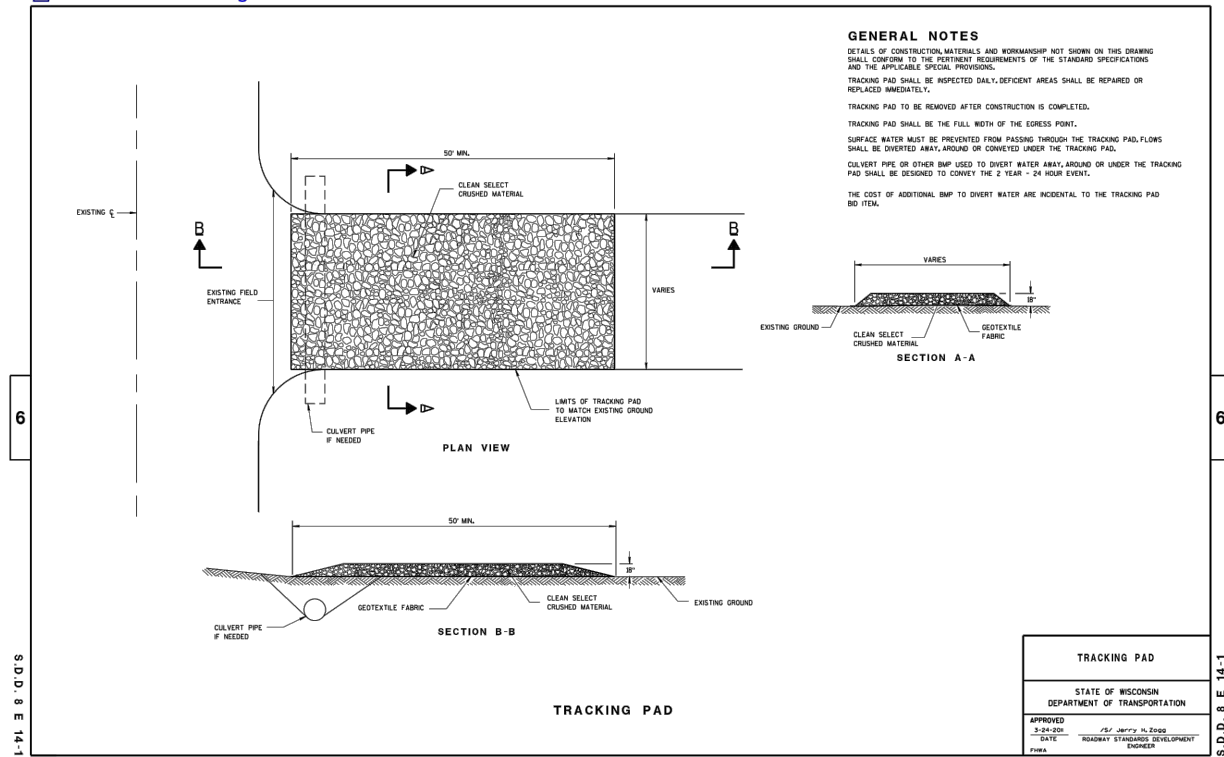
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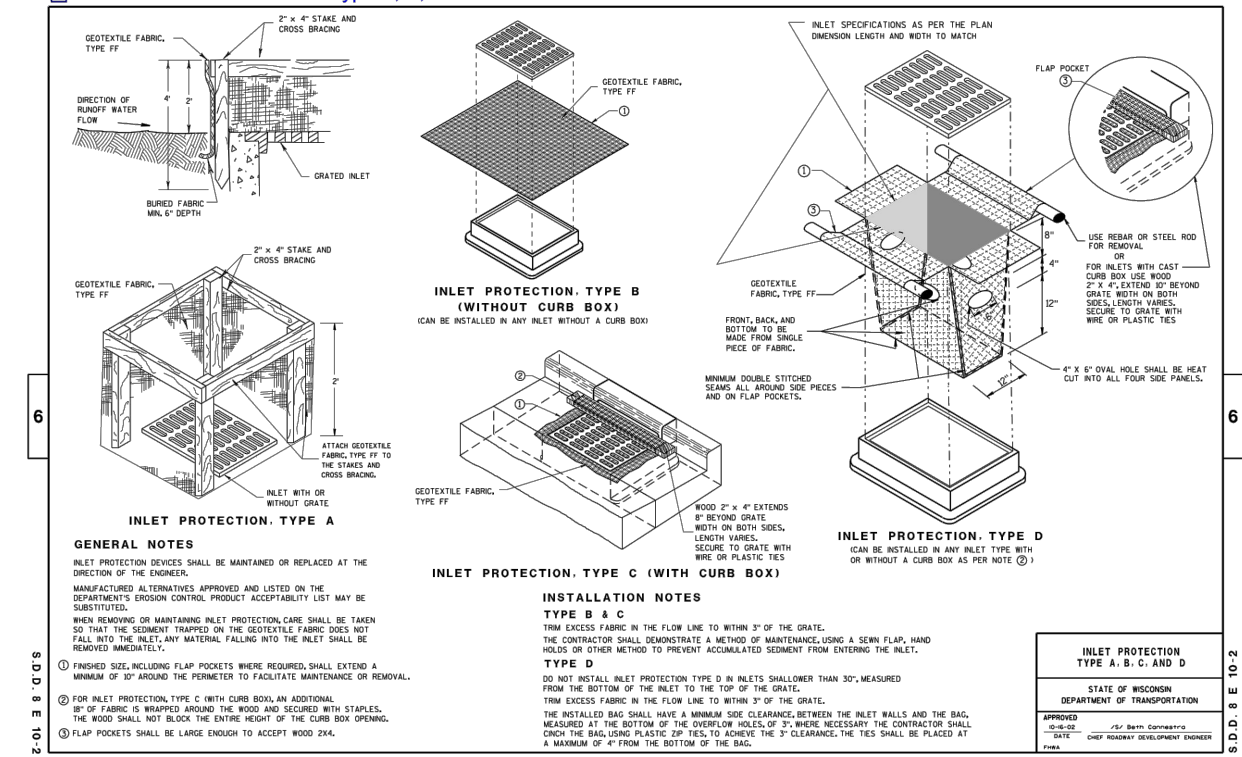
RESTORATION PLAN  
 SHEET 10 OF 18 SHEETS

**SDD 8e14 Tracking Pad**



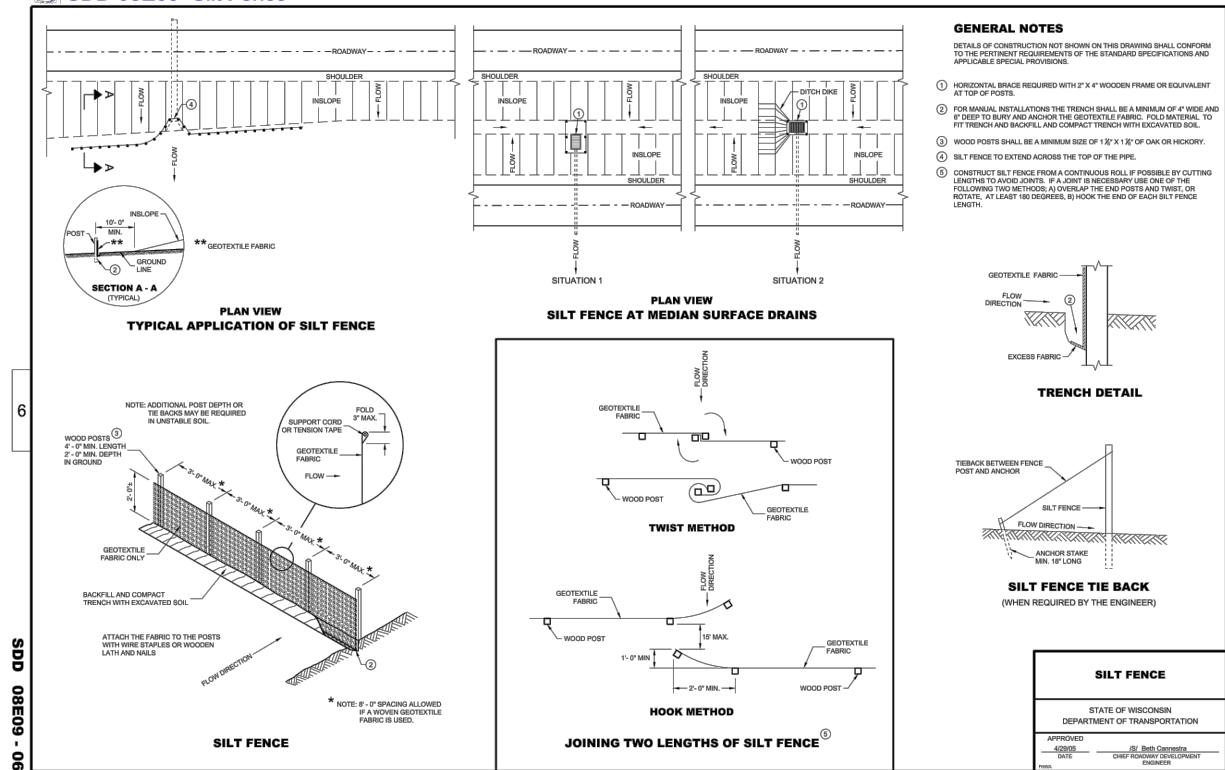
**01 TRACKING PAD**  
 11 NOT TO SCALE

**SDD 8e10 Inlet Protection Type A, B, C and D**



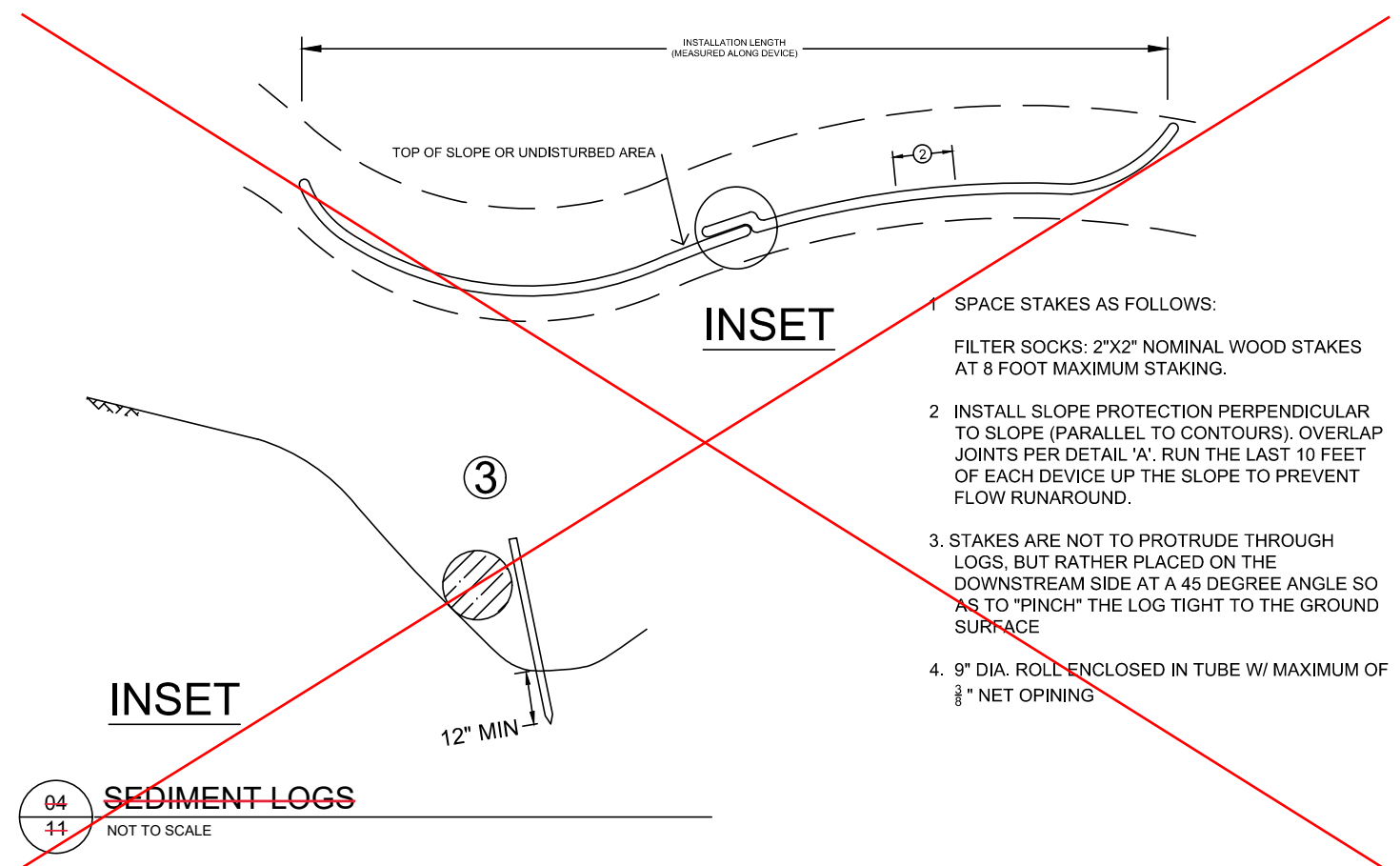
**02 INLET PROTECTION**  
 11 NOT TO SCALE

**SDD 08E09 Silt Fence**



**03 SILT FENCE**  
 11 NOT TO SCALE

**04 SEDIMENT LOGS**  
 11 NOT TO SCALE



Plot Date: 07/05/2023  
 Drawing Name: A:Clients\_Phase000900\_Beaver\_Dam\_Lake\_Assoc0037\_Library\_Lake\_SE\_Phase\_209\_GMS(Sig)Drawings(Shades)DETAILS.dwg  
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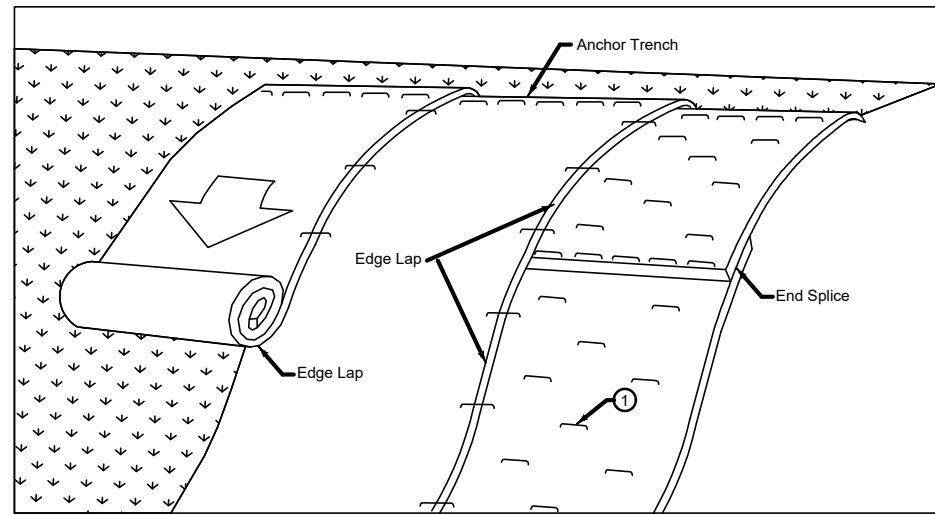
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LIBRARY LAKE SOUTHEAST STORMWATER  
 IMPROVEMENTS  
 PHASE 2  
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DETAIL SHEET 1

SHEET 11 OF 18 SHEETS

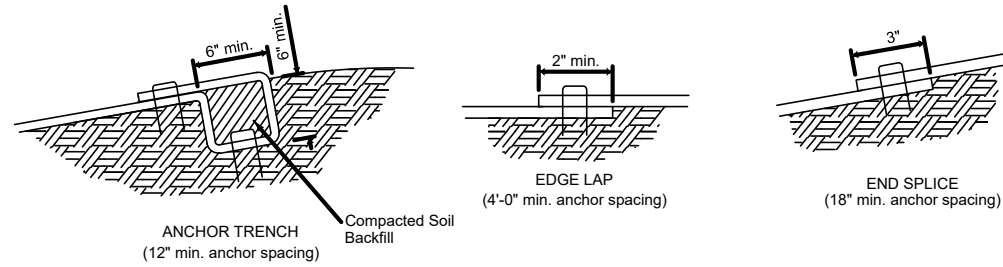




- NOTES:
1. SECURE BLANKET TO GROUND ACCORDING TO MANUFACTURER'S RECOMMENDED ANCHORING PATTERN AND MINIMUM SHOWN IN TABLE 1.
  2. SPACE TOP ROW OF STAPLES AT 18 INCH, BOTTOM ROW AT 36 INCH CENTERS, AND ALL OTHERS AT 24 INCH CENTERS. APPROXIMATELY 30 STAPLES REQUIRED PER SQUARE (100 SQ.-FT.) OF EROSION CONTROL MAT.
  3. WHERE EROSION GULLIES HAVE DEVELOPED IN BACKSLOPE, FILL WITH SOIL AND COMPACT PRIOR TO PLACEMENT OF EROSION CONTROL MAT.
  4. 4 FEET MINIMUM TO 8 FEET MAXIMUM OR AS SPECIFIED. PLACE STAPLES THE SAME AS FOR SPECIAL DITCH CONTROL.
  5. 4 FEET UNLESS SPECIFIED OTHERWISE FOR FORESLOPE PROTECTION.
  6. IF EROSION RILL HAS DEVELOPED ADJACENT TO SHOULDER MATERIAL, FILL WITH SUITABLE SOIL AND COMPACT PRIOR TO PLACEMENT OF MAT.
  7. EROSION CONTROL BLANKET SHALL BE MNDOT CATEGORY 3N.

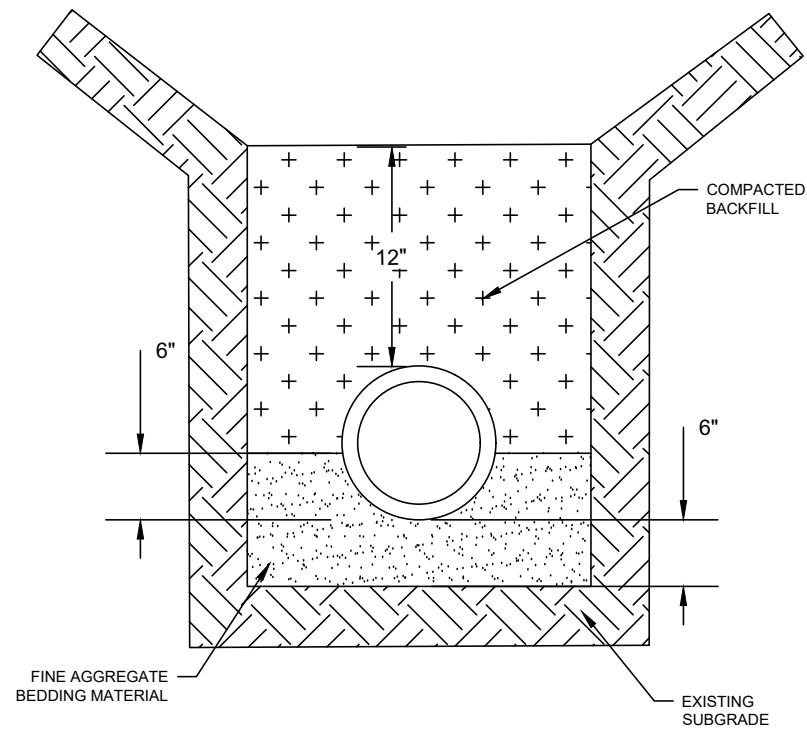
TABLE 1

Max. slope	Min. anchors
≤ 3:1	1.5/yd <sup>2</sup>
2:1	2/yd <sup>2</sup>
1:1	2.5/yd <sup>2</sup>



01 EROSION CONTROL MATTING  
12 NOT TO SCALE

02 NOT IN USE  
12 NOT TO SCALE



03 PIPE BEDDING DETAIL  
12 NOT TO SCALE

Plot Date: 07/05/2023  
 Drawing Name: R:\Clients\_Phases\Phase000009\_Beaver\_Dam\_Lake\_Assoc0037\_Library\_Lake\_SE\_Phase\_209\_GINS(Sig)Drawings\Sheets\DETAILS.dwg  
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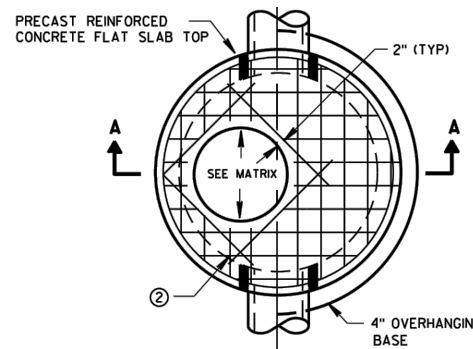
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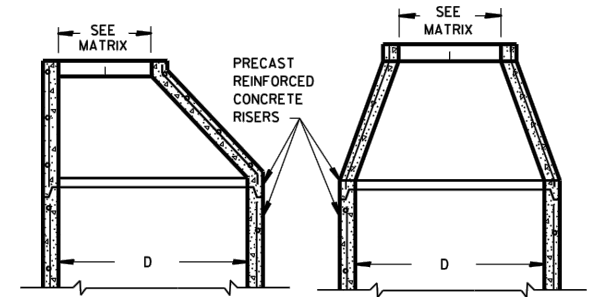
DETAIL SHEET 2

SHEET 12 OF 18 SHEETS

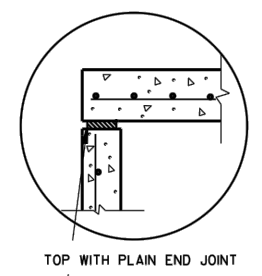
# SDD 8b9 Manholes 3-FT, 4-FT, 5-FT, 6-FT, 7-FT, and 8-FT Diameter



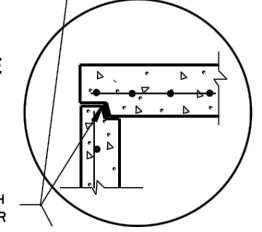
PLAN VIEW CIRCULAR OPENING



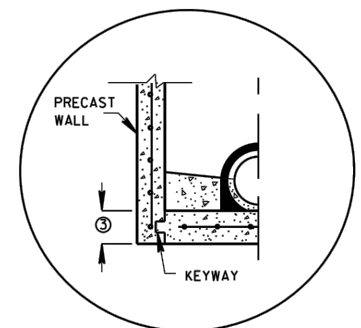
OPTIONAL PRECAST REINFORCED CONCRETE ECCENTRIC TOP  
OPTIONAL PRECAST REINFORCED CONCRETE CONCENTRIC TOP



TOP WITH PLAIN END JOINT

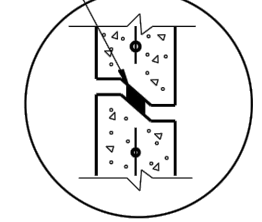


TOP WITH TONGUE AND GROOVE JOINT

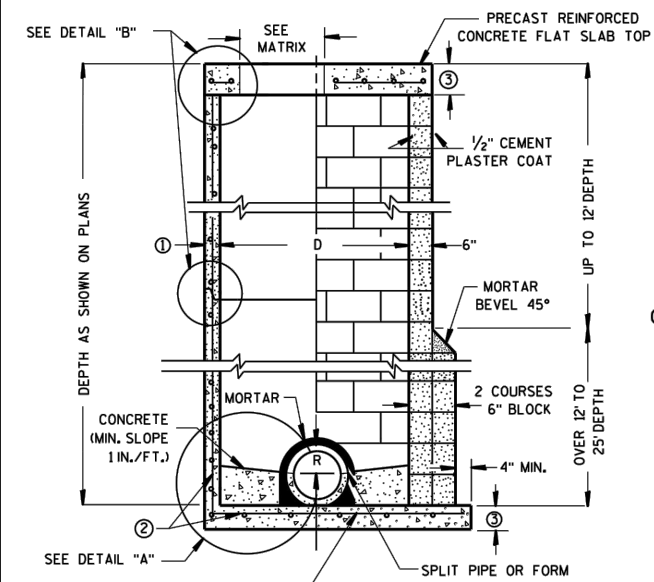


PRECAST REINFORCED CONCRETE WITH INTEGRAL BASE OPTION

JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C990 (TYP)

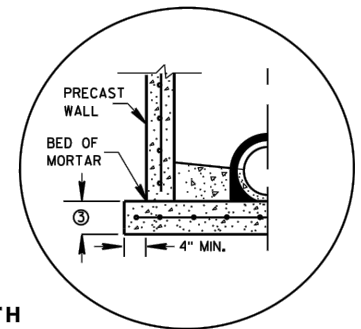


RISER WITH TONGUE AND GROOVE JOINT

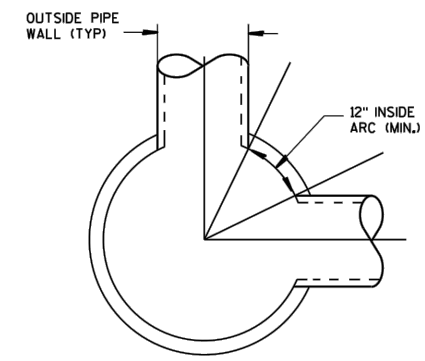


CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES

PRECAST REINFORCED CONCRETE BLOCK WITH CONCRETE WITH MONOLITHIC BASE  
CAST-IN-PLACE OR PRECAST REINFORCED CONCRETE BASE



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION  
DETAIL "A"



DETAIL "C"

## MANHOLES 3-FT, 4-FT, 5-FT, 6-FT, 7-FT AND 8-FT DIAMETER

### GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS. UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST MANHOLE UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATE THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF FOUNDATION BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

PRECAST REINFORCED CONE TOPS (ECCENTRIC OR CONCENTRIC) OR PRECAST REINFORCED FLAT SLAB TOPS MAY BE USED ON CONCRETE BLOCK STRUCTURES.

ECCENTRIC CONE TOPS MAY BE USED ON ALL STRUCTURES, AND CONCENTRIC CONE TOPS SHALL BE USED ONLY ON STRUCTURES 5 FEET OR LESS IN DEPTH, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEPS MEETING AASHTO M199 AND THE FOLLOWING REQUIREMENTS SHALL BE INSTALLED IN ALL STRUCTURES OVER 5 FEET IN DEPTH: 16 INCH C-C MAXIMUM SPACING; PROJECT A MINIMUM CLEAR DISTANCE OF 4 INCHES FROM THE WALL AT THE POINT OF EMBEDMENT; MINIMUM LENGTH OF 10 INCHES; MINIMUM WALL EMBEDMENT OF 3 INCHES. FERROUS METAL STEPS NOT PAINTED OR TREATED TO RESIST CORROSION SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1 INCH.

STEPS OF APPROVED POLYPROPYLENE PLASTIC COATED REINFORCEMENT BAR ARE ACCEPTABLE. REINFORCING BAR MUST BE A MINIMUM OF 1/2" AND MEET THE REQUIREMENTS OF ASTM A615.

CERTIFICATION SHALL BE PROVIDED THAT INSTALLED STEPS WHEN TESTED IN ACCORDANCE WITH SECTION 10 OF AASHTO T280 CAN WITHSTAND A VERTICAL LOAD OF 800 LBS. AND A HORIZONTAL LOAD OF 400 LBS.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

CONCRETE BLOCK WILL NOT BE PERMITTED FOR STRUCTURES GREATER THAN 4 FEET IN DIAMETER.

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

ALL PRECAST MANHOLE UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M 199.

4" OVERHANGING BASES ARE REQUIRED FOR ALL CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

FOR ADDITIONAL CONFIGURATIONS, MAINTAIN A MINIMUM OF 12 INCHES AS MEASURED FROM THE INSIDE OF THE STRUCTURE WALL BETWEEN THE OUTSIDE PIPE WALLS OF ADJACENT PIPES. SEE DETAIL "C".

- ① MINIMUM WALL THICKNESS SHALL BE 4 INCHES FOR 3-FT, 5 INCHES FOR 4-FT, 6 INCHES FOR 5-FT, 7 INCHES FOR 6-FT, 8 INCHES FOR 7-FT AND 9 INCHES FOR 8-FT DIAMETER PRECAST MANHOLES.
- ② FOR PRECAST MANHOLES PROVIDE REINFORCING STEEL IN ACCORDANCE TO AASHTO M199.
- ③ PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER OF 48" AND LESS SHALL HAVE A MINIMUM THICKNESS OF 6". PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER LARGER THAN 48" SHALL HAVE A MINIMUM THICKNESS OF 8".

### MANHOLE COVER OPENING MATRIX

MANHOLE COVER TYPE	C	ALL J'S	K	L	M
OPENING SIZE (FT)					
2 DIA.	X	X		X	
3 DIA.			X		X

### PIPE MATRIX

MANHOLE SIZE	MAXIMUM INSIDE PIPE DIAMETER FOR TWO PIPES	
	180° SEPARATION (IN)	90° SEPARATION (IN)
3-FT	15	12
4-FT	24	18
5-FT	36	24
6-FT	42	36
7-FT	48	36
8-FT	60	42

### MANHOLES 3-FT, 4-FT, 5-FT, 6-FT, 7-FT AND 8-FT DIAMETER

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
Sept., 2016 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR  
FHWA

6

6

S.D.D. 8 B 9-2

S.D.D. 8 B 9-2

### 01 MANHOLE DETAIL

13 NOT TO SCALE

NO	DATE	BY	REVISION
6			
5			
4			
3			
2			
1			



SUBMISSION DATE: 6/23/2023  
DESIGN BY DRAWN BY CHECKED BY: DRL KFA DRL  
EOR PROJECT NO. 00909-0037

**EOR** Emmons & Olivier Resources, Inc.  
1919 University Ave W, Suite 300, St Paul, MN 55104  
water ecology community  
Tele: 651.770.8448  
www.eorinc.com

BEAVER DAM LAKE MANAGEMENT DISTRICT  
P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS PHASE 2  
CUMBERLAND, BARRON COUNTY, WISCONSIN  
STATE PROJECT NO. ### CITY PROJECT NO. ###

DETAIL SHEET 3  
SHEET 13 OF 18 SHEETS

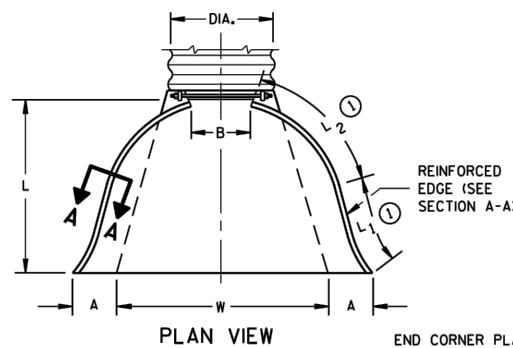
# SDD 8f1 Apron Endwalls for Culvert Pipe

PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1/2")	L (±1/2")	L1	L2	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 3/4	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	6	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1 2 Pc.	
42	.109	.105	16	22	H	69	24	75 3/4	84	2 1/2 to 1 2 Pc.	
48	.109	.105	18	27	12	78	24	81	90	2 1/2 to 1 3 Pc.	
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/2 to 1 3 Pc.	
60	.109x	.105x	18	33	12	87	—	—	114	2 to 1 3 Pc.	
66	.109x	.105x	18	36	12	87	—	—	120	2 to 1 3 Pc.	
72	.109x	.105x	18	39	12	87	—	—	126	2 to 1 3 Pc.	
78	.109x	.105x	18	42	12	87	—	—	132	1 1/2 to 1 3 Pc.	
84	.109x	.105x	18	45	12	87	—	—	138	1 1/2 to 1 3 Pc.	
90	.109x	.105x	18	37	12	87	—	—	144	1 1/2 to 1 3 Pc.	
96	.109x	.105x	18	35	12	87	—	—	150	1 1/2 to 1 3 Pc.	

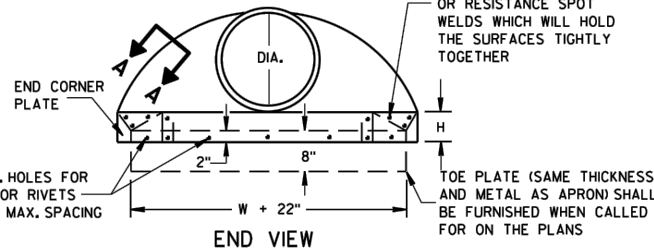
\* EXCEPT CENTER PANEL SEE GENERAL NOTES

PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 1/8	72 3/8	24	2	3 to 1
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1
30	3 1/2	12	54	19 1/4	73 1/2	60	3 1/2	3 to 1
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1
48	5	24	72	26	98	84	5	3 to 1
54	5 1/2	27	65	33 1/4-35	98 1/4-100	90	5 1/2	2 1/2 to 1
60	6	30-35	60	39	99	96	5	2 to 1
66	6 1/2	24-30	72-78	21-27	99	102	5 1/2	2 to 1
72	7	24-36	78	21	99	106	6	2 to 1
78	7 1/2	24-36	78	21	99	114	6 1/2	2 to 1
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1

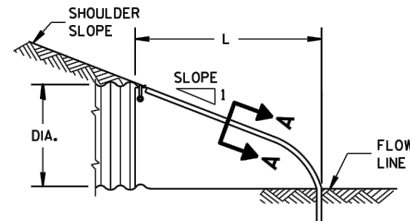
\* MINIMUM  
\*\* MAXIMUM



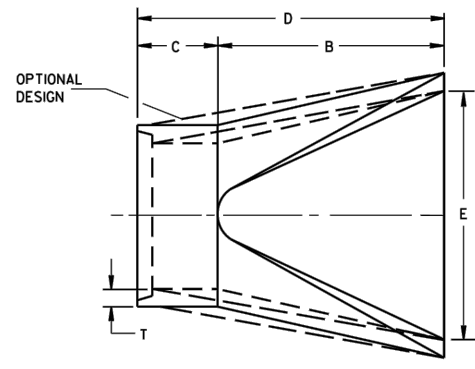
PLAN VIEW



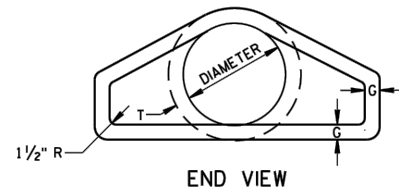
END VIEW



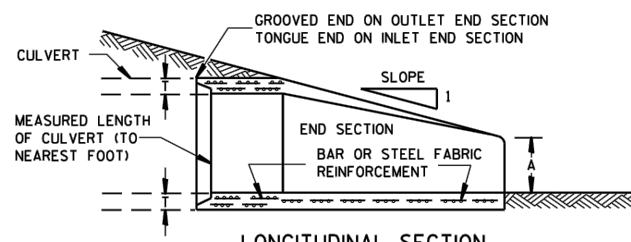
SIDE ELEVATION METAL ENDWALLS



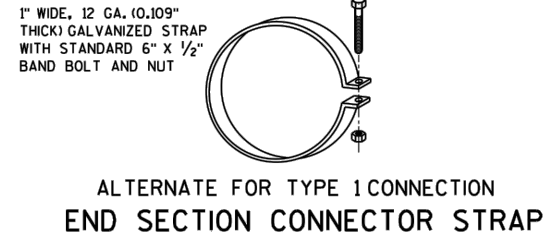
PLAN



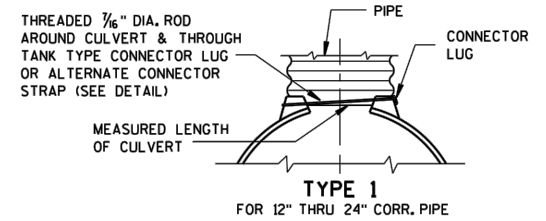
END VIEW



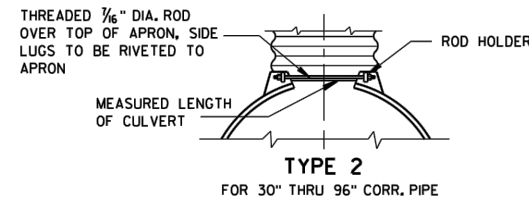
LONGITUDINAL SECTION CONCRETE ENDWALLS



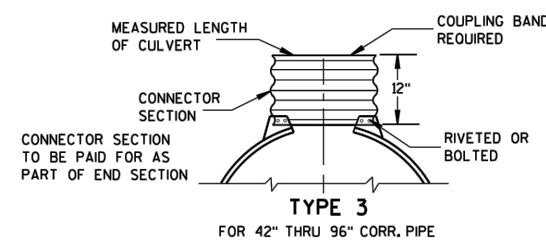
ALTERNATE FOR TYPE 1 CONNECTION END SECTION CONNECTOR STRAP



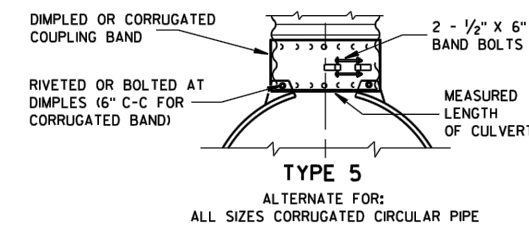
TYPE 1 FOR 12" THRU 24" CORR. PIPE



TYPE 2 FOR 30" THRU 96" CORR. PIPE



TYPE 3 FOR 42" THRU 96" CORR. PIPE



TYPE 5 ALTERNATE FOR: ALL SIZES CORRUGATED CIRCULAR PIPE

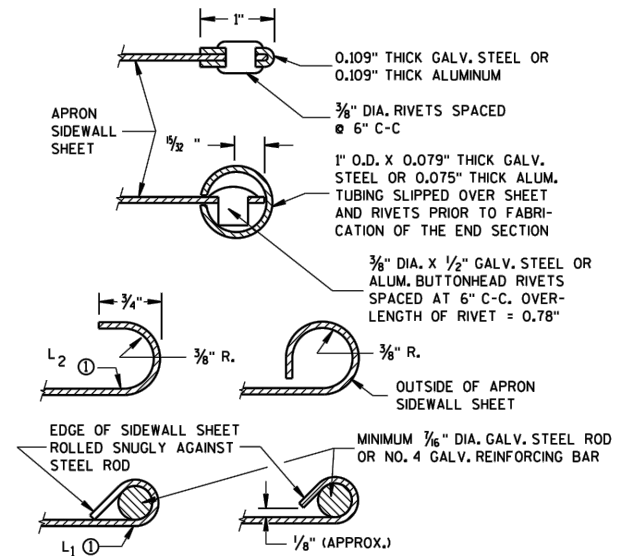
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3 OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2 OR 3.

CONNECTION DETAILS



SECTION A-A

## GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VICE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

## APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
8-30-94 DATE /S/ Rory L. Rhinesmith  
CHIEF ROADWAY DEVELOPMENT ENGINEER  
FHWA

## 01 APRON ENDWALLS DETAIL

14 NOT TO SCALE

6			
5			
4			
3			
2			
1			
NO	DATE	BY	REVISION



SUBMISSION DATE:  
6/23/2023  
DESIGN BY DRAWN BY CHECKED BY  
DRL KFA DRL  
EOR PROJECT NO.  
00909-0037

**EOR** Emmons & Olivier Resources, Inc.  
1919 University Ave W,  
Suite 300, St Paul, MN 55104  
w a t e r e c o l o g y c o m m u n i t y  
T e l e : 6 5 1 . 7 7 0 . 8 4 4 8  
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BEAVER DAM LAKE  
MANAGEMENT DISTRICT  
P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER  
IMPROVEMENTS  
PHASE 2  
CUMBERLAND, BARRON COUNTY, WISCONSIN

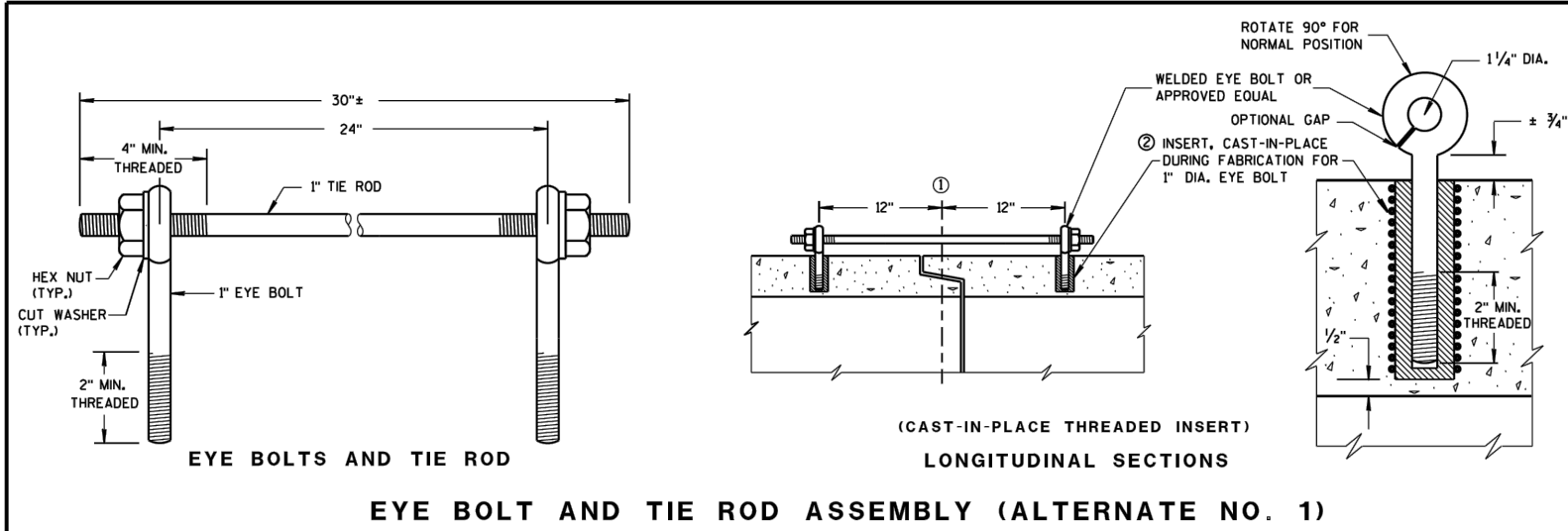
DETAIL SHEET 4

SHEET 14 OF 18 SHEETS

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S.D.D. 8 F 1-11

# SDD 8f4 Joint Ties for Concrete Pipe and Concrete Pipe Collars



## GENERAL NOTES

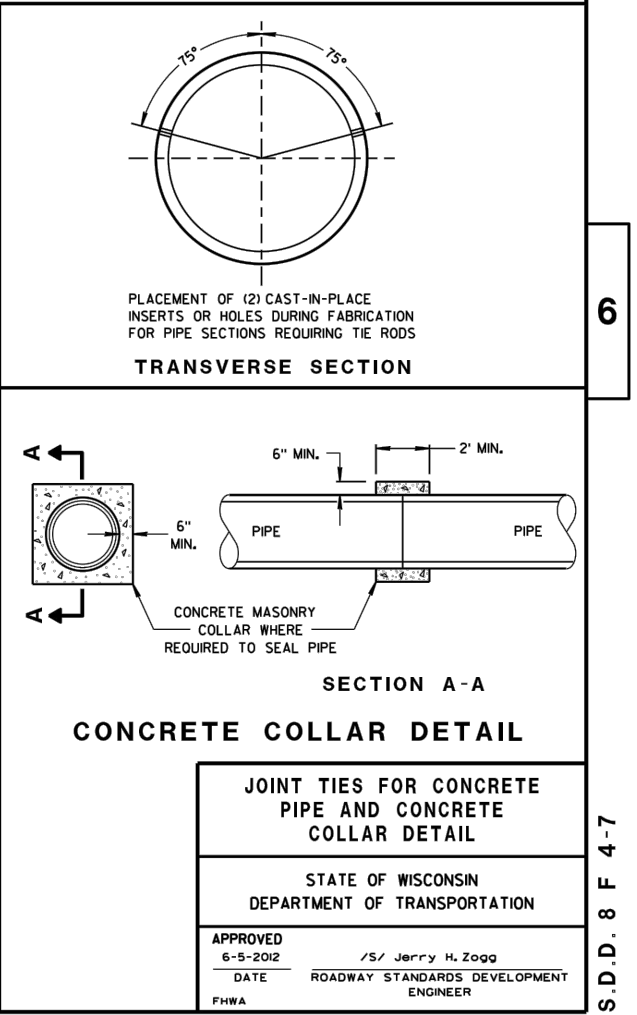
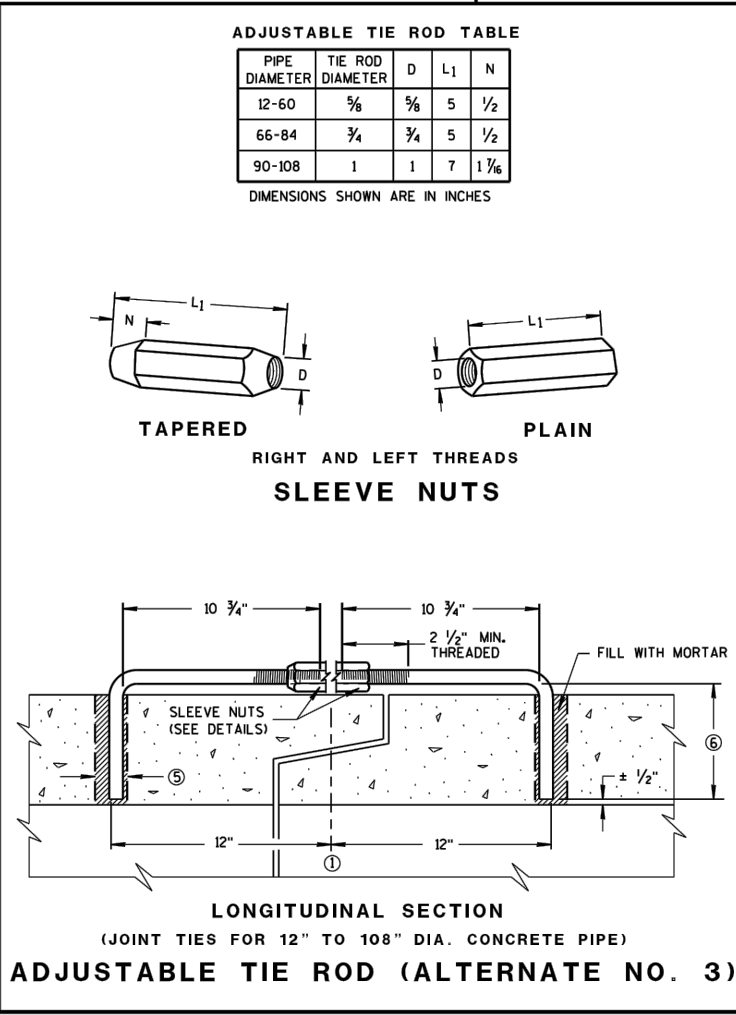
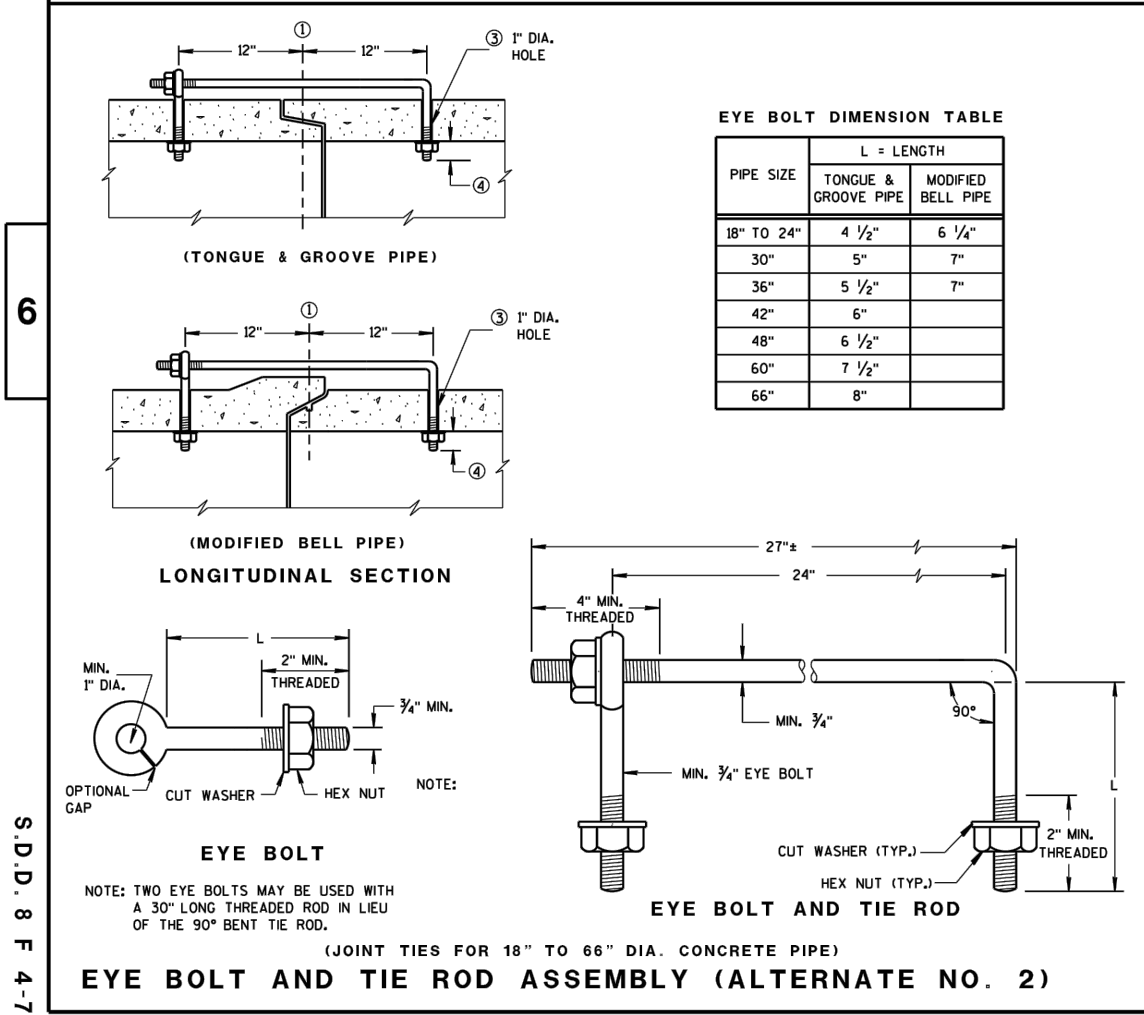
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT AND STORM SEWER PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AT LOCATIONS DESIGNATED IN THE STANDARD SPECIFICATIONS AND THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2 OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES. UNLESS OTHERWISE STATED IN THE CONTRACT, THE MATERIALS, FABRICATION AND WORK NECESSARY TO TIE THE PIPE BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO THE PIPE AND APRON ENDWALLS IF REQUIRED.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

- ①  $\phi$  OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12 INCHES FROM  $\phi$  OF TONGUE AND GROOVE.
- ④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.
- ⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.
- ⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN 1/2 INCH OF THE INNER SURFACE OF THE PIPE.

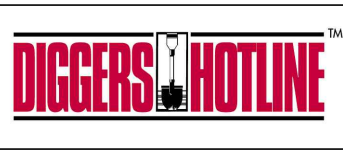


S.D.D. 8 F 4-7

S.D.D. 8 F 4-7

01 JOINT TIES DETAIL  
15 NOT TO SCALE

NO	DATE	BY	REVISION
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3			
2			
1			



SUBMISSION DATE:  
6/23/2023

DESIGN BY DRAWN BY CHECKED BY  
DRL KFA DRL

EOR PROJECT NO.  
00909-0037

**EOR** Emmons & Olivier Resources, Inc.  
1919 University Ave W,  
Suite 300, St Paul, MN 55104  
water ecology community  
Tele: 651.770.8448  
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BEAVER DAM LAKE  
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P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER  
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CUMBERLAND, BARRON COUNTY, WISCONSIN

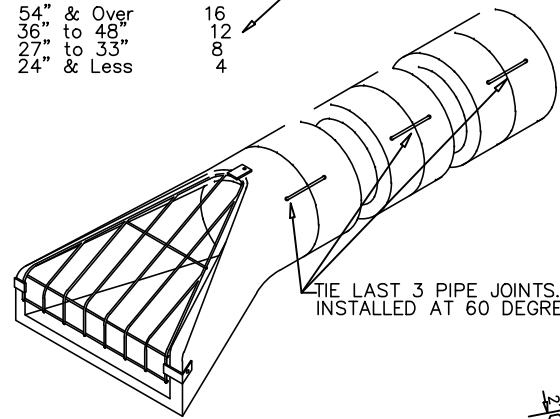
STATE PROJECT NO. #### CITY PROJECT NO. ###

DETAIL SHEET 5  
SHEET 15 OF 18 SHEETS

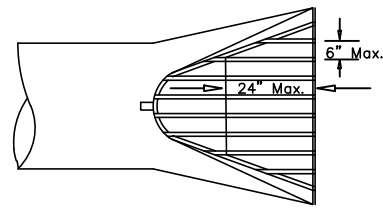
SEE DWGS FOR QTY OF RIPRAP REQUIRED

SIZE OF PIPE	CU. YD.
54" & Over	16
36" to 48"	12
27" to 33"	8
24" & Less	4

THESE QUANTITIES AND CLASS OF RIP-RAP SHOULD VARY ON VELOCITY.

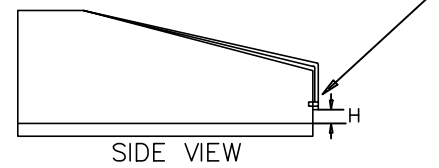


PROVIDE 3 CLIPS TO FASTEN TRASH GUARD TO FLARED END. HOT DIP GALVANIZE AFTER FABRICATION.

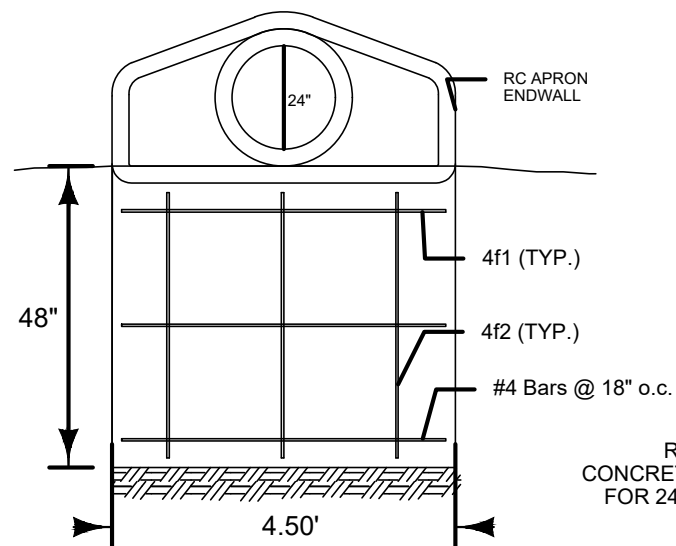


SIZE OF BARS	"H"	BOLTS
15-18"	3/4"	4" 5/8"
21" to 42"	1"	6" 3/4"
48" to 72"	1 1/4"	12" 1"

ANCHOR BOTH SIDES

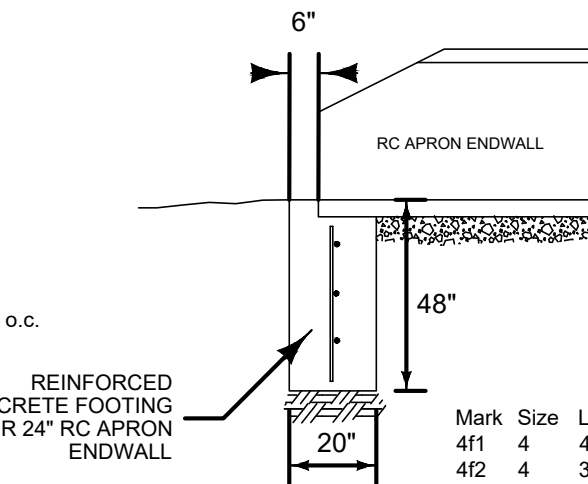


FRONT FACE



REINFORCED CONCRETE FOOTING FOR 24" RC APRON ENDWALL

TYPICAL SECTION



Mark	Size	Length	Count
4f1	4	4'-2"	3
4f2	4	3'-8"	3

01 APRON ENDWALL & RIPRAP (W/ RC FOOTING) DETAIL

16 NOT TO SCALE



NOTES:

1. HAALA INDUSTRIES SLEEPY EYE, MN OR APPROVED EQUAL
2. MODEL NUMBER PS48-58H
3. GALVANIZED STEEL
4. FASTEN TO MANHOLE BARREL A MINIMUM OF FOUR MOUNTING SLOTS
5. UTILIZE STAINLESS STEEL WEDGE ANCHORS MIN 1/2" X 3 3/4"
6. PRECAST REINFORCED CONCRETE BASE AND WALLS (SEE 01/13)

02 POND SKIMMER GRATE

16 NOT TO SCALE

File Path: 07/05/2023  
 Drawing Name: R:\Clients\_Phases\Phase00037\_Library\_Dam\_Lake\_Asecc0037\_Library\_Lake\_SE\_Phase\_209\_GINSingDrawings\Sheets\DETAILS.dwg  
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SUBMISSION DATE:  
6/23/2023

DESIGN BY DRAWN BY CHECKED BY  
KFA KFA DRL

EOR PROJECT NO.  
00909-0037

**EOR** Emmons & Olivier Resources, Inc.  
 1919 University Ave W,  
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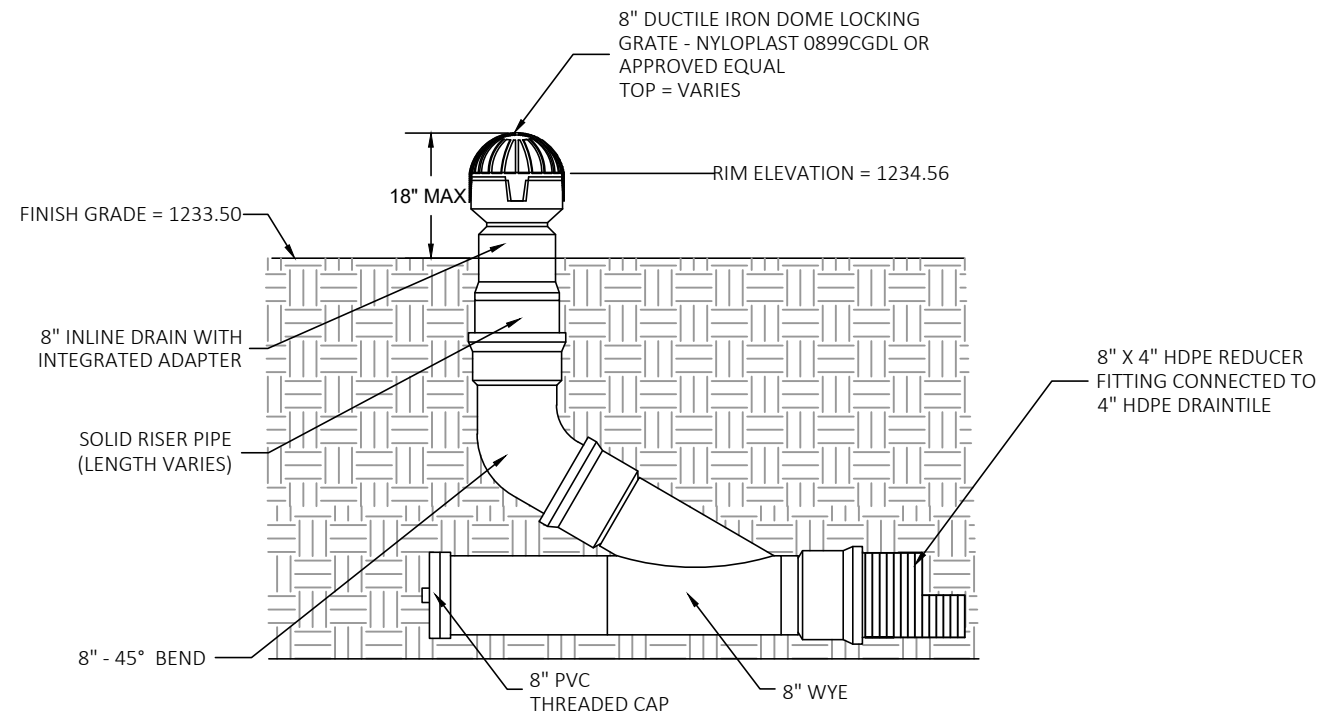
STATE PROJECT NO. ### CITY PROJECT NO. ###

DETAIL SHEET 6

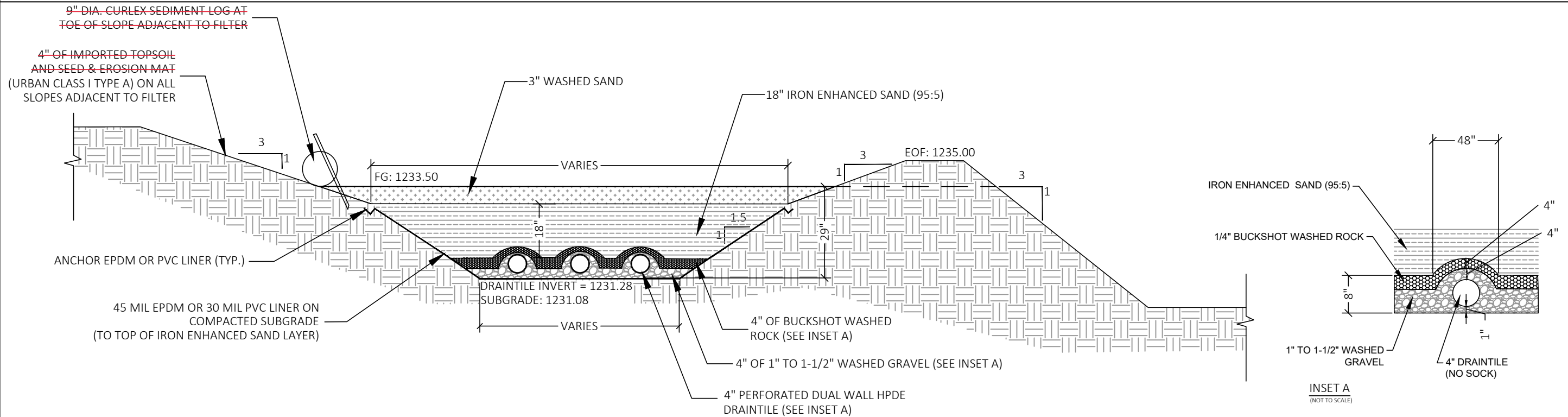
SHEET 16 OF 18 SHEETS

**SEQUENCE OF CONSTRUCTION**

1. STABILIZE ALL UP-GRADIENT EXPOSED EARTH WITH SEED, BLANKET, ~~AND SEDIMENT LOG.~~
2. INSTALL 45 MIL EPDM OR 30 MIL PVC LINER ON SUBGRADE.
3. INSTALL DRAINTILE, CLEANOUTS, VALVES AND MANHOLES.
4. PLACE WASHED GRAVEL, SCREED LEVEL.
5. PLACE IRON ENHANCED SAND FILTER MEDIA PER SPECIFICATION AND RAKE SURFACE SMOOTH.
6. PLACE 3" WASHED SAND AND RAKE SURFACE SMOOTH.



**01 DRAINTILE CLEANOUT**  
17 NOT TO SCALE



**02 IRON ENHANCED SAND FILTER**  
17 NOT TO SCALE

Plot Date: 07/05/2023  
 Drawing Name: R:\Clients\_Phases\Phase\_209\_GMS\Shed\Drawings\Sheets\DETAILS.dwg  
 User: Xieffs

NO	DATE	BY	REVISION
6			
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3			
2			
1			



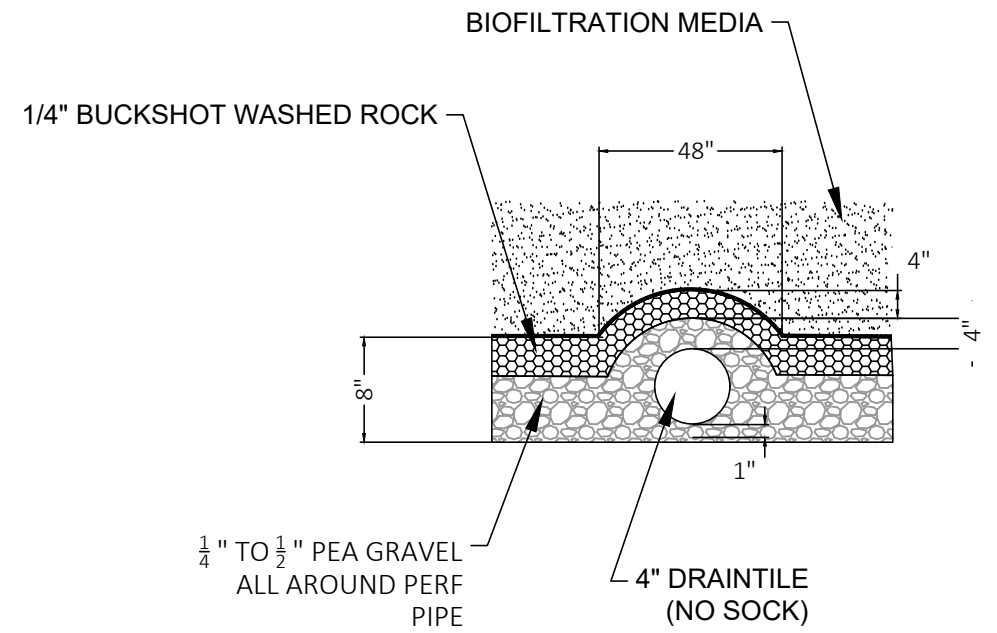
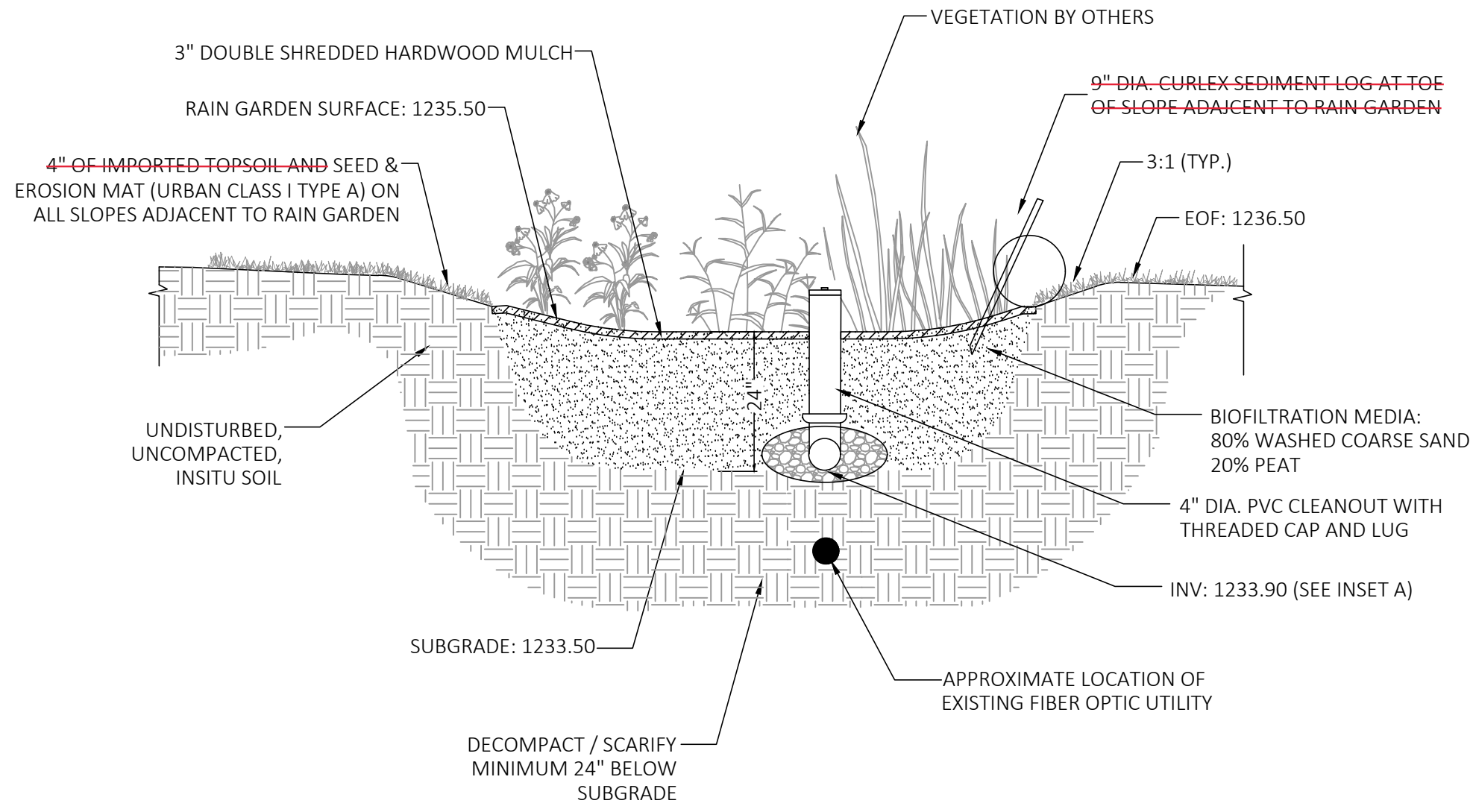
SUBMISSION DATE:  
 6/23/2023  
 DESIGN BY: DRL  
 DRAWN BY: KFA  
 CHECKED BY: DRL  
 EOR PROJECT NO.  
 00909-0037

**EOR** Emmons & Olivier  
 Resources, Inc.  
 1919 University Ave W,  
 Suite 300, St Paul, MN 55104  
 water ecology  
 community  
 Tele: 651.770.8448  
 www.eorinc.com

BEAVER DAM LAKE  
 MANAGEMENT DISTRICT  
 P.O. BOX 232 CUMBERLAND, WI 54829

LIBRARY LAKE SOUTHEAST STORMWATER  
 IMPROVEMENTS  
 PHASE 2  
 CUMBERLAND, BARRON COUNTY, WISCONSIN  
 STATE PROJECT NO. ###  
 CITY PROJECT NO. ###

DETAIL SHEET 7  
 SHEET 17 OF 18 SHEETS



**INSET A**  
(NOT TO SCALE)

**01 RAIN GARDEN**  
18 NOT TO SCALE

Plot Date: 07/05/2023  
 Drawing Name: R:\Clients\_Phases\Phase000090\_Beaver\_Dam\_Lake\_Assoc0037\_Library\_Lake\_SE\_Phase\_209\_GNIS\dwg\Drawings\Streets\DETAILS.dwg  
 Xrefs:

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SUBMISSION DATE:  
6/23/2023

DESIGN BY: DRL    DRAWN BY: KFA    CHECKED BY: DRL

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LIBRARY LAKE SOUTHWATER IMPROVEMENTS  
 PHASE 2  
 CUMBERLAND, BARRON COUNTY, WISCONSIN

STATE PROJECT NO. ###    CITY PROJECT NO. ###

DETAIL SHEET 8

SHEET 18 OF 18 SHEETS