

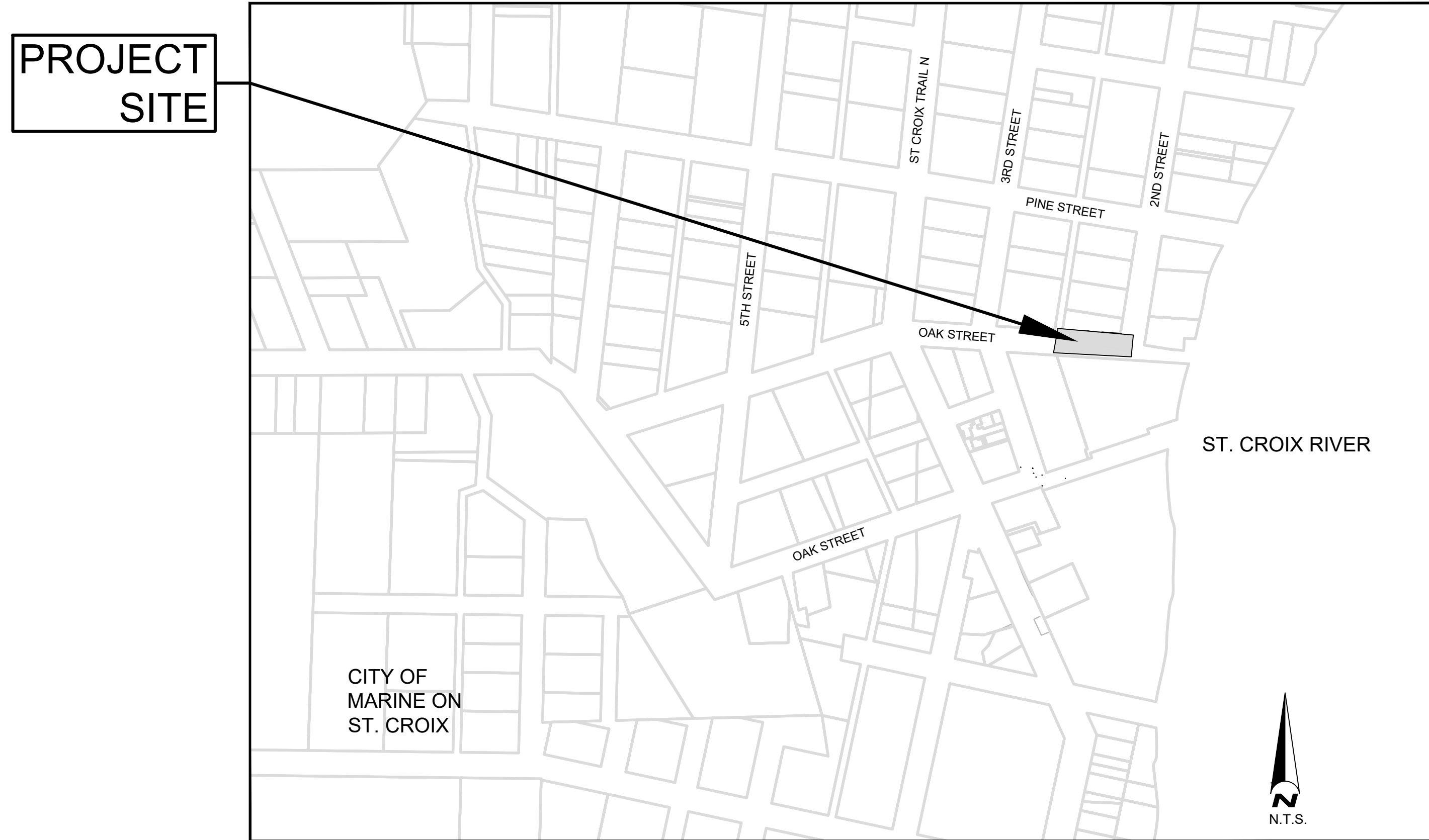
CARNELIAN-MARINE-ST. CROIX WATERSHED DISTRICT

OAK STREET BIOFILTRATION BASINS

MARINE ON ST. CROIX, WASHINGTON COUNTY, MINNESOTA



FEATURE	EXISTING	PROPOSED
SILT FENCE		---SF---SF---SF---
SEDIMENT CONTROL LOG FENCE	-----	-----
OVERHEAD ELECTRIC LINES	---E-O---	
BURIED ELECTRIC LINES	---E-U---	
FIBER OPTIC LINES	---FO---	
GAS LINES	---G---	
PIPELINE	---PL---	
OVERHEAD TELEPHONE	---T-O---	
BURIED TELEPHONE	---T-U---	
CENTER LINE ROADWAY	-----	-----
SANITARY SEWER LINE	-----	-----
SANITARY SEWER FORCEMAIN	---FM---	---FM---
SANITARY SEWER MANHOLE	---○---	---○---
STORM SEWER LINE	-----	-----
STORM SEWER CULVERT	-----	-----
STORM SEWER FORCEMAIN	---FM---	---FM---
STORM SEWER MANHOLE	---○---	---○---
WATERMAIN	---W---	---W---
WATERMAIN MANHOLE	---W○---	---W○---
HYDRANT	---◇---	---◇---
WATER VALVE	---W◇---	---W◇---



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UTILITIES

THE LOCATION OF UNDERGROUND FACILITIES OR STRUCTURES AS SHOWN ON THE PLANS ARE BASED ON AVAILABLE RECORDS AT THE TIME THE PLANS WERE PREPARED AND ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITIES 72 HOURS PRIOR TO CONSTRUCTION TO DETERMINE THE EXACT LOCATION OF SAID FACILITIES AND TO PROVIDE ADEQUATE PROTECTION OF SAID UTILITIES DURING THE COURSE OF WORK.

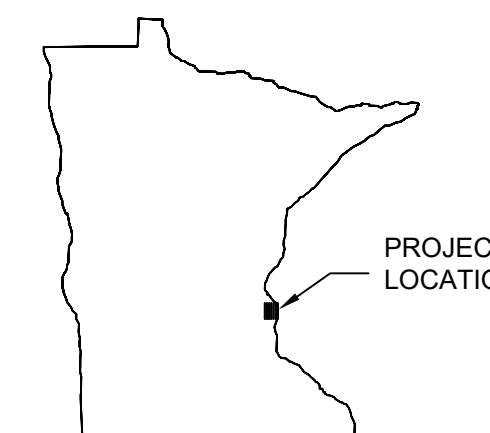
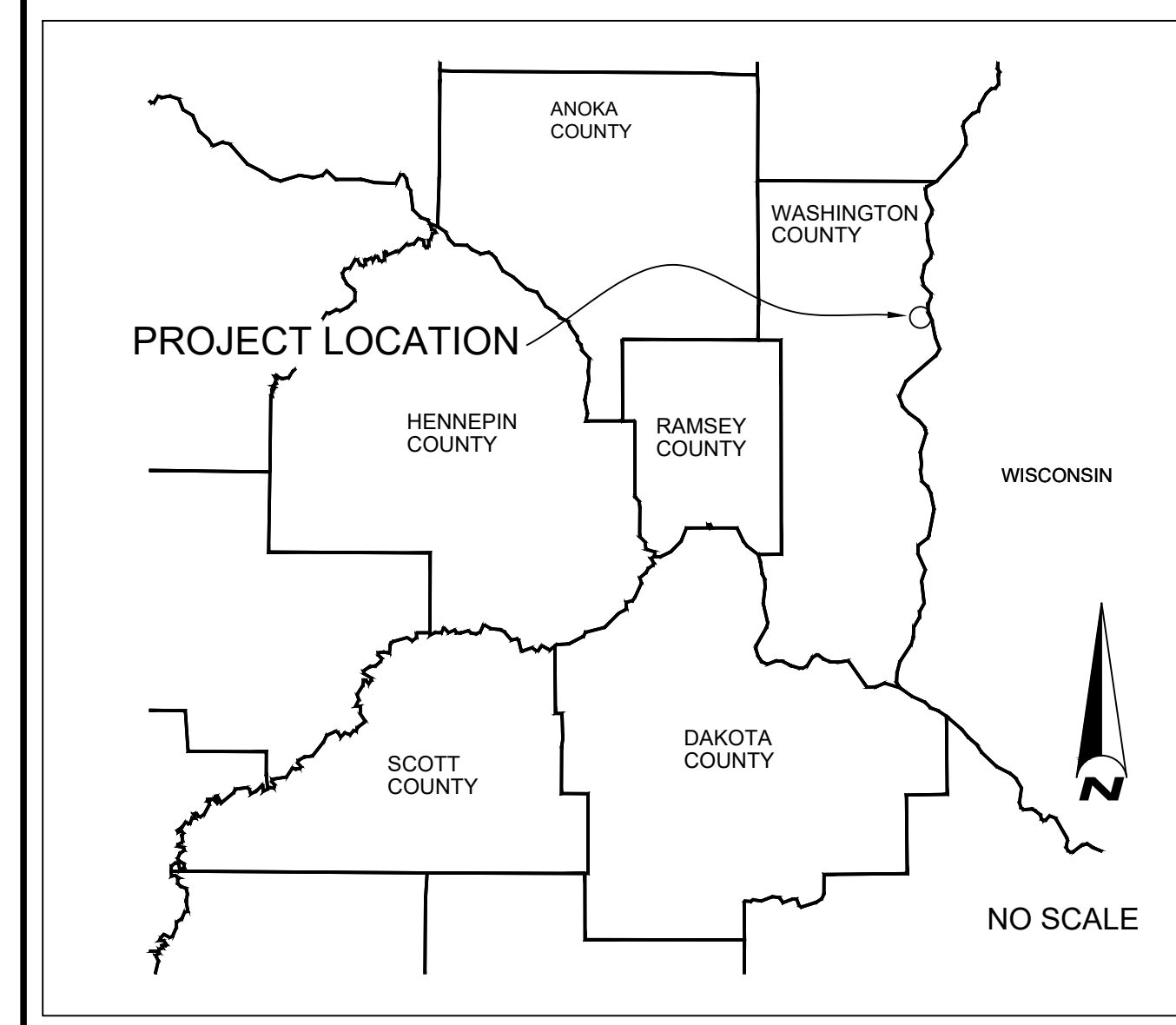
CONSTRUCTION NOTE

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



GOVERNING SPECIFICATIONS

THE 2020 OR CURRENT 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

CARNELIAN-MARINE-ST. CROIX WATERSHED DISTRICT
11660 MYERON ROAD NORTH
STILLWATER, MN 55082

ENGINEER

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



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 Crawford
KYLE CRAWFORD, P.E.
DATE: 02/01/2022 LICENSE # 54906

SUBMISSION DATE:
02/01/2022

DESIGN DRAWN BY: KDC
CHECKED BY: MB
BY: BH

EOR PROJECT NO.
00051-0216

EOR Emmons & Olivier Resources, Inc.
1919 Univ. Ave. #300
St. Paul, MN 55104
ecology Tele: 651.770.8448
community www.eorinc.com



OAK STREET BIOFILTRATION BASINS
MARINE ON ST. CROIX,
WASHINGTON COUNTY, MINNESOTA

TITLE SHEET

SHEET 01 OF 06 SHEETS

NO	DATE	BY	REVISION
6			
5			
4			
3			
2			
1	02/01/2022	KDC	FINAL BID DOCUMENTS

GENERAL SITE WORK NOTES

- 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.
- REFERENCE TO MNDOT SPECIFICATIONS SHALL MEAN DIVISIONS II AND III OF THE 2020 SPECIFICATIONS FOR CONSTRUCTION.
- SEE RESTORATION PLAN, VEGETATION RESTORATION REQUIREMENTS.
- TOPOGRAPHIC SURVEY FOR EOR, INC.
- A CONSTRUCTION STAGING PLAN SHALL BE PREPARED AND SUBMITTED BY THE CONTRACTOR FOR REVIEW BY THE PROJECT ENGINEER.
- ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, JANUARY 1998. ONE ELEVEN FOOT MINIMUM WIDTH LANE IN EACH DIRECTION SHALL BE PROVIDED AT ALL TIMES. ANY TRAFFIC CONTROL REQUIRED SHALL BE INCIDENTAL TO THE PROJECT.
- ALL CONSTRUCTION WORK SHALL BE COMPLETED WITHIN CITY APPROVED WORKING HOURS.
- A PRECONSTRUCTION MEETING WILL BE REQUIRED WITH ENGINEER PRIOR TO ANY MOBILIZATION OF CONSTRUCTION EQUIPMENT OR MATERIAL.
- CONTRACTOR SHALL PROTECT ALL INFRASTRUCTURE, INCLUDING NEW PAVEMENT. ANY DAMAGE SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.

GENERAL UTILITY NOTES

- 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.
- 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.
- ALL UTILITY WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY OF MARINE ON ST. CROIX SPECIFICATIONS AND BUILDING PERMIT REQUIREMENTS.
- CONTRACTOR SHALL NOTIFY THE CITY OF MARINE ON ST. CROIX 48 HOURS IN ADVANCE OF WORKING WITHIN THE EXISTING RIGHT OF WAY.

STORM SEWER NOTES

- STORM SEWER CONSTRUCTION IS IN ACCORDANCE WITH MNDOT 2501-2511 SPECIFICATIONS.
- STORM SEWER SHALL BE AS SPECIFIED.
- PIPE LENGTHS ON THE PLAN ARE FROM CENTER TO CENTER OF STRUCTURES.

GENERAL LANDSCAPE NOTES

- CONTRACTOR SHALL INSPECT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS RELATING TO THE NATURE AND SCOPE OF WORK.
- CONTRACTOR SHALL VERIFY PLAN LAYOUT AND BRING TO THE ATTENTION OF THE ENGINEER DISCREPANCIES WHICH MAY COMPROMISE THE DESIGN OR INTENT OF THE LAYOUT.
- CONTRACTOR SHALL ASSURE COMPLIANCE WITH APPLICABLE CODES AND REGULATIONS GOVERNING THE WORK AND MATERIALS SUPPLIED.
- CONTRACTOR SHALL PROTECT EXISTING ROADS, CURBS/GUTTERS, TRAILS, TREES, IRRIGATION SYSTEM, LAWNS AND SITE ELEMENTS DURING CONSTRUCTION OPERATIONS. DAMAGE TO SAME SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
- 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.
- 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.
- 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.

GRADING & EROSION CONTROL NOTES

- 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.
- ENGINEER SHALL PROVIDE HORIZONTAL AND VERTICAL CONTROL BENCHMARKS. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL SAID HORIZONTAL AND VERTICAL CONTROL POINTS SET BY ENGINEER AND ANY ADDITIONAL CONSTRUCTION STAKING.
- INSTALL PERIMETER EROSION CONTROL MEASURES AND PERFORM TREE CLEAN ROOT CUTTING (IF NECESSARY) BEFORE BEGINNING SITE GRADING ACTIVITIES. SOME EROSION CONTROL SUCH AS SEDIMENT CONTROL LOG 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.
- CONTRACTOR TO ADHERE TO ALL CITY AND WATERSHED 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.
- 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 7 DAYS (STEEPER THAN 3:1 SLOPES), 14 DAYS (FLATTER THAN 3:1 SLOPES).
- WHERE NECESSARY, INLET PROTECTION IS TO BE USED DURING CONSTRUCTION.
- ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH CITY AND WATERSHED DISTRICT PERMITS.
- 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.
- MAINTAIN EXISTING EROSION CONTROL. RE-ESTABLISH ANY EXISTING EROSION CONTROL DISTURBED BY CONSTRUCTION.
- CONTRACTOR SHALL PROVIDE ADDITIONAL TEMPORARY EROSION CONTROL MEASURES AS REQUIRED FOR CONSTRUCTION. ANY ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
- ANY EXCESS SEDIMENT IN PROPOSED BASINS SHALL BE REMOVED BY THE CONTRACTOR AT THE DIRECTION OF THE ENGINEER.
- REMOVE ALL EROSION CONTROL MEASURES AFTER THE WORK HAS BEEN ACCEPTED BY THE WATERSHED.
- THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO EXISTING STREETS AND PAVED AREAS WITHIN 24 HOURS OF NOTICE. THIS SHALL BE INCIDENTAL TO THE PROJECT.
- IF BLOWING DUST BECOMES A NUISANCE, THE CONTRACTOR SHALL APPLY WATER FROM A TANK TRUCK TO ALL CONSTRUCTION AREAS. THIS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
- SWEEP ADJACENT STREETS IN ACCORDANCE WITH CITY AND PROJECT REQUIREMENTS.
- INSPECT EROSION CONTROL DEVICES AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. IMMEDIATELY REPAIR FAILED OR FAILING EROSION CONTROL DEVICES.
- SEDIMENT REMOVAL - SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT.
- 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 CITY AND WATERSHED.
- 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.
- EXISTING GRANULAR MATERIALS SHALL BE SEGREGATED AND STOCKPILED FOR REUSE ON-SITE.
- 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 SODDED OR SEEDED, EXCEPT BIOFILTRATION AREAS.
- 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.
- GRADES SHOWN ARE FINISHED GRADES, CONTRACTOR SHALL ROUGH GRADE TO SUBGRADE ELEVATION, LEAVE SITE READY FOR SUBBASE.
- COMPLETION OF SITE GRADING OPERATIONS SHALL RESULT IN ALL AREAS BEING GRADED TO 'PLAN SUBGRADE ELEVATION'. DRIVEWAY AREAS SHALL BE DETERMINED BY REFERRING TO THE SITE PLAN AND PAVEMENT SECTION DETAILS FOR LOCATION AND LIMITS OF BITUMINOUS PAVEMENT SECTIONS.
- FINAL GRADING TOLERANCES ARE ±0.1 FEET OF PLAN GRADES. OVERFLOW SPILLWAYS ARE TO BE GRADED TO WITHIN ±0.05 FEET OF GRADE PLANS, UNLESS NOTED OTHERWISE.
- 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.
- CONTRACTOR IS RESPONSIBLE FOR GRADING AND SLOPING THE FINISHED GROUND SURFACE TO PROVIDE SMOOTH & UNIFORM SLOPES, WHICH PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AND PREVENT PONDING IN LOWER AREAS. CONTACT ENGINEER IF FIELD ADJUSTMENTS TO GRADING PLANS ARE REQUIRED.

WCD BIOPRETENTION DESIGN AND INSTALLATION STANDARDS

- TIMING AND WEATHER - INSTALLATION WITH DRY SOIL CONDITIONS IS CRITICAL TO PREVENT SMEARING AND COMPACTION. SCHEDULE WORK FOR PERIODS OF DRY WEATHER. DO NOT WORK IF SOIL CONDITIONS ARE WET. EXCAVATION, SOIL PLACEMENT AND RAPID STABILIZATION OF PERIMETER SLOPES MUST BE COMPLETED BEFORE THE NEXT PRECIPITATION EVENT.
- OVERNIGHT EROSION CONTROL - DO NOT LEAVE INFILTRATION AREAS AND/OR PERIMETER SLOPES EXPOSED OVERNIGHT. SECURE THE SITE FROM RISK OF PRECIPITATION DAMAGES AT THE END OF EVERY WORK DAY. IN THE EVENT OF RAIN, TAKE ACTION TO DIVERT STORMWATER AWAY FROM THE WORK AREA AND TEMPORARILY COVER OF ALL EXPOSED SOILS WITH FILTER FABRIC OR IMPERMEABLE SHEETING.
- PONDING DEPTH - BASIN FULL ELEVATION (THE DESIGNED PONDING DEPTH) SHALL BE MEASURED FROM CENTER OF THE WEIR SPILLWAY. SEE PLANS AND DETAILS FOR CORRECT ELEVATIONS.
- SOIL REPLACEMENT MEDIA - THE REPLACEMENT SOIL MEDIA SHALL BE A WELL-BLENDED MIXTURE OF 80% ASTM C-33 COARSE WASHED SAND (MNDOT 3126), 20% PEAT FROM PLAISTEDS (OR APPROVED EQUAL).
- SUBSOIL PREPARATION - USE BACKHOE WITH TOOTH BUCKET FOR BASIN EXCAVATION TO AVOID COMPACTING OR SMEARING OF SOILS. (DO NOT USE SKID STEER FOR EXCAVATION WITHIN THE BASIN) USE TOOTH BUCKET TO SCARIFY (RIP) UNDERLYING SOILS 6" TO 9" DEEP TO REMOVE COMPACTION. GENTLY MIX THE FIRST LIFT OF ENGINEERED SOILS WITH THE LOOSENED UNDERLYING SOILS TO AVOID STRATIFICATION AND PROMOTE PERMEABILITY. USE EXCAVATOR BUCKET TO LOOSELY PLACE MATERIALS. (DO NOT USE SKID STEER TO PLACE OR SPREAD MATERIALS WITHIN THE CELL). LEVELING AND FINAL GRADING WITHIN THE CELL MUST BE COMPLETED BY HAND.
- INSTALL CHECKPOINT - NOTIFY THE ENGINEER PRIOR TO PLACING ANY SEED OR EROSION CONTROL BLANKET. THE ENGINEER SHALL FIELD CHECK ELEVATIONS, SOIL COMPACTION AND PERMEABILITY. NOTE: DEPENDING ON CONDITIONS OBSERVED, COMPACTION REMOVAL BY HAND MAY BE NEEDED PRIOR TO SEEDING.

TEMPORARY EROSION CONTROL NOTES

- SPECIFIC PAYABLE EROSION CONTROL PRACTICES HAVE BEEN ITEMIZED. ADDITIONAL EROSION CONTROL NECESSARY TO ACHIEVE PERMIT REQUIREMENTS AND THIS GUIDANCE IS INCIDENTAL TO THE PROJECT.
- THE CONTRACTOR SHALL IMPLEMENT EROSION CONTROL IN ACCORDANCE WITH NPDES REQUIREMENTS REGARDLESS OF WHETHER AN NPDES PERMIT IS REQUIRED.
- THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES, INCLUDING THE REMOVAL OF ACCUMULATED SEDIMENT AT ½ CAPACITY FROM BMPS DURING THE DURATION OF CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED.
- THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED OUTSIDE OF CONSTRUCTION LIMITS DAILY. REMOVE SEDIMENT FROM ALL PAVED SURFACES DAILY.
- SWEEP ADJACENT STREETS IN ACCORDANCE WITH CITY REQUIREMENTS.
- INSPECT EROSION CONTROL DEVICES AFTER EACH RAINFALL. IMMEDIATELY REPAIR FAILED OR FAILING EROSION CONTROL DEVICES.
- STOCKPILED SOIL IS ONLY PERMITTED IN APPROVED LOCATION(S) AT SLOPES EQUAL TO OR SHALLOWER THAN 2h:1v. ALL STOCKPILED SOILS SHALL BE PROTECTED WITH TWO ≥ 6" DIAMETER COMPOST/ROCK LOGS AND DAILY SURFACE PROTECTION.
- SOLID WASTE AND OTHER WASTES MUST BE DISPOSED OF PROPERLY AND MUST COMPLY WITH MPCA DISPOSAL REQUIREMENTS.
- NO RE-FUELING OF TRUCK AND CONSTRUCTION EQUIPMENT IS PERMITTED ANYWHERE ON SITE EXCEPT IN THE VICINITY OF FIELD APPROVED STAGING AREA(S). A CONSPICUOUSLY LABELED SPILL KIT MUST BE ON SITE AND BE KEPT IN THE VICINITY OF THE STAGING AREA(S).
- TRUCK AND CONSTRUCTION VEHICLE WASHING AND DEGREASING IS PROHIBITED ON SITE. CONSTRUCTION EQUIPMENT MUST BE THOROUGHLY CLEANED PRIOR TO ACCESSING THE SITE TO LIMIT THE SPREAD OF INVASIVE SPECIES.
- NO HAZARDOUS MATERIALS (OIL, GAS, FLUIDS, PAINTS, LUBRICANTS, ETC.) ARE TO BE STORED ON SITE.
- NO CONCRETE WASHOUT SHALL BE ALLOWED ON SITE.

STORMWATER BMP PROTECTION NOTES

THE FOLLOWING DIRECTION IS GIVEN TO PROTECT THE INTEGRITY AND LIFESPAN OF THE PROJECT'S STORMWATER BEST MANAGEMENT PRACTICES (BMPs). ANY AND ALL DEVIATIONS FROM THIS DIRECTION MUST BE APPROVED BY THE PROJECT ENGINEER PRIOR TO IMPLEMENTATION.

STORMWATER BMPs ON THIS PROJECT INCLUDE THE FOLLOWING: TWO (2) BIOFILTRATION BASINS.

IF STORMWATER BMPs ARE COMPROMISED, AS DETERMINED BY ENGINEER, THE FACILITIES SHALL BE REPAIRED AND/OR REPLACED PER THE DIRECTION OF THE ENGINEER AT THE COST OF THE CONTRACTOR.

Item No.	Item	MnDOT Reference #	Unit	Estimated
1	Mobilization	2021.501	LS	1
2	Clearing	2101.505	ACRE	0.1
3	Tree Removal (> 6" DBH)	2104.502	EA	2
4	Remove Culvert Pipe (partial)	2104.503	LF	5
5	Common Excavation (139 CY CUT, 128 CY FILL)	2105.507	CY	139
6	Select Topsoil Borrow (80% Sand, 20% Peat Mix)	2105.526	CY	37
7	Dewatering	2105.601	LS	1
8	Rock Excavation Allowance	2105.607	CY	20
9	6" HDPE Pipe Drain - Solid Wall	2501.602	LF	14
10	CMP Apron, 15"	2501.502	EA	1
11	6" Gate Valve & Box	2502.502	EA	2
12	6" Perforated HDPE Pipe Drain	2502.503	LF	117
13	6" HDPE Pipe Drain Cleanout	2502.602	EA	2
14	Construct Drainage Structure, 30" Concrete	2506.503	LF	1
15	Hand-placed Riprap	2511.507	CY	10
16	Culvert Inlet End Control	2573.502	EA	2
17	12" Coir Log	2573.503	LF	255
18	Temporary Erosion Control Allowance	2575.601	ALLOW	1
19	Erosion Control Blanket, Category 25	2575.504	SY	323
20	Erosion Control Blanket, Category 35	2575.504	SY	6
21	Sod, Type Salt Tolerant	2575.504	SY	107
22	Seeding	2575.505	ACRE	0.1
23	Custom Native Seed Mix	2575.508	LB	2

Plot Date: 02/01/2022
 Drawing Title: WCD0161 - OAK ST. BIOFILTRATION - Basin109 - GMS (w/seq)015_0216_CD_Set.dwg
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1	02/01/2022	KDC	FINAL BID DOCUMENTS
NO	DATE	BY	REVISION

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Kyle Crawford
 KYLE CRAWFORD, P.E.
 DATE: 02/01/2022 LICENSE # 54906

SUBMISSION DATE: 02/01/2022

DESIGN DRAWN BY	CHECKED BY
KDC	MB
	BH

EOR PROJECT NO. 00051-0216

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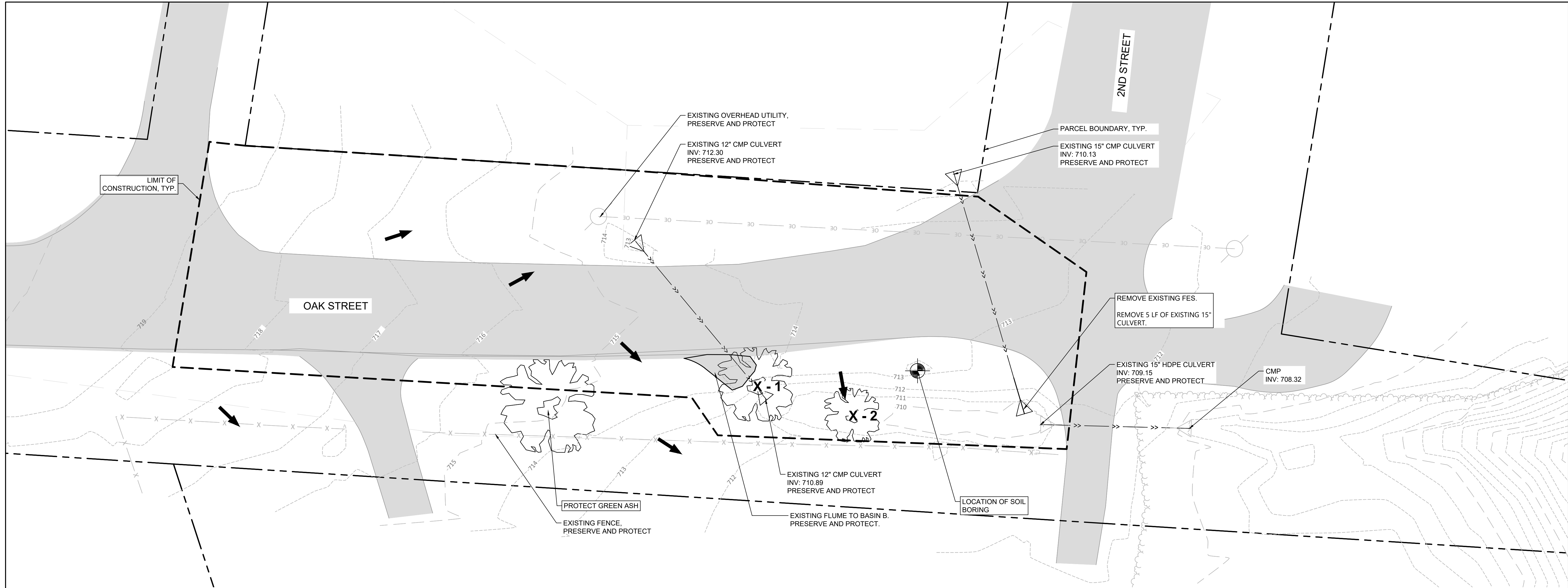


OAK STREET BIOFILTRATION BASINS
 MARINE ON ST. CROIX, WASHINGTON COUNTY, MINNESOTA

NOTES & SEQ

SHEET 02 OF 06 SHEETS

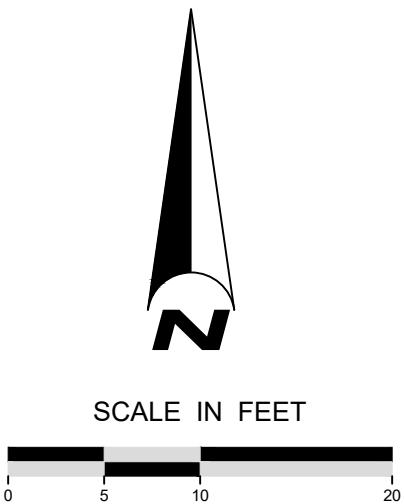




NOTES:
X- 6" + TREE REMOVALS (2)
 ALL OTHER TREES/BRUSH SMALLER THAN 6" DIAMETER TO BE REMOVED WITHIN THE TREE REMOVAL AREA TO BE PAID UNDER CLEARING (.10 ACRE).

OAK STREET BIOFILTRATION BASIN TREE REMOVALS			
#	SPECIES	DBH	TYPE
1	GREEN ASH	15	DECID
2	GREEN ASH	11	DECID

SOIL BORING: SURFACE ELEVATION 712.94
 712.94 - 712.5 2" BITUMINOUS PAVEMENT, THEN FILL. SILTY SAND WITH GRAVEL (A-2-4 OR A-1-B).
 712.5 - 711.5 FILL, SILTY SAND WITH GRAVEL (A-2-4).
 711.5 - 711 SILTY SAND (SM) (A-4).
 7011 - 709 SILTY SAND WITH GRAVEL (SM) (A-2-4)
 709 - 707.2 SANDSTONE.
 GROUNDWATER OBSERVED AT DEPTH OF 5' (707.94) ON 3/12/07



Plot Date: 02/01/2022
 Project: 0216 - Oak St. Biofiltration - Basin109 - GMS\mg051_0216_CD_Set.dwg
 User: krcrawford
 Date: 02/01/2022

NO	DATE	BY	REVISION
6			
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1	02/01/2022	KDC	FINAL BID DOCUMENTS

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Kyle Crawford
 KYLE CRAWFORD, P.E.
 DATE: 02/01/2022 LICENSE # 54906

SUBMISSION DATE:
 02/01/2022

DESIGN DRAWN BY: KDC
 CHECKED BY: MB
 BY: BH

EOR PROJECT NO.
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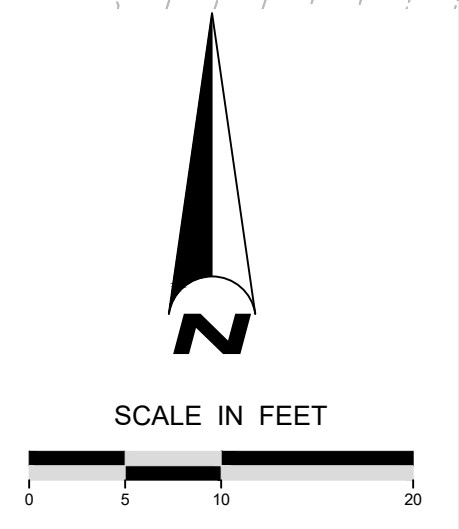
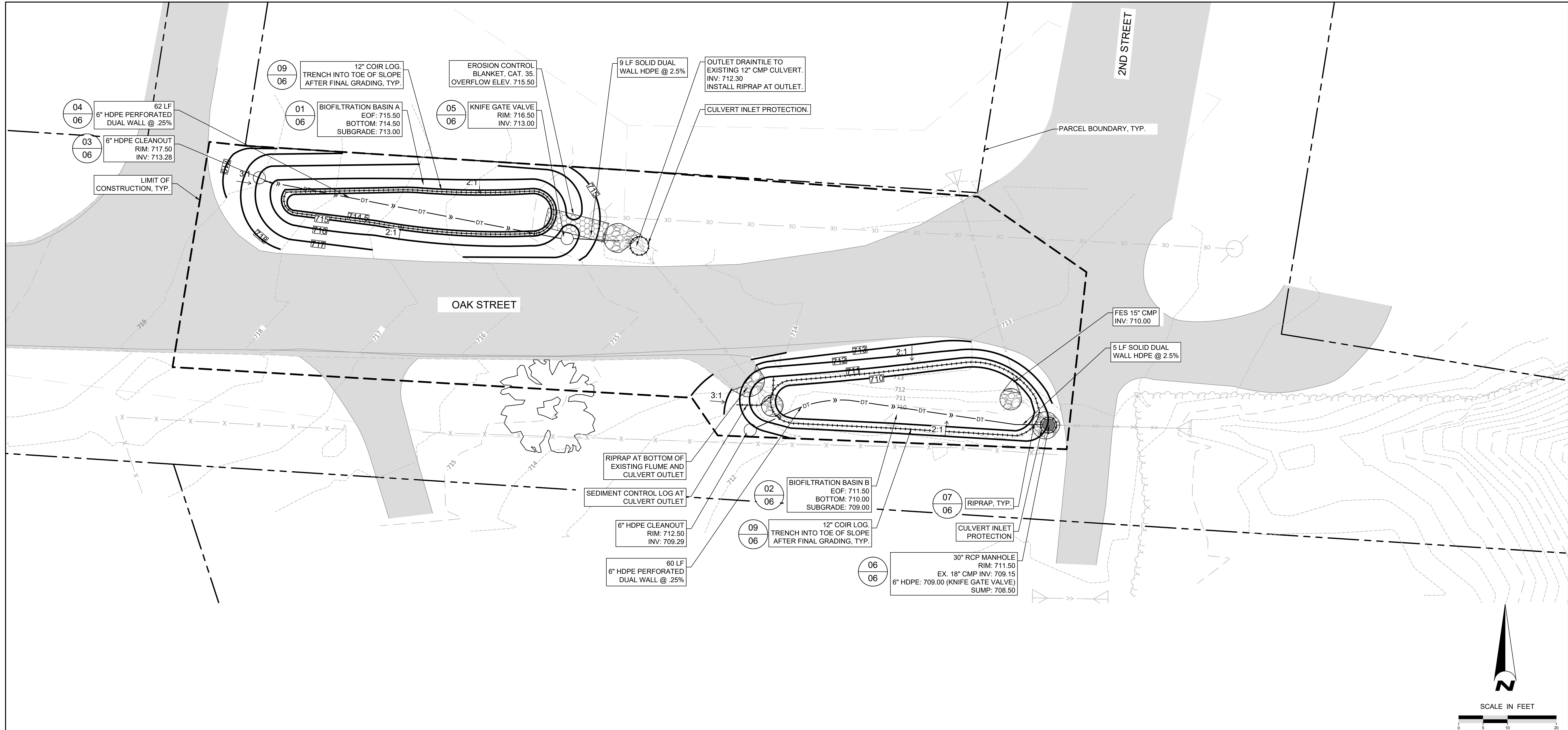


OAK STREET BIOFILTRATION BASINS
 MARINE ON ST. CROIX,
 WASHINGTON COUNTY, MINNESOTA

EXISTING CONDITIONS AND REMOVALS PLAN

SHEET 03 OF 06 SHEETS





Plot Date: 02/01/2022
 Project: 02/01/2022
 Drawing: 02/01/2022
 Title: 02/01/2022
 Path: C:\Users\KDC\OneDrive\Documents\02_01_2022\02_01_2022_01.dwg

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1	02/01/2022	KDC	FINAL BID DOCUMENTS

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 CRAWFORD, P.E.
 DATE: 02/01/2022 LICENSE # 54906

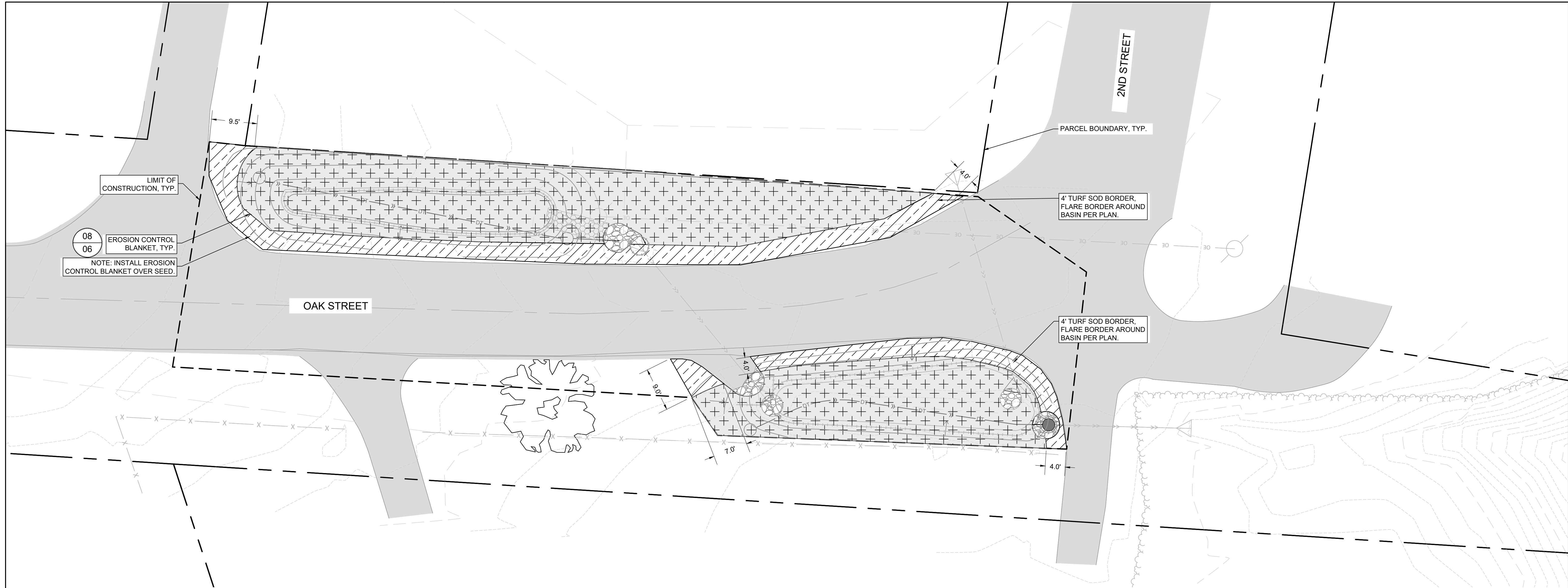
SUBMISSION DATE:
 02/01/2022
 DESIGN DRAWN BY: KDC
 CHECKED BY: MB
 BY: BH
 EOR PROJECT NO.
 00051-0216

EOR Emmons & Olivier Resources, Inc.
 1919 Univ. Ave. #300
 St. Paul, MN 55104
 Ecology Tele: 651.770.8448
 community www.eorinc.com



OAK STREET BIOFILTRATION BASINS
 MARINE ON ST. CROIX,
 WASHINGTON COUNTY, MINNESOTA

GRADING & DRAINAGE PLAN
 SHEET 04 OF 06 SHEETS



SEEDING NOTES

- SEEDING SHALL FOLLOW MNDOT SEEDING MANUAL 2014 EDITION.
- SEED SHALL BE LOCAL ORIGIN AND WILD ECOTYPE. SEED ORIGIN SHALL BE CERTIFIED BY THE MN CROP IMPROVEMENT ASSOCIATION. LOCAL ORIGIN SHALL MEAN WITHIN 200 MILES OF PROJECT SITE. PROVIDE MCIA DOCUMENTATION TO LANDSCAPE ARCHITECT PRIOR TO SEEDING. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT THE PROPOSED SEED SUPPLIER AND REQUEST A DIFFERENT ONE.
- SOW SEED MIXES ON DISTURBED AREAS AFTER ALL GRADING ACTIVITIES HAVE BEEN COMPLETED.
- PREPARE SEED BED PRIOR TO SEEDING PER MNDOT SPEC. 2574.3.A.4. LOOSEN SOIL TO A DEPTH OF 3" PRIOR TO SEEDING.
- ACCEPTABLE SEEDING DATES FOR NATIVE SEED ARE APRIL 15 - JULY 20 IN THE SPRING, OR SEPTEMBER 20 - OCTOBER 20 IN THE FALL. WRITTEN PERMISSION MUST BE GRANTED BY THE LANDSCAPE ARCHITECT TO PERFORM SEEDING OPERATIONS ON ANY OTHER DATES OF THE YEAR.
- INCLUDE A COVER CROP OF OATS WITHIN NATIVE SEED MIXES AT A RATE OF 30 LB PER ACRE. INCIDENTAL TO NATIVE SEED BID ITEM.
- DO NOT APPLY FERTILIZER WITH NATIVE SEED MIXES.
- STABILIZE ALL SEED MIXES WITH CATEGORY 25 EROSION CONTROL BLANKET.
- USE TEMPORARY EROSION CONTROL DEVICES (SEDIMENT LOGS, SILT FENCE) AS NEEDED TO PREVENT EROSION PRIOR TO AND DURING SEED ESTABLISHMENT.
- REPAIR ALL DISTURBED AREAS OUTSIDE OF PLAN SEEDING LIMITS WITH CUSTOM NATIVE SEED MIX, EROSION CONTROL BLANKET, OR TURF SOD PER ENGINEER'S DIRECTION.
- WARRANTY FOR ALL SEEDING AREAS RUNS FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE. IF AFTER ONE YEAR ALL AREAS DO NOT HAVE >90% GERMINATION, BARE AND SPARSE AREAS SHALL BE RE-SEED PER PLAN UPON THE DIRECTION OF THE ENGINEER.

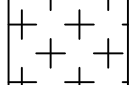

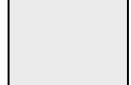
SEED ESTABLISHMENT NOTES (BY OWNER)

- ESTABLISHMENT PERIOD COMMENCES UPON ACCEPTANCE OF SEEDING (ADEQUATE COVER CROP GERMINATION AND COVERAGE) AND RUNS FOR TWO YEARS FROM THIS DATE.
- MONITOR THE SITE MONTHLY DURING THIS PERIOD TO DETECT AREAS OF WEED COLONIZATION. CUT OR TREAT ALL NOXIOUS WEEDS (AS CURRENTLY DEFINED BY MN DEPARTMENT OF AGRICULTURE) WITH GLYPHOSATE HERBICIDE AS SOON AS DETECTED.
- DURING THE FIRST GROWING SEASON MOW OR CUT THE ENTIRE SEEDED AREA EVERY 30 DAYS UNTIL SEPTEMBER 30TH AT A HEIGHT OF 5-8".
- DURING THE SECOND GROWING SEASON MOW OR CUT THE ENTIRE SEEDED AREA ONCE IN MID-JUNE AND ONCE IN MID-AUGUST AT A HEIGHT OF 5-8".
- IF AREAS OF BARE GROUND PERSIST AFTER FIRST GROWING SEASON RESEED PER PLAN.
- AFTER THE FIRST TWO GROWING SEASONS MOW OR CUT NATIVE SEED AREAS IN LATE FALL OR EARLY SPRING (EACH YEAR). RAKE OUT AND REMOVE DOWNED VEGETATION.

TURF NOTES

- SOD ALL AREAS DISTURBED DUE TO GRADING AND CONSTRUCTION, EXCEPT BASIN PER PLAN.
- WHERE SOD ABUTS PAVED SURFACES, FINISHED GRADE OF SOD SHALL BE HELD 1.5" BELOW SURFACE ELEVATION OF SLAB.
- SOD SHALL BE LAID PARALLEL TO THE CONTOURS AND SHALL HAVE STAGGERED JOINTS. ON SLOPES 3:1 OR STEEPER OR IN DRAINAGE SWALES, SOD SHALL BE STAKED SECURELY. STAKE SOD SECURELY OVER TURF REINFORCEMENT MAT OVERFLOWS.
- WATER SOD REGULARLY FOR A MINIMUM OF 30 DAYS, SUFFICIENTLY TO ENSURE ESTABLISHMENT OF PERMANENT VEGETATION. IN THE ABSENCE OF RAIN THIS MEANS A MINIMUM OF .75" AND A MAXIMUM OF 1.0" OF WATER PER SQUARE FOOT PER DAY. CONTRACTOR TO PROVIDE 30 DAY WARRANTY ON ALL SOD.

SEEDING SCHEDULE

	A. CUSTOM NATIVE SEED MIX W OATS COVER CROP	.10 ACRE (2,900 sf)
	B. TURF SOD	107 SY (958 sf)
	EROSION CONTROL BLANKET	323 SY (2,900 sf)

Custom Native Seed Mix

Type	Scientific Name	Common Name	% Mix (by PLS weight)	Rate
Grass	<i>Andropogon gerardi</i>	Big bluestem	32%	5 LB/ 10,000 sf (Broadcast)
	<i>Elymus canadensis</i>	Canada wild rye	32%	
	<i>Sorghastrum nutans</i>	Indian grass	18%	
	<i>Schizachyrium scoparium</i>	Little bluestem	8%	
	<i>Panicum virgatum</i>	Switch grass	6%	
	<i>Bouteloua curtipendula</i>	Side oats grama	4%	
Forb	<i>Monarda fistulosa</i>	Wild Bergamot	2%	
	<i>Rudbeckia hirta</i>	Black-Eyed Susan	2%	
	<i>Verbena hastata</i>	Blue Vervain	2%	
TOTAL SEED MIX			100%	

Plot Date: 02/01/2022
 Project: 02/01/2022
 Drawing: 02/01/2022
 Title: OAK STREET BIOFILTRATION BASINS RESTORATION PLAN SHEET 05 OF 06 SHEETS

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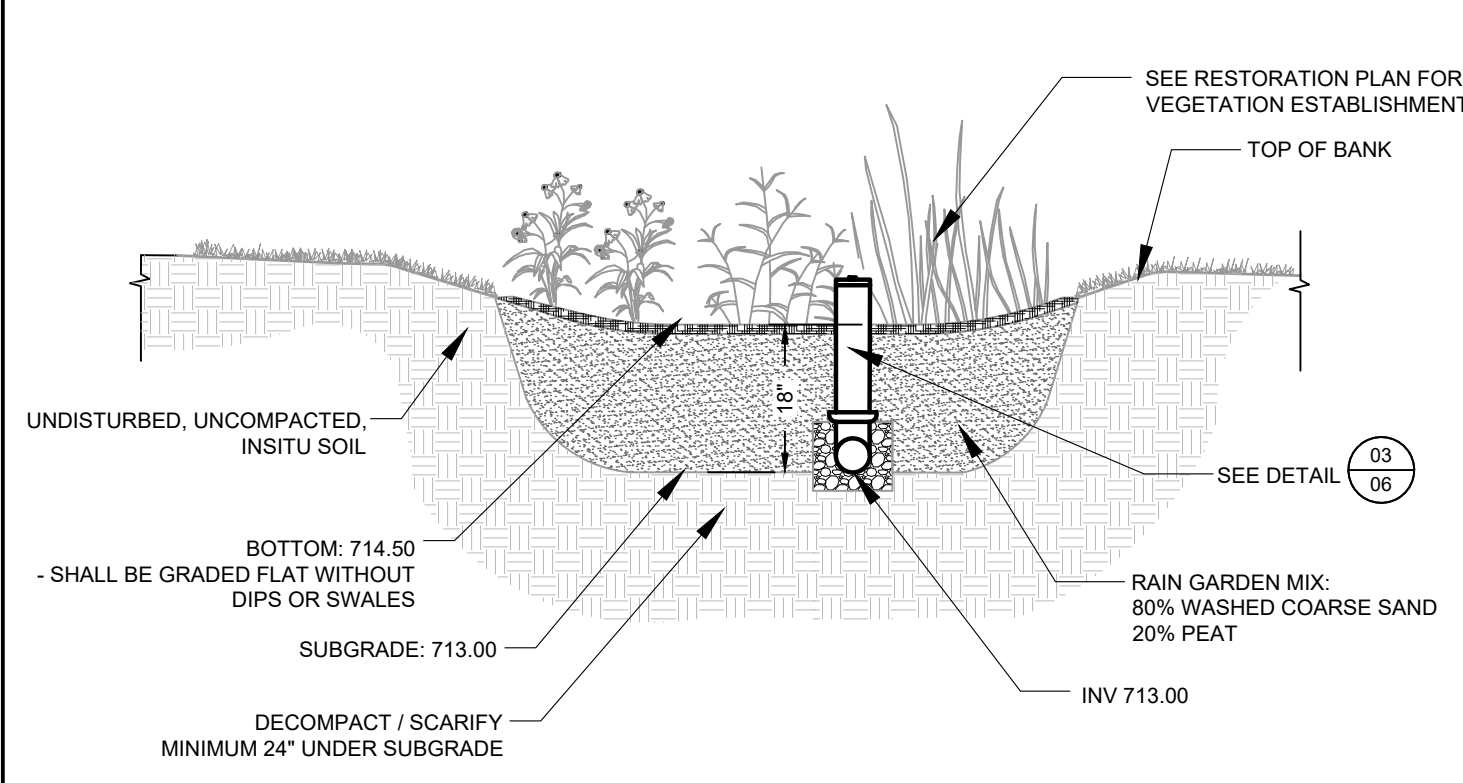
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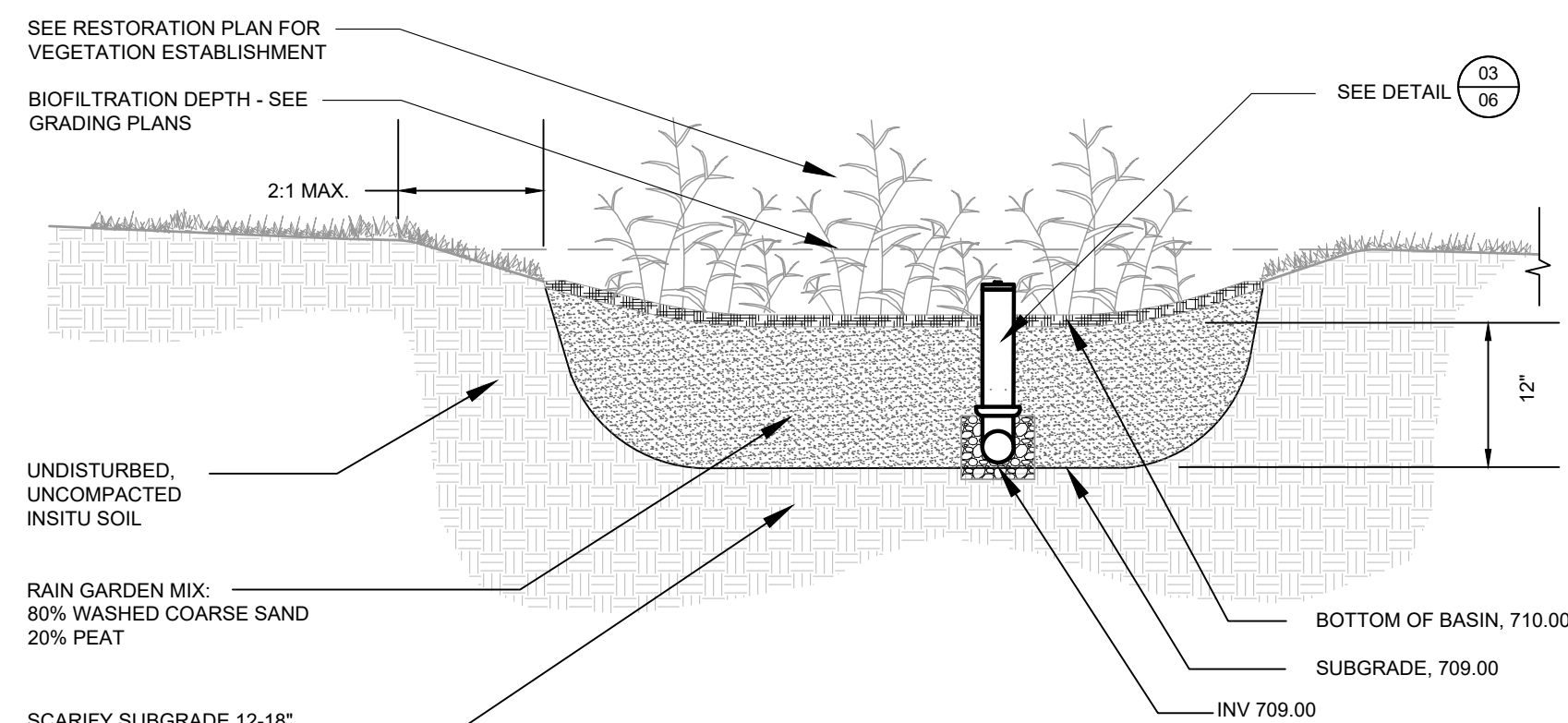
OAK STREET BIOFILTRATION BASINS
 MARINE ON ST. CROIX,
 WASHINGTON COUNTY, MINNESOTA

RESTORATION PLAN

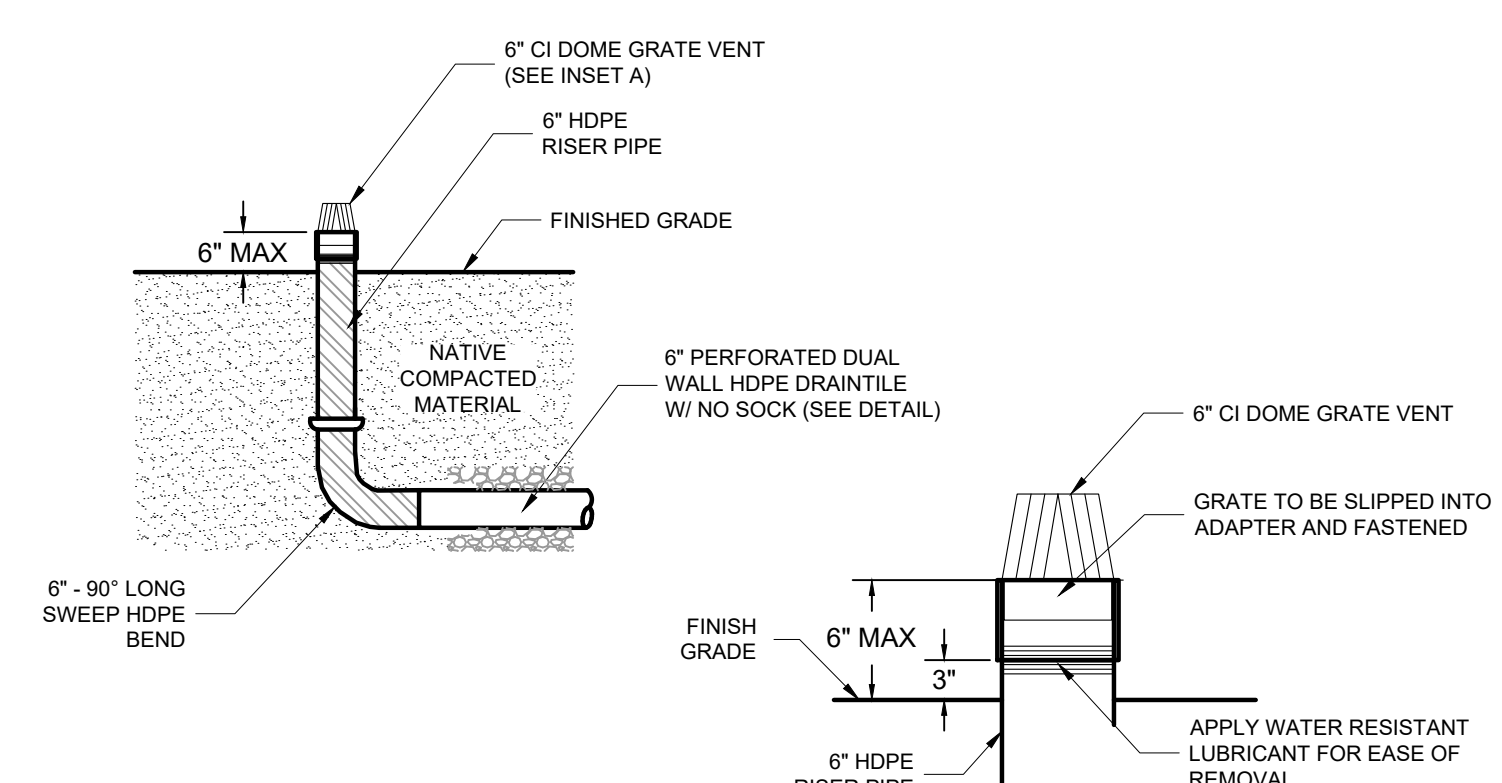
SHEET 05 OF 06 SHEETS



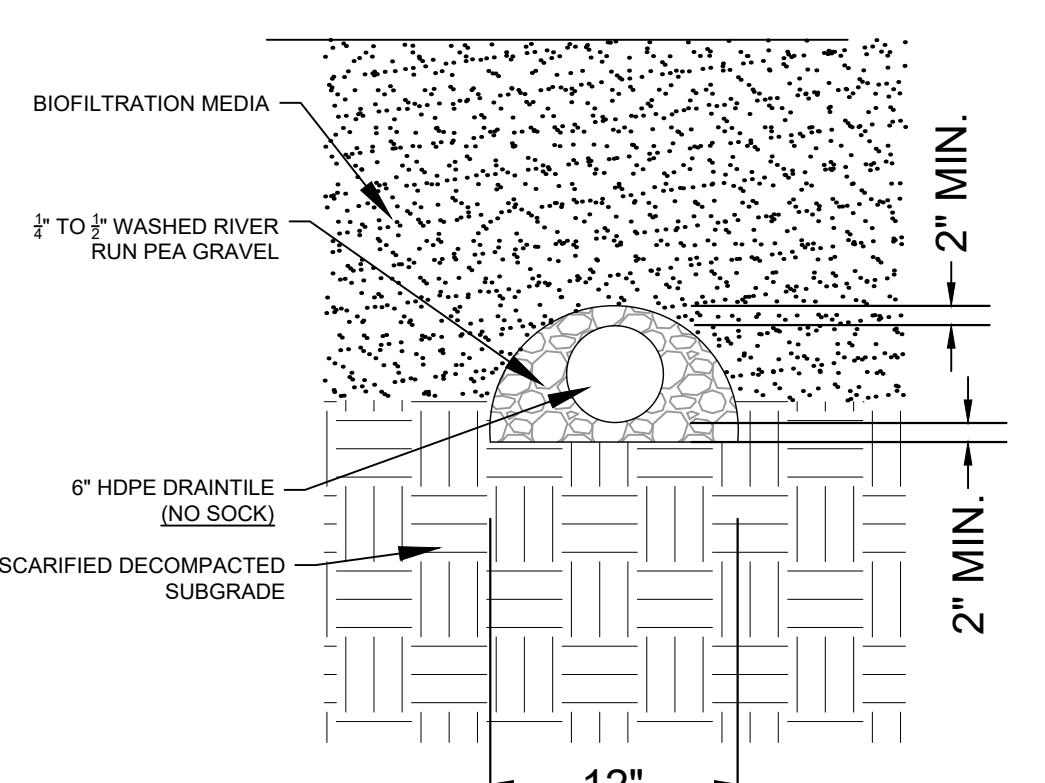
01 BIOFILTRATION BASIN A (WITH UNDERDRAIN)
06



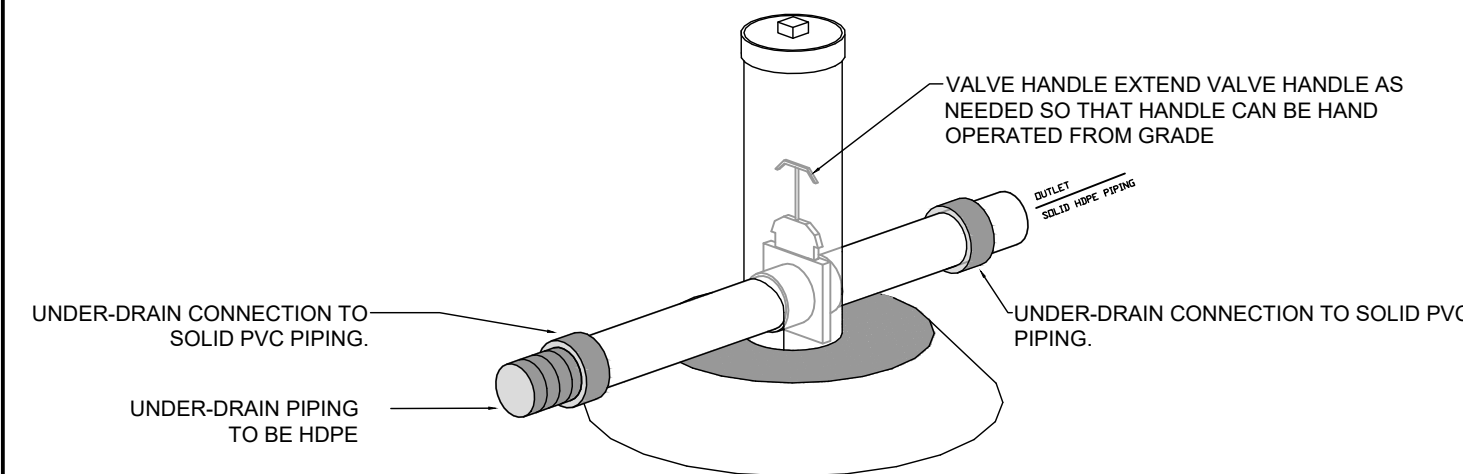
02 BIOFILTRATION BASIN B (WITHOUT UNDERDRAIN)
06



03 DRAINTILE CLEANOUT
06

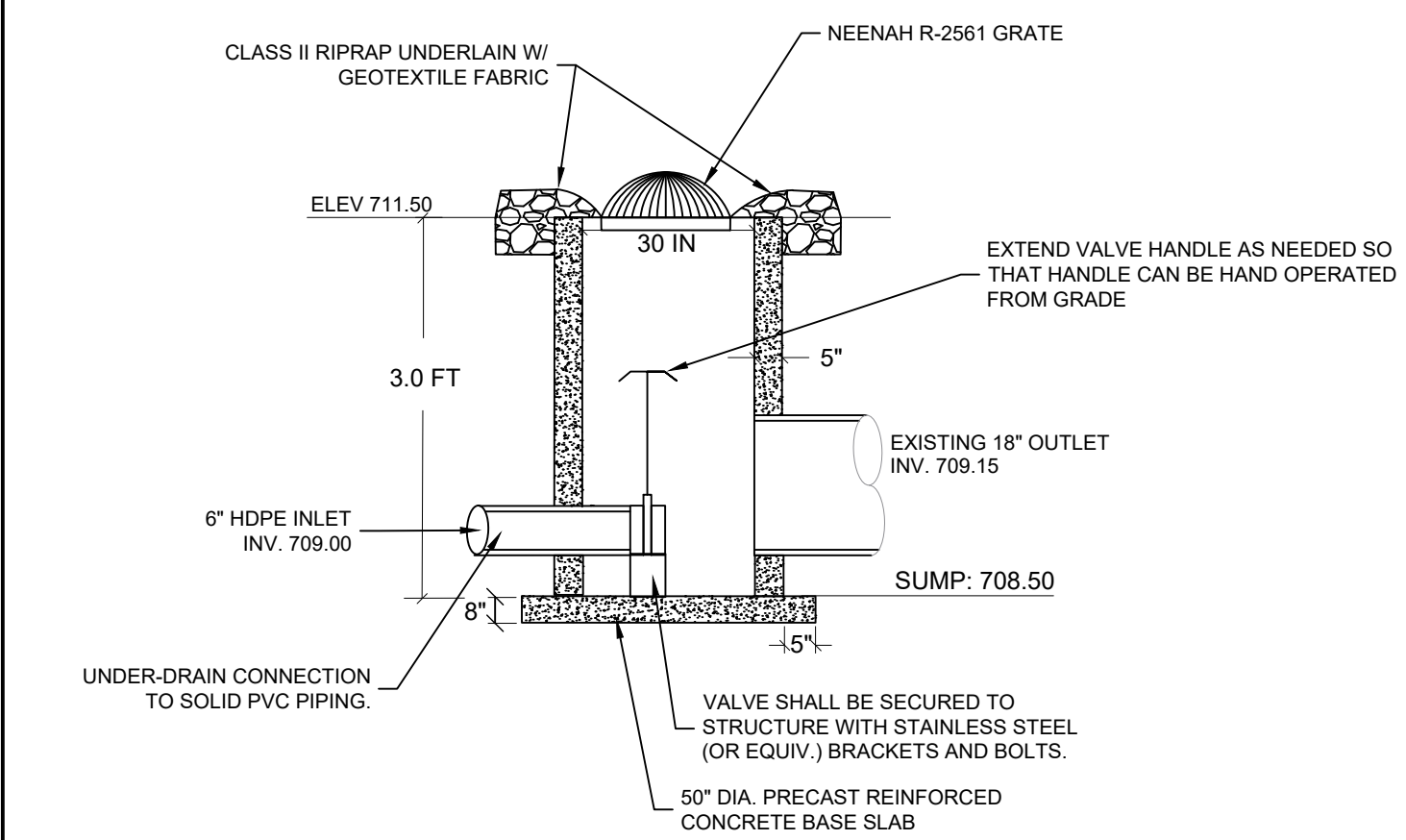


04 DRAINTILE INSTALLATION
06



- NOTES:
- SOLID PIPING AND FITTINGS SHALL BE PVC SCHEDULE 40 UNLESS NOTED OTHERWISE. PIPING DIAMETERS AND ELEVATIONS SHALL BE AS SHOWN ON THE APPROVED PLANS. ALL SOLID PIPE FITTING AND JOINTS SHALL BE SOLVENT WELDED OR HAVE MECHANICAL COUPLER TO PROVIDE WATERTIGHT CONNECTIONS.
 - UNDER-DRAIN CONNECTION TO SOLID PVC PIPING. USE FERNCO 1070 SERIES FLEXIBLE COUPLING OR GENOVA PVC TO CORRUGATED ADAPTOR (SPIGOT X INSERT) OR APPROVED EQUAL.
 - THE KNIFE GATE VALVE SHALL BE A VALTERRA GKV PVC SCHEDULE 40 WITH 304 STAINLESS STEEL PADDLE SNA METAL HANDLE OR APPROVED EQUAL. PVC KNIFE GATE VALVE SHALL BE SOLVENT WELDED TO SOLID PVC PIPING. THE VALVE DIAMETER SHALL MATCH THE DIAMETER OF THE UNDER-DRAIN PIPING UNLESS NOTED OTHERWISE.
 - THE VALVE SHALL BE INSTALLED IN THE FULL OPEN POSITION.

05 KNIFE GATE VALVE DETAIL
06



- NOTES:
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 - THE VALVE SHALL BE INSTALLED IN THE FULL OPEN POSITION.

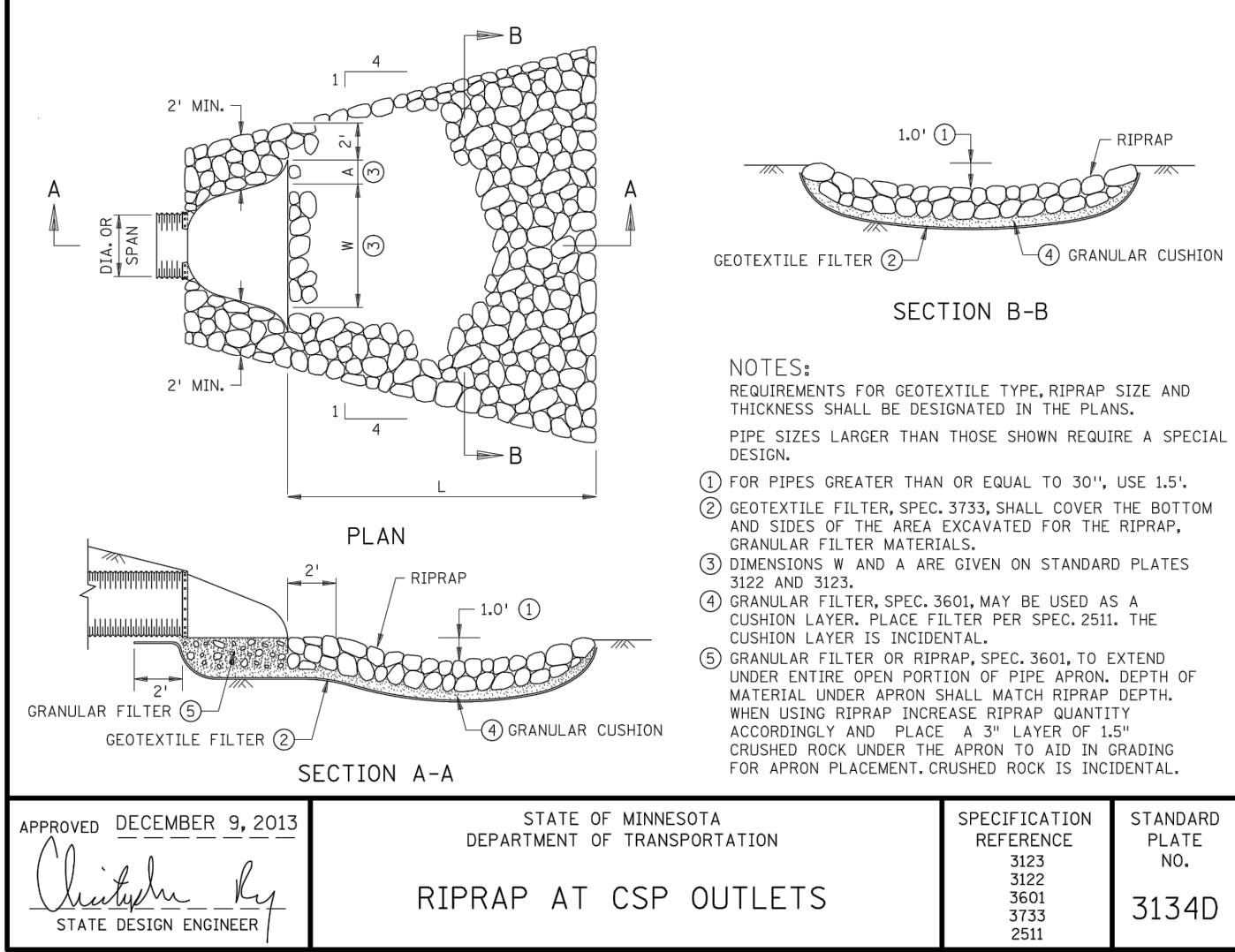
06 VALVE MANHOLE DETAIL
06

TABLE OF QUANTITIES
RIPRAP AT CSP OUTLETS

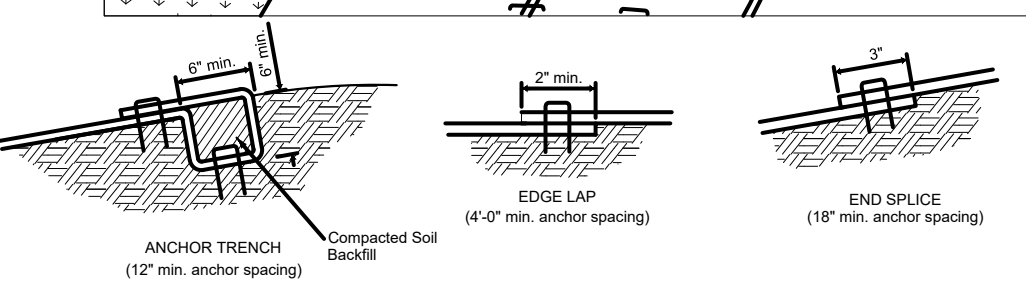
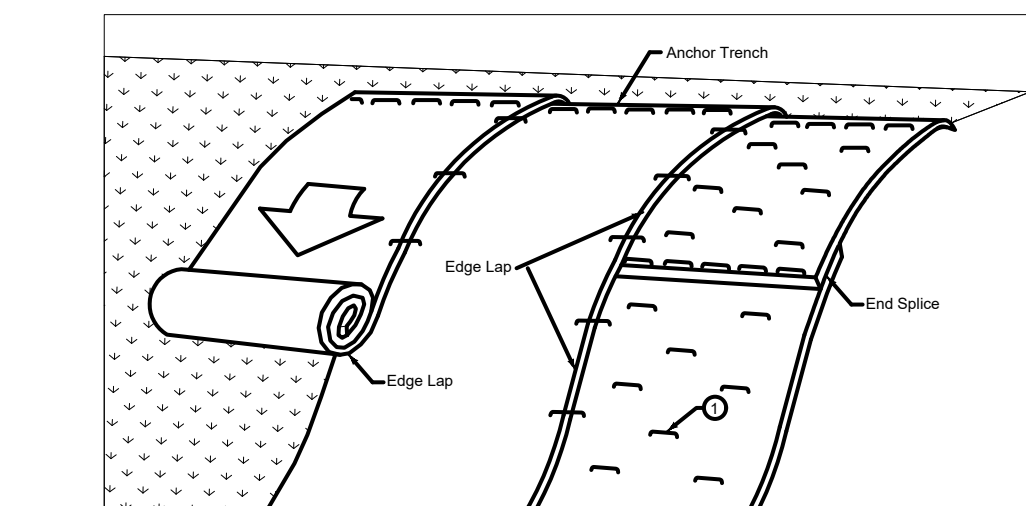
DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d ₅₀ = 6"				CLASS III d ₅₀ = 9"				CLASS IV d ₅₀ = 12"			
		GRANUL. FILTER UNDER APRON (SQ. YD.)	12" DEPTH RIPRAP (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (SQ. YD.)	12" DEPTH RIPRAP (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (SQ. YD.)	12" DEPTH RIPRAP (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)
12	8	16.4	0.2	3.0	19.2	0.2	4.5	22.5	0.3	6.0	0.3	6.0	
15	8	17.8	0.2	3.3	20.7	0.3	4.9	23.9	0.4	6.6	0.4	6.6	
18	10	22.9	0.3	4.6	26.2	0.5	6.8	29.7	0.6	9.1	0.6	9.1	
21	10	24.5	0.4	4.9	27.9	0.6	7.3	31.5	0.8	9.7	0.8	9.7	
24	12	30.4	0.5	6.4	34.2	0.8	9.5	38.2	1.0	12.7	1.0	12.7	
30	14	38.9	0.8	8.5	43.2	1.2	12.7	47.7	1.5	16.9	1.5	16.9	
36	16	48.3	1.1	10.8	53.1	1.6	16.2	58.1	2.1	21.6	2.1	21.6	
42	18	58.7	1.5	13.5	64.0	2.2	20.2	69.5	2.9	27.0	2.9	27.0	
48	20	68.5	1.8	16.0	74.2	2.7	24.0	80.1	3.5	32.0	3.5	32.0	

TABLE OF QUANTITIES
RIPRAP AT CSP-A OUTLETS

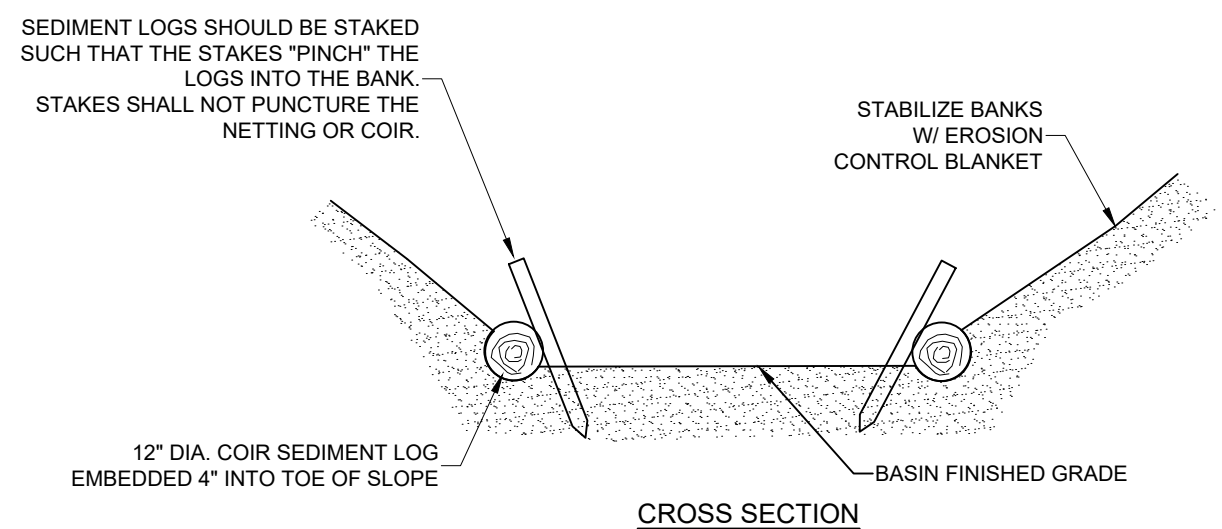
SPAN OF PIPE ARCH (IN.)	L (FT.)	CLASS II d ₅₀ = 6"				CLASS III d ₅₀ = 9"				CLASS IV d ₅₀ = 12"			
		GRANUL. FILTER UNDER APRON (SQ. YD.)	12" DEPTH RIPRAP (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (SQ. YD.)	12" DEPTH RIPRAP (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (SQ. YD.)	12" DEPTH RIPRAP (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)
17	8	18.7	0.2	3.1	20.1	0.3	4.7	23.2	0.3	6.3	0.3	6.3	
21	10	21.9	0.3	4.5	25.1	0.4	6.7	28.6	0.5	9.0	0.5	9.0	
24	10	23.5	0.3	4.9	26.9	0.5	7.4	30.4	0.6	9.8	0.6	9.8	
28	12	29.2	0.4	6.4	32.9	0.6	9.6	36.8	0.8	12.9	0.8	12.9	
35	14	36.8	0.6	8.5	41.0	0.9	12.8	45.4	1.2	17.1	1.2	17.1	
42	16	46.5	0.9	11.2	51.1	1.3	16.9	56.0	1.7	22.9	1.7	22.9	
49	18	55.5	1.1	13.8	60.6	1.7	20.7	66.0	2.2	27.6	2.2	27.6	
57	20	66.6	1.5	17.0	72.2	2.3	25.5	78.0	3.0	34.0	3.0	34.0	



07 RIP RAP
06



08 EROSION CONTROL BLANKET
06



09 LOG BANK TOE STABILIZATION
06

APPROVED DECEMBER 9, 2013
STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
RIPRAP AT CSP OUTLETS
SPECIFICATION REFERENCE: 3123, 3122, 3601, 3733, 2511
STANDARD PLATE NO. 3134D

Per Date: 02/01/2022
Project: 02/01/2022
Drawing: 02/01/2022
Sheet: 06 of 06

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CARNELIAN-MARINE-ST. CROIX WATERSHED DISTRICT
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DETAILS
SHEET 06 OF 06 SHEETS