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PROJECT NO. _____ DATE _____

MY LICENSE RENEWAL DATE IS _____

PAGES OR SHEETS COVERED BY THIS SEAL: _____

ALL SHEETS

BEAVER DAM LAKE MANAGEMENT DISTRICT

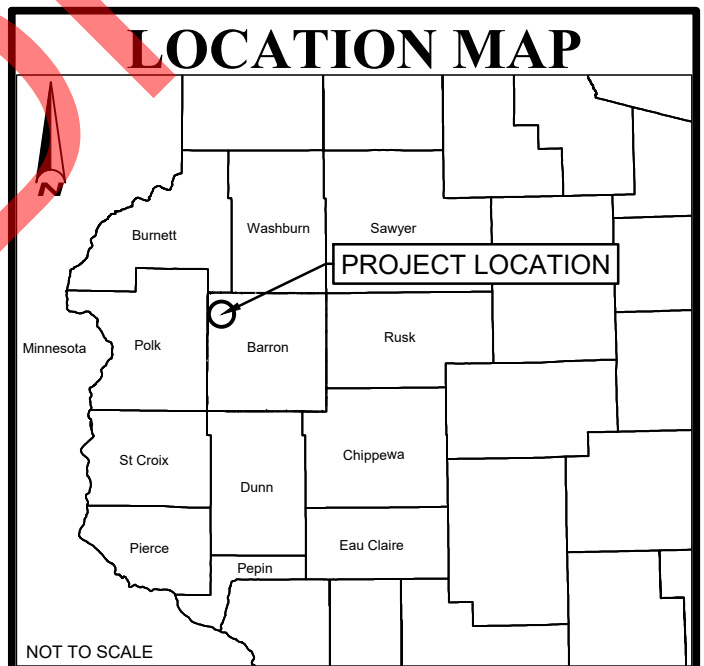
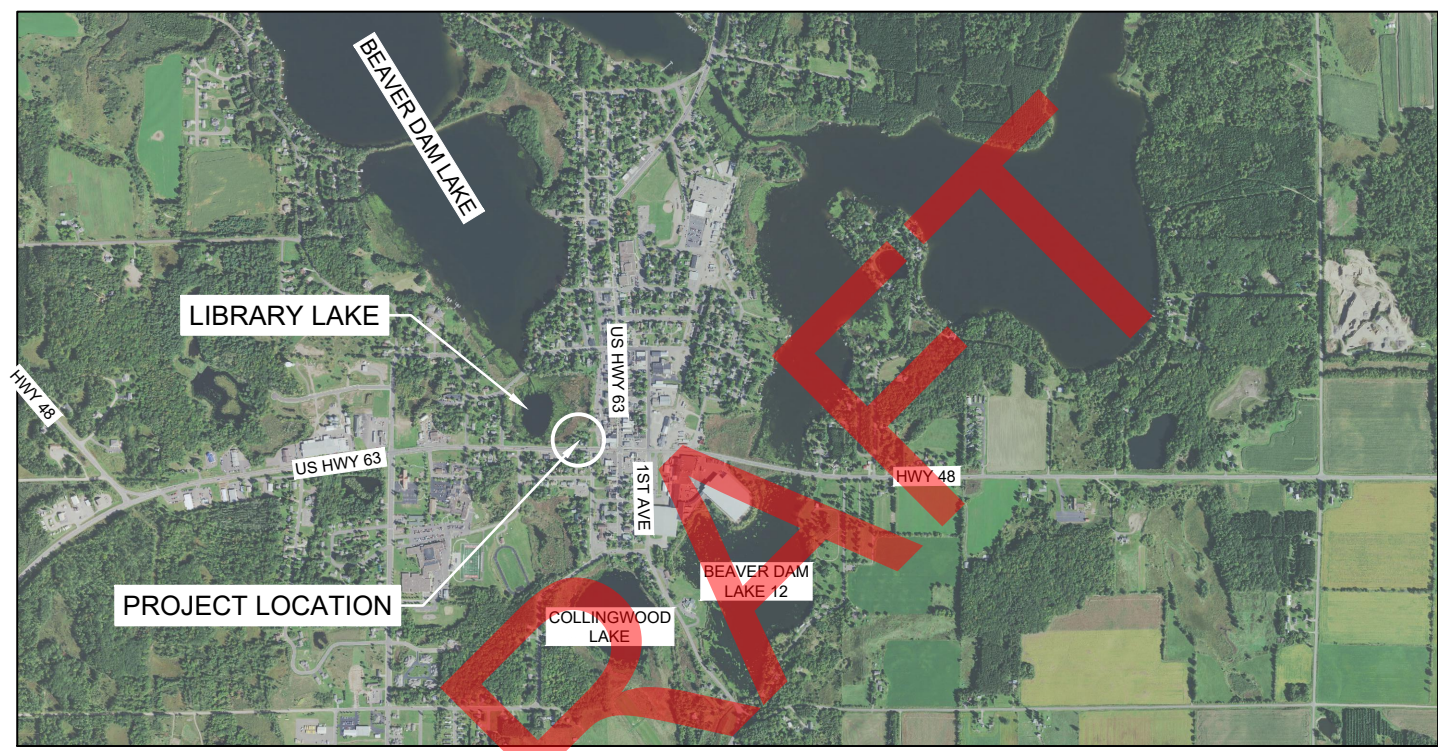
LIBRARY LAKE SOUTHEAST STORMWATER IMPROVEMENTS PHASE 2

CUMBERLAND, BARRON COUNTY, WISCONSIN

ALL ELEVATIONS ARE IN
NAVD 88 - DATUM

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FEATURE	EXISTING	PROPOSED
MINOR CONTOUR	---1246---	---1246---
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EDGE OF CATTAILS	- . . . - . . . -	
DELINEATED WETLAND	- - - - W/D	
FENCE	X X X X	
BURIED ELECTRIC LINES	-E-U-	
OVERHEAD ELECTRIC	-E-O-	
PROPERTY LINE	- - - - -	
TREE LINE	~ ~ ~ ~ ~	
TREE	●	
BORING	●	
SANITARY SEWER LINE	- - - - -	- - - - -
SANITARY SEWER MANHOLE	⊕	⊕
STORM SEWER LINE	- - - - -	- - - - -
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BOLLARD	○	
ELECTRIC POLE	⊕	
GUY WIRE	→	
SILT FENCE	- - - - -	- - - - -
SEDIMENT LOG	○	
INLET PROTECTION	○	
CONSTRUCTION LIMITS	- - - - -	- - - - -



* THIS PLAN SET CONTAINS 18 PLAN SHEETS

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, YOU CAN EMAIL LOCATE REQUESTS TO THE CALL CENTER. TO ACCESS THE ONLINE EMAIL FORM, GO TO DIGGERS HOTLINE WEBSITE, 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.

GOVERNING SPECIFICATIONS

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

THE 2021 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: 08/22/2022
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 Xrefs: 909-29_P-hand2_909-29_X-hairn_LLSE_PH2

 Know what's below. Call before you dig.		SUBMISSION DATE: 08/22/2022 DESIGN BY DRAWN BY CHECKED BY DRL ERK --- EOR PROJECT NO. 00909-0029	Emmons & Olivier Resources, Inc. 1919 University Ave W, 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 STATE PROJECT NO. --- CITY PROJECT NO. ---	TITLE SHEET SHEET 01 OF 18 SHEETS
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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 AND ANY ADDITIONAL CONSTRUCTION STAKING.
4. CONTRACTOR TO ADHERE TO ALL CITY, DNR, WISDOT AND WPDES PERMIT REQUIREMENTS, EVEN IF ACQUISITION OF THE WPDES PERMIT IS NOT REQUIRED, 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.
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.
13. SWEEP ADJACENT STREETS AS DIRECTED BY THE ENGINEER.
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.
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.

Library Lake Southeast Stormwater Improvements			
Engineering Standards			
Prepared by EOR; October 30, 2020			
1	Streambank or shoreline protection with revegetation, soil bioengineering or upland erosion control	NRCS Technical Guide Streambank and Shoreline Protection Standard 580 (August, 2018)	580
2		NRCS Technical Guide Shoreland Habitat Standard 643A (July, 2001)	643A
3	Sediment Basins	Wisconsin DNR Technical Standard 1001, Wet Detention Basin (October 2007)	1001
4	Pervious Pavement	Wisconsin DNR Technical Standard 1008, Permeable Pavement (February, 2016)	1008
5	Rain Gardens	Wisconsin DNR Technical Standard 1009, Rain Garden (September, 2018)	1009
6	Vegetation Planting	NRCS Technical Guide Tree / Shrub Establishment Standard 612 (January, 2018)	612
7		Part 2 - Earthwork	
8		Part 3 - Bases and Subbases	
9		Part 4 - Pavements	
10		Part 5 - Structures	
11		Part 6 - Incidental Construction	

ITEM NO.	ITEM DESCRIPTION	WISDOT REFERENCE	UNIT	QUANTITY
1	Removing Pavement	204.0100	SY	600
2	Removing Curb & Gutter	204.0150	LF	80
3	Removing Guardrail (Wood Bollards)	204.0165	LF	223
4	Sealing Pipe	204.0280	EACH	-
5	Excavation Common (Phase 2)	205.0100	CY	1400
6	Excavation Common (Phase 3)	205.0100	CY	500
7	Rain Garden Media (90%#20)	209.0000	CY	50
8	Iron Enhanced Sand Filter Media (96.5)	209.0000	CY	270
9	Backfill Granular Grade 1 (Drainage Aggregate)	209.1100	CY	140
10	Base Aggregate Dense 3/4-Inch (P, Parking Lot)	305.0110	TON	465
11	Bedding Coarse ASTM No. 8 (2" Thick)	310.0000	TON	33
12	Base ASTM No. 67 (4" Thick)	310.0000	TON	66
13	Subbase ASTM No. 2 (12" Thick)	350.0000	TON	198
14	PICP Pavers / Blocks (Parking Lot)	405.0000	SF	2805
15	Macadam (8", Walking Path)	450.0000	TON	130
16	HMA Pavement 4 LT 58-28 S (3", Parking Lot)	460.0224	TON	148
17	Rubberized Membrane Waterproofing (IESF Liner)	516.0500	SY	700
18	Apron Endwalls for Culvert Pipe 21-Inch	620.1021	EACH	-
19	Apron Endwalls for Culvert Pipe 24-Inch	620.1024	EACH	1
20	Concrete Curb & Gutter 24-Inch (Parking Lot, Flat Curb)	601.0000	LF	175
21	Concrete Curb & Gutter 30-Inch Type A (Highway)	601.0429	LF	20
22	Concrete Curb & Gutter 30-Inch Type A (Parking Lot)	601.0409	LF	803
23	Concrete Sidewalk 6-Inch	602.0415	SF	2230
24	Curb Ramp Detectable Warning Field Yellow	602.0505	SF	112
25	Riprap Medium	606.0200	CY	20
26	Storm Sewer Pipe Reinforced Concrete Class IV 24-Inch	608.0424	LF	25
27	Storm Sewer Pipe Reinforced Concrete Class V 15-Inch	608.0515	LF	28
28	Ditch Grate, Stool Type (Neerath Part No. R-4341-A)	611.0000	EACH	1
29	Manhole Covers Type J	611.0530	EACH	-
30	Inlet Covers Type H	611.0624	EACH	-
31	Manholes 4-FT Diameter	611.2004	EACH	2
32	Manholes 4-FT Diameter (Owner Provided)	611.2004	EACH	2
33	Manholes 5-FT Diameter	611.2004	EACH	1
34	Pipe Underdrain 6-Inch	612.0106	LF	601
35	Mobilization	619.1000	EACH	2
36	Topsoil	625.0105	CY	210
37	Silt Fence	628.1504	LF	1050
38	Silt Fence Maintenance	628.1520	LF	1050
39	Erosion Mat Class 1 Type B	628.2004	SY	2380
40	Soil Stabilizer Type A	628.6505	ACRE	2.25
41	Inlet Protection Type B	628.7010	EACH	6
42	Tracking Pads	628.7500	EACH	2
43	Seeding Mixture No. 10 (1.5 Pounds Per 1000 Square Feet)	630.0110	LB	40
44	Seeding Mixture No. 75 (0.70 Pounds Per 1000 Square Feet)	630.0175	LB	14
45	Seeding Temporary (3.0 Pounds Per 1000 Square Feet)	630.0200	LB	44
46	Seeding Nurse Crop (0.80 Pounds Per 1000 Square Feet)	630.0400	LB	35
47	Trees (species, root, size)	632.0101	EACH	30
48	Shrubs (species, root, size)	632.0201	EACH	600
49	Traffic Control	643.5000	EACH	2
50	Geotextile Type DF Schedule A	645.0111	SY	410
51	Marking Line Epoxy 4-Inch	646.1020	LF	564
52	Wooden Bollards	SP	EA	4
53	Dredging Access	SP	LS	1
54	Landscape Block	SP	EA	38
55	Public Dock	SP	LF	200
56	Maintenance Vehicle Access	SP	SF	1175
57	Baffle (Momentum Preserver, Energy Dissipator, D16)	SP	EA	2
58	Baffle (Momentum Preserver, Energy Skimmer, S15)	SP	EA	2
59	Baffle (Momentum Preserver, Energy Skimmer, S21)	SP	EA	1

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 SHALL SUBMIT FOR THE PERMIT.
4. WISCONSIN DNR WETLAND IMPACTS
 - A. OWNER HAS SUBMITTED FOR THIS PERMIT.
5. ARMY CORPS OF ENGINEERS WETLAND IMPACTS
 - A. OWNER HAS SUBMITTED FOR THIS PERMIT.

6			
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1	08/22/2022	DRL	PRELIMINARY PLAN SET
NO	DATE	BY	REVISION



SUBMISSION DATE:
08/22/2022
DESIGN BY DRAWN BY CHECKED BY
DRL ERK ###
EOR PROJECT NO.
00909-0029

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
Tele: 651.770.8448
www.eorinc.com

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

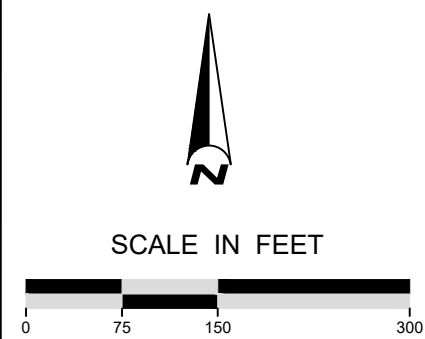
LIBRARY LAKE SOUTHEAST
STORMWATER IMPROVEMENTS
PHASE 2
CUMBERLAND, BARRON COUNTY,
WISCONSIN
STATE PROJECT NO. ---- CITY PROJECT NO. ---

NOTES & ESTIMATED QUANTITIES
SHEET 02 OF 18 SHEETS

File Path: 08/22/2022
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NOTE:
FOR SOIL BORING
INFORMATION AND LOGS,
REFER TO THE REPORT BY
AET PROJECT NO. 31-20717



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1	08/22/2022	DRL	PRELIMINARY PLAN SET
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EOE Emmons & Olivier
 Resources, Inc.
 1919 University Ave W,
 Suite 300, St Paul, MN 55104
 water ecology
 community www.eorinc.com
 Tele: 651.770.8448

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

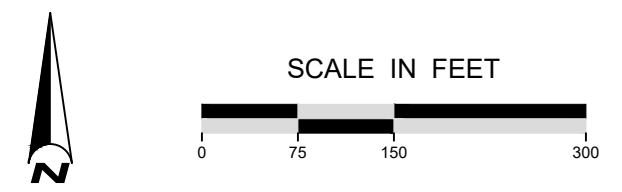
LIBRARY LAKE SOUTHEAST STORMWATER
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 PHASE 2
 CUMBERLAND, BARRON COUNTY, WISCONSIN
 STATE PROJECT NO. --- CITY PROJECT NO. ---

OVERVIEW & SOIL BORING PLAN
 SHEET 03 OF 18 SHEETS



- NOTES:
1. 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.
 2. 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



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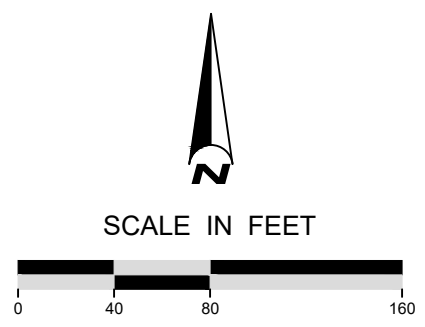
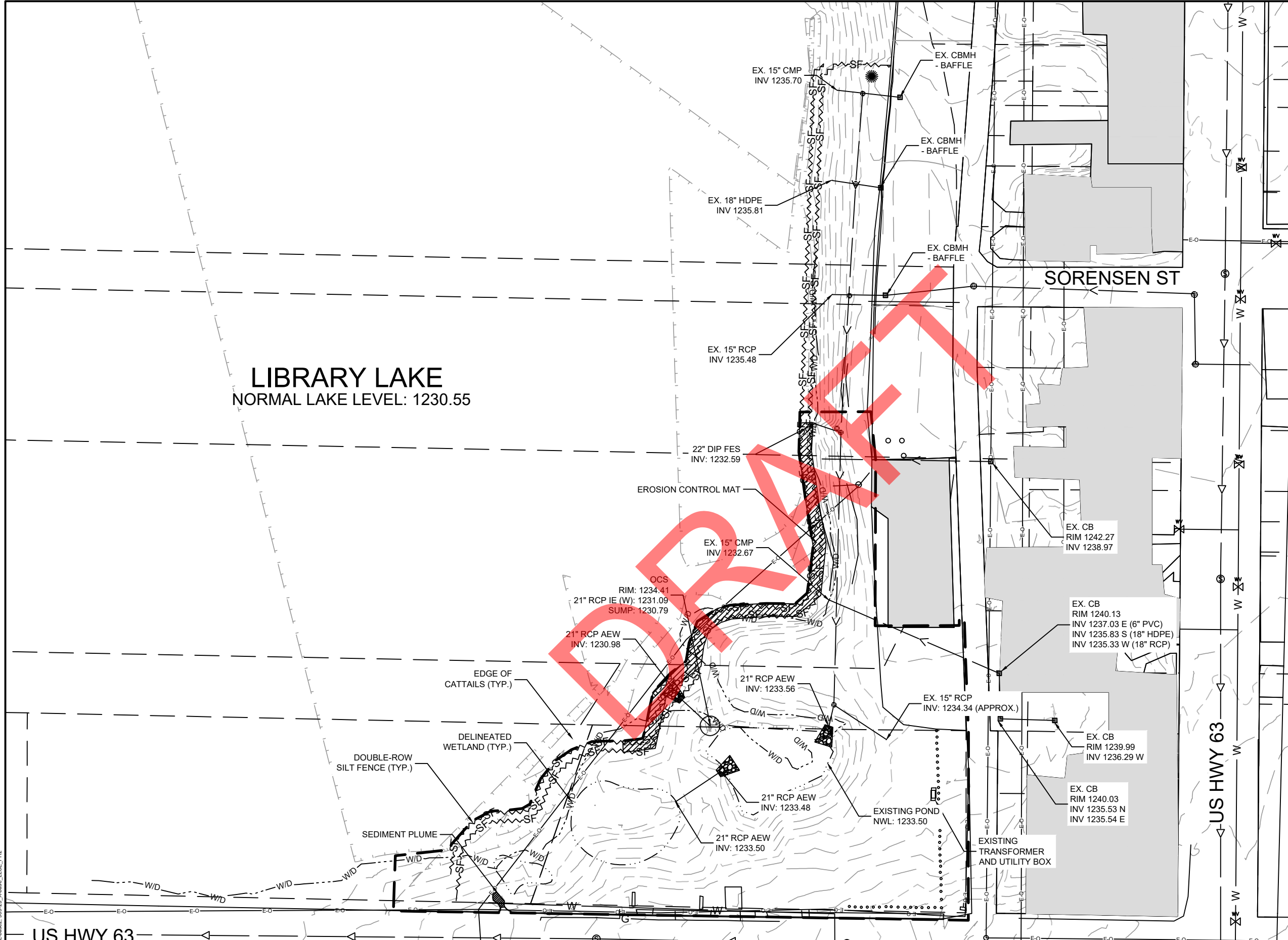
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 community
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DRAINAGE AREA & SWPPP SITE PLAN
 SHEET 04 OF 18 SHEETS

LIBRARY LAKE
NORMAL LAKE LEVEL: 1230.55




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

EXISTING CONDITIONS

SHEET 05 OF 18 SHEETS

LIBRARY LAKE
NORMAL LAKE LEVEL: 1230.55

EXISTING SILT FENCE
DOUBLE ROLL ADJACENT
TO LAKE (TYP.)

SILT FENCE
SURROUNDING POND
(TYP.)

TURBIDITY BARRIER

EXISTING SILT FENCE
DOUBLE ROLL ADJACENT
TO LAKE (TYP.)

EROSION CONTROL
MATTING

SORENSEN ST

US HWY 63

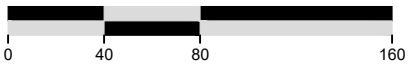
US HWY 63

NOTE:

1. CONTRACTOR TO INSTALL TRACKING PAD AND INLET PROTECTION IN CITY PARKING LOT & ROADWAYS AND IN DOT HIGHWAY PRIOR TO GRADING ACTIVITIES.
2. CONTRACTOR SHALL PLACE OUTLET PROTECTION IN ALL APRON ENDWALLS DURING CONSTRUCTION TO MINIMIZE SEDIMENT DISCHARGE TO THE LAKE.
3. CONTRACTOR SHALL REMOVE EXCESS SEDIMENT ACCUMULATION IN PROPOSED STORMWATER POND IF BOTTOM ELEVATION IS SHALLOWER THAN 1228.50- FEET.
4. EROSION CONTROL MATTING TO BE INSTALLED ON SLOPES ADJACENT TO STORMWATER BASINS A MINIMUM OF EIGHT (8) FEET OR ONE ROLL, WHICHEVER IS GREATER.



SCALE IN FEET



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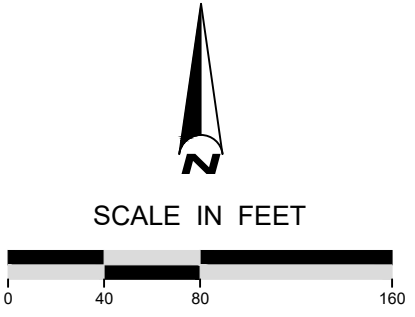
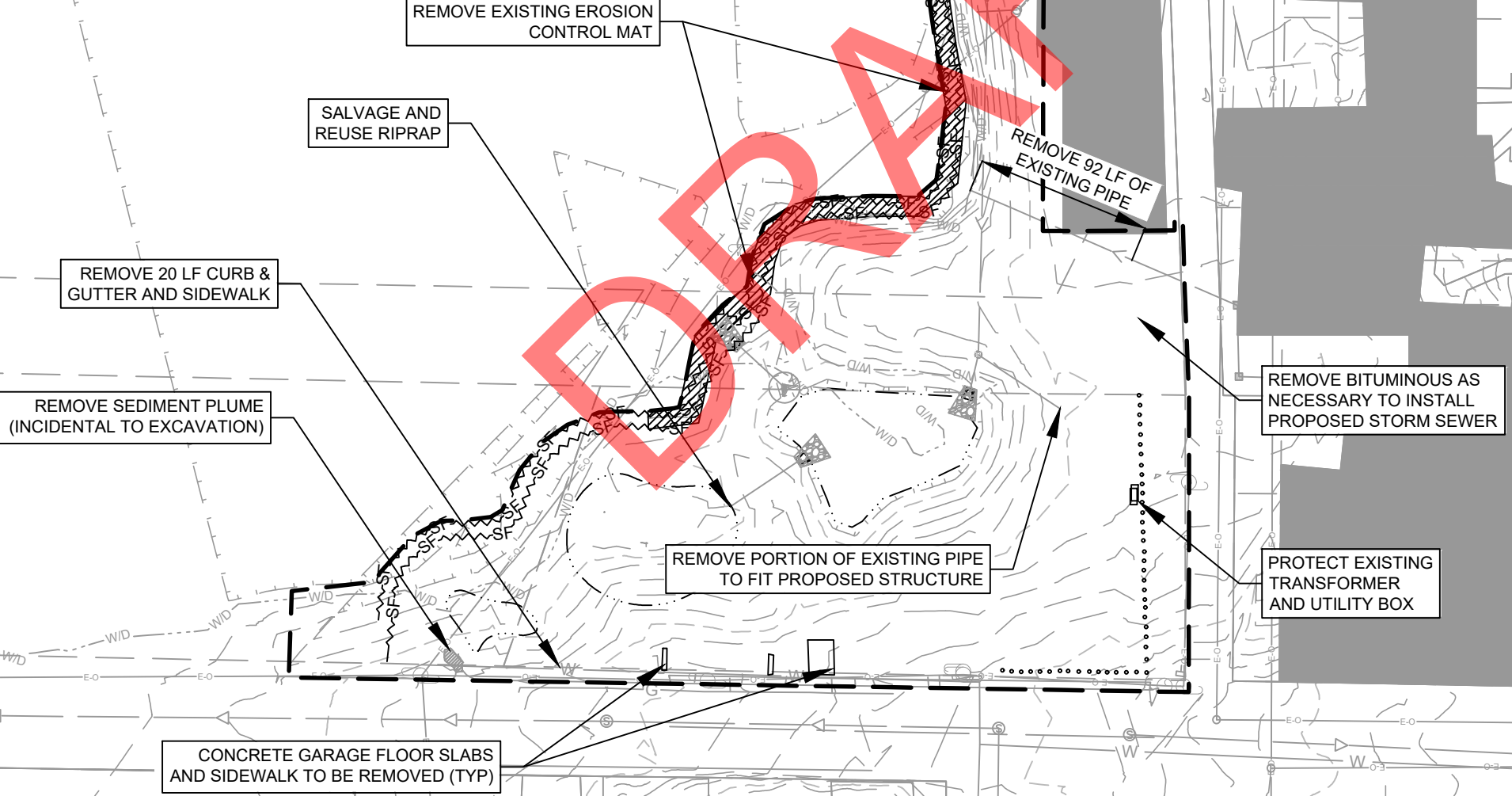
EROSION & SEDIMENT CONTROL PLAN
SHEET 06 OF 18 SHEETS

LIBRARY LAKE
NORMAL LAKE LEVEL: 1230.55

SORENSEN ST

US HWY 63

US HWY 63



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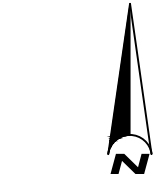
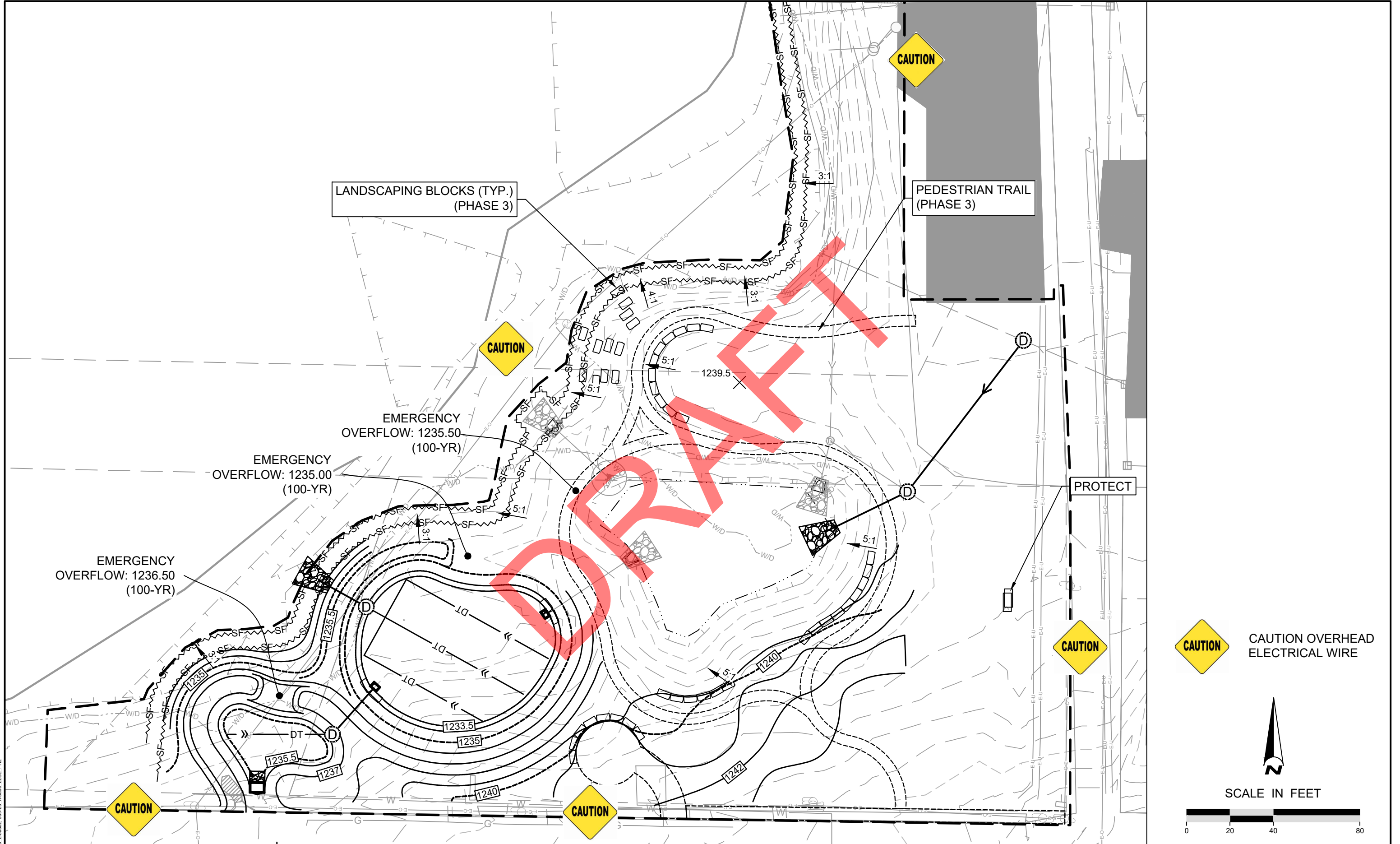
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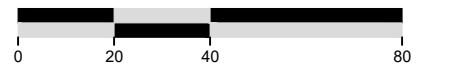
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PHASE 2
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STATE PROJECT NO. --- CITY PROJECT NO. ---

DEMOLITION & REMOVALS PLAN
SHEET 07 OF 18 SHEETS



SCALE IN FEET



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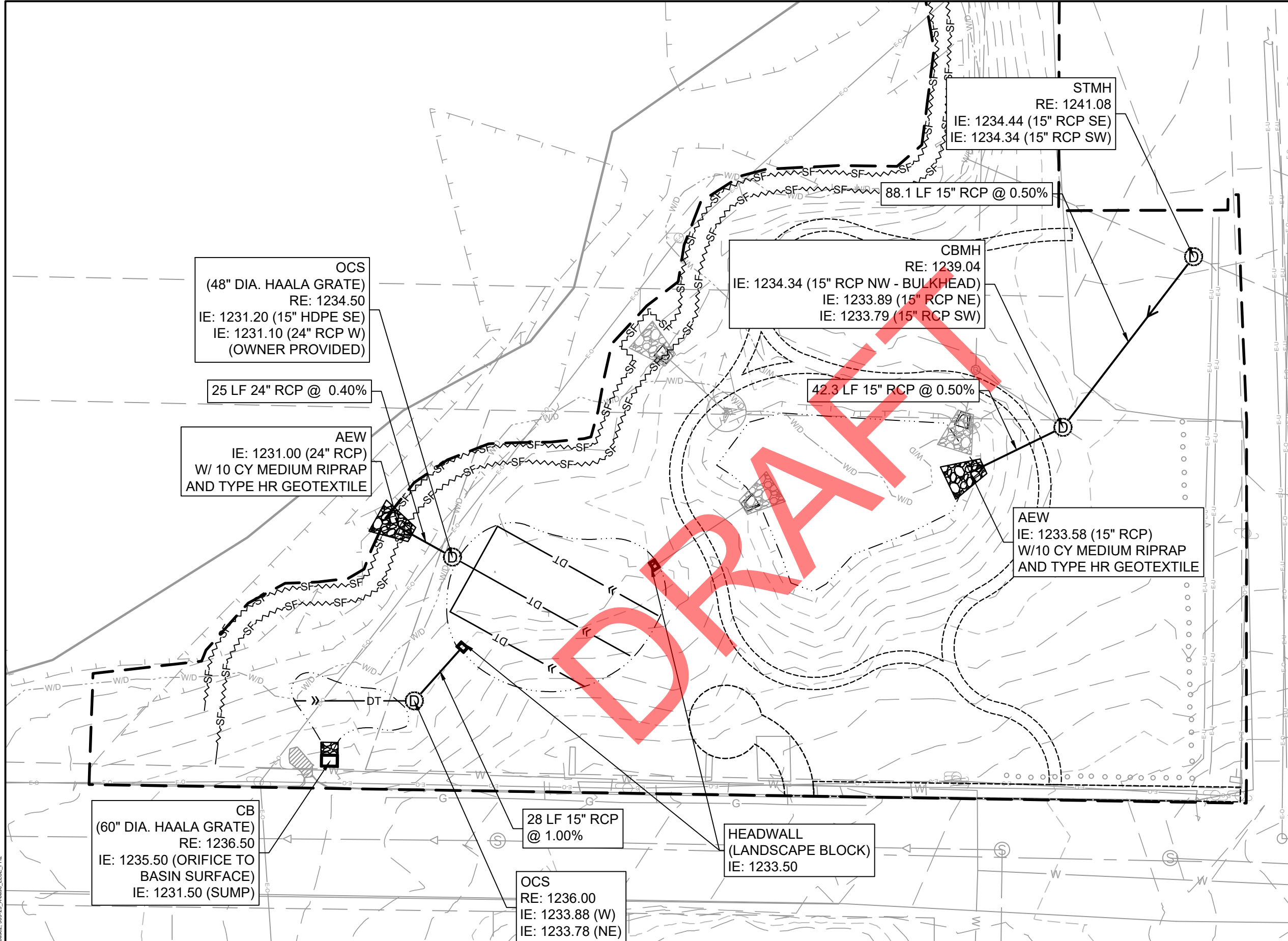
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GRADING & DRAINAGE PLAN
SHEET 08 OF 18 SHEETS

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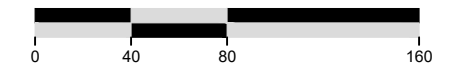
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CAUTION OVERHEAD
/UNDERGROUND
ELECTRICAL WIRE



SCALE IN FEET



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STORM SEWER PLAN OVERVIEW
SHEET 09 OF 18 SHEETS

LIBRARY LAKE
NORMAL LAKE LEVEL: 1230.55

SEED MIXTURE NO. 70 (TYP.)

SORENSEN ST

US HWY 63

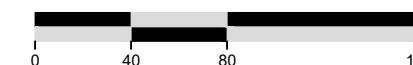
US HWY 63

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 STRAW MULCH (CRIMPED) AT A RATE OF 2 TONS PER ACRE. INSURE UNIFORM COVERAGE AND NO STRAW IS BLOWN OFF THE PROJECT SITE.
4. INSTALL EROSION CONTROL MAT (URBAN CLASS I TYPE A - CURLEX I FIBRENET OR APPROVED EQUAL) AS SPECIFIED IN THE PLANS.
5. CONTRACTOR SHALL NOT BE PAID FOR ANY EROSION CONTROL MAT IF IT IS NOT INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING BUT NOT LIMITED TO EDGE TRENCHING AND PROPER STAPLE INSTALLATION.



SCALE IN FEET



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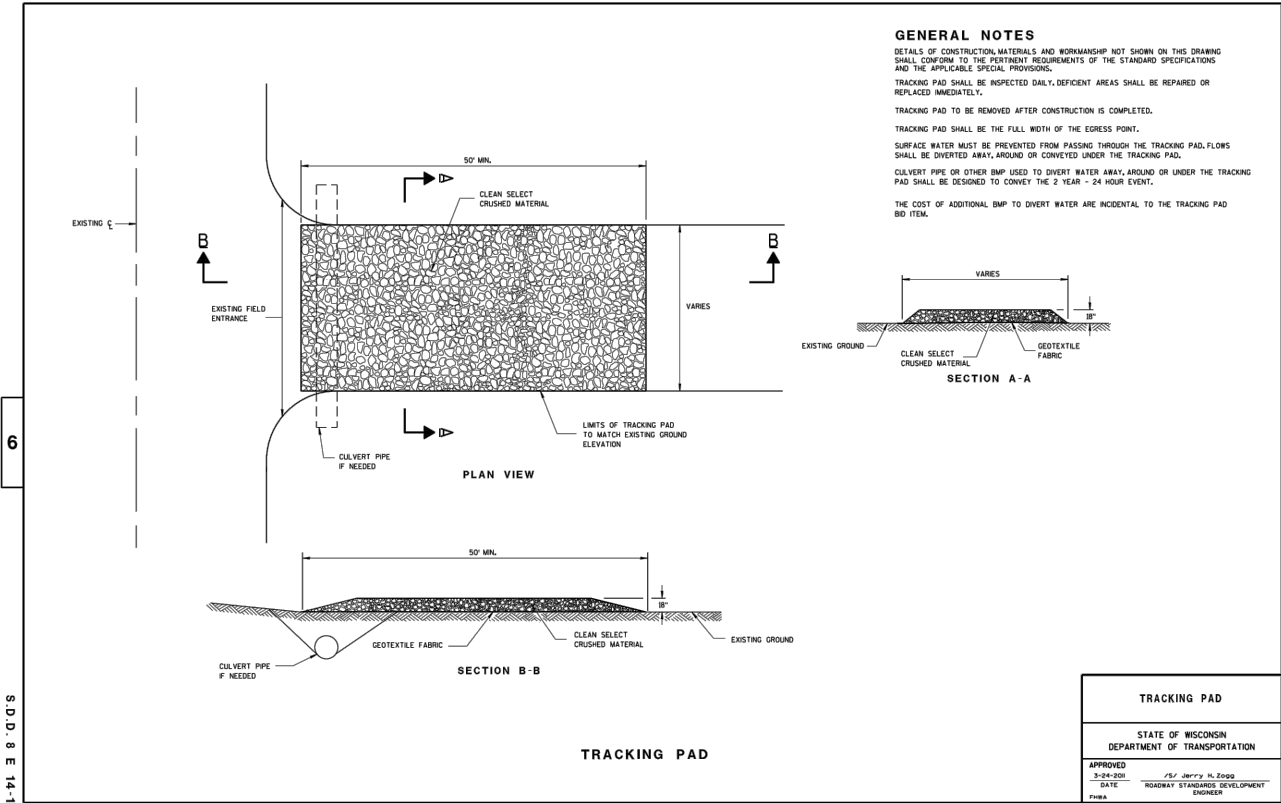
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RESTORATION PLAN

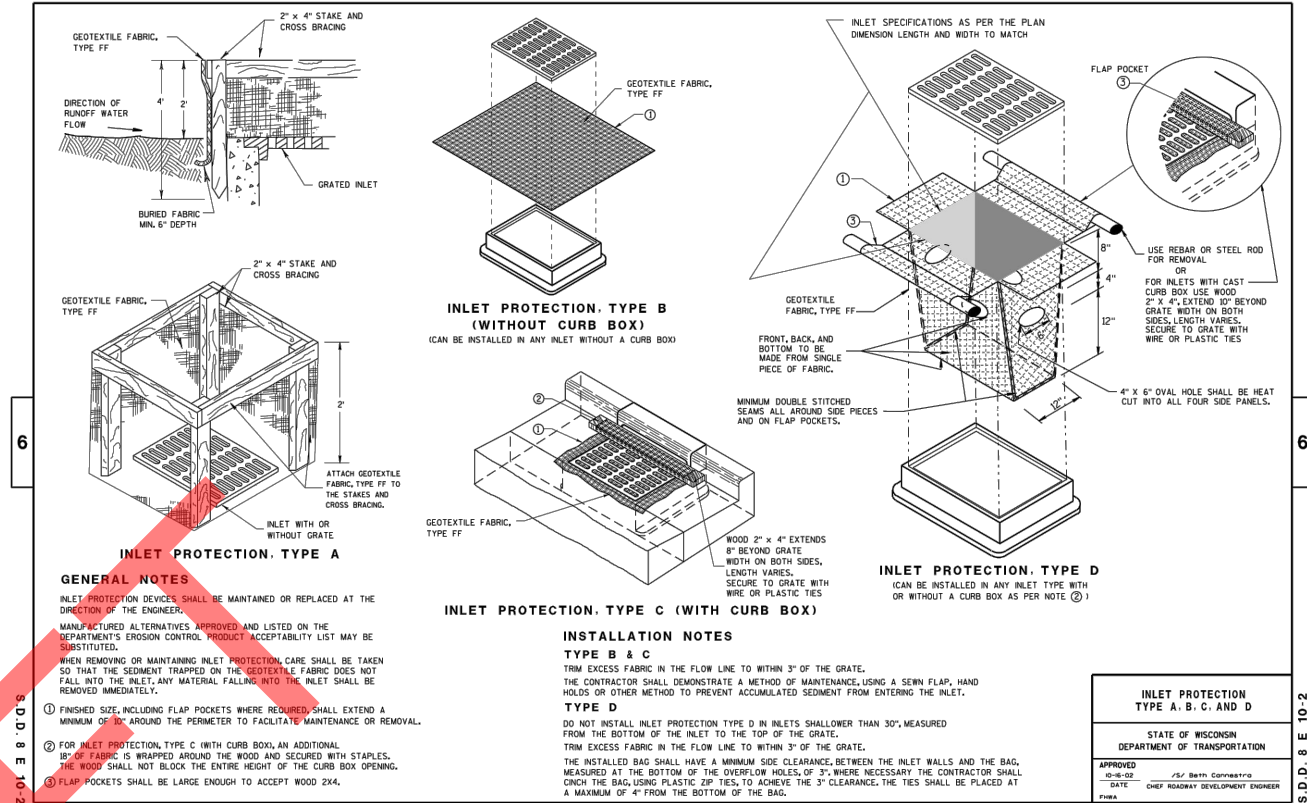
SHEET 10 OF 18 SHEETS

SDD 8e14 Tracking Pad



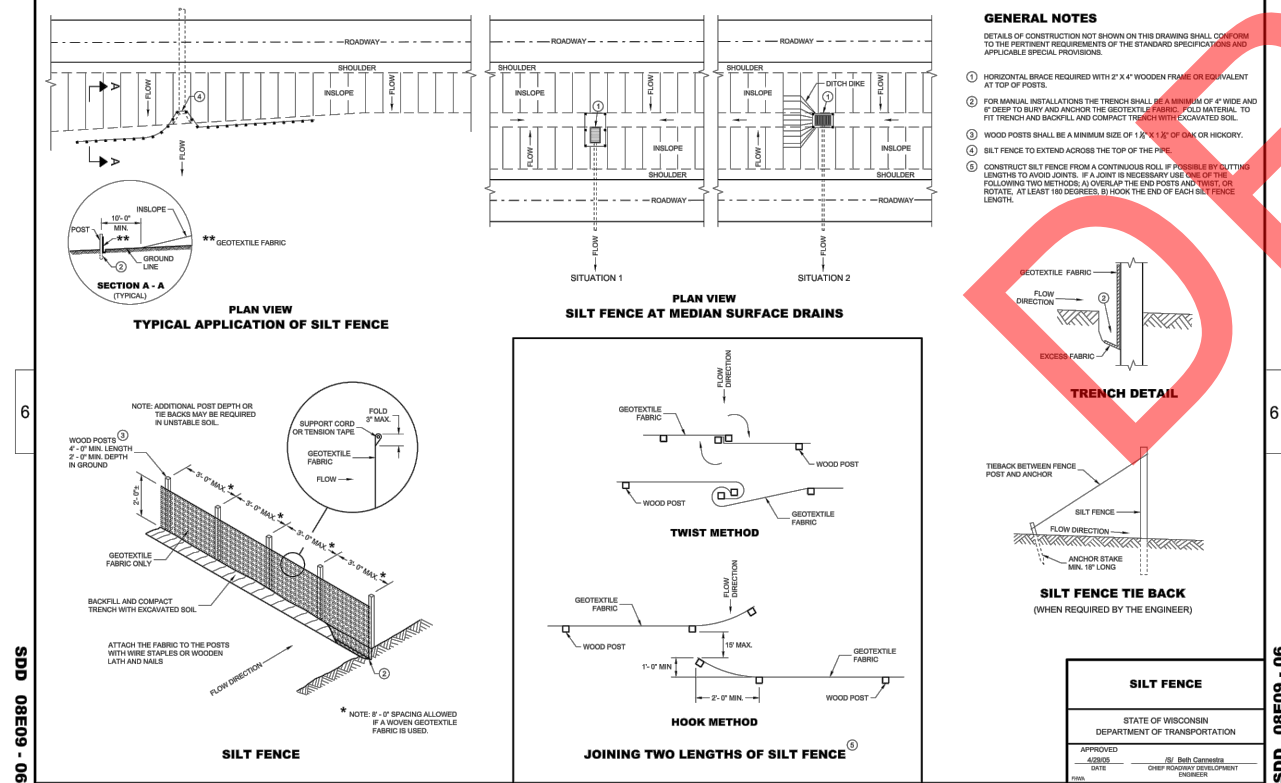
01 TRACKING PAD
 11 NOT TO SCALE

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



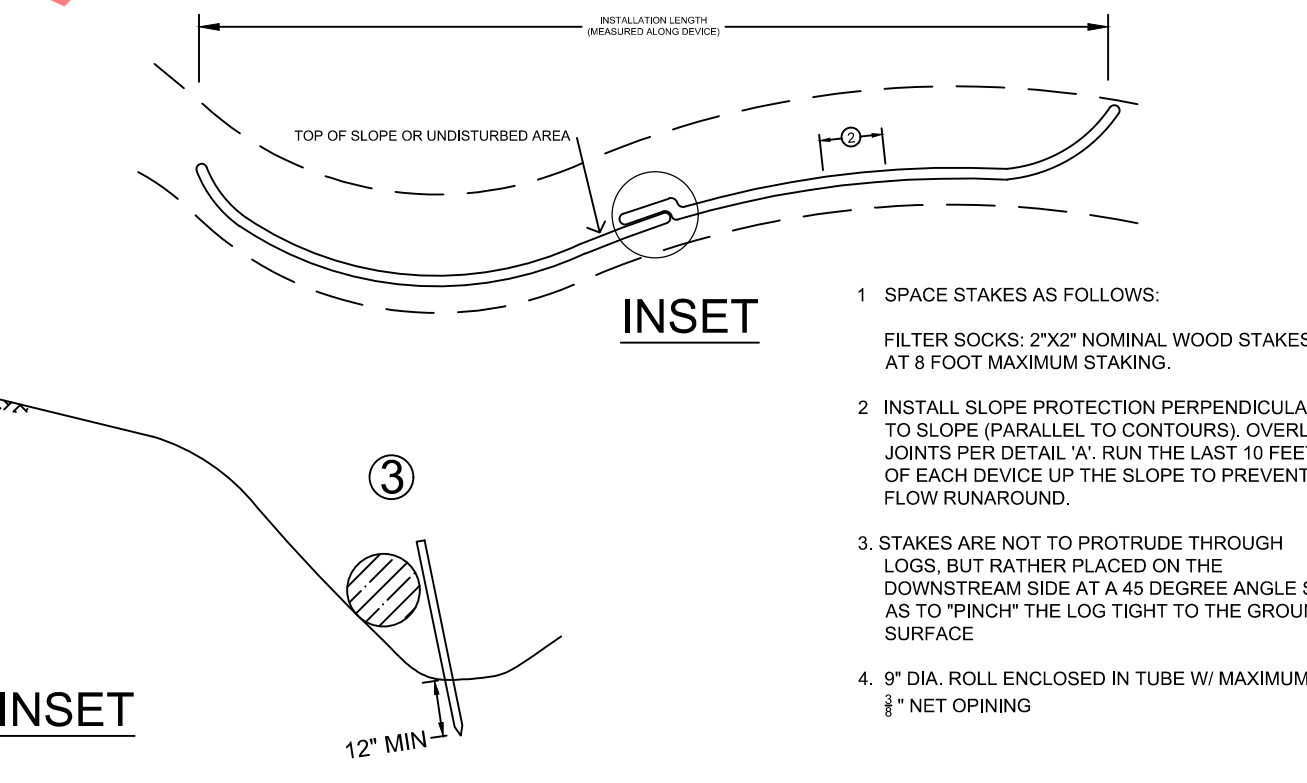
02 INLET PROTECTION
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SDD 08E09 Silt Fence



03 SILT FENCE
 11 NOT TO SCALE

SDD 8e10 Sediment Logs



04 SEDIMENT LOGS
 11 NOT TO SCALE

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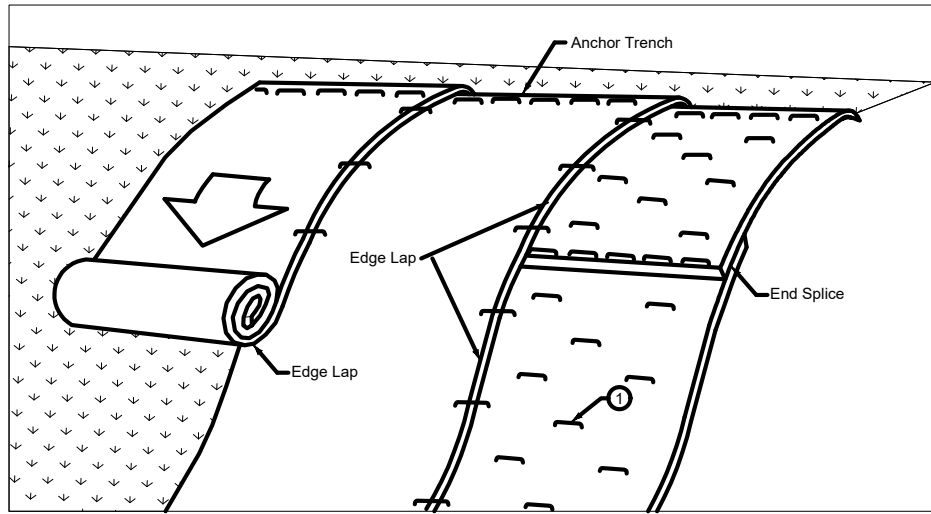
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STATE PROJECT NO. --- CITY PROJECT NO. ---
 DETAIL SHEET 1
 SHEET 11 OF 18 SHEETS

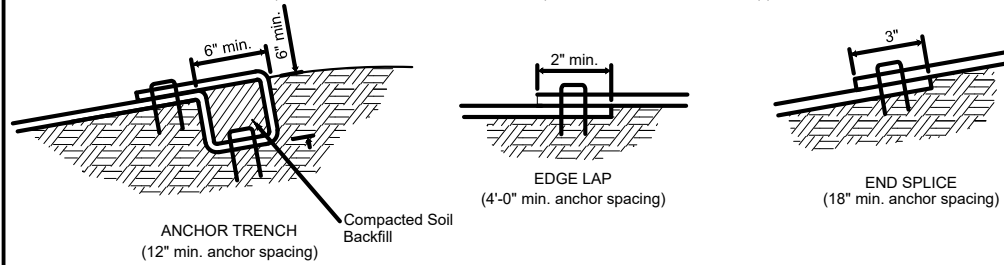


NOTES:

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.

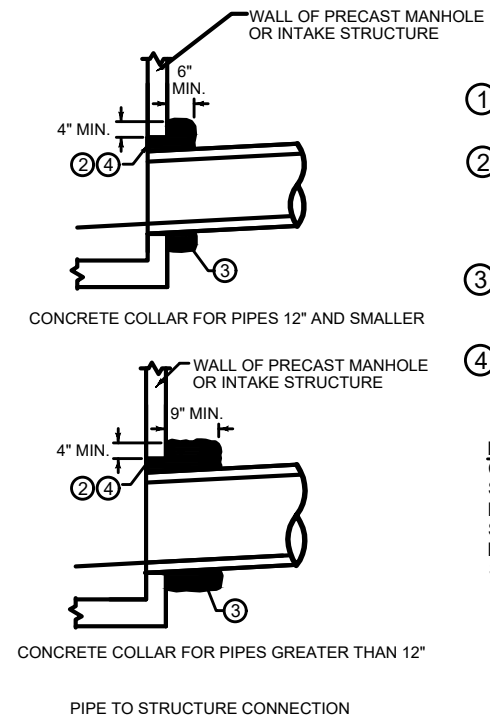
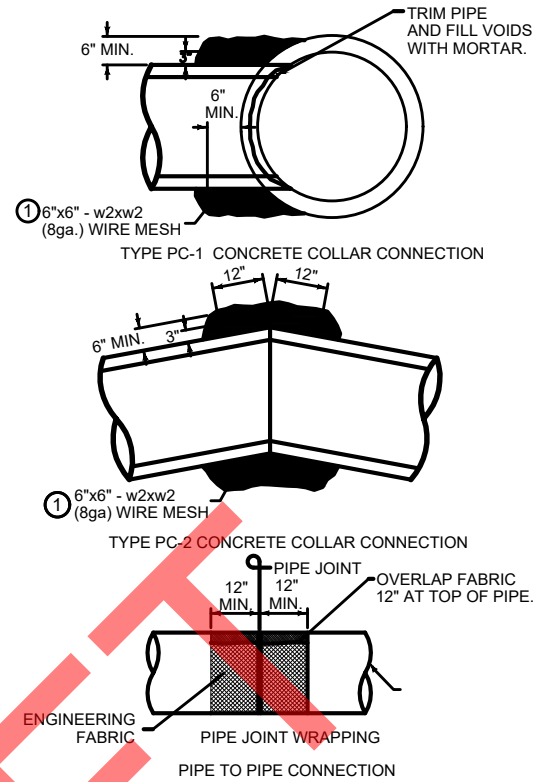
TABLE 1

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



01 EROSION CONTROL MATTING

12 NOT TO SCALE

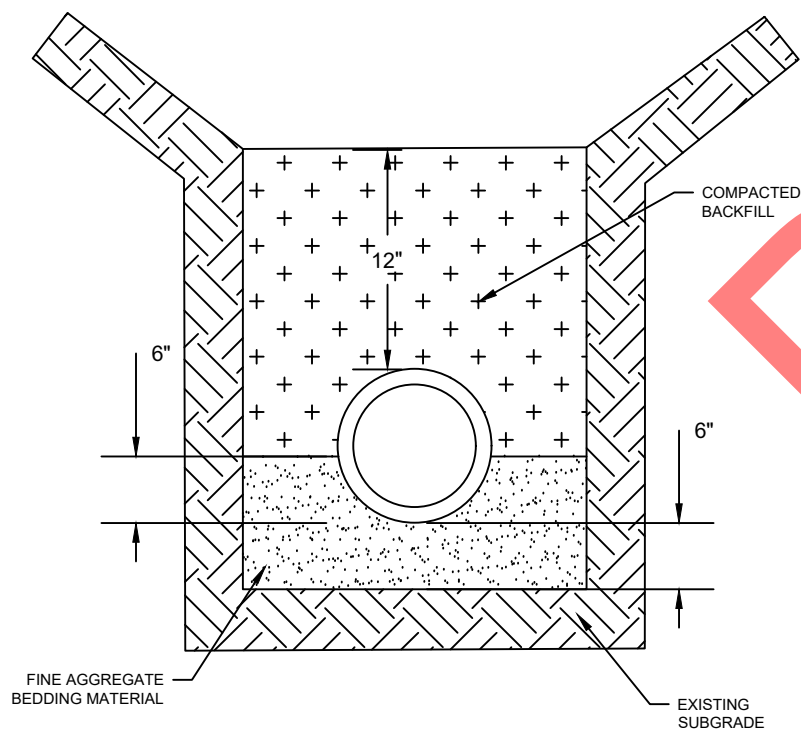


- ① LAP ENDS OF WIRE MESH A MINIMUM OF 6 INCHES.
- ② CONCRETE COLLAR IS REQUIRED WHEN ANNULAR SPACE BETWEEN THE OUTSIDE OF THE PIPE AND THE WALL OF THE STRUCTURE IS 2 INCHES OR GREATER.
- ③ PROVIDE TWO #4 HOOP BARS IN CONCRETE COLLAR. LAP BARS A MINIMUM OF 6 INCHES.
- ④ TROWEL CONCRETE FLUSH WITH INSIDE WALL OF STRUCTURE.

NOTE CONNECTIONS TO EXISTING PIPE AND STRUCTURES MUST INCLUDE BUT NOT LIMITED TO THE FOLLOWING BELL & SPIGOT, GASKET, TIES & GEOTEXTILE FABRIC, MORTAR & REBAR, FLEXSEAL OR SIMILAR WATER INTRUSION SEAL

02 CONNECTION TO EXISTING STORM SEWER

12 NOT TO SCALE



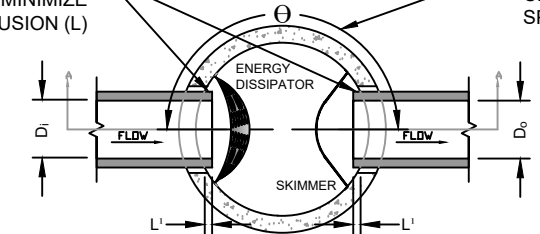
03 PIPE BEDDING DETAIL

12 NOT TO SCALE

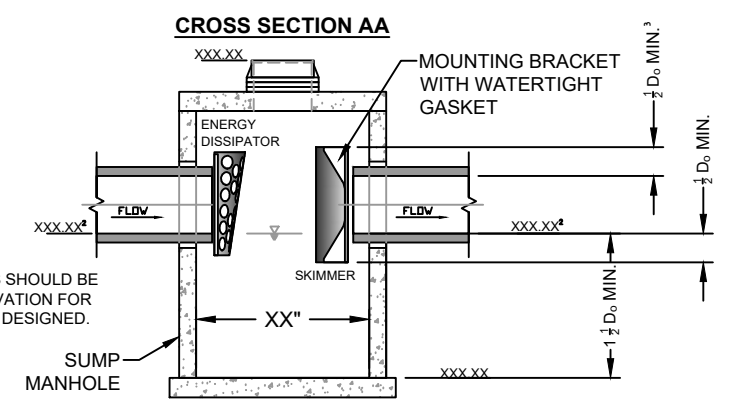
FOR NEW MANHOLE CONSTRUCTION, CONTRACTOR TO MINIMIZE PIPE PROTRUSION (L)

PLAN VIEW

REFER TO MANHOLE SIZING CHART TO ENSURE PROJECT SPECIFIC DESIGN FEASIBILITY



NOTE 1: STOCK COMPONENTS ARE DESIGNED TO ACCOMMODATE A 6" CONCRETE PIPE PROTRUSION (L, MEASURED AT SIDE OF PIPE). FOR CUSTOM DESIGNS, AND/OR PROJECT SPECIFIC DETAILS, CONTACT MOMENTUM.



NOTE 2: INLET AND OUTLET INVERTS SHOULD BE AT APPROXIMATELY THE SAME ELEVATION FOR THE PRESERVER™ TO FUNCTION AS DESIGNED.

NOTE 3: STOCK SKIMMERS HAVE A FREEBOARD DEPTH OF 1/2 D_o. FOR GREATER FREEBOARD DEPTHS, DESIGNERS CAN UPSIZE THE SKIMMER, OR USE A CUSTOMIZED SKIMMER. FOR CUSTOM DESIGNS, AND/OR PROJECT SPECIFIC DETAILS, CONTACT MOMENTUM.

04 BAFFLE DETAIL

12 NOT TO SCALE

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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

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

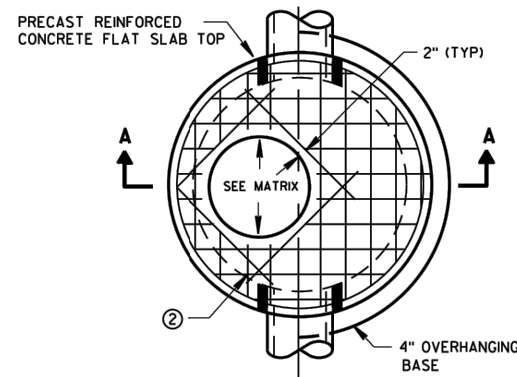
APPROVED

Sept., 2016

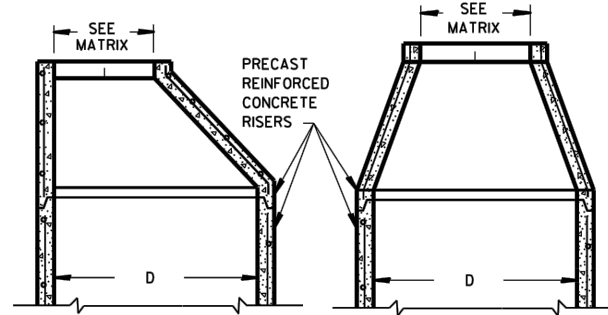
DATE

FHWA

/s/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR

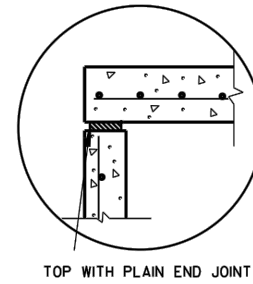


PLAN VIEW CIRCULAR OPENING

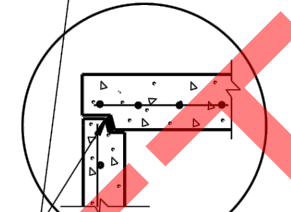


OPTIONAL PRECAST REINFORCED CONCRETE ECCENTRIC TOP

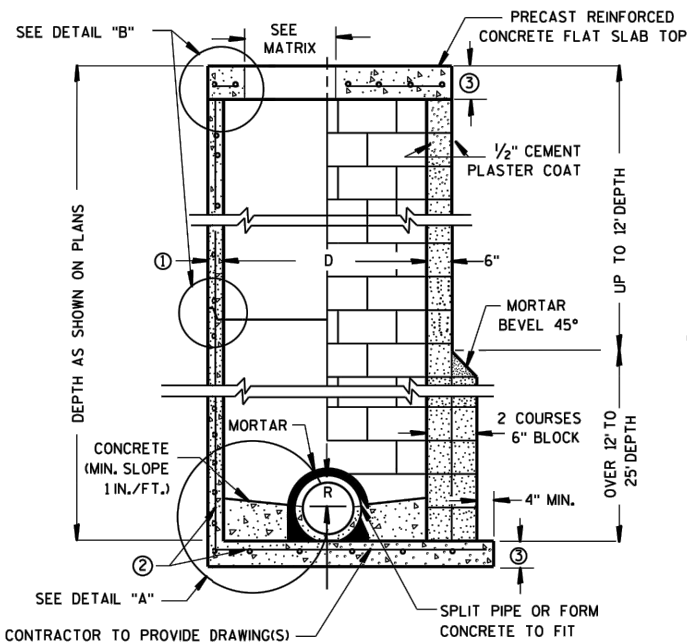
OPTIONAL PRECAST REINFORCED CONCRETE CONCENTRIC TOP



TOP WITH PLAIN END JOINT

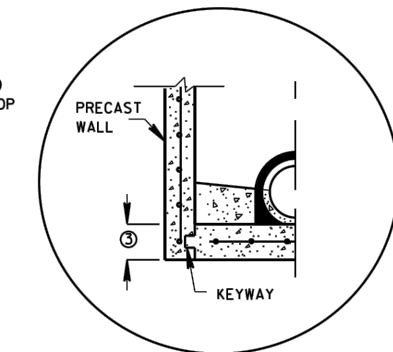


TOP WITH TONGUE AND GROOVE JOINT

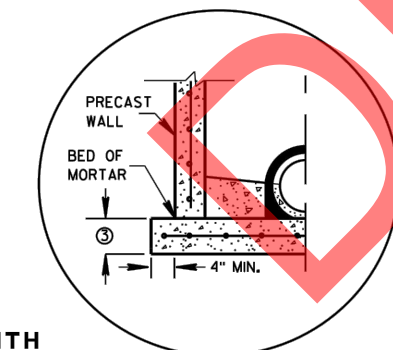


CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES

PRECAST REINFORCED CONCRETE BLOCK WITH CONCRETE WITH MONOLITHIC BASE
CONCRETE WITH CAST-IN-PLACE OR PRECAST REINFORCED CONCRETE BASE ②



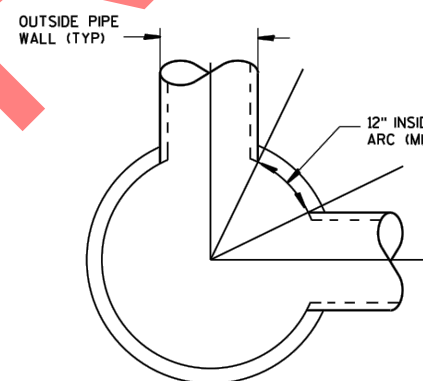
PRECAST REINFORCED CONCRETE WITH INTEGRAL BASE OPTION



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

DETAIL "A"

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



DETAIL "C"

6

6

S.D.D. 8 B 9-2

S.D.D. 8 B 9-2

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

01 MANHOLE DETAIL

13 NOT TO SCALE

NO	DATE	BY	REVISION
6			
5			
4			
3			
2			
1	08/22/2022	DRL	PRELIMINARY PLAN SET



SUBMISSION DATE:
08/22/2022
DESIGN BY DRAWN BY CHECKED BY
DRL ERK
EOR PROJECT NO.
00909-0029

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

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STORMWATER IMPROVEMENTS
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CUMBERLAND, BARRON COUNTY,
WISCONSIN
STATE PROJECT NO. --- CITY PROJECT NO. ---

DETAIL SHEET 3

SHEET 13 OF 18 SHEETS

File Path: 08/22/2022
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SDD 8f1 Apron Endwalls for Culvert Pipe

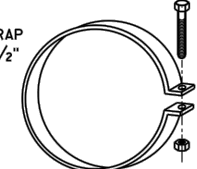
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A	B	H	L	L1	L2	W		
	(±1")	(±1")	(MAX.)	(±1")	(±1 1/2")	(±1 1/2")	(±1 1/2")	(±2")			
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 3/8	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	8	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	11	69	24	75 3/4	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 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

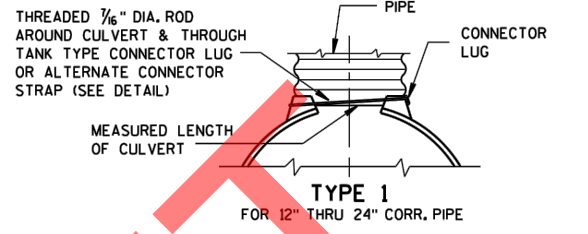
PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
	12	2	4	24	48 1/8	72 1/8	24	
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1
30	3 1/2	12	54	19 3/4	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 3/4 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	108	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

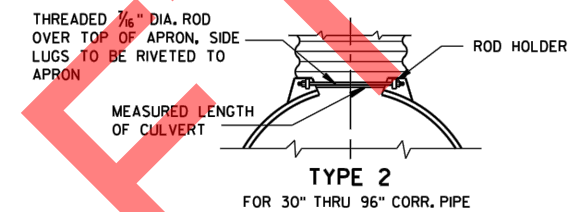
1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



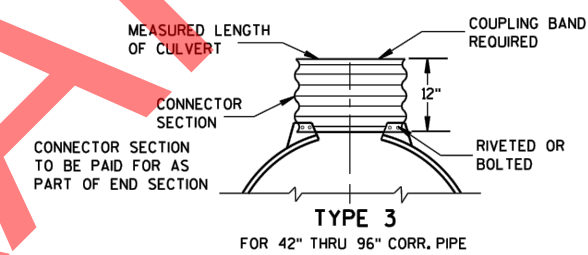
ALTERNATE FOR TYPE 1 CONNECTION
END SECTION CONNECTOR STRAP



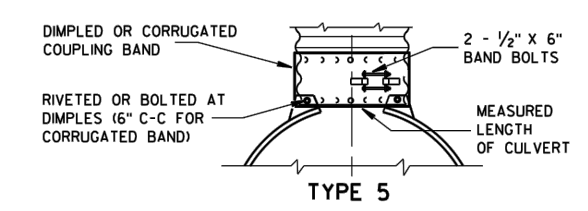
TYPE 1
FOR 12" THRU 24" CORR. PIPE



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

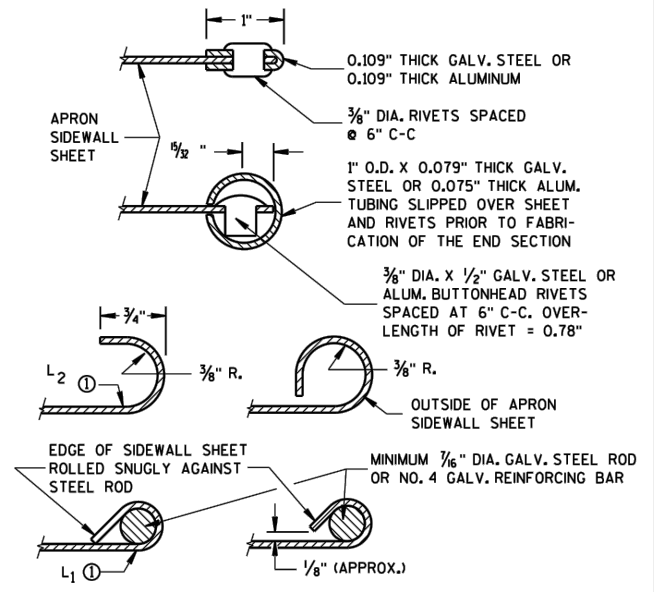
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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

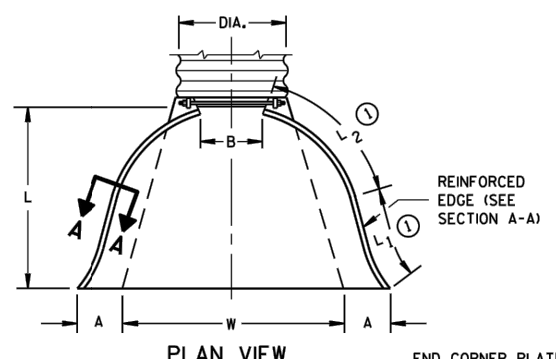
FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

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

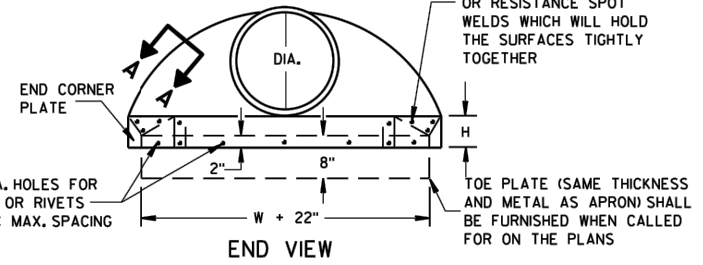
CONNECTION DETAILS



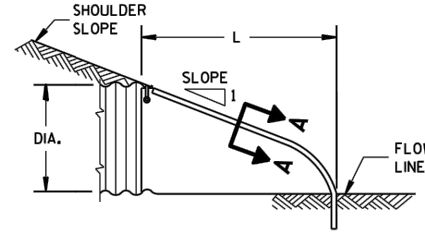
SECTION A-A



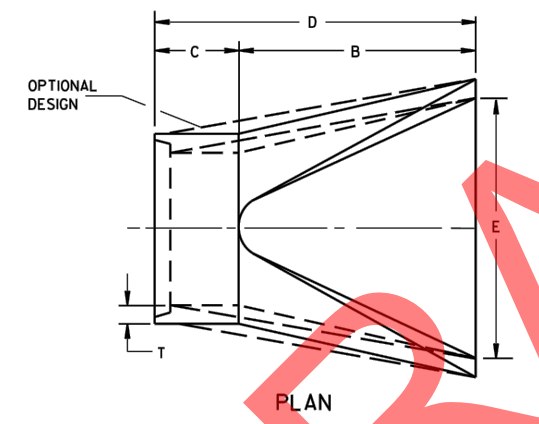
PLAN VIEW



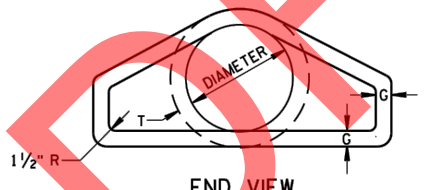
END VIEW



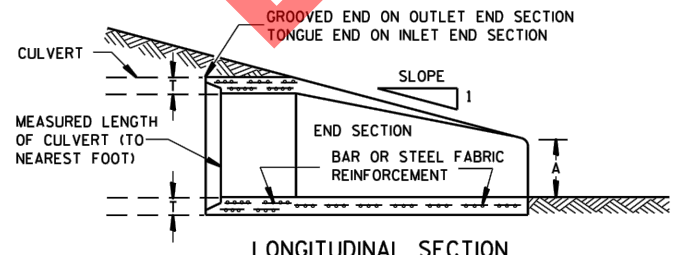
SIDE ELEVATION
METAL ENDWALLS



PLAN



END VIEW



LONGITUDINAL SECTION
CONCRETE ENDWALLS

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	

6

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S.D.D. 8 F 1-11

S.D.D. 8 F 1-11

01 APRON ENDWALLS DETAIL 14 NOT TO SCALE

6			
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2			
1	08/22/2022	DRL	PRELIMINARY PLAN SET
NO	DATE	BY	REVISION



SUBMISSION DATE:
08/22/2022
DESIGN BY DRAWN BY CHECKED BY
DRL ERK
EOR PROJECT NO.
00909-0029

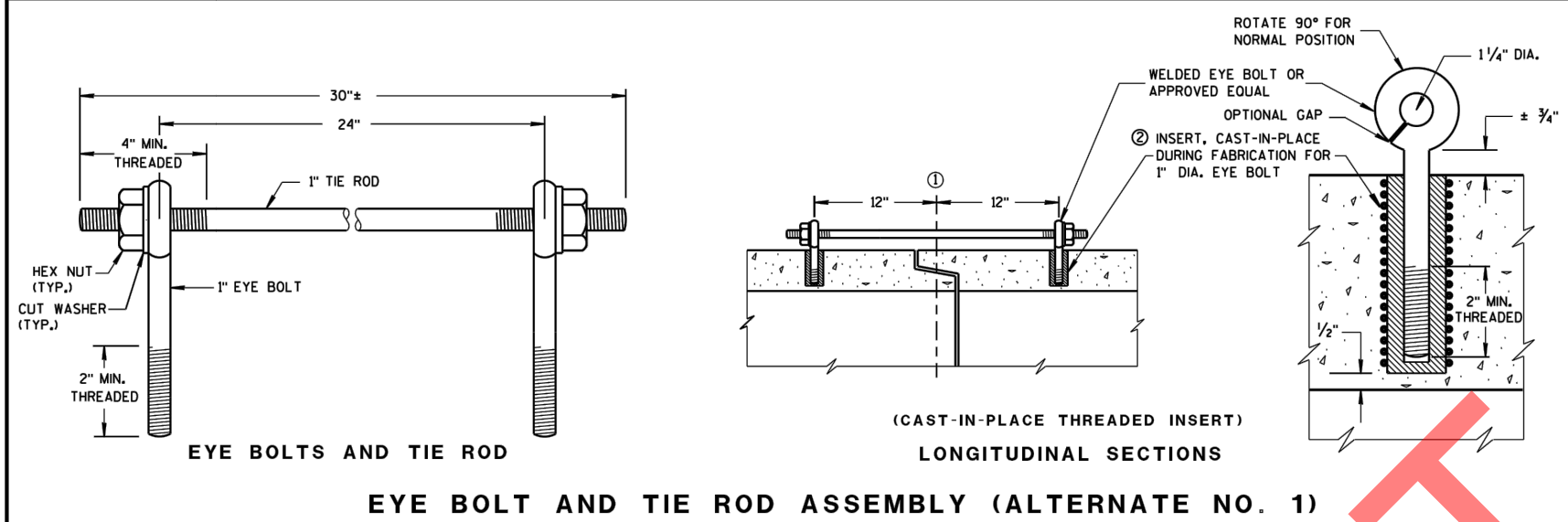
EOR Emmons & Olivier
Resources, Inc.
1919 University Ave W,
Suite 300, St Paul, MN 55104
water ecology community
Tele: 651.770.8448
www.eorinc.com

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CUMBERLAND, WI 54829

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STORMWATER IMPROVEMENTS
PHASE 2
CUMBERLAND, BARRON COUNTY,
WISCONSIN

DETAIL SHEET 4
SHEET 14 OF 18 SHEETS

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



GENERAL NOTES

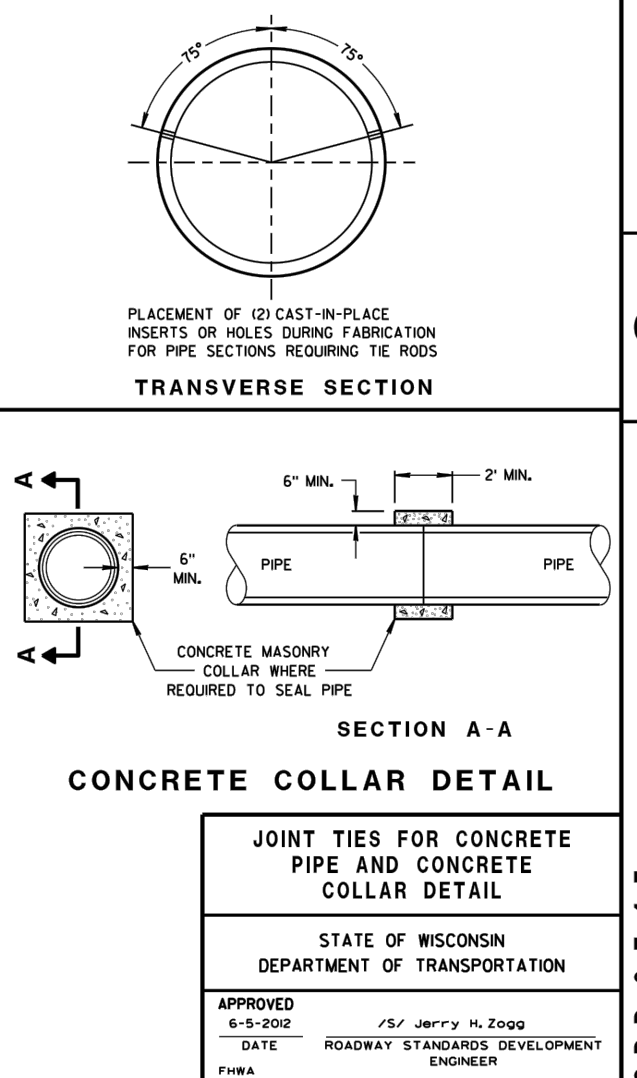
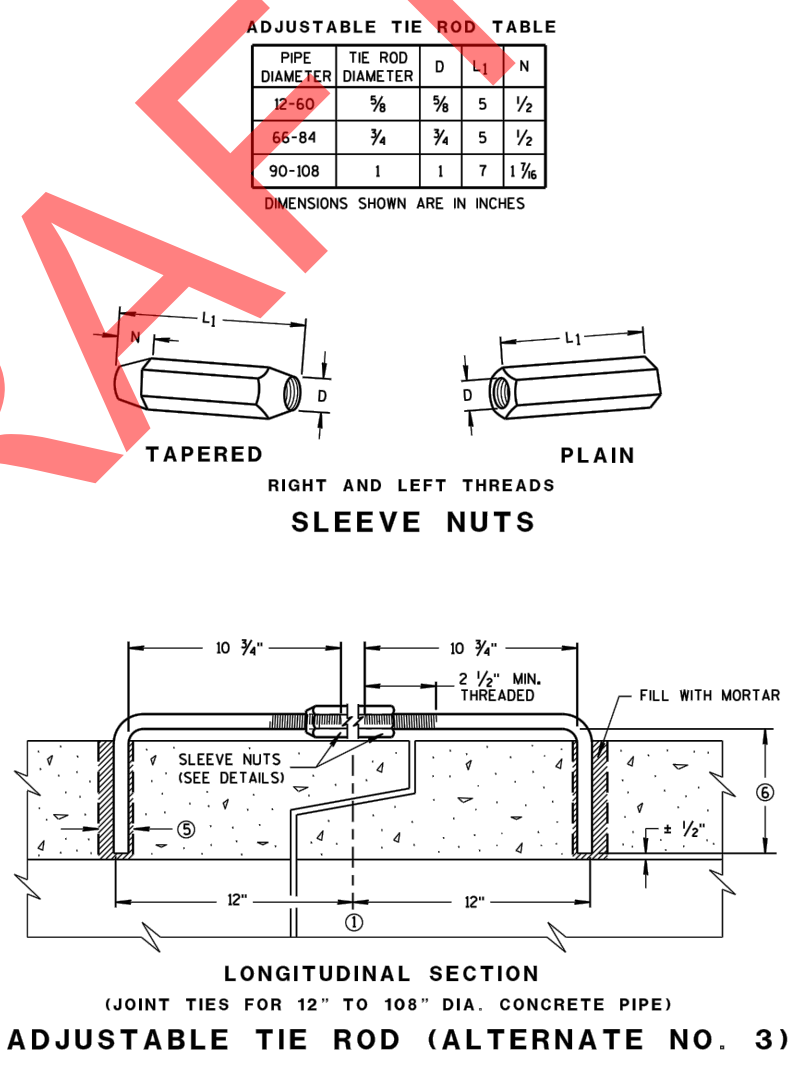
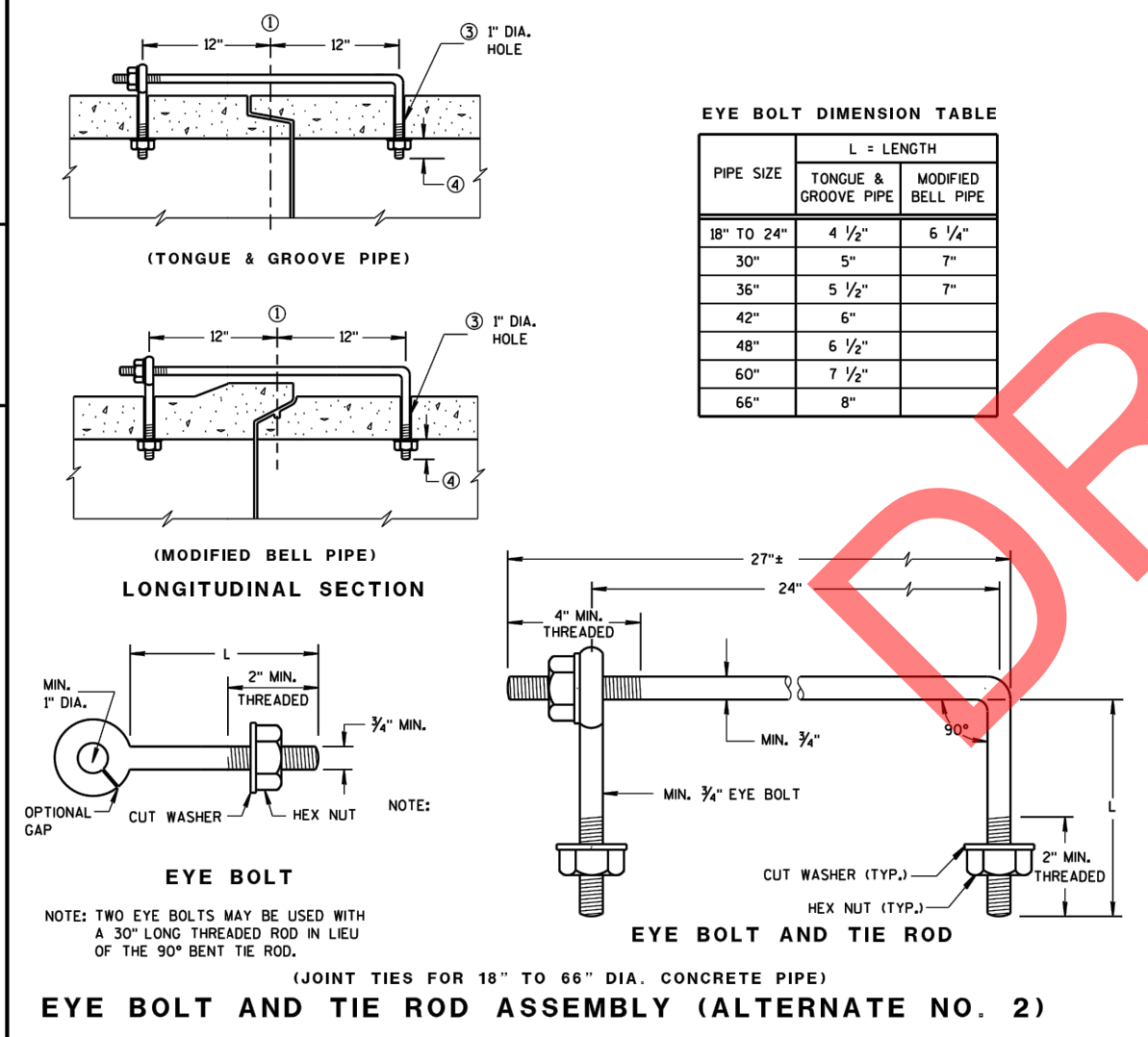
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

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 ϕ 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 ϕ 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.



01 JOINT TIES DETAIL
15 NOT TO SCALE

NO	DATE	BY	REVISION
6			
5			
4			
3			
2			
1	08/22/2022	DRL	PRELIMINARY PLAN SET

811
Know what's below.
Call before you dig.

DIGGERS HOTLINE

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1919 University Ave W,
Suite 300, St Paul, MN 55104
water ecology
community

Tele: 651.770.8448
www.eorinc.com

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DETAIL SHEET 5

SHEET 15 OF 18 SHEETS

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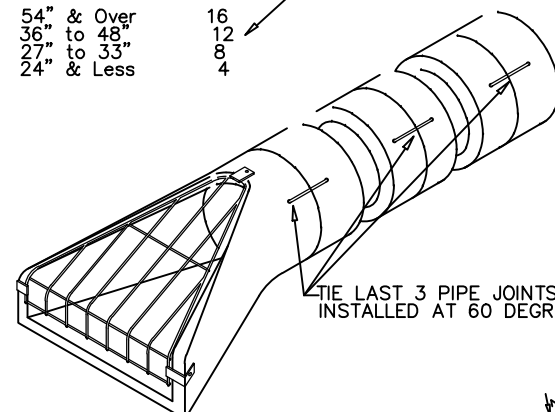
S.D.D. 8 F 4-7

S.D.D. 8 F 4-7

SEE DWGS FOR QTY OF RIPRAP REQUIRED

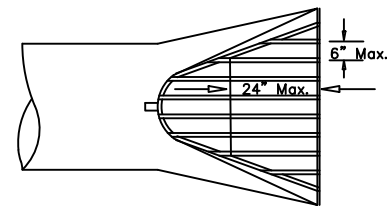
SIZE OF PIPE	CU. YD.
54" & Over	16
36" to 48"	12
27" to 33"	8
24" & Less	4

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



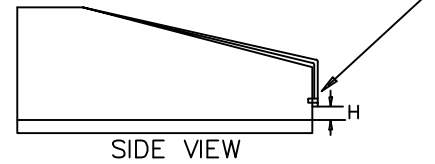
TIE LAST 3 PIPE JOINTS. USE 2 TIE BOLT FASTENERS PER JOINT INSTALLED AT 60 DEGREES FROM TOP OR BOTTOM OF PIPE

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

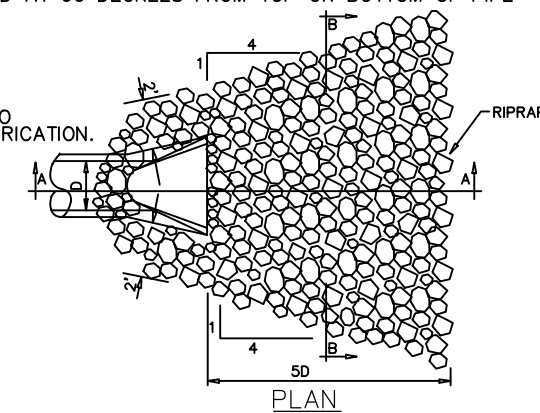
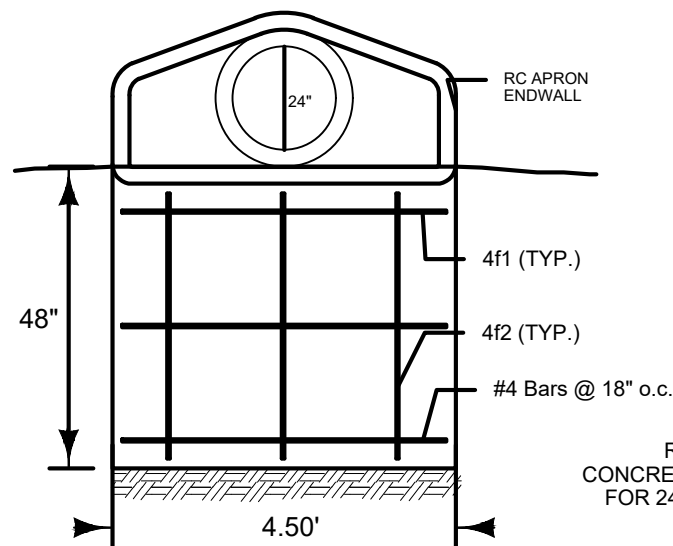


SIZE OF BARS	"H"	BOLTS
15-18"	3/4"	4"
21" to 42"	1"	6"
48" to 72"	1 1/4"	12"

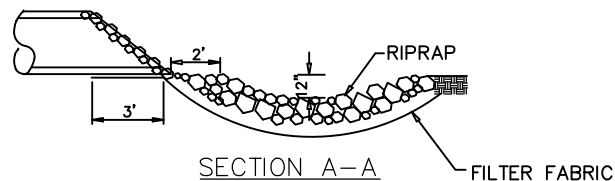
ANCHOR BOTH SIDES



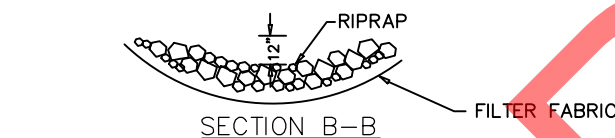
FRONT FACE



PLAN



SECTION A-A



SECTION B-B

TYPICAL SECTION

REINFORCED CONCRETE FOOTING FOR 24" RC APRON ENDWALL

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



NOTES:

1. HAALA INDUSTRIES SLEEPY EYE, MN OR APPROVED EQUAL
2. MODEL NUMBER PS60-72H
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 WITH MONOLITHIC BASE (SEE 01/16)

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

16 NOT TO SCALE

02 5' DIA. POND SKIMMER GRATE

16 NOT TO SCALE

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NO	DATE	BY	REVISION
1	08/22/2022	DRL	PRELIMINARY PLAN SET



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EOR PROJECT NO. 00909-0029

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 Suite 300, St Paul, MN 55104
 water ecology
 community
 Tele: 651.770.8448
 www.eorinc.com

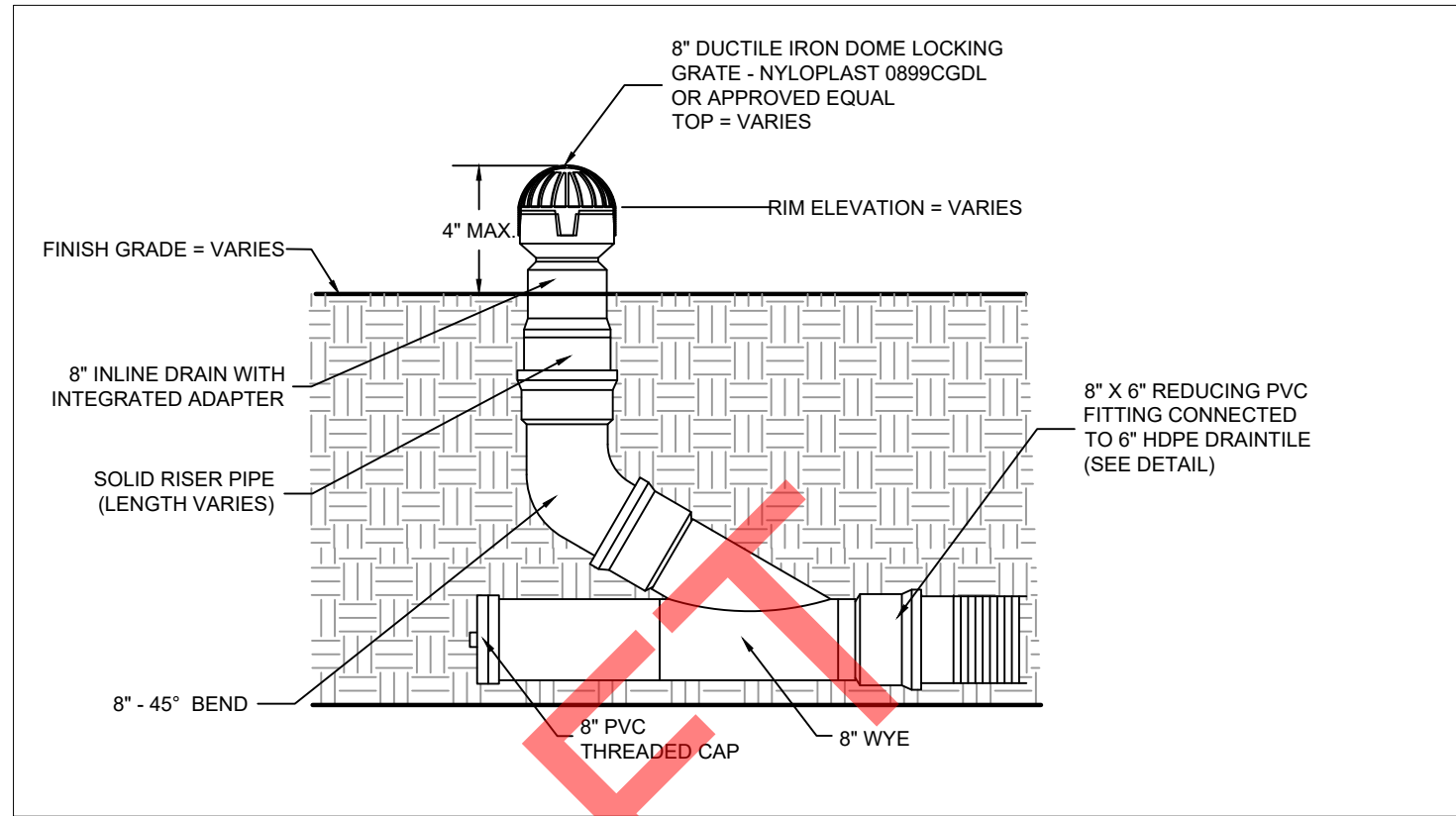
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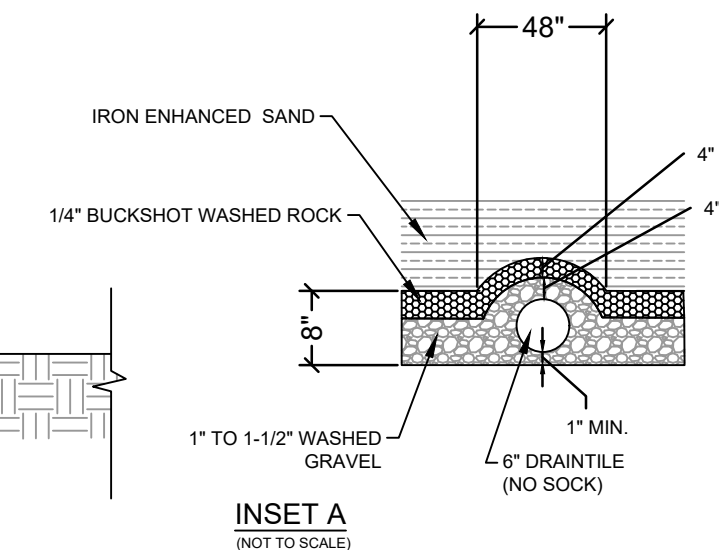
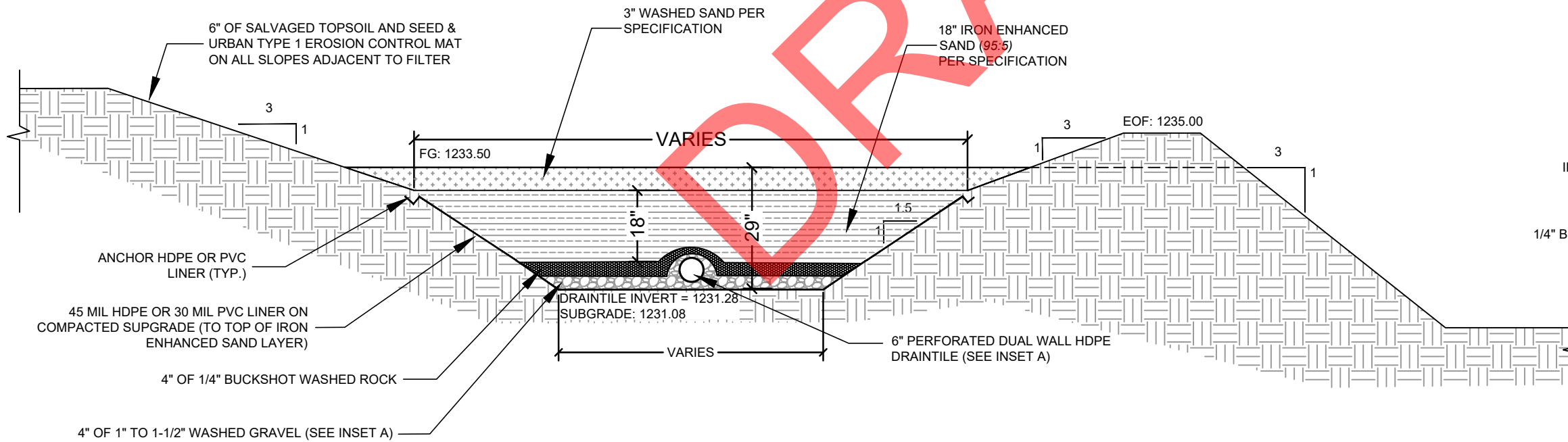
DETAIL SHEET 6
 SHEET 16 OF 18 SHEETS

SEQUENCE OF CONSTRUCTION

1. STABILIZE ALL UP-GRADIENT EXPOSED EARTH WITH SEED, BLANKET, AND SEDIMENT LOG.
2. INSTALL 45 MIL HDPE 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
NOT TO SCALE



02 IRON ENHANCED SAND FILTER
NOT TO SCALE

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1	08/22/2022	DRL	PRELIMINARY PLAN SET



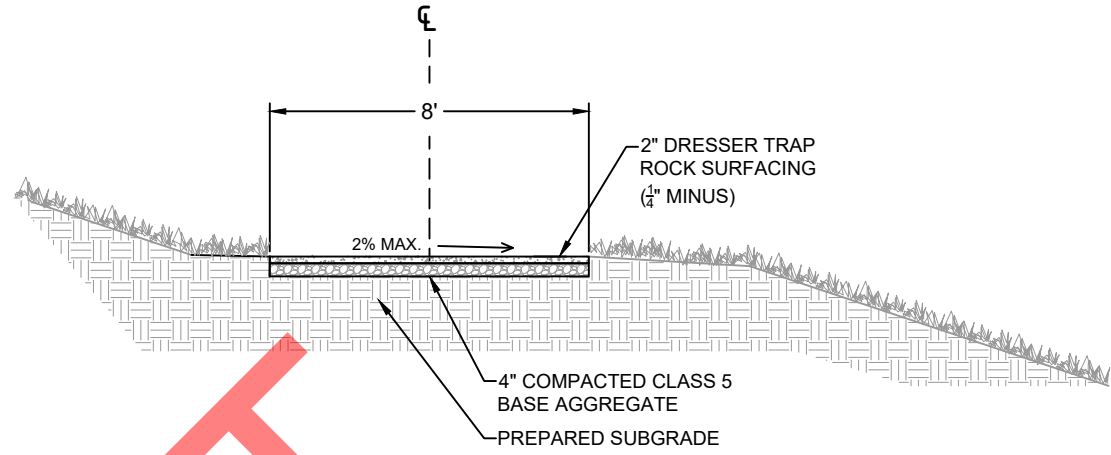
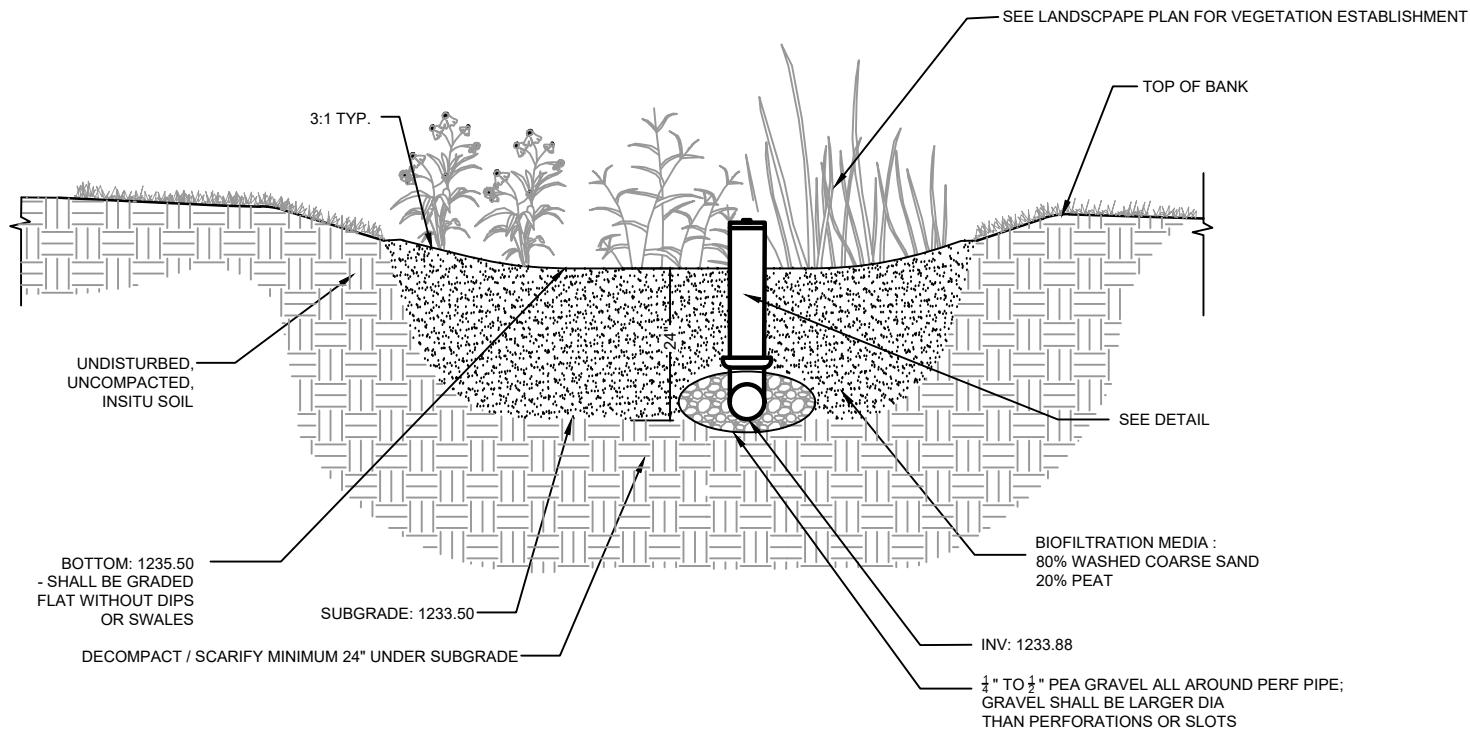
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 DESIGN BY: DRL
 DRAWN BY: ERK
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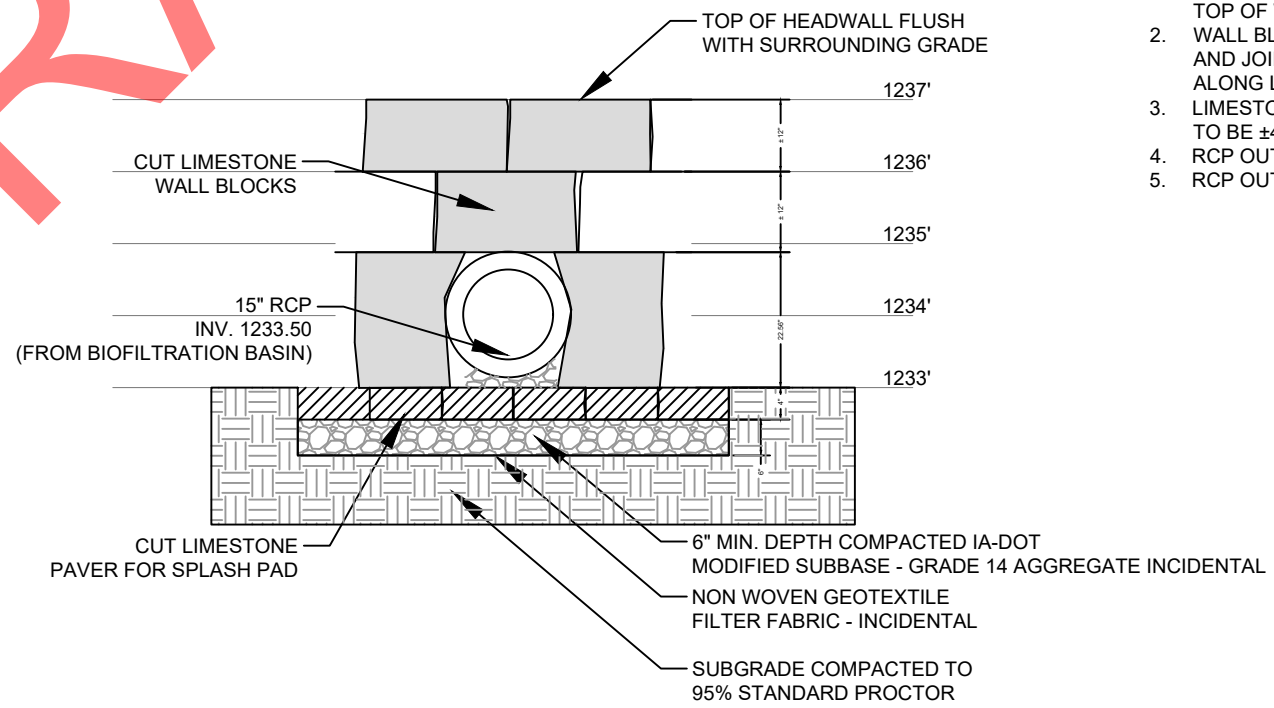
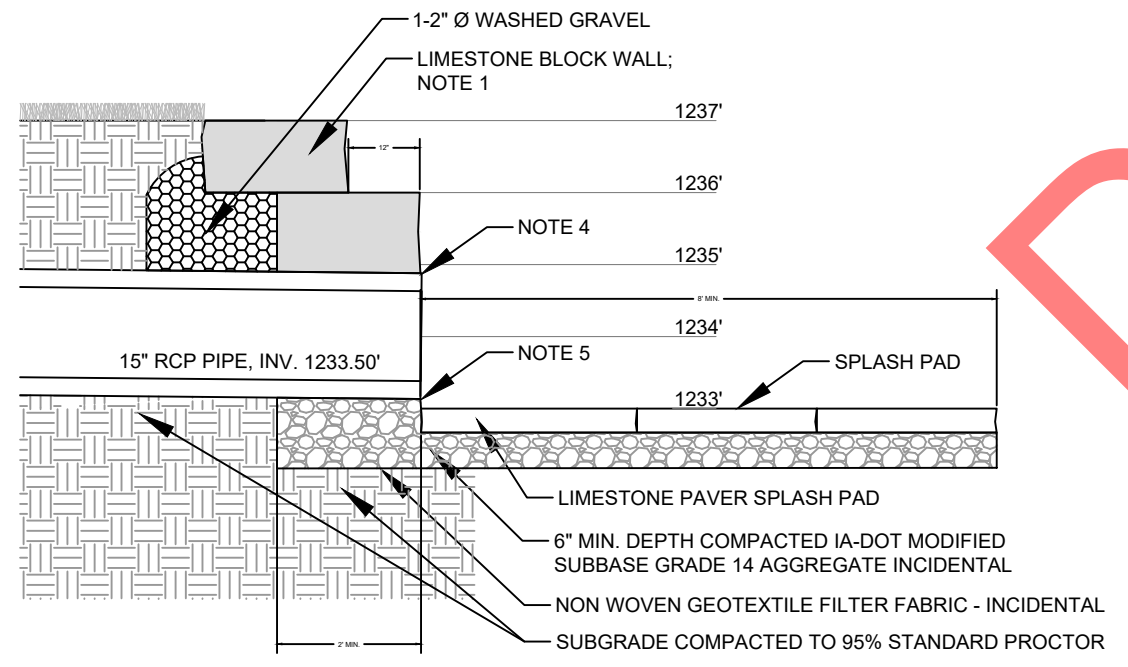
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DETAIL SHEET 7
 SHEET 17 OF 18 SHEETS



01 BIOFILTRATION BASIN
18 NOT TO SCALE

02 TRAIL SECTION
18 NOT TO SCALE



- HEADWALL NOTES:
1. WALL DEPTH SHALL BE UNIFORM. SET TOP OF WALL BACK FROM FACE 12".
 2. WALL BLOCK LENGTHS SHALL BE 18-48" AND JOINTS SHALL BE STAGGERED ALONG LENGTH OF WALL.
 3. LIMESTONE PAVERS FOR SPLASH PAD TO BE 4" x 12" x 30".
 4. RCP OUTSIDE TOP EL. = 1235.00 (±)
 5. RCP OUTSIDE BOTTOM EL. = 1233.25 (±)

03 HEADWALL PROFILE & CROSS-SECTION
18 NOT TO SCALE

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08/22/2022

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DETAIL SHEET 8
SHEET 18 OF 18 SHEETS