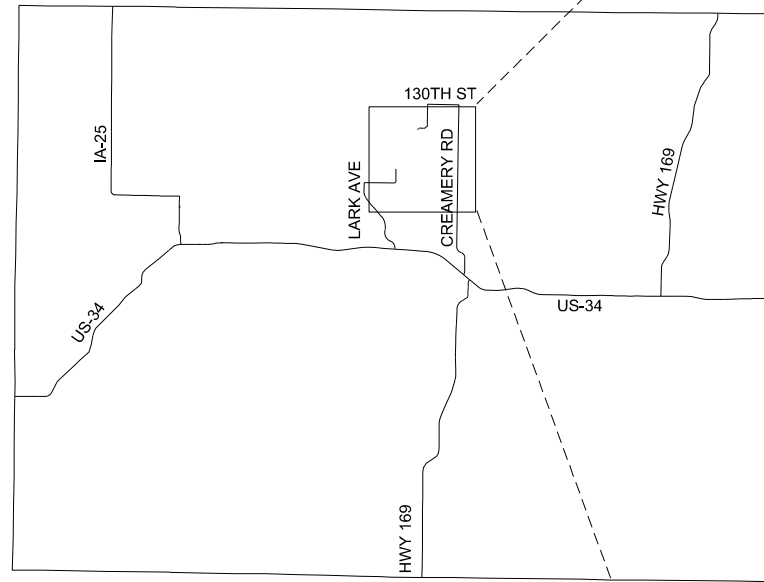


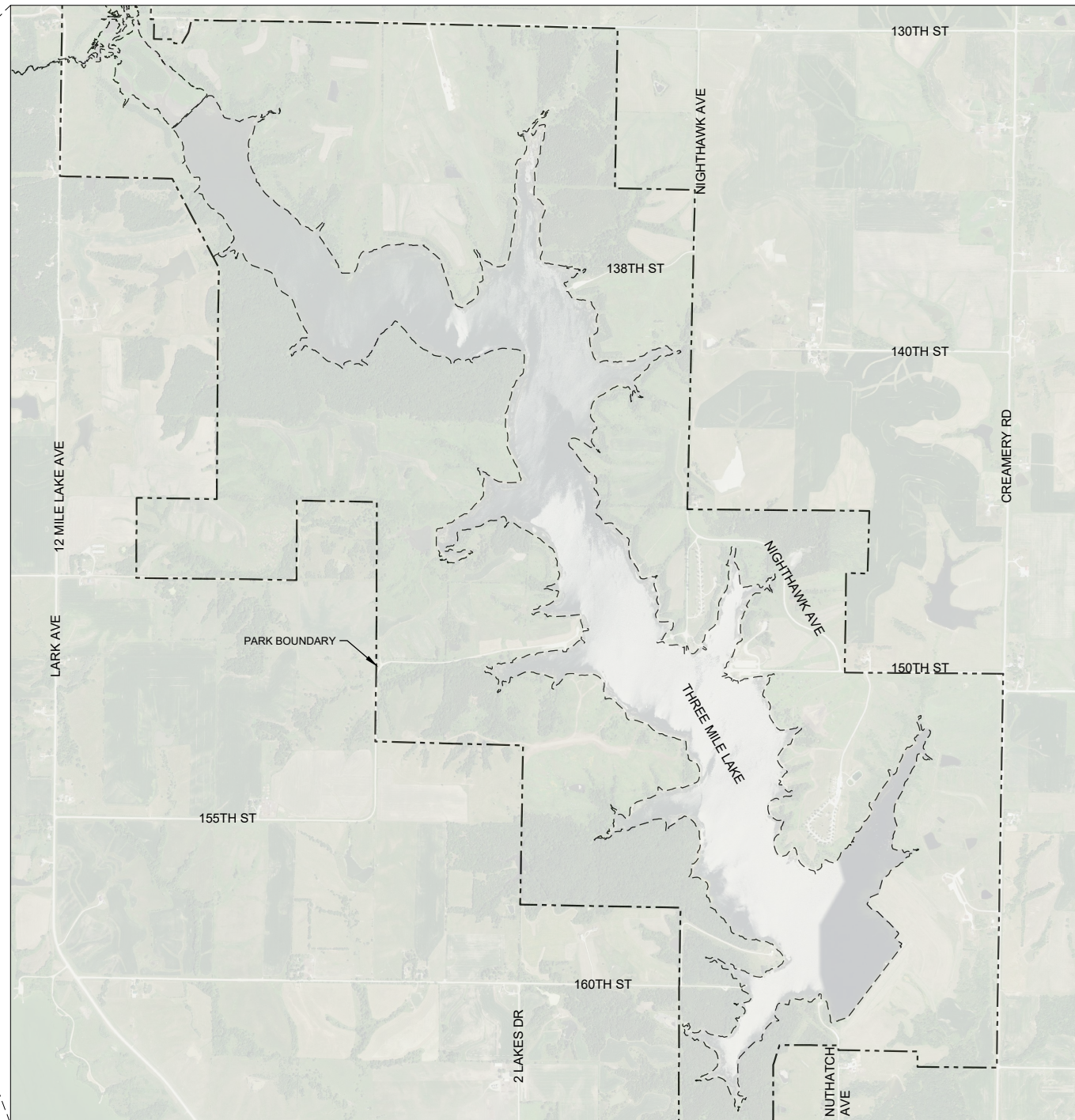
# THREE MILE LAKE RESTORATION PHASE 1



IOWA DEPARTMENT OF  
NATURAL RESOURCES



UNION COUNTY



SITE MAP

## SHEET INDEX

- A.1 COVER SHEET
- A.2 GENERAL NOTES
- A.3 SITE MAP
  
- B.1 BMP 3 SITE PLAN
- B.2 BMP 3 PRINCIPAL SPILLWAY PLAN AND PROFILE
- B.3 BMP 7 SITE PLAN
- B.4 BMP 7 PRINCIPAL SPILLWAY PLAN AND PROFILE
- B.5 BMP 15 SITE PLAN
- B.6 BMP 16 SITE PLAN
- B.7 BMP 15 & 16 SPOILS PLAN
  
- B.100 BMP DETAILS (1 OF 2)
- B.101 BMP DETAILS (2 OF 2)
- B.102 ANTI-VORTEX DETAILS
- B.103 DREDGE DETAILS (1 OF 2)
- B.104 DREDGE DETAILS (2 OF 2)
  
- M.1 SITE B STREAM MITIGATION SHEET KEY
- M.2 SITE B STREAM MITIGATION PLAN AND PROFILE (1 OF 4)
- M.3 SITE B STREAM MITIGATION PLAN AND PROFILE (2 OF 4)
- M.4 SITE B STREAM MITIGATION PLAN AND PROFILE (3 OF 4)
- M.5 SITE B STREAM MITIGATION PLAN AND PROFILE (4 OF 4)
- M.6 SITE B STREAM MITIGATION SPOILS PLAN
  
- M.100 STREAM STABILIZATION DETAILS
- M.101 STREAM MITIGATION DETAILS
  
- S.1 SWPP PLAN
  
- S.100 SWPP DETAILS (1 OF 2)
- S.101 SWPP DETAILS (2 OF 2)

REVISIONS	
NO.	DATE

<b>AUTHORIZATION TO BID</b>	
AUTHORIZATION - PARKS   WILDLIFE   FISHERIES   LAW ENFORCEMENT   FORESTRY DATE	
ENGINEERING BUREAU CHIEF	DATE

THREE MILE LAKE RESTORATION PHASE 1  
 IOWA DEPARTMENT OF NATURAL RESOURCES  
 UNION COUNTY, IOWA  
 2021

ENGINEER'S SEAL

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 IOWA.

Michael K. Sotak      DATE: 9 Aug 2021  
 MICHAEL K. SOTAK      DATE  
 LICENSE NO: 16681  
 MY LICENSE RENEWAL DATE IS: 31 DEC 2022  
 PAGES OR SHEETS COVERED BY THIS SEAL:  
ALL SHEETS

DESIGNED BY: SEM  
 DRAWN BY: CKW  
 QA / QC BY: MKS  
 PROJECT NO.: 007-20-01  
 DATE: 08.10.2021

TITLE  
**COVER SHEET**

**GENERAL NOTES:**

- THE LOCATIONS OF ALL AERIAL AND UNDERGROUND UTILITY FACILITIES ARE APPROXIMATE OR MAY NOT BE INDICATED IN THESE PLANS. UNDERGROUND FACILITIES, WHETHER INDICATED OR NOT, SHALL BE LOCATED AND FLAGGED BY THE CONTRACTOR AND UTILITY COMPANIES 48 HOURS BEFORE WORK IS STARTED. VERIFY UTILITY LOCATIONS BY CONTACTING THE IOWA ONE CALL (ONLINE AT WWW.IOWONECALL.COM AND/OR CALL 811). THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY AND COORDINATE ALL NECESSARY UTILITY SERVICE INTERRUPTIONS WITH THE OWNERS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, PAVEMENT, STRUCTURES, FENCES, POLES, SIGNS, TREES, IRRIGATION LINES, SPRINKLER HEADS, SUB- DRAINS AND OTHER IMPROVEMENTS NOT DESIGNATED FOR REMOVAL. ANY DAMAGE CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- CONTOURS SHOWN ON THE PLANS ARE 2 FT CONTOURS FROM LIDAR & 2 FT CONTOUR BATHYMETRY FROM IDNR. ELEVATIONS CALLED OUT ON THE PLANS ARE REFERENCED TO NAVD 88 VERTICAL DATUM. HORIZONTAL CONTROL IS NAD83 IOWA STATE PLANE NORTH.
- THE CONTRACTOR SHALL CONDUCT ALL OPERATIONS AND MAINTAIN CONSTRUCTION WORK AREA IN A SAFE MANNER IN ACCORDANCE WITH OSHA COMPLIANCE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL TEMPORARY MARKERS, LIGHTS, SIGNS, FLAGMEN, BARRICADES AND OTHER PROTECTIVE DEVICES TO PROVIDE ADEQUATE TRAFFIC CONTROL. THIS SHALL INCLUDE ANY BARRICADES OR SIGNS NECESSARY FOR PEDESTRIAN TRAIL CLOSURE.
- ELECTRONIC GRADING FILES AND EXISTING UTILITIES AND WETLANDS CAN BE PROVIDED BY ENGINEER UPON REQUEST.
- CONTRACTOR IS RESPONSIBLE FOR REPAIRING DAMAGE TO ROADS USED AS HAUL ROUTES. CONDITIONS PRIOR TO CONSTRUCTION TO BE DOCUMENTED BY THE CONTRACTOR AND MUST BE RESTORED TO ORIGINAL CONDITIONS OR BETTER BY SMOOTHING COMPACTED SOILS PRIOR TO FINISHED GRADING AND SEEDING WITH SPECIFIED MIX OR COVER CROP IN DISTURBED AREAS WITHOUT A SEEDING MIX CALLED OUT.
- ACCESS ROUTES IDENTIFIED TO EACH SITE MUST BE STRICTLY ABIDED TO. CONTRACTOR MAY PROPOSE ALTERNATE ROUTES FOR APPROVAL BY FIELD ENGINEER PRIOR TO MOBILIZATION.
- THE QUANTITIES SHOWN FOR SEEDING INCLUDE ALL NON-PAVED AREAS WITHIN THE LIMITS OF CONSTRUCTION AND DOES NOT ACCOUNT FOR ANY AREA THAT IS DISTURBED OUTSIDE THE LIMITS OF CONSTRUCTION. DISTURBED AREAS OUTSIDE THE LIMITS OF CONSTRUCTION MUST BE RESTORED, SEEDED, AND MULCHED AND WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.
- ALL SEEDED AREAS MUST BE HYDROMULCHED.
- BORROW MATERIAL TO BE OBTAINED FROM EACH POND AS DESCRIBED ON PLAN SHEETS. COORDINATE WITH FIELD ENGINEER TO DETERMINE SUITABLE FILL MATERIAL. IF SUITABLE MATERIAL CANNOT BE OBTAINED ON SITE AS DESCRIBED, CONTRACTOR TO COORDINATE WITH FIELD ENGINEER.
- CLEARING AND GRUBBING TO BE PERFORMED ONLY IN LOCATIONS NECESSARY TO CONSTRUCT/BORROW AND ACCESS THE SITE. CONTRACTOR SHALL LIMIT CONSTRUCTION OPERATIONS TO MINIMIZE CLEARING AND GRUBBING EXTENTS.
- TREES/SHRUBS AND ANY UNUSABLE FILL MATERIAL EXCAVATED, TO OBTAIN BORROW, TO BE SPOILED ON SITE IN EXISTING TREATED AREA OUTSIDE OF PROPOSED AREAS OF CONSTRUCTION OR PERMANENT POOL, UNLESS DIRECTED OTHERWISE ON PLAN SHEETS.
- PROTECT BY WHATEVER MEANS REQUIRED ALL FENCES, SIGNS, STRUCTURES, DRIVES, SIDEWALKS, STREETS, BUSHES, TREES, ETC. SHOWN TO REMAIN OUTSIDE OR INSIDE THE LIMITS OF CONSTRUCTION.
- THE OWNER SHALL RESERVE THE RIGHT TO SALVAGE ANY MATERIALS.
- REPAIR OR REPLACE ITEMS THAT ARE DAMAGED AS A RESULT OF DEMOLITION OR CONSTRUCTION TO MATCH OR IMPROVE EXISTING CONDITIONS.
- CONTRACTOR TO ATTEND THE PRE-CONSTRUCTION CONFERENCE WITH OWNER, ENGINEER, AND OTHER PROJECT STAKEHOLDERS.
- RAMPS AND HAUL ROUTES THAT THE CONTRACTOR CONSTRUCTS FOR HAULING MATERIAL AND TRANSPORTING EQUIPMENT SHALL BE CONSIDERED INCIDENTAL TO MOBILIZATION.

**PERMITTING NOTES**

- NO TREE CLEARING PERMITTED BETWEEN APRIL 1 AND SEPTEMBER 30.
- CONTRACTOR MUST DEVELOP ALL DOCUMENTATION REQUIRED TO APPLY FOR AND OBTAIN THE NPDES PERMIT GRANTED BY IOWA DEPARTMENT OF NATURAL RESOURCES. CONTRACTOR MUST ADHERE TO THE REQUIREMENTS OF THE NPDES PERMIT AND SWPPP (SHEET S.1). CONTRACTOR TO IMPLEMENT COVER CROP ON ALL DISTURBED AREAS IMMEDIATELY UPON COMPLETION OF GRADING OPERATIONS AT SITE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
- CONTRACTOR MUST ADHERE TO THE REQUIREMENTS OF THE 404 PERMIT GRANTED BY THE UNITED STATES ARMY CORPS OF ENGINEERS FOR THIS PROJECT. A COPY OF THE REQUIREMENTS WILL BE PROVIDED TO THE SELECTED CONTRACTOR, OR UPON REQUEST.
- DELINEATED WETLANDS ARE SHOWN ON THE PLANS. CONTRACTOR SHALL LIMIT ALL CONSTRUCTION ACTIVITIES FROM ENCRACING UPON WETLAND AREAS, EXCEPT LOCATIONS SPECIFICALLY DESIGNATED IN THE CONSTRUCTION DRAWINGS. WETLAND AREAS THAT ARE TEMPORARILY DISTURBED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED AND RESEEDED WITH THE WETLAND SEEDING MIX AS DETAILED IN THE PROJECT SPECIFICATIONS.
- AVOID WETLANDS UNLESS INDICATED ON SHEETS.

**QUANTITIES**

**GENERAL**

ITEM	UNITS	QUANTITY
MOBILIZATION	LS	1
CLEARING AND GRUBBING	LS	1
WATER HANDLING	LS	1
EROSION CONTROL (SWPPP)	LS	1
SURVEYING & STAKING	LS	1
SEEDING - COVER CROP	AC	8.9

**BMP 3**

ITEM	UNITS	QUANTITY
STRIP, STOCKPILE AND REPLACE 9" TOPSOIL	CY	1421
EARTH EMBANKMENT	CY	4305
24" SMP	LF	109
CLASS "E" ROCK RIPRAP	TN	17
SEEPAGE FILTER SAND FOR DIAPHRAGM FILTER	CY	22
8" PVC SEEPAGE DRAIN SOLID WALL PIPE	LF	60
8" PVC SEEPAGE DRAIN PERFORATED PIPE	LF	8
SEEDING - GRASS SEED MIX	AC	1.2
TIMBER POLE	EA	4

**BMP 7**

ITEM	UNITS	QUANTITY
STRIP, STOCKPILE AND REPLACE 9" TOPSOIL	CY	1509
EARTH EMBANKMENT	CY	5443
24" SMP PIPE	LF	127
36" DIA VERTICAL RISER	EA	1
ANTI-VORTEX DEVICE	EA	1
CLASS "E" ROCK RIPRAP	TN	16
SEEPAGE FILTER SAND FOR DIAPHRAGM FILTER	CY	22
8" PVC SEEPAGE DRAIN SOLID WALL PIPE	LF	62
8" PVC SEEPAGE DRAIN PERFORATED PIPE	LF	8
SEEDING - GRASS SEED MIX	AC	1.3
TIMBER POLE	EA	4

**LEGEND**

	EXISTING CONTOUR MINOR
	EXISTING CONTOUR MAJOR
	PARK BOUNDARY LINE
	GAS UTILITY LINE
	LIQUEFIED PETROLEUM UTILITY LINE
	OVERHEAD POWER UTILITY LINE
	FIBER OPTIC UTILITY LINE
	PARK TRAIL
	EXCAVATION EXTENTS
	SILT FENCE
	PARK FENCE
	LIMITS OF CONSTRUCTION
	ROCK RIPRAP
	EXISTING WETLANDS
	SLOPE LINE
	SAND
	GRAVEL
	EXCAVATION
	EARTH FILL
	STOCK PILE

**BMP 15**

ITEM	UNITS	QUANTITY
DREDGE (LOCAL SPOIL)	CY	849
CATTLE FENCE	LF	96
CATTLE PANEL	EA	2
CLASS "E" ROCK RIPRAP	TN	66

**BMP 16**

ITEM	UNITS	QUANTITY
DREDGE (LOCAL SPOIL)	CY	3020
CATTLE FENCE	LF	126
CATTLE PANEL	EA	2
CLASS "E" ROCK RIPRAP	TN	61

**BMP 15 & 16 SPOILS**

ITEM	UNITS	QUANTITY
EARTH EMBANKMENT	CY	2893
12" SOLID WALL PVC & APPURTENANCES	LF	81
12" PERFORATED PVC RISER W/ SOCK	EA	1
CLASS "E" ROCK RIPRAP	TN	2
SEEDING - COVER CROP	AC	2.2

**SITE B STREAM MITIGATION**

ITEM	UNITS	QUANTITY
EXCAVATION (LOCAL SPOIL)	CY	911
TRENCH AND BACKFILL	CY	9
PLACE 9" TOPSOIL	CY	732
CLASS "E" ROCK RIPRAP	TN	494
CLASS "B" ROCK RIPRAP	TN	50
18"-24" DIA HARDWOOD LOGS	EA	2
LIVE STAKES	EA	95
SEEDING - FLOODPLAIN SEED MIX	AC	2.2
SEEDING - COVER CROP	AC	8.9

**ABBREVIATIONS**

AC	- ACRES
CL	- CENTERLINE
CY	- CUBIC YARD
EL	- ELEVATION
FT	- FEET
MAX	- MAXIMUM
MIN	- MINIMUM
SY	- SQUARE YARD
SWPPP	- STORM WATER POLLUTION PREVENTION PLAN
TYP	- TYPICAL
EA	- EACH
TN	- TON
LS	- LUMP SUM
DIA	- DIAMETER
FES	- FLARED END SECTION
MFG	- MANUFACTURER
SMP	- SMOOTH METAL PIPE
RB	- RIGHT BANK
LB	- LEFT BANK
FBG	- FLOODPLAIN BANK GRADING
SBS	- STREAM BANK STABILIZATION

**CONTROL POINTS**

ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

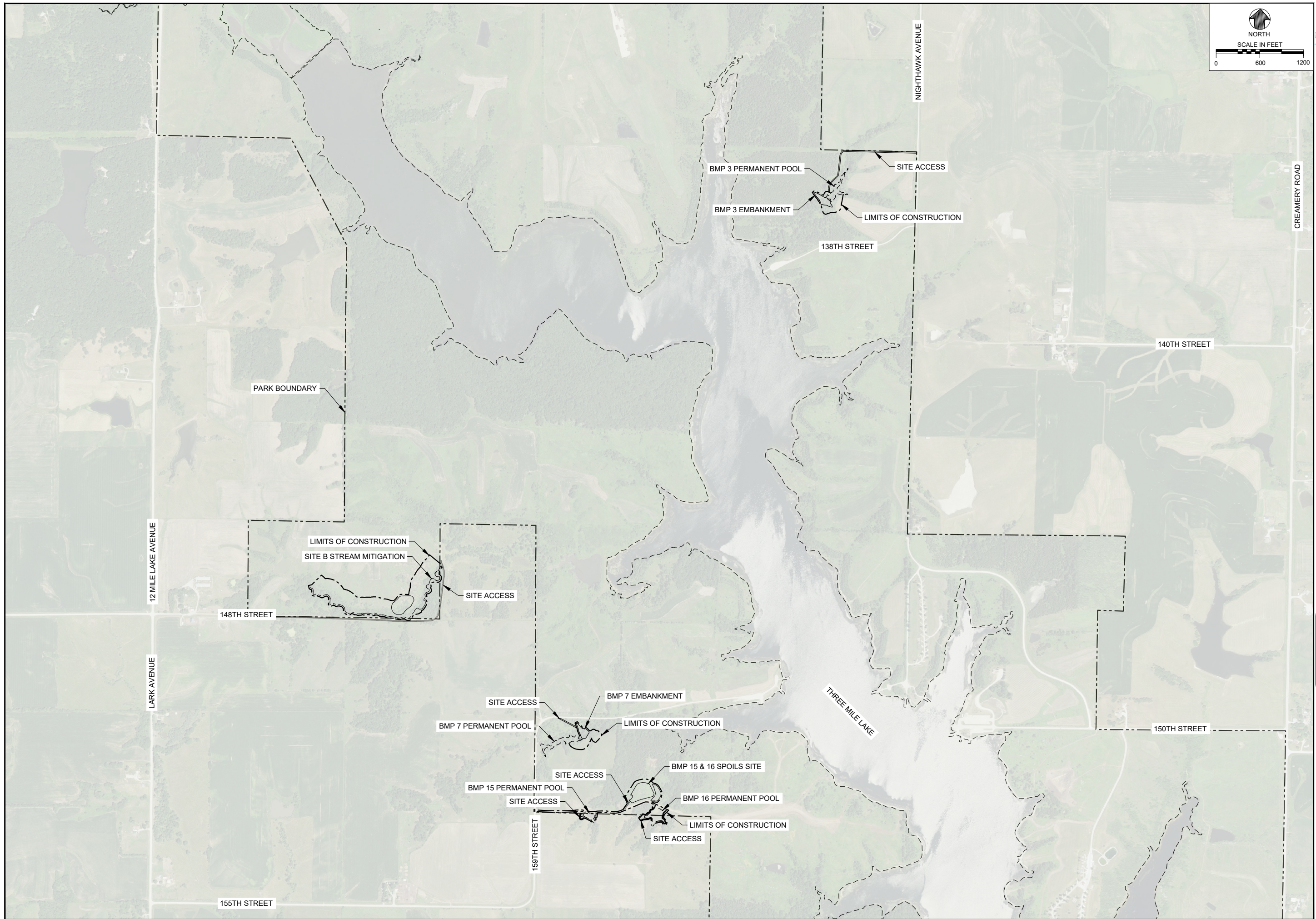
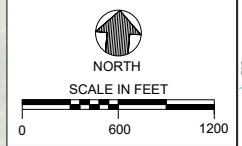
TITLE  
**GENERAL NOTES**

SHEET  
**A.2**

**CONTACT INFORMATION**

IOWA DEPARTMENT OF NATURAL RESOURCES  
MS. MICHELLE BALMER  
515.238.2458  
MICHELLE.BALMER@DNR.IOWA.GOV  
5002 EAST 9TH STREET  
DES MOINES, IA 50309  
  
FYRA ENGINEERING  
MR. MICHAEL SOTAK, PE, D. WRE  
402.502.7131  
MSOTAK@FYRAENGINEERING.COM  
12702 WESTPORT PARKWAY, SUITE 300  
OMAHA, NEBRASKA 68138  
  
MR. CHARLES IKENBERRY, PE  
515.444.5394  
CIKENBERRY@FYRAENGINEERING.COM  
100 COURT AVE., SUITE 202  
DES MOINES, IOWA 50309





THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

ENGINEER'S SEAL

REVISIONS	
NO.	DATE

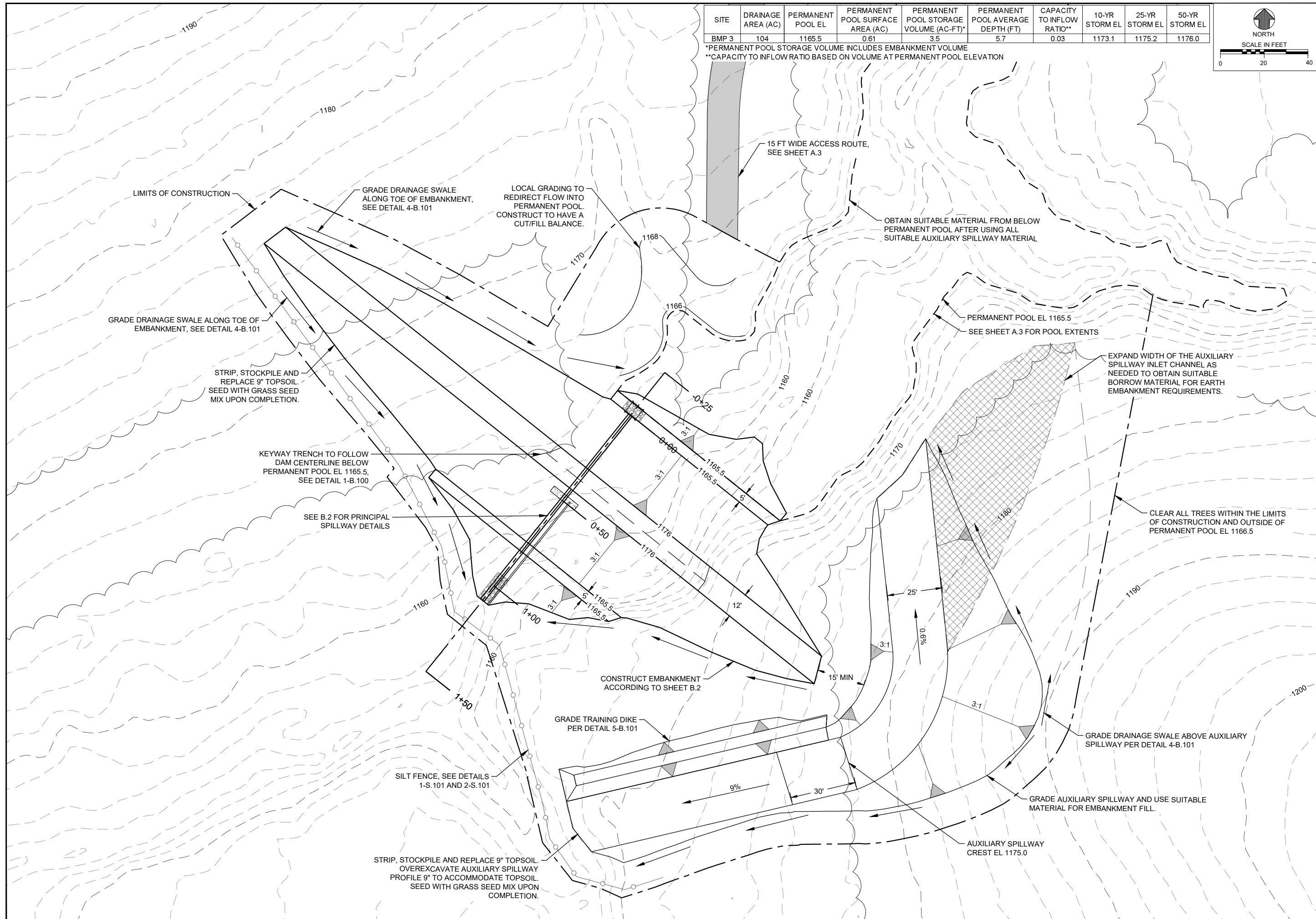
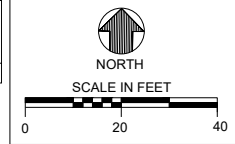
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**SITE MAP**



SITE	DRAINAGE AREA (AC)	PERMANENT POOL EL	PERMANENT POOL SURFACE AREA (AC)	PERMANENT POOL STORAGE VOLUME (AC-FT)*	PERMANENT POOL AVERAGE DEPTH (FT)	CAPACITY TO INFLOW RATIO**	10-YR STORM EL	25-YR STORM EL	50-YR STORM EL
BMP 3	104	1165.5	0.61	3.5	5.7	0.03	1173.1	1175.2	1176.0

\*PERMANENT POOL STORAGE VOLUME INCLUDES EMBANKMENT VOLUME  
 \*\*CAPACITY TO INFLOW RATIO BASED ON VOLUME AT PERMANENT POOL ELEVATION



THREE MILE LAKE RESTORATION PHASE 1  
 IOWA DEPARTMENT OF NATURAL RESOURCES  
 UNION COUNTY, IOWA  
 2021

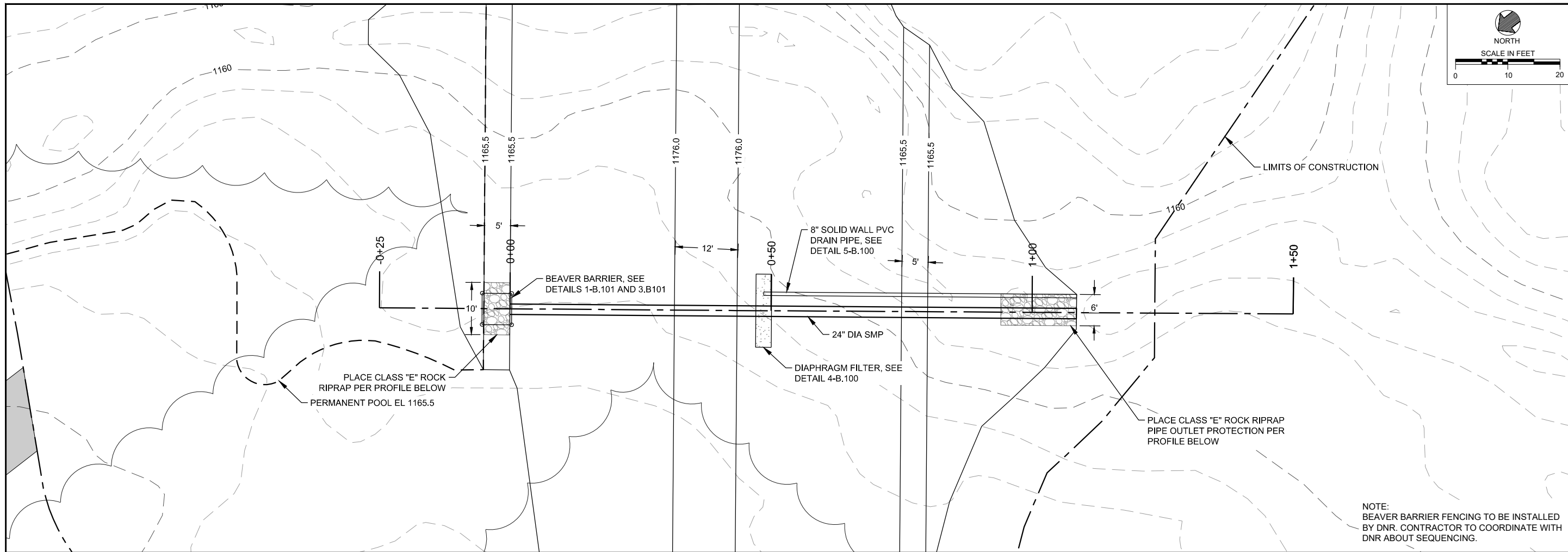
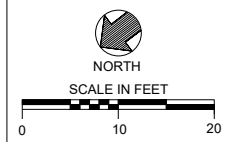
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
 DRAWN BY: CKW  
 QA / QC BY: MKS  
 PROJECT NO.: 007-20-01  
 DATE: 08.10.2021

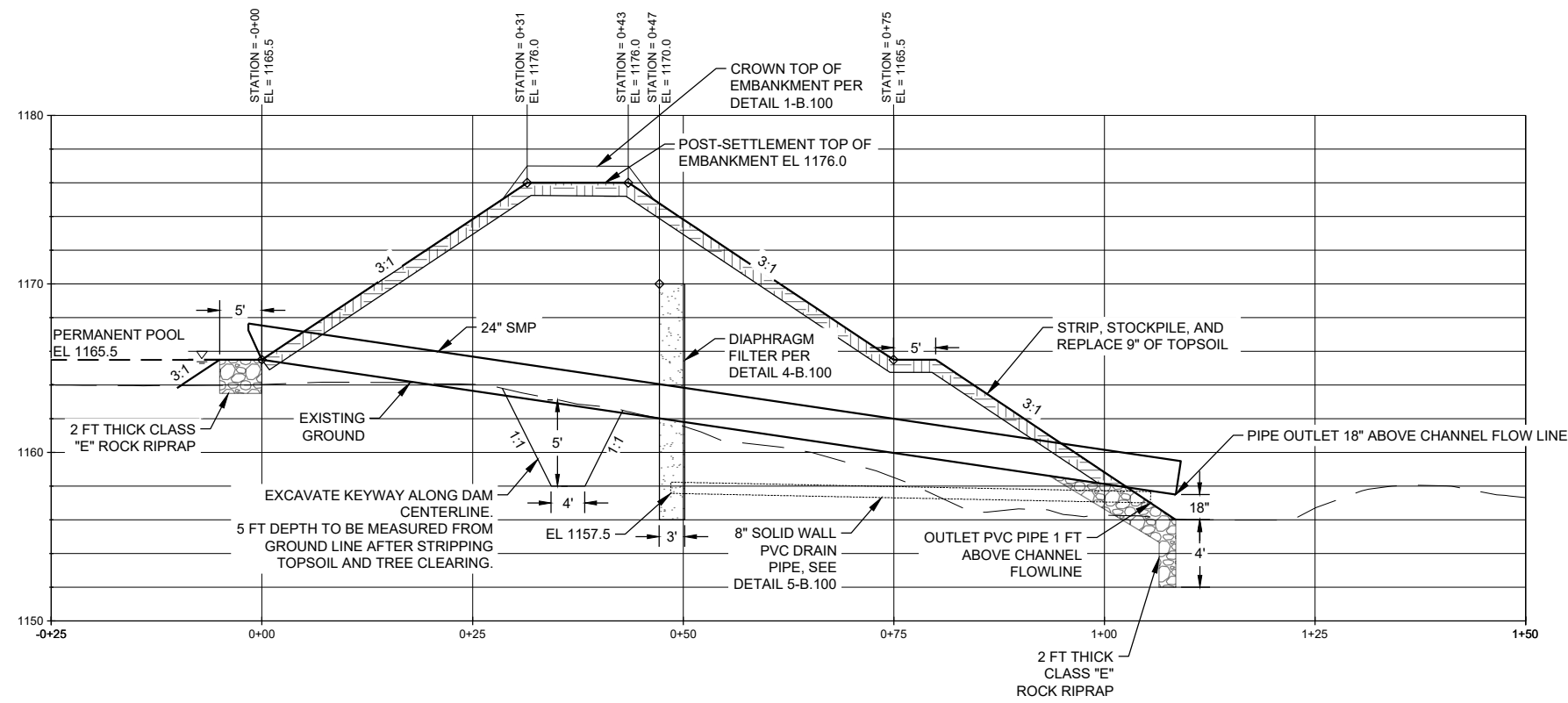
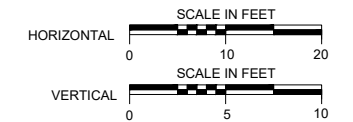
TITLE  
**BMP 3 SITE PLAN**





PLAN VIEW

NOTE: BEAVER BARRIER FENCING TO BE INSTALLED BY DNR. CONTRACTOR TO COORDINATE WITH DNR ABOUT SEQUENCING.



PROFILE VIEW

ENGINEER'S SEAL

REVISIONS	
NO.	DATE

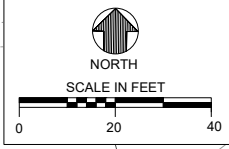
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**BMP 3  
PRINCIPAL  
SPILLWAY  
PLAN AND  
PROFILE**

SHEET  
**B.2**

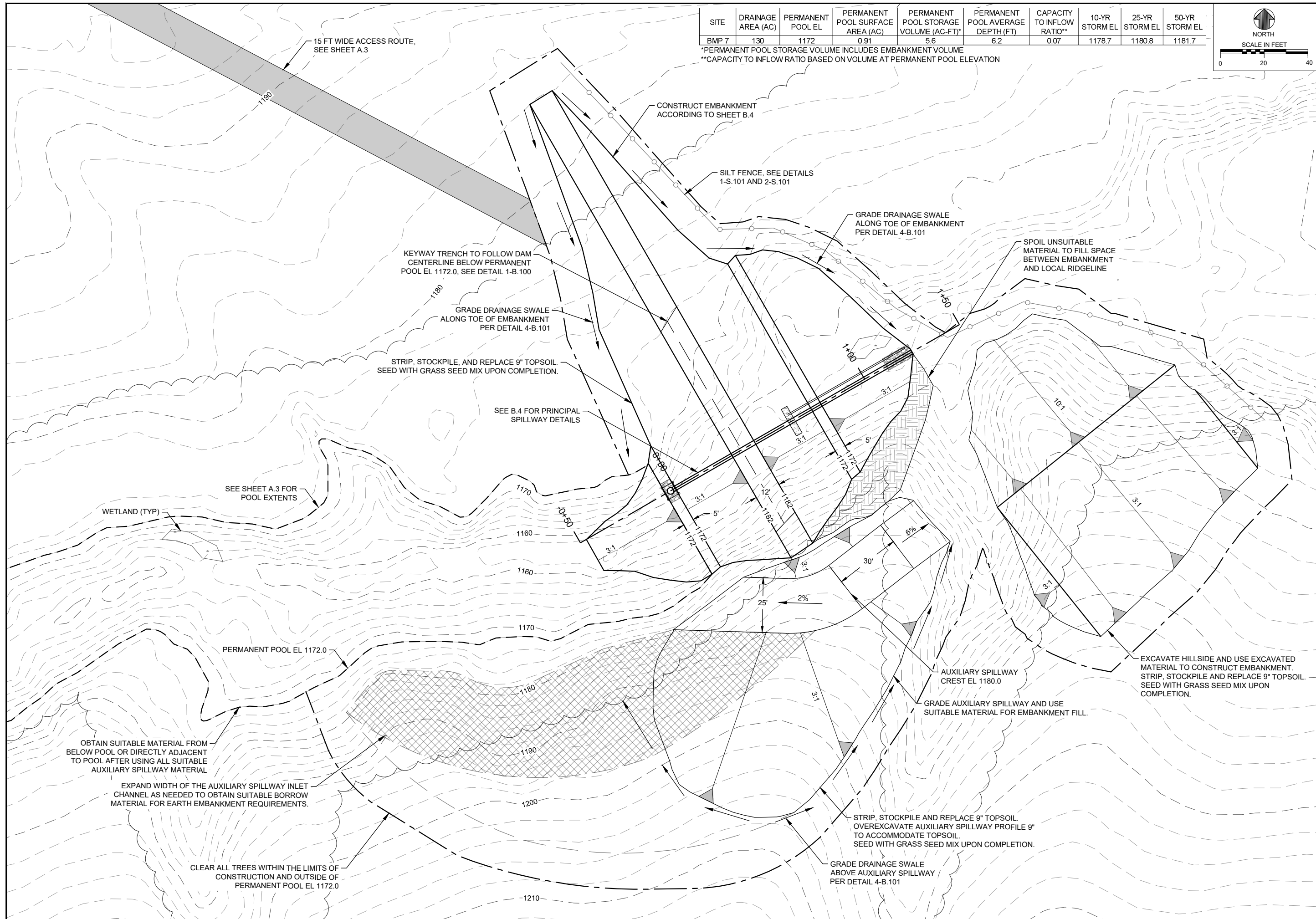
SITE	DRAINAGE AREA (AC)	PERMANENT POOL EL	PERMANENT POOL SURFACE AREA (AC)	PERMANENT POOL STORAGE VOLUME (AC-FT)*	PERMANENT POOL AVERAGE DEPTH (FT)	CAPACITY TO INFLOW RATIO**	10-YR STORM EL	25-YR STORM EL	50-YR STORM EL
BMP 7	130	1172	0.91	5.6	6.2	0.07	1178.7	1180.8	1181.7

\*PERMANENT POOL STORAGE VOLUME INCLUDES EMBANKMENT VOLUME  
 \*\*CAPACITY TO INFLOW RATIO BASED ON VOLUME AT PERMANENT POOL ELEVATION



**FYRA**  
ENGINEERING

100 Court Avenue, Suite 202  
Des Moines, Iowa 50309  
515.444.5393  
www.fyraengineering.com



THREE MILE LAKE RESTORATION PHASE 1  
 IOWA DEPARTMENT OF NATURAL RESOURCES  
 UNION COUNTY, IOWA  
 2021

ENGINEER'S SEAL

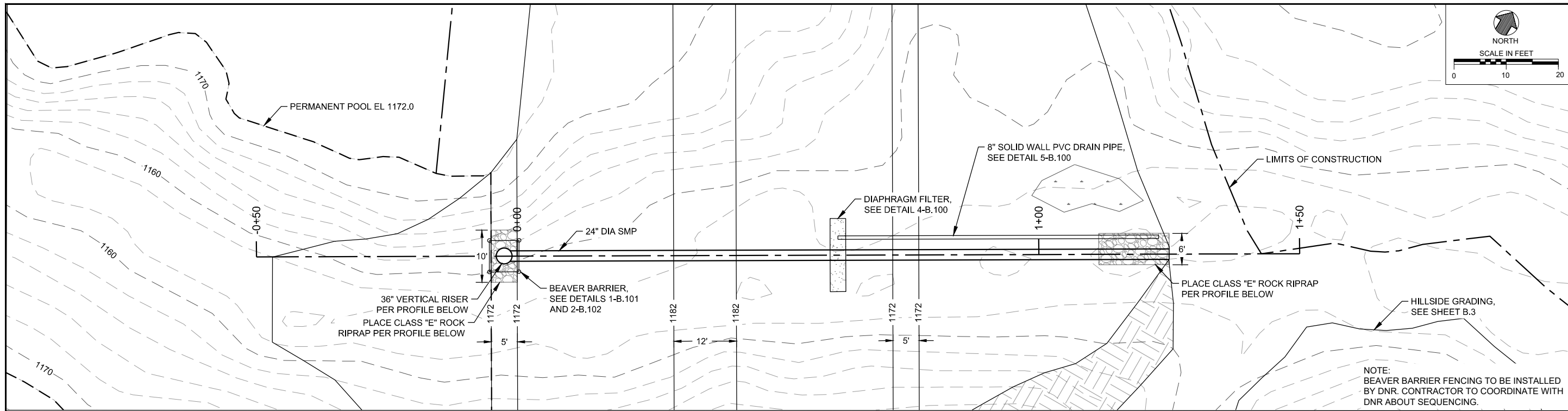
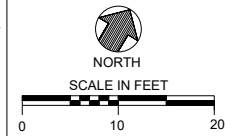
REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
 DRAWN BY: CKW  
 QA / QC BY: MKS  
 PROJECT NO.: 007-20-01  
 DATE: 08.10.2021

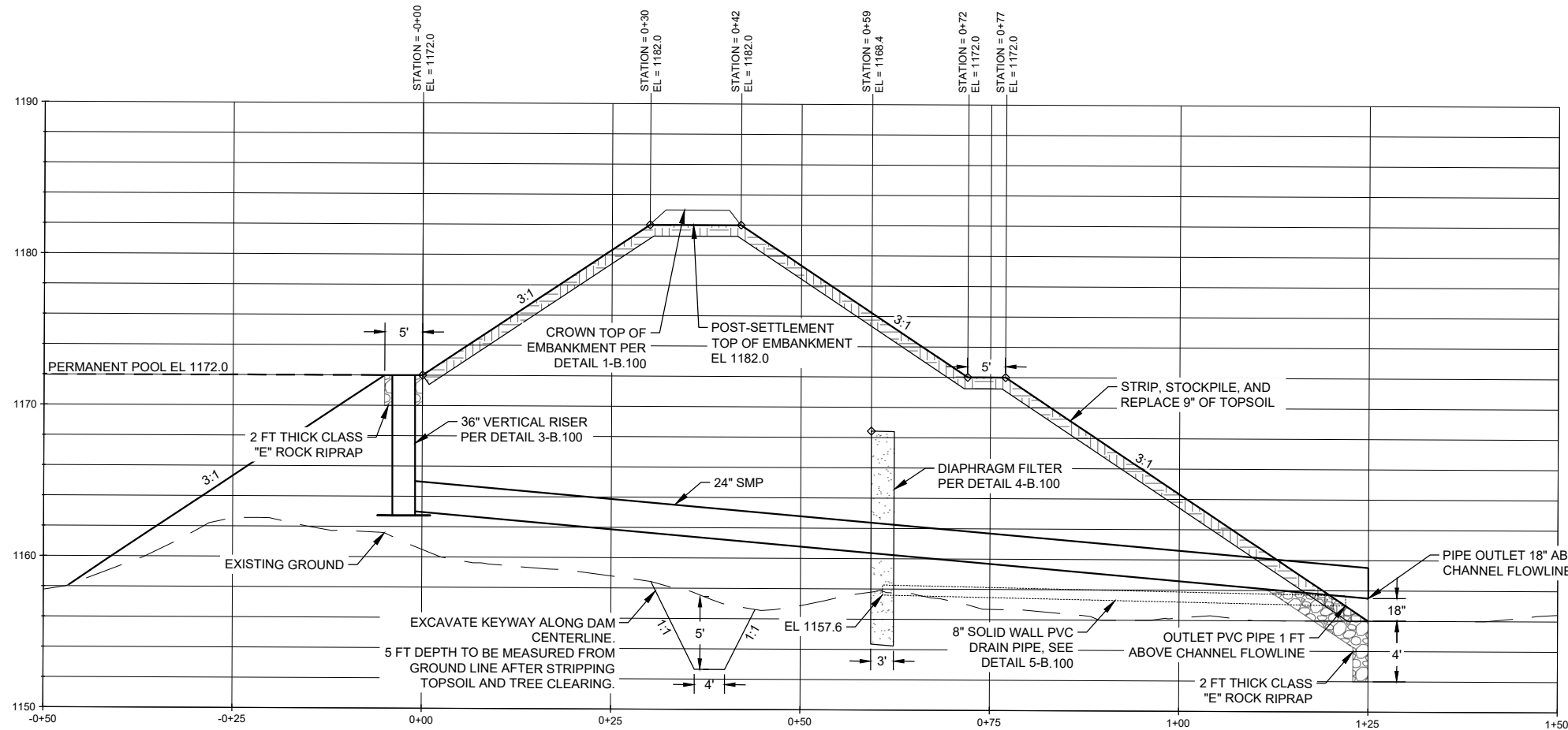
TITLE  
**BMP 7 SITE PLAN**

SHEET  
**B.3**

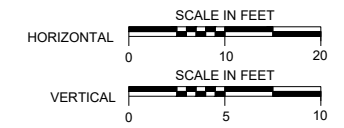




PLAN VIEW



PROFILE VIEW



THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

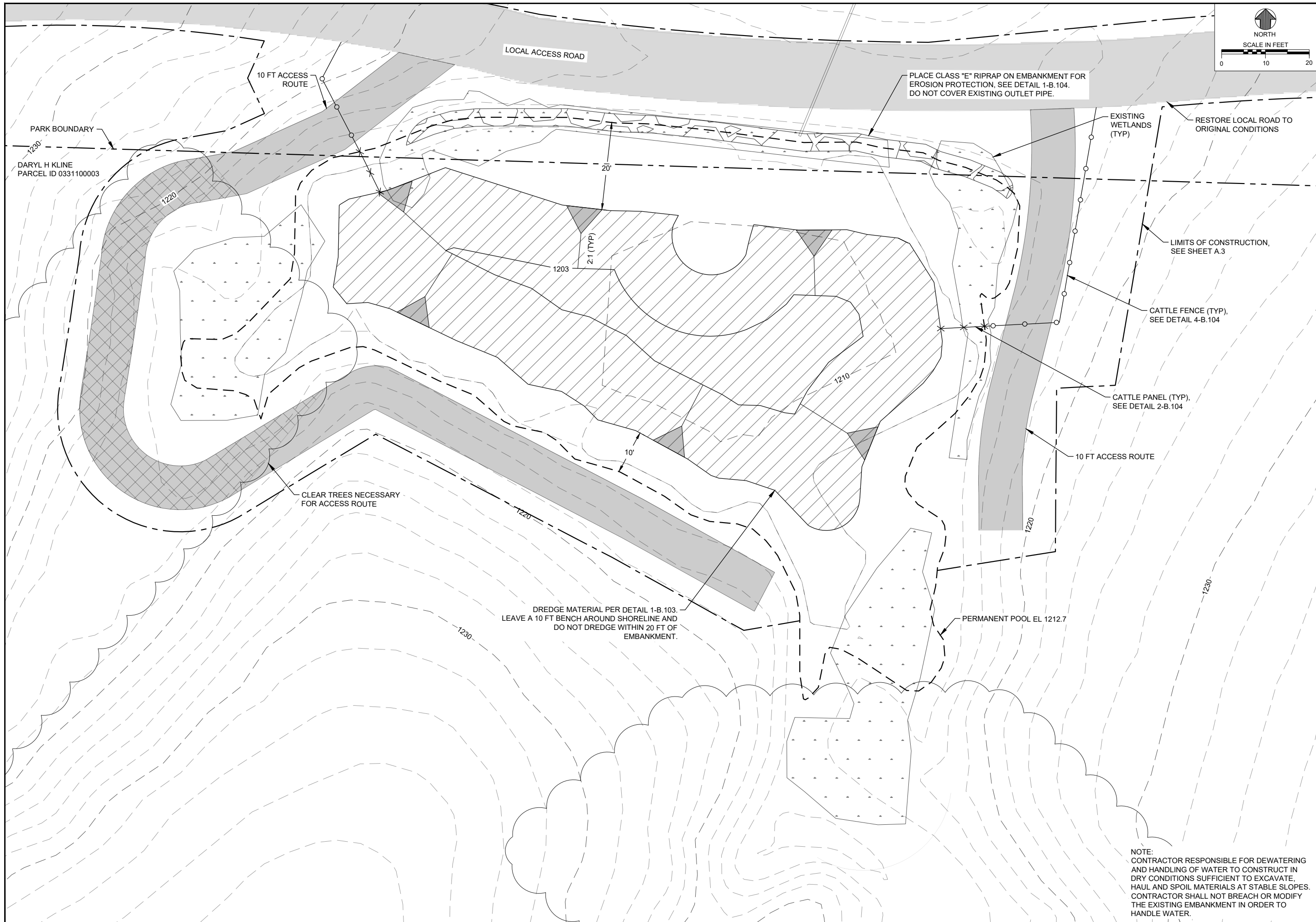
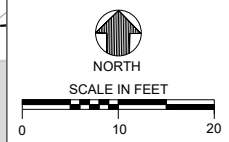
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**BMP 7  
PRINCIPAL  
SPILLWAY  
PLAN AND  
PROFILE**

SHEET  
**B.4**



PLACE CLASS "E" RIPRAP ON EMBANKMENT FOR EROSION PROTECTION. SEE DETAIL 1-B.104. DO NOT COVER EXISTING OUTLET PIPE.

RESTORE LOCAL ROAD TO ORIGINAL CONDITIONS

EXISTING WETLANDS (TYP)

LIMITS OF CONSTRUCTION, SEE SHEET A.3

CATTLE FENCE (TYP), SEE DETAIL 4-B.104

CATTLE PANEL (TYP), SEE DETAIL 2-B.104

10 FT ACCESS ROUTE

PERMANENT POOL EL 1212.7

DREDGE MATERIAL PER DETAIL 1-B.103. LEAVE A 10 FT BENCH AROUND SHORELINE AND DO NOT DREDGE WITHIN 20 FT OF EMBANKMENT.

CLEAR TREES NECESSARY FOR ACCESS ROUTE

PARK BOUNDARY

DARYL H KLINE  
PARCEL ID 0331100003

THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

ENGINEER'S SEAL

REVISIONS	
NO.	DATE

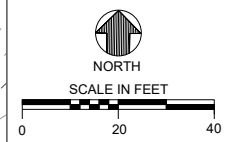
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**BMP 15 SITE PLAN**

SHEET  
**B.5**

NOTE:  
CONTRACTOR RESPONSIBLE FOR DEWATERING AND HANDLING OF WATER TO CONSTRUCT IN DRY CONDITIONS SUFFICIENT TO EXCAVATE, HAUL AND SPOIL MATERIALS AT STABLE SLOPES. CONTRACTOR SHALL NOT BREACH OR MODIFY THE EXISTING EMBANKMENT IN ORDER TO HANDLE WATER.





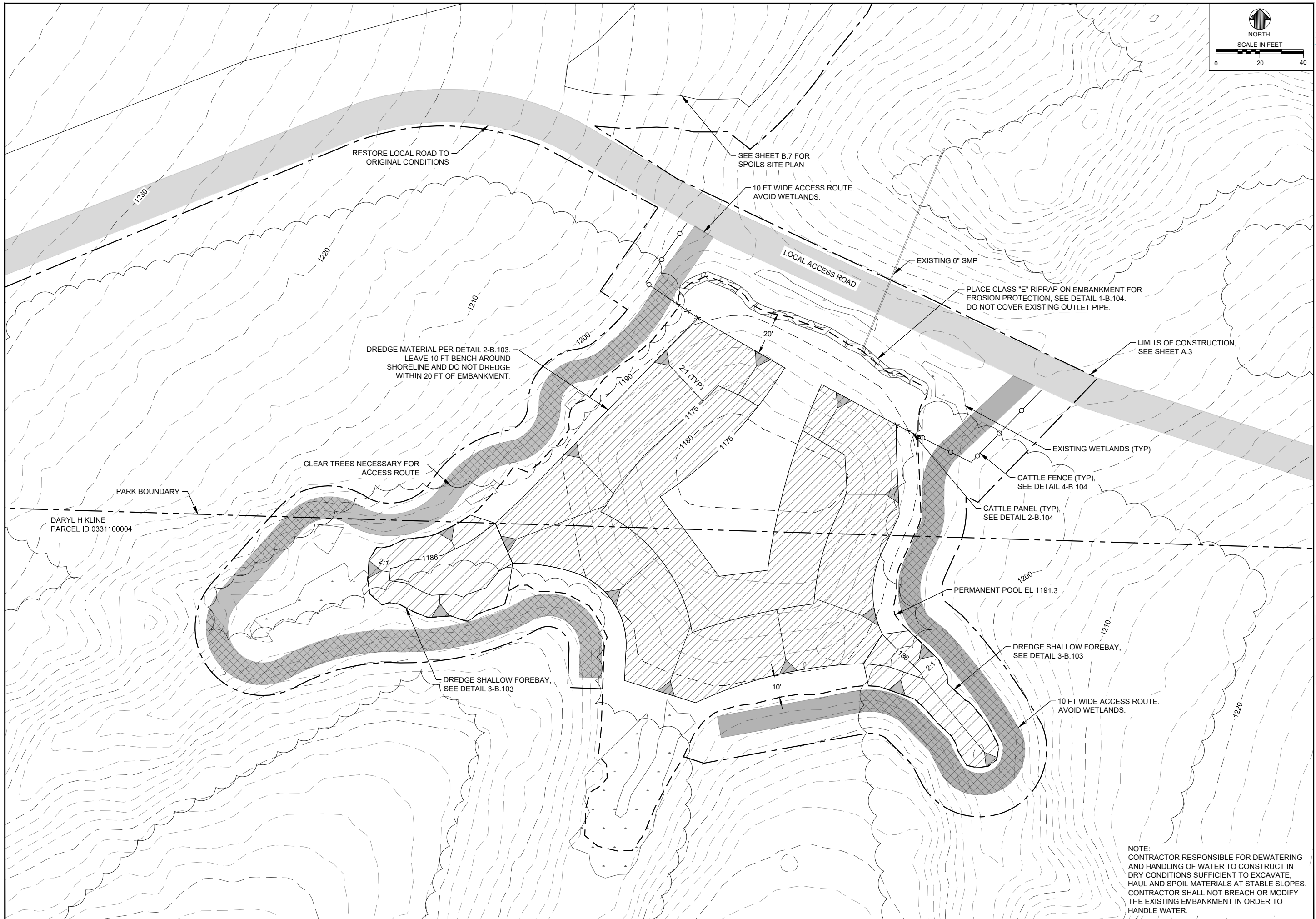
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

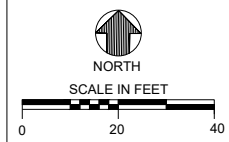
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**BMP 16 SITE PLAN**

SHEET  
**B.6**



NOTE:  
CONTRACTOR RESPONSIBLE FOR DEWATERING  
AND HANDLING OF WATER TO CONSTRUCT IN  
DRY CONDITIONS SUFFICIENT TO EXCAVATE,  
HAUL AND SPOIL MATERIALS AT STABLE SLOPES.  
CONTRACTOR SHALL NOT BREACH OR MODIFY  
THE EXISTING EMBANKMENT IN ORDER TO  
HANDLE WATER.



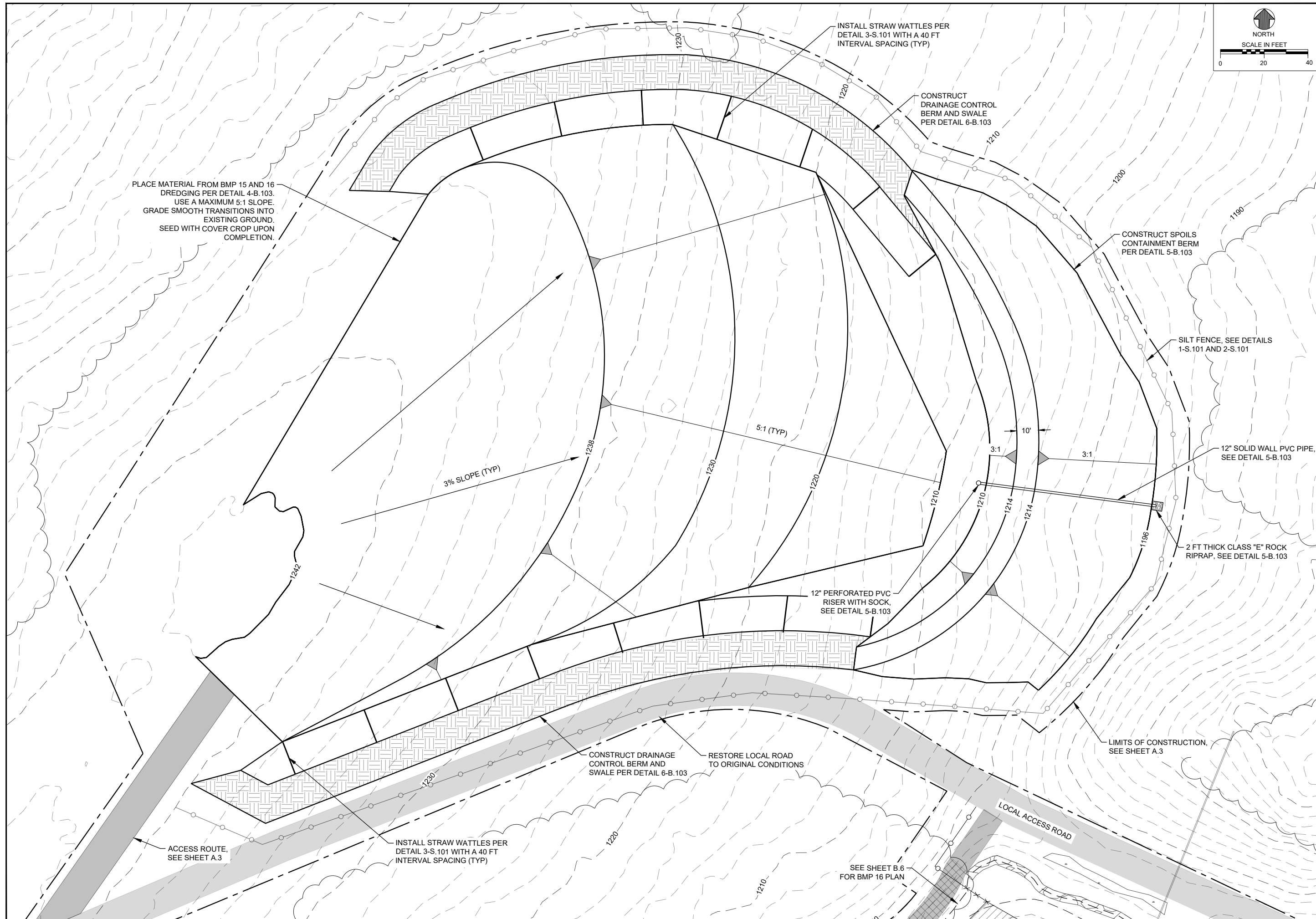
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**BMP 15 & 16  
SPOILS PLAN**

SHEET  
**B.7**



PLACE MATERIAL FROM BMP 15 AND 16 DREDGING PER DETAIL 4-B.103. USE A MAXIMUM 5:1 SLOPE. GRADE SMOOTH TRANSITIONS INTO EXISTING GROUND. SEED WITH COVER CROP UPON COMPLETION.

INSTALL STRAW WATTLES PER DETAIL 3-S.101 WITH A 40 FT INTERVAL SPACING (TYP)

CONSTRUCT DRAINAGE CONTROL BERM AND SWALE PER DETAIL 6-B.103

CONSTRUCT SPOILS CONTAINMENT BERM PER DETAIL 5-B.103

SILT FENCE, SEE DETAILS 1-S.101 AND 2-S.101

12" SOLID WALL PVC PIPE, SEE DETAIL 5-B.103

2 FT THICK CLASS "E" ROCK RIPRAP, SEE DETAIL 5-B.103

12" PERFORATED PVC RISER WITH SOCK, SEE DETAIL 5-B.103

LIMITS OF CONSTRUCTION, SEE SHEET A.3

CONSTRUCT DRAINAGE CONTROL BERM AND SWALE PER DETAIL 6-B.103

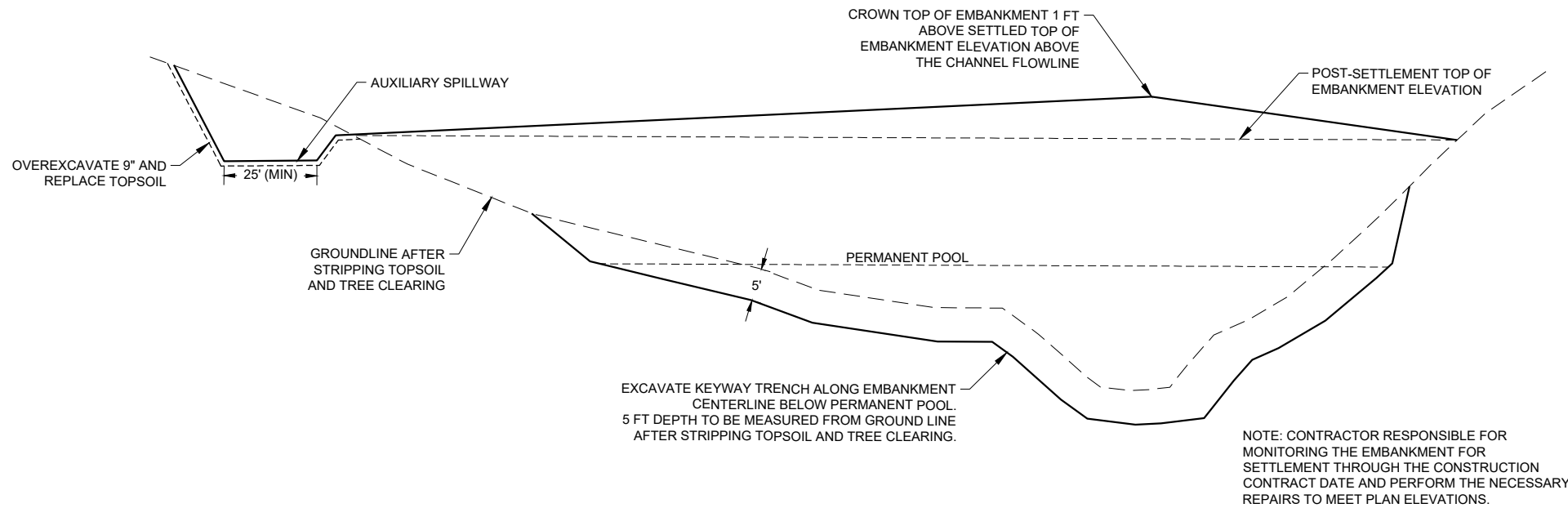
RESTORE LOCAL ROAD TO ORIGINAL CONDITIONS

ACCESS ROUTE, SEE SHEET A.3

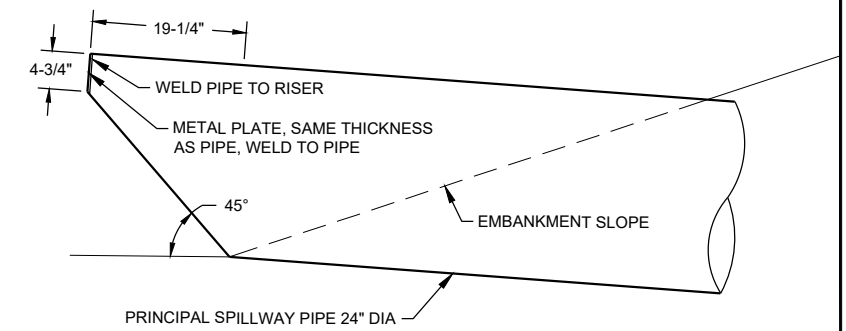
INSTALL STRAW WATTLES PER DETAIL 3-S.101 WITH A 40 FT INTERVAL SPACING (TYP)

SEE SHEET B.6 FOR BMP 16 PLAN

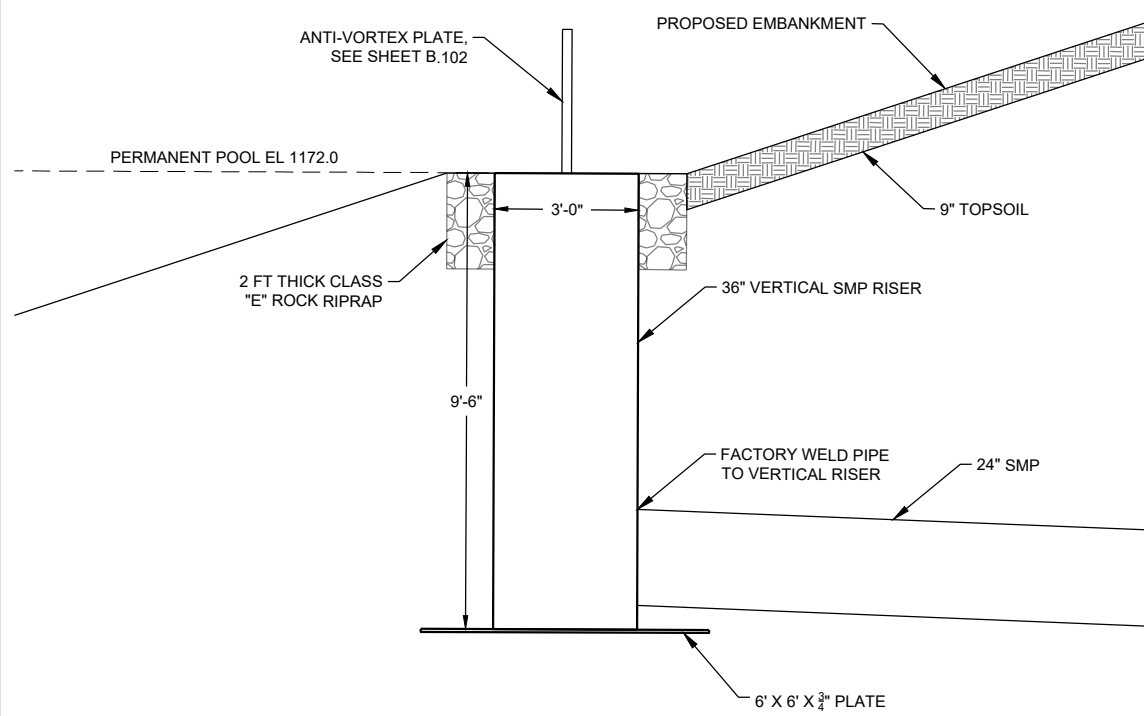




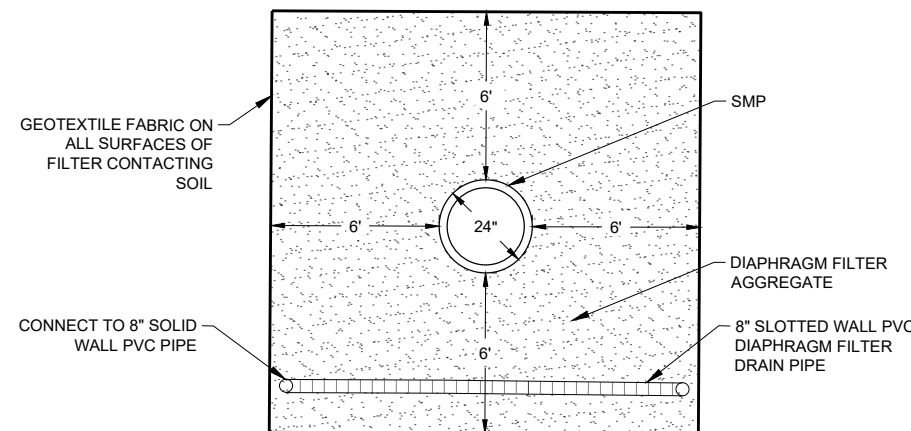
TYPICAL EMBANKMENT PROFILE 1  
NOT TO SCALE B.100



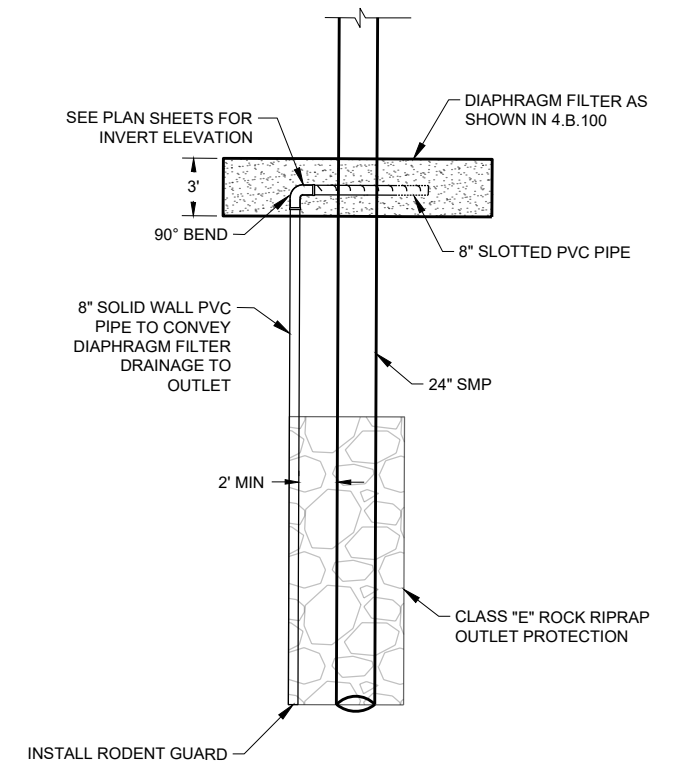
BMP 3 CANOPY INLET 2  
NOT TO SCALE B.100



PROPOSED BMP 7 RISER DETAIL 3  
NOT TO SCALE B.100



DIAPHRAGM FILTER 4  
NOT TO SCALE B.100

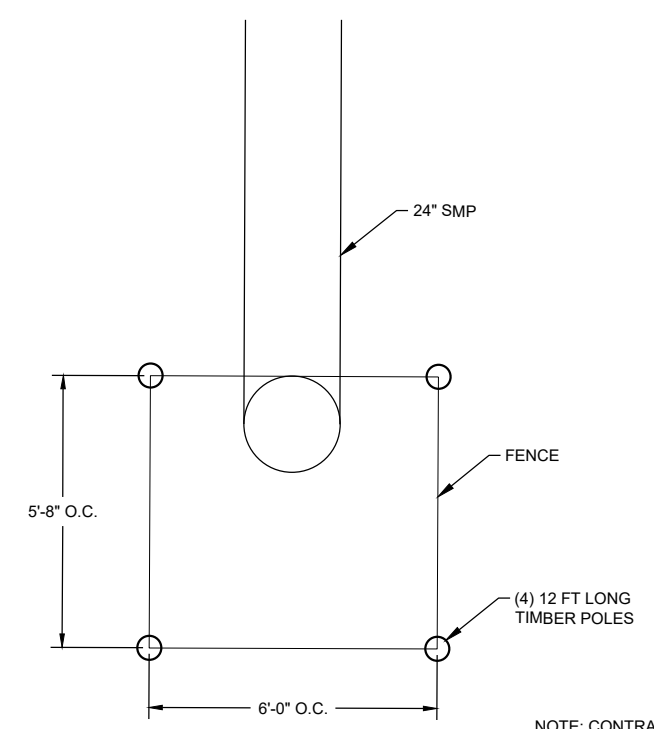


DIAPHRAGM FILTER PLAN VIEW 5  
NOT TO SCALE B.100

REVISIONS	
NO.	DATE

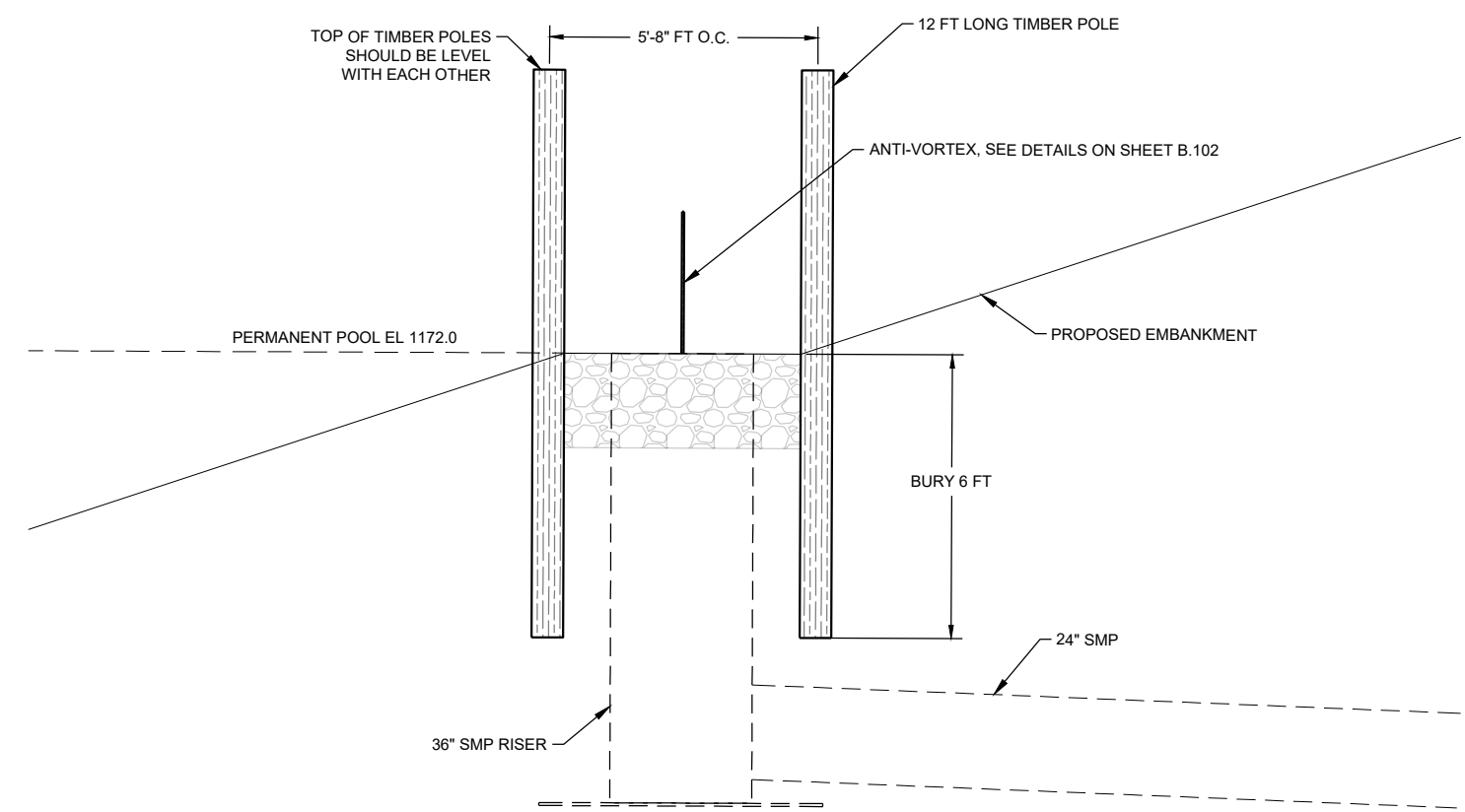
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
BMP DETAILS  
(1 OF 2)

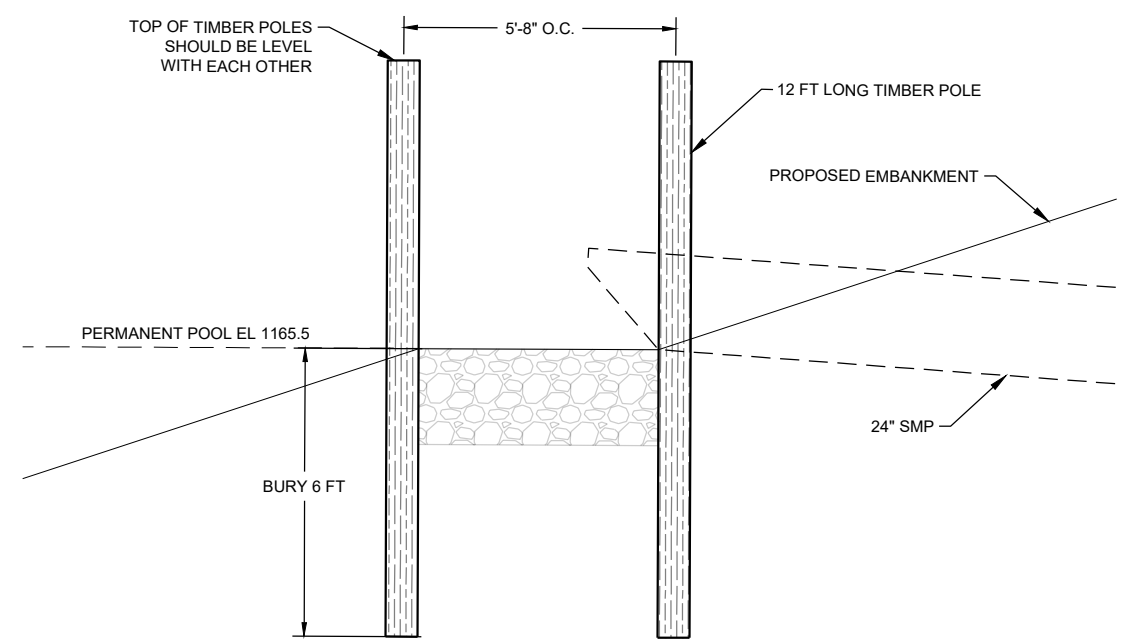


**BEAVER BARRIER PLAN VIEW** 1  
NOT TO SCALE B.101

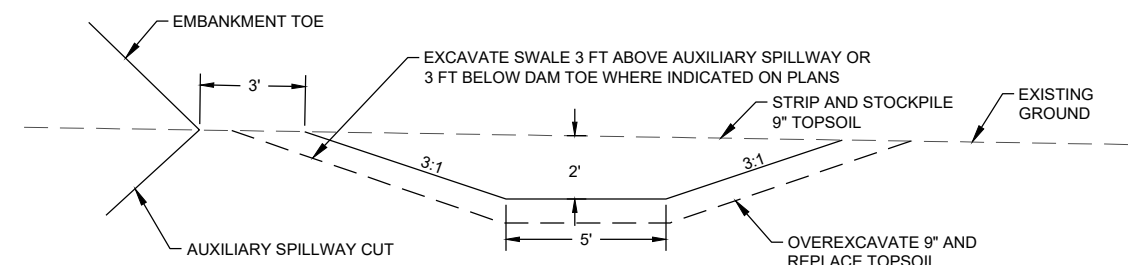
NOTE: CONTRACTOR TO INSTALL UTILITY POLES ONLY. CLIENT WILL INSTALL FENCE.



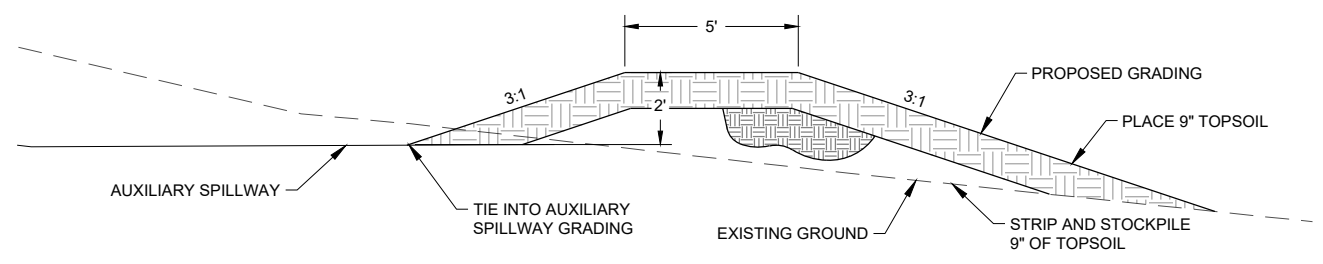
**BMP 7 BEAVER BARRIER DETAIL** 2  
NOT TO SCALE B.101



**BMP 3 BEAVER BARRIER DETAIL** 3  
NOT TO SCALE B.101



**DRAINAGE SWALE** 4  
NOT TO SCALE B.101



**TRAINING DIKE** 5  
NOT TO SCALE B.101

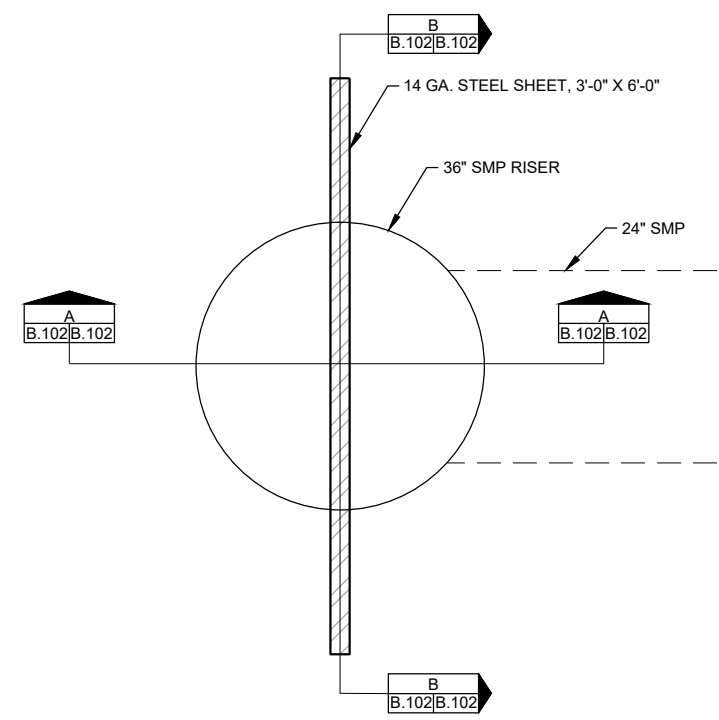
REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

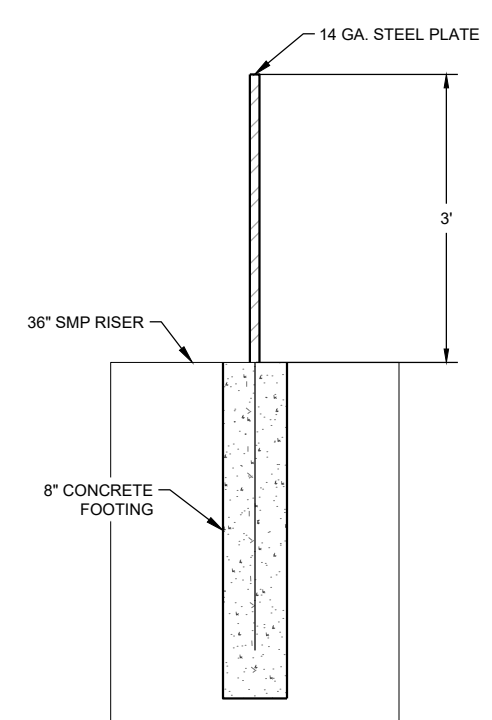
TITLE  
**BMP DETAILS**  
(2 OF 2)



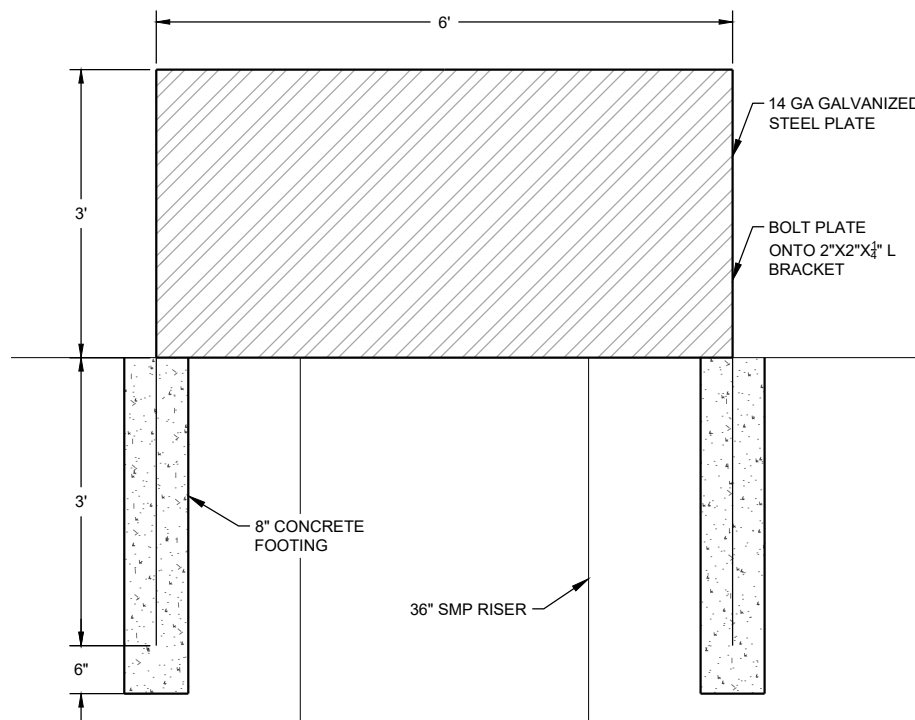
ENGINEER'S SEAL



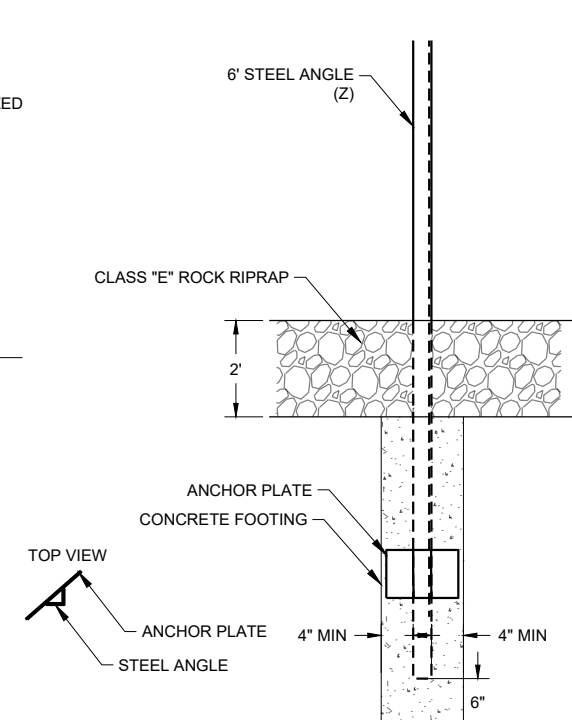
**SMP RISER ANTI-VORTEX PLAN VIEW** 1  
NOT TO SCALE B.102



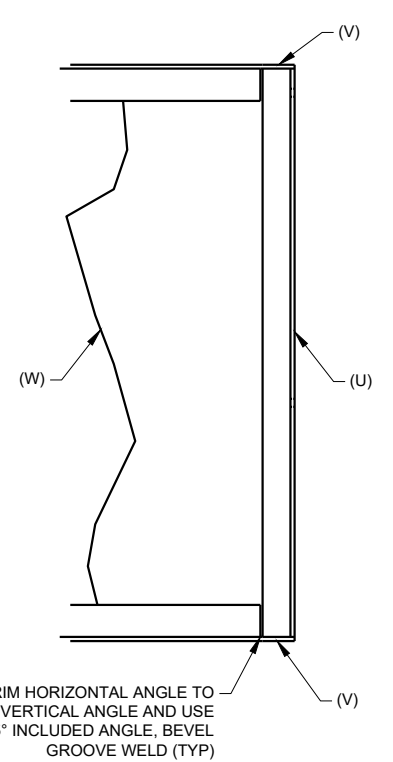
**SMP RISER ANTI-VORTEX CROSS SECTION A**  
NOT TO SCALE B.102



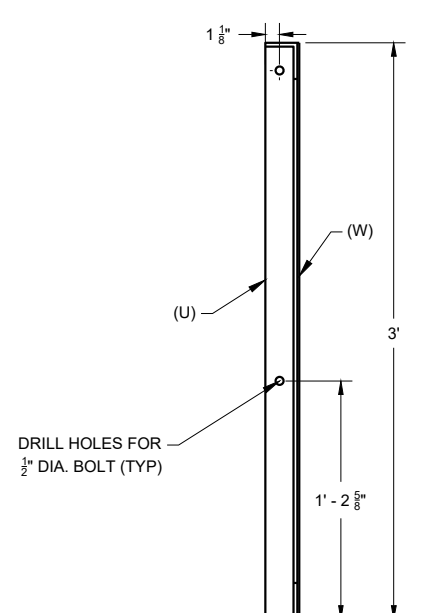
**SMP RISER ANTI-VORTEX PROFILE DETAIL B**  
NOT TO SCALE B.102



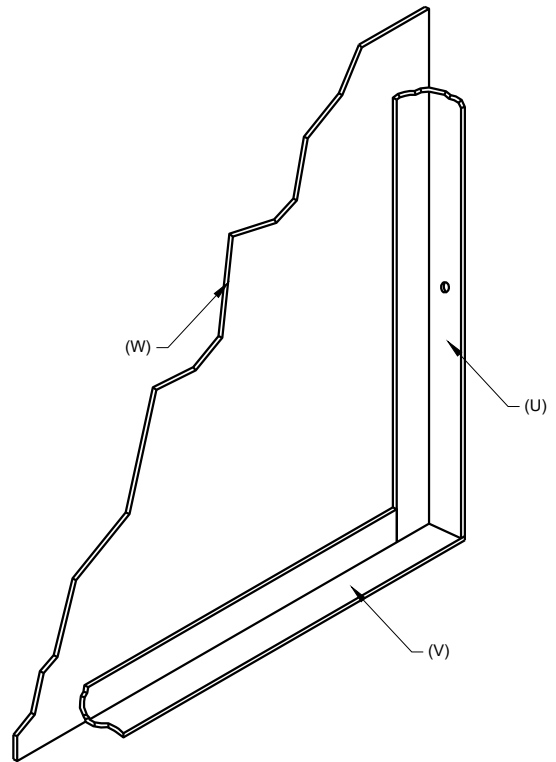
**ANGLE POST ANCHOR DETAIL** 2  
NOT TO SCALE B.102



**ANTI-VORTEX WALL DETAILS** 3  
NOT TO SCALE B.102



**ANTI-VORTEX DRILL HOLE DETAIL** 4  
NOT TO SCALE B.102



**ANTI-VORTEX CORNER DETAIL** 5  
NOT TO SCALE B.102

**MATERIAL LIST**

(U)	2" X 2" X 1/4" X 2' - 11 1/2" ANGLES	2
(V)	2" X 2" X 1/4" X 6' - 0" ANGLES	2
(Z)	2" X 2" X 1/4" X 6' - 0" ANGLES (POST)	2
(P)	9" X 6" X 1/4" ANCHOR PLATES	2
(W)	14 GA. STEEL SHEET, 3' - 0" X 6' - 0"	1
	1/2" X 1 1/2" HEX BOLTS (INCLUDING NUTS)	6
	1/2" X 3" LENGTH "J" BOLTS (INCLUDING NUTS)	2
	1/2" DIA. LOCK WASHERS (FOR ABOVE BOLTS)	8

ITEM	WEIGHT IN POUNDS (STEEL)
2" X 2" X 1/4" ANGLES (8)	58
ANTI-VORTEX STEEL SHEET (1)	57
STEEL BOLTS, NUTS AND LOCK WASHERS (8)	2
STEEL POST	276

- FABRICATION NOTES**
- ALL ANGLES, SHEETS AND PLATES TO BE SECURELY WELDED AND/OR BOLTED AS SHOWN ON THIS DRAWING, IN ACCORDANCE WITH SPECIFICATIONS.
  - ALL WELDS AND HEAT AFFECTED AREAS, ON GALVANIZED METAL SHALL BE TREATED IN ACCORDANCE WITH CONSTRUCTION SPECIFICATIONS.
  - WHEN MATERIALS USED ARE NOT GALVANIZED, ALL PARTS SHALL BE PAINTED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
  - INSTALL METAL ANTI-VORTEX WALL AT 90° TO CENTERLINE OF STRUCTURE.

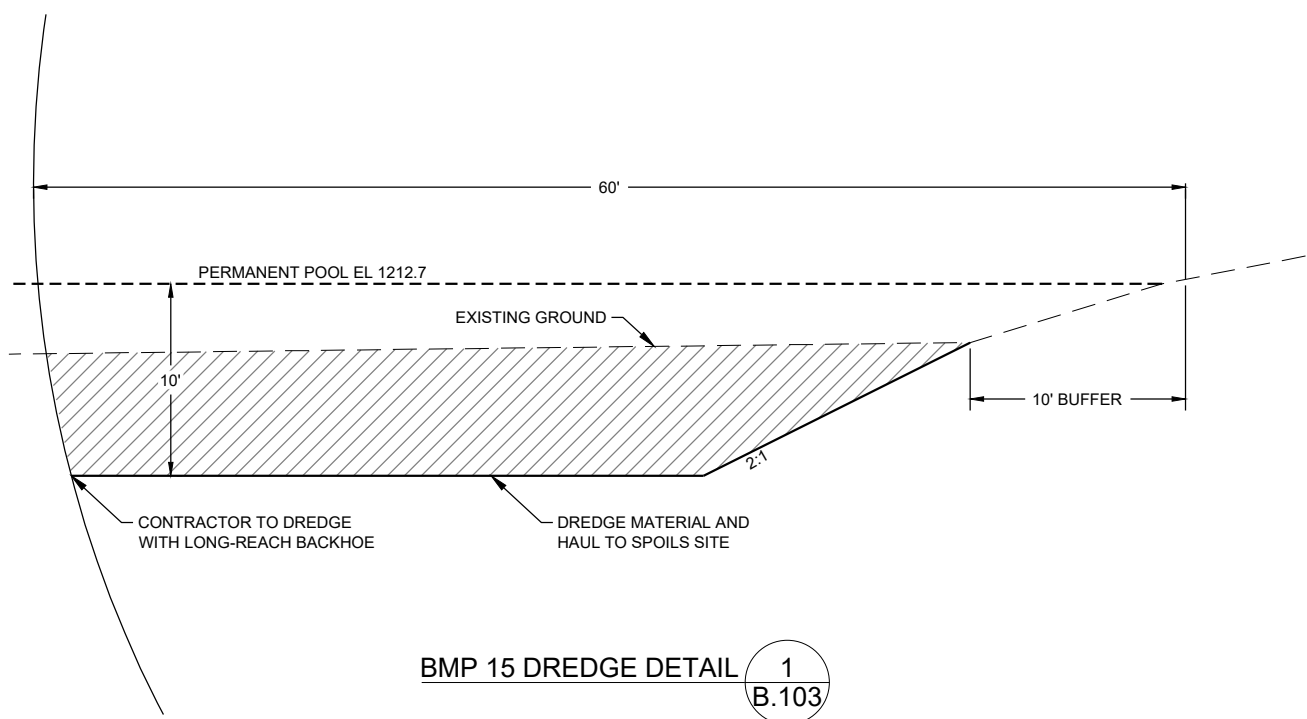
**REVISIONS**

NO.	DATE

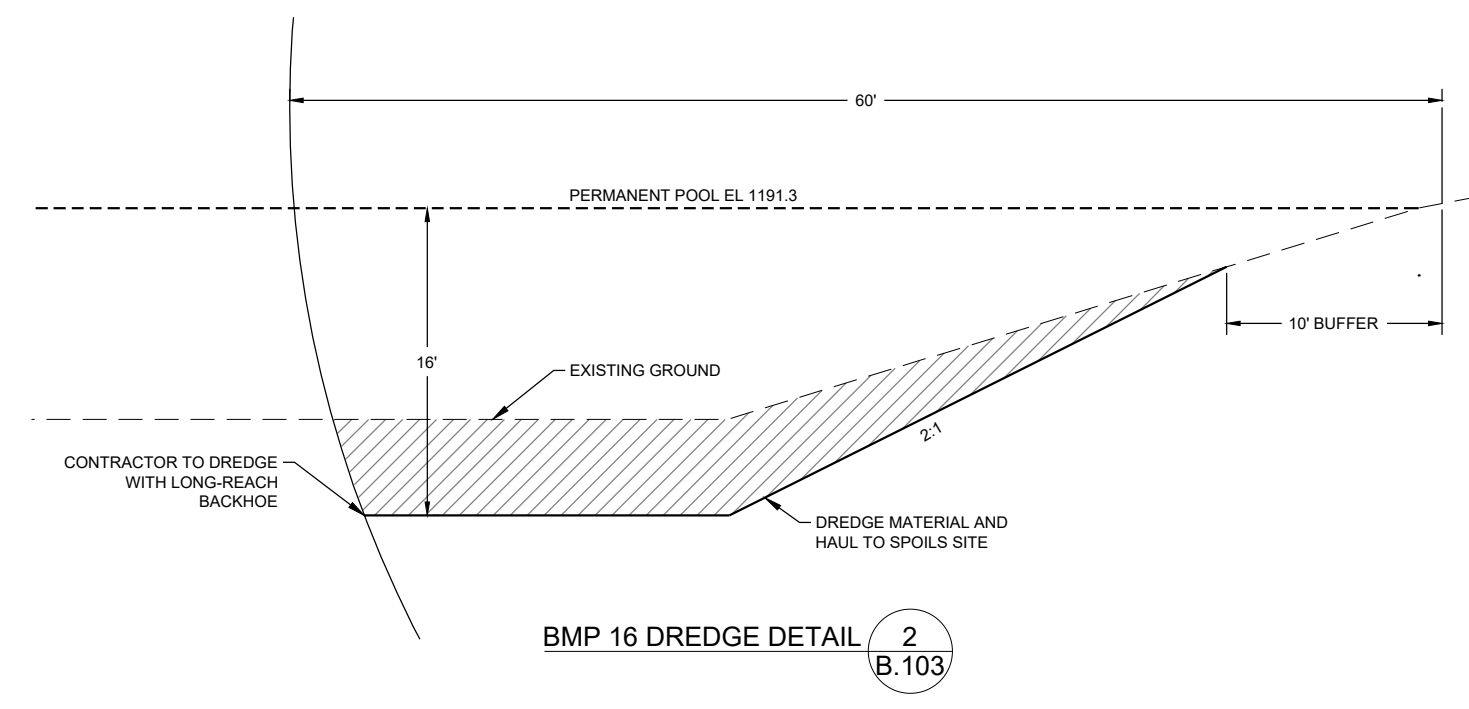
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**ANTI-VORTEX DETAILS**

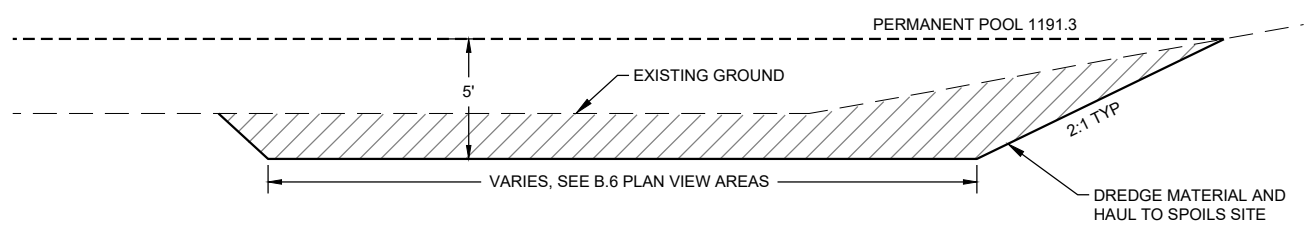
ENGINEER'S SEAL



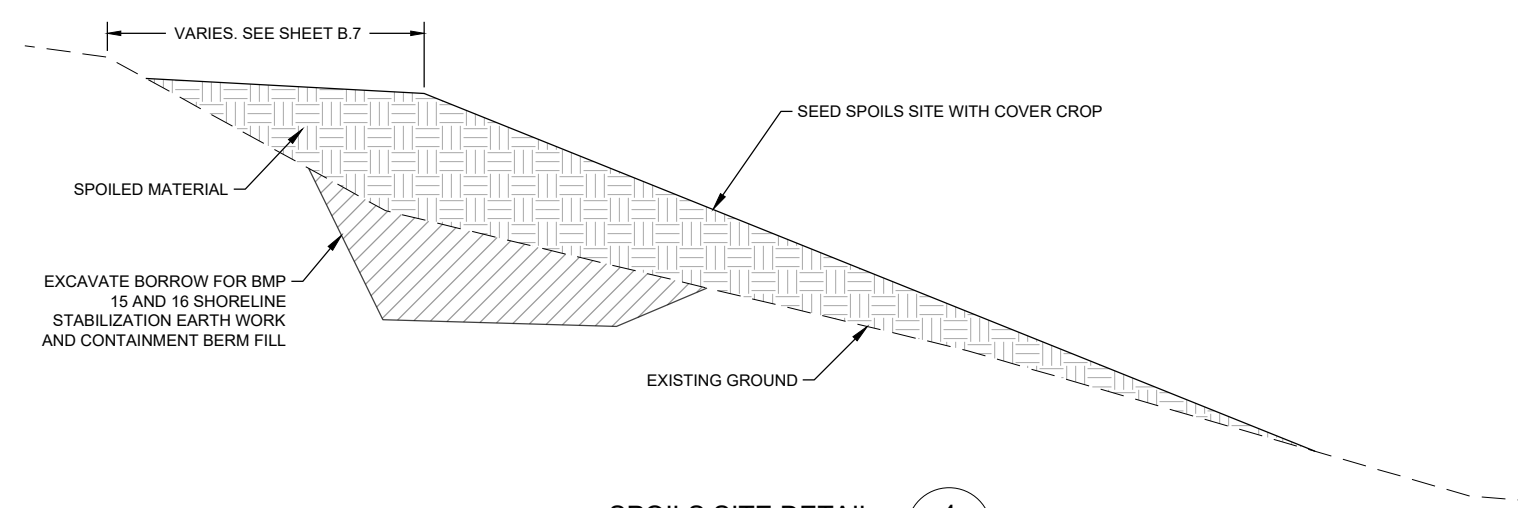
**BMP 15 DREDGE DETAIL** 1  
B.103



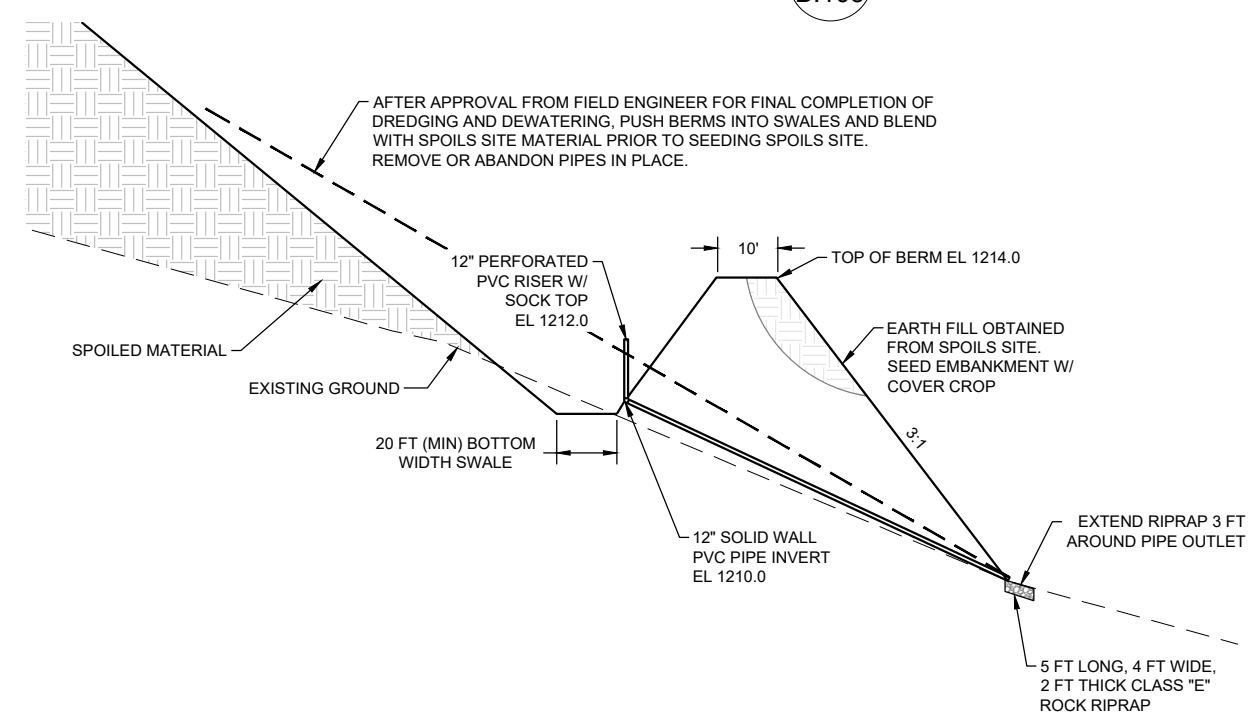
**BMP 16 DREDGE DETAIL** 2  
B.103



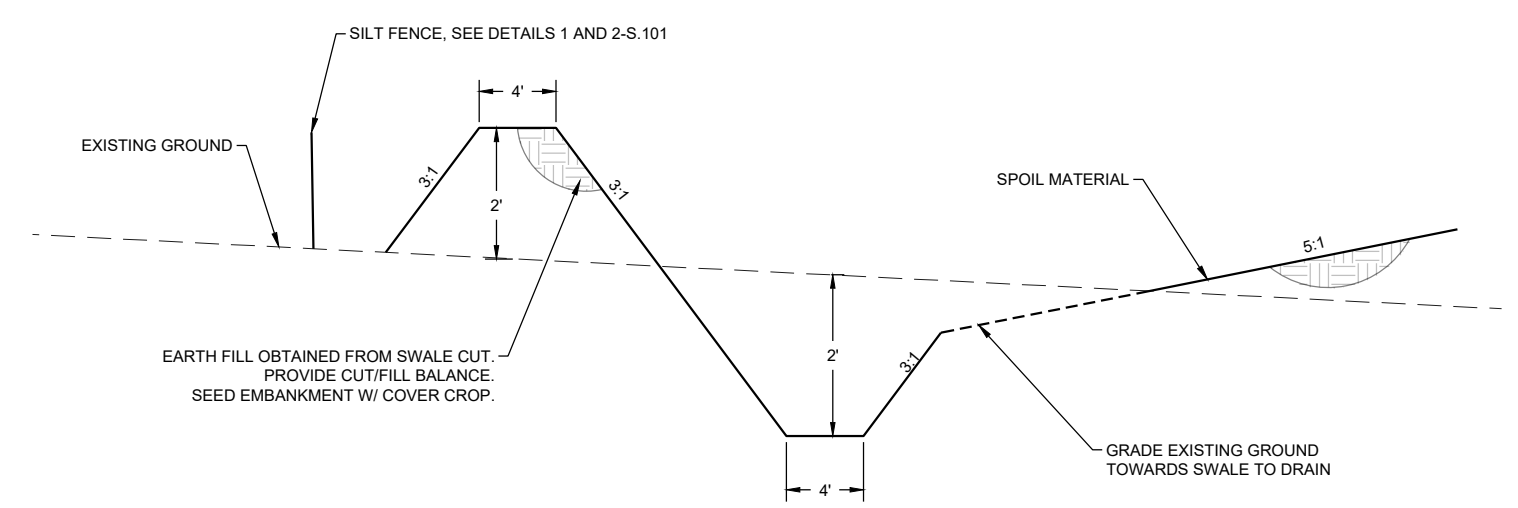
**SHALLOW DREDGE DETAIL** 3  
B.103



**SPOILS SITE DETAIL** 4  
B.103



**SPOILS CONTAINMENT BERM DETAIL** 5  
B.103



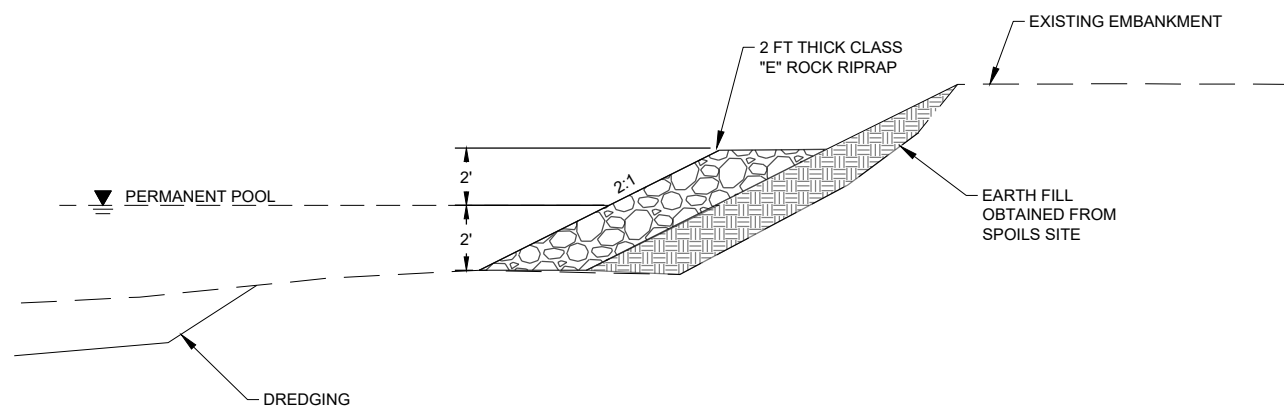
**DRAINAGE CONTROL BERM AND SWALE DETAIL** 6  
B.103

REVISIONS	
NO.	DATE

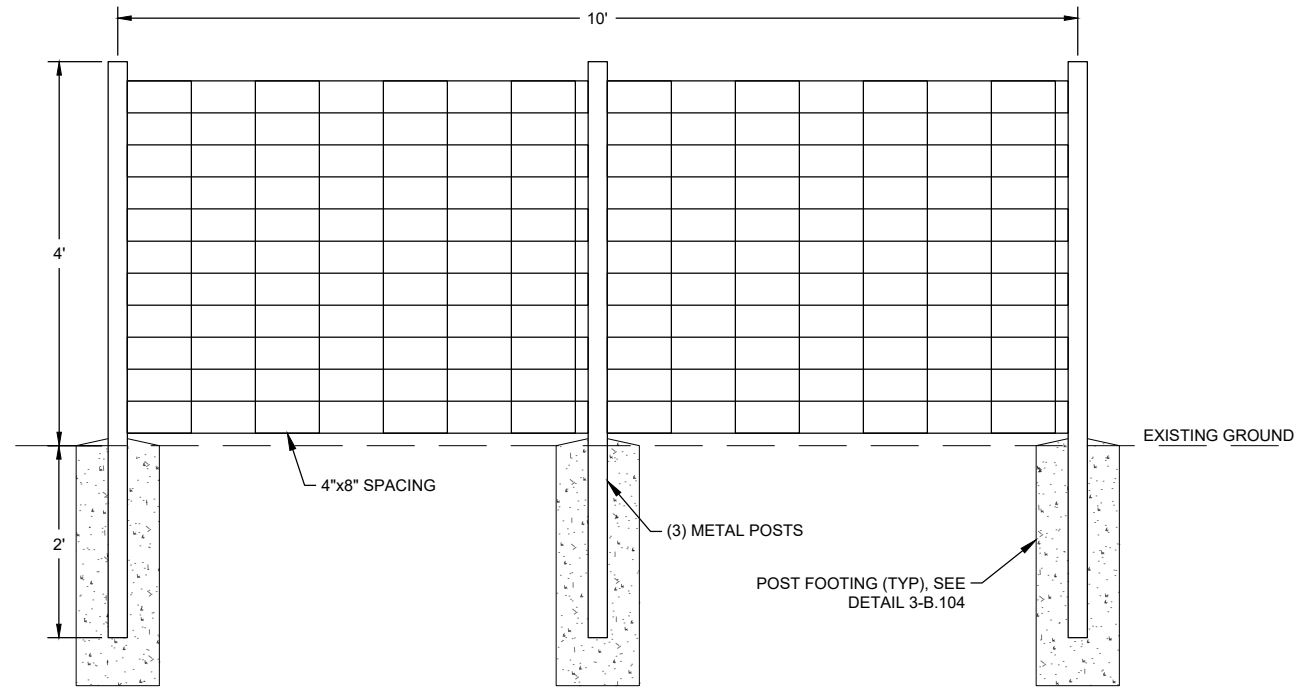
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**DREDGE DETAILS (1 OF 2)**

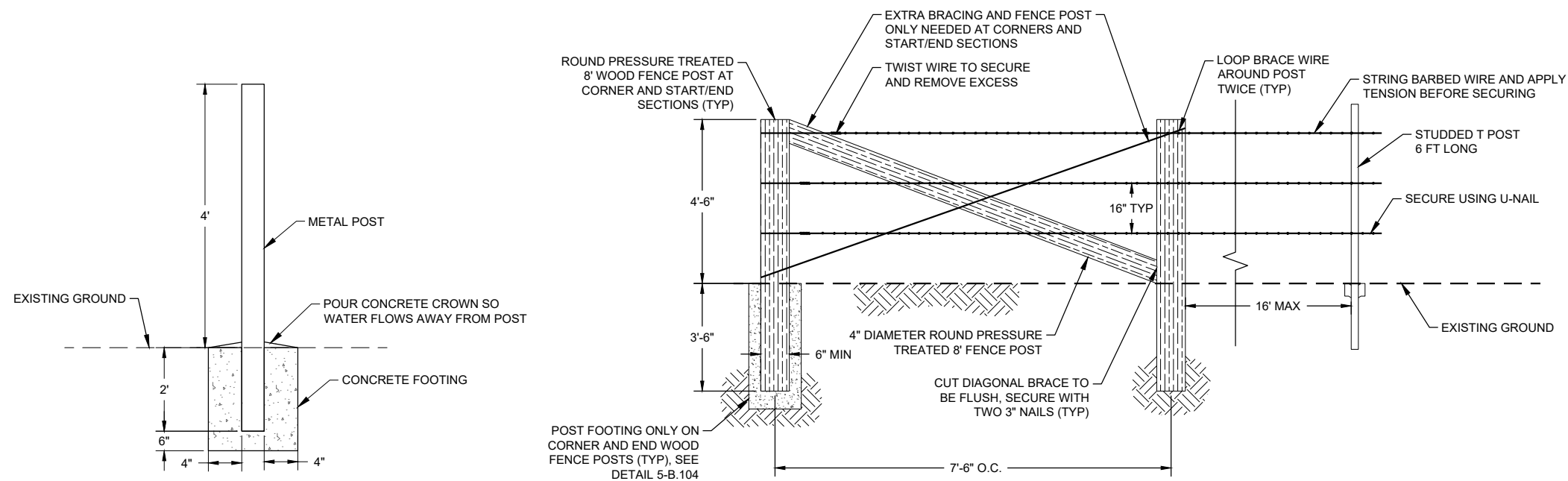




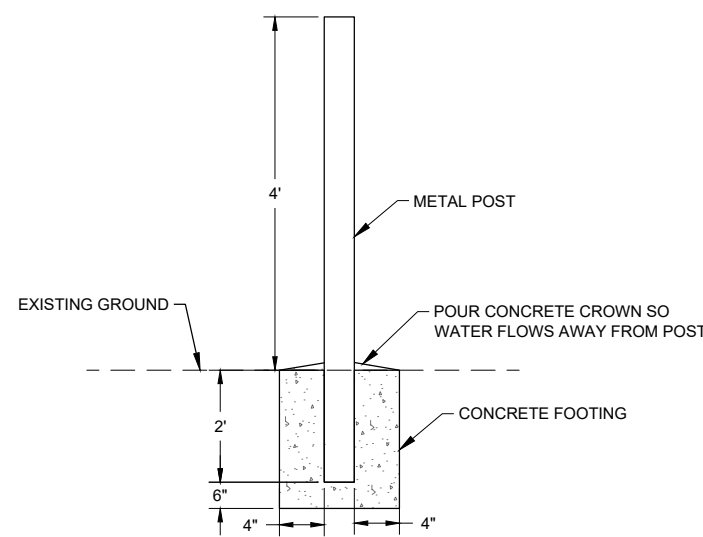
SHORELINE STABILIZATION DETAIL 1  
B.104



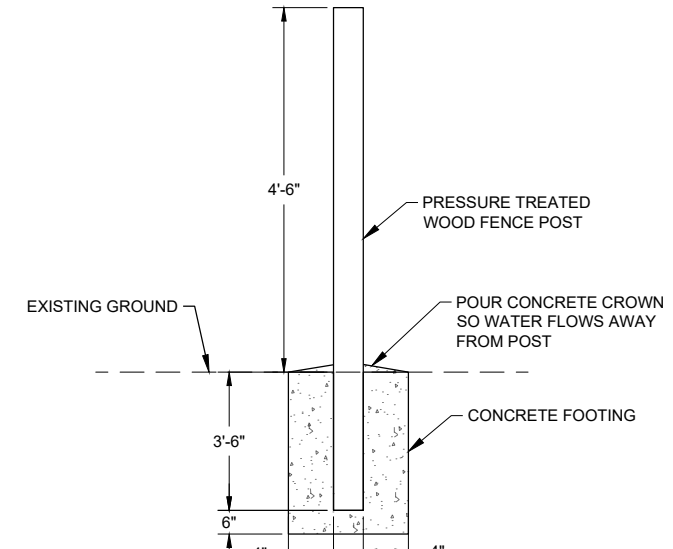
CATTLE PANEL DETAIL 2  
B.104



CATTLE FENCE DETAIL 4  
B.104



METAL POST FOOTING DETAIL 3  
B.104



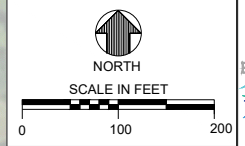
WOOD POST FOOTING DETAIL 5  
B.104

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
DREDGE  
DETAILS  
(2 OF 2)





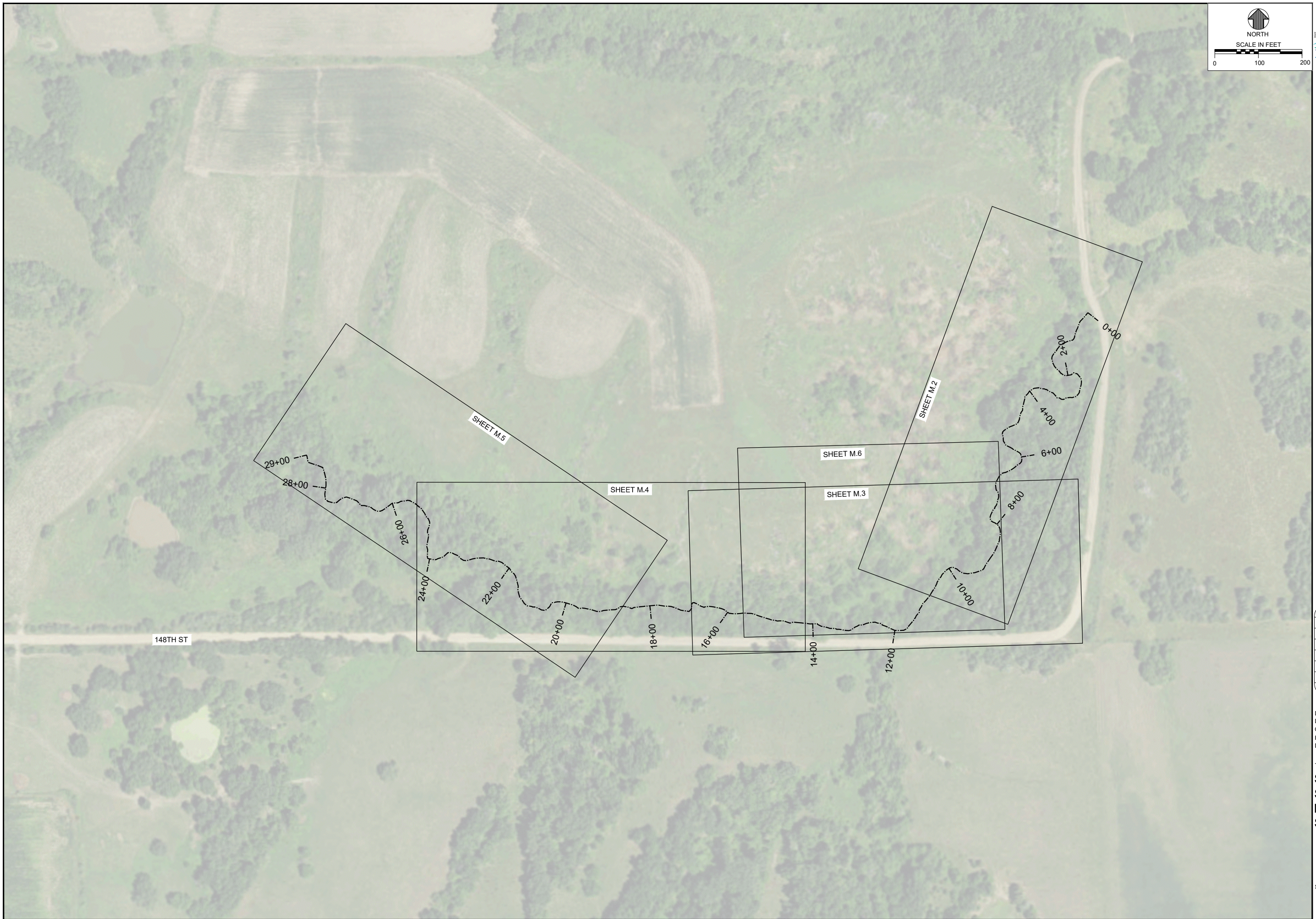
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

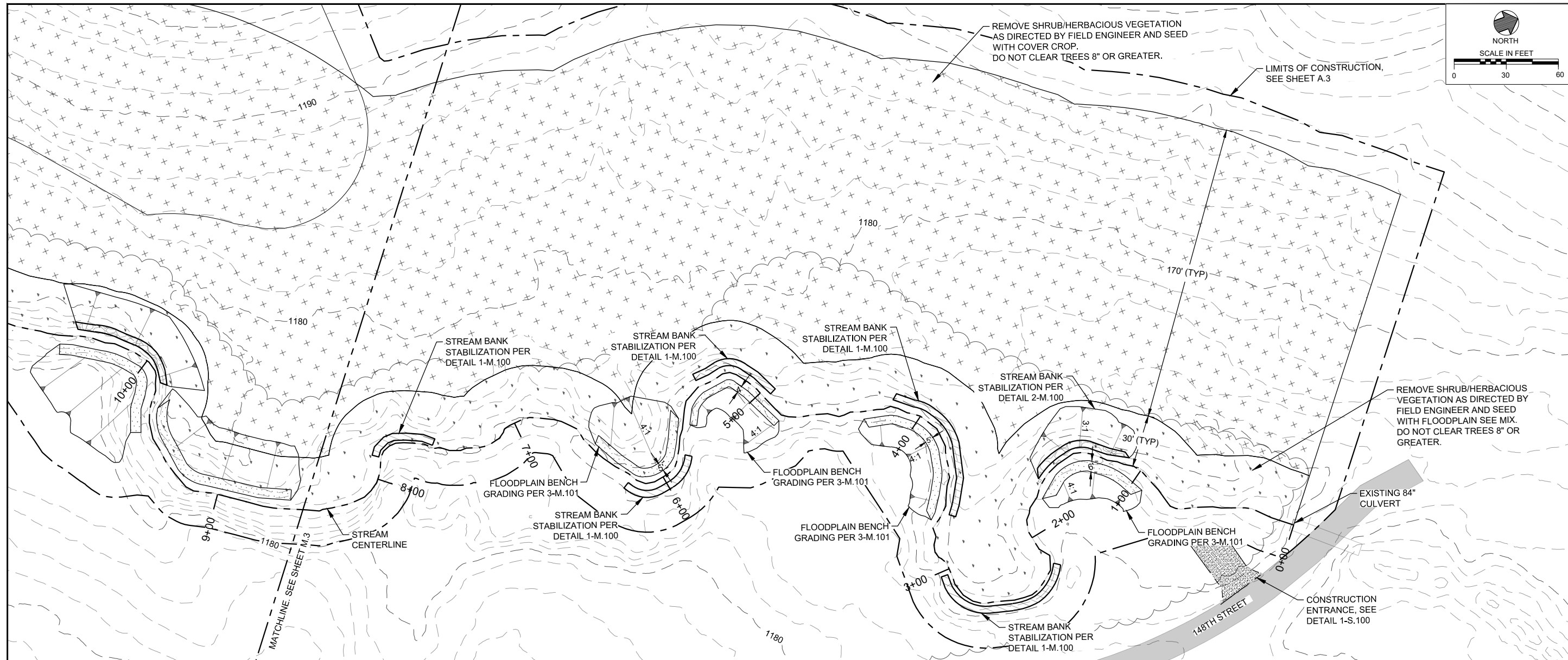
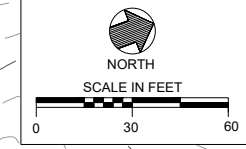
DESIGNED BY: SEM  
 DRAWN BY: CKW  
 QA / QC BY: MKS  
 PROJECT NO.: 007-20-01  
 DATE: 08.10.2021

TITLE  
**SITE B  
 STREAM  
 MITIGATION  
 SHEET KEY**

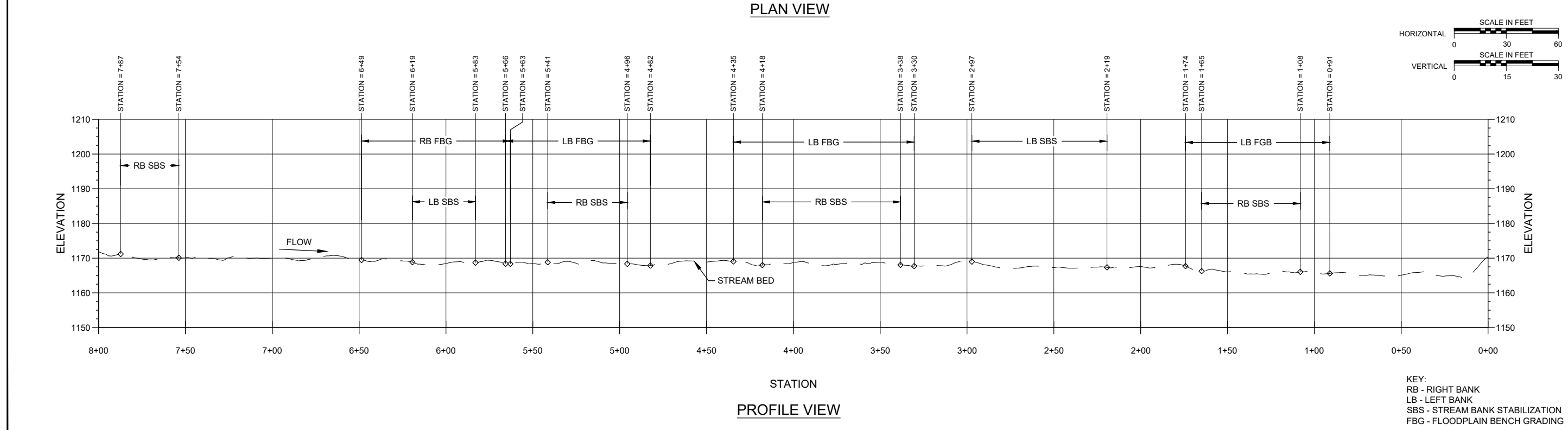
SHEET  
**M.1**







PLAN VIEW



PROFILE VIEW

THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

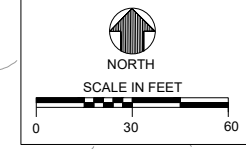
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

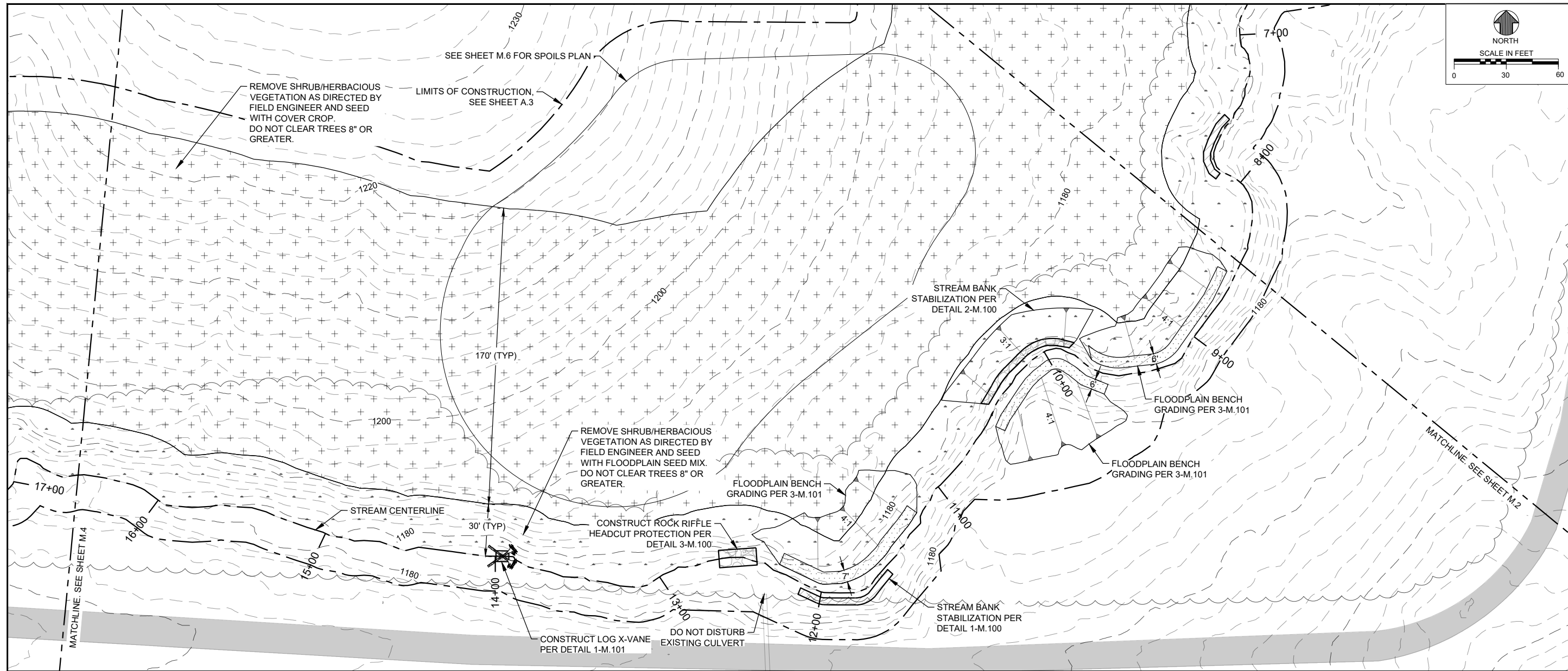
TITLE  
SITE B  
STREAM  
MITIGATION  
PLAN AND  
PROFILE  
(1 OF 4)

SHEET  
**M.2**

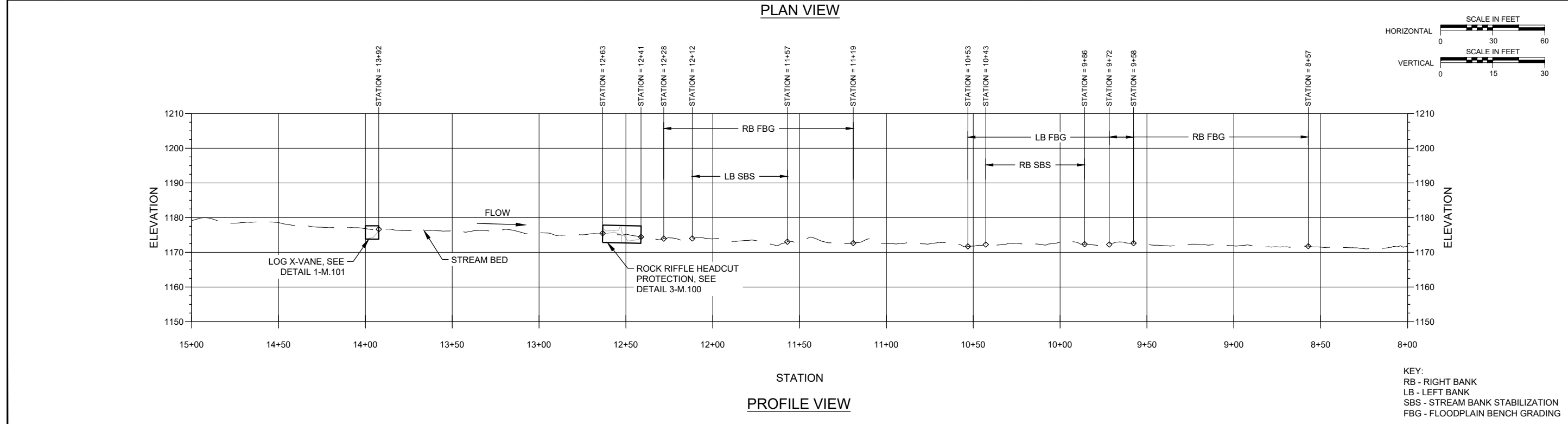


THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

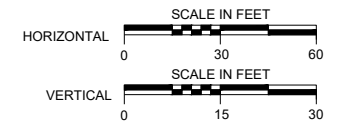
ENGINEER'S SEAL



PLAN VIEW



PROFILE VIEW



REVISIONS	
NO.	DATE

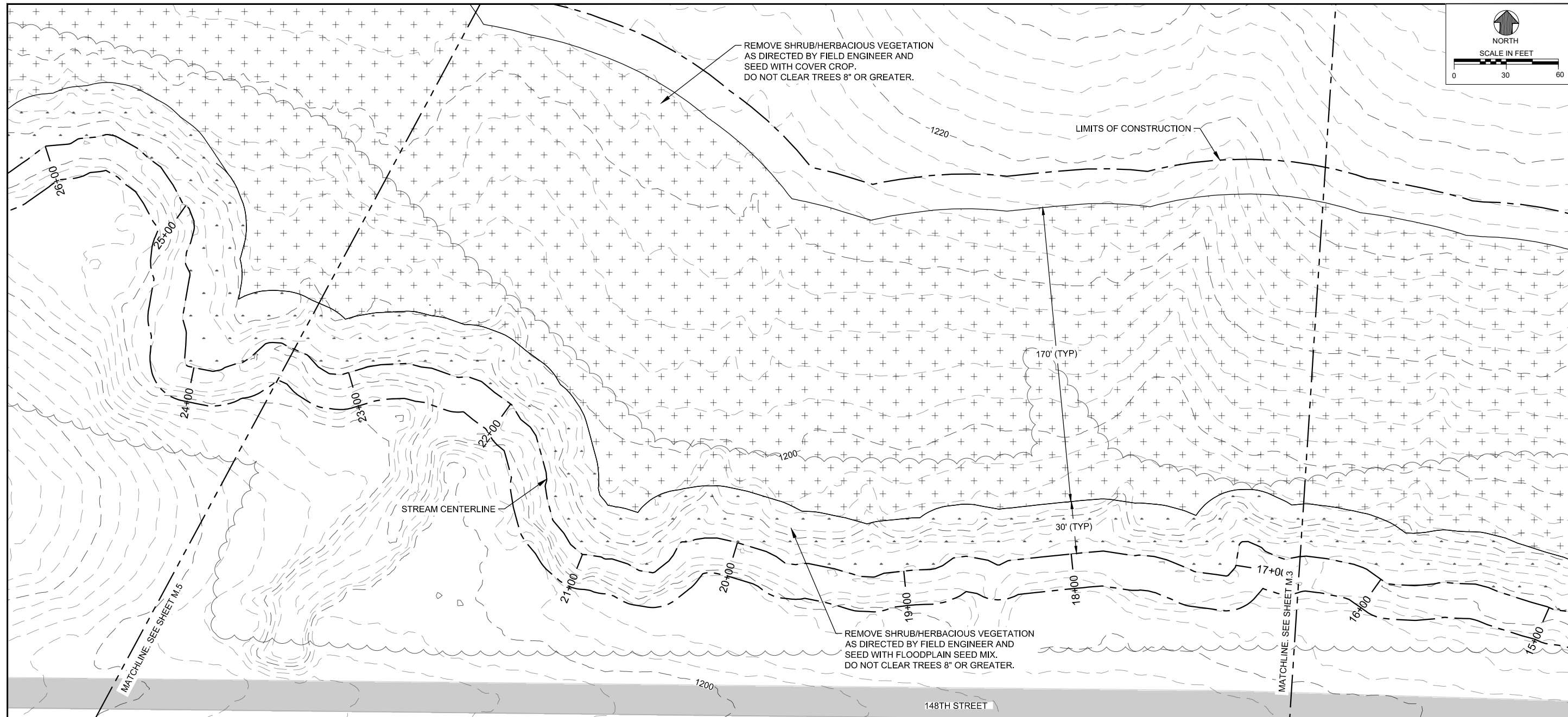
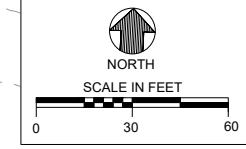
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**SITE B  
STREAM  
MITIGATION  
PLAN AND  
PROFILE  
(2 OF 4)**

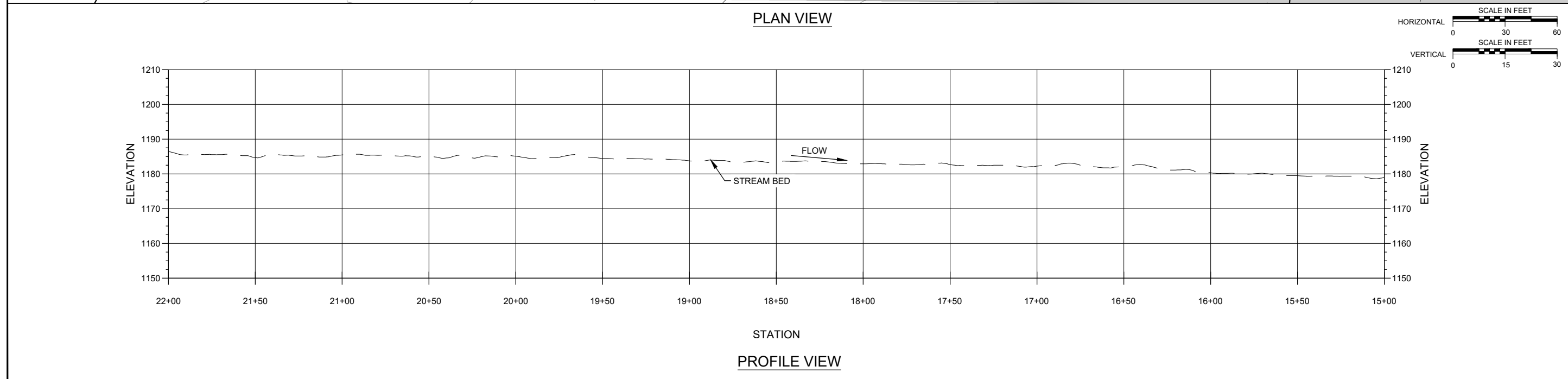
KEY:  
RB - RIGHT BANK  
LB - LEFT BANK  
SBS - STREAM BANK STABILIZATION  
FBG - FLOODPLAIN BENCH GRADING

SHEET  
**M.3**





PLAN VIEW



PROFILE VIEW

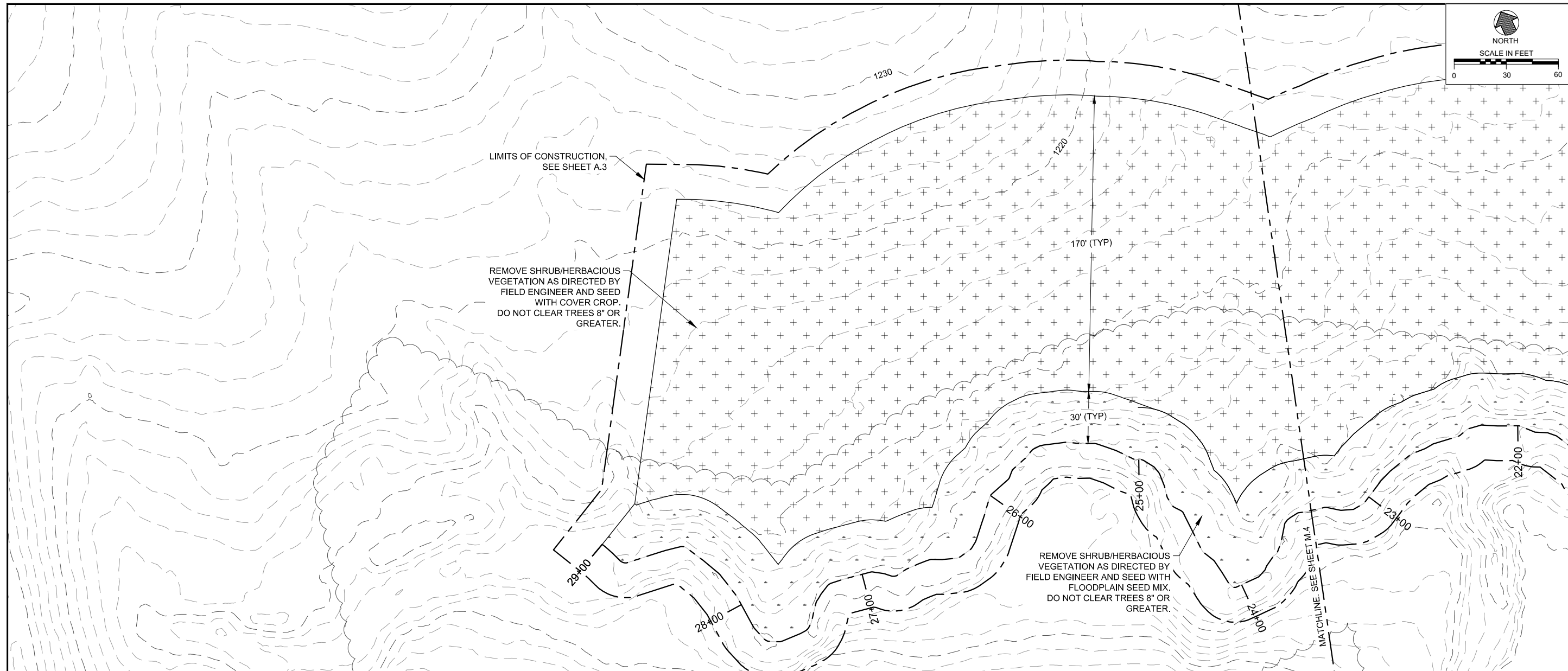
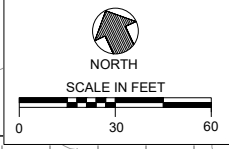
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

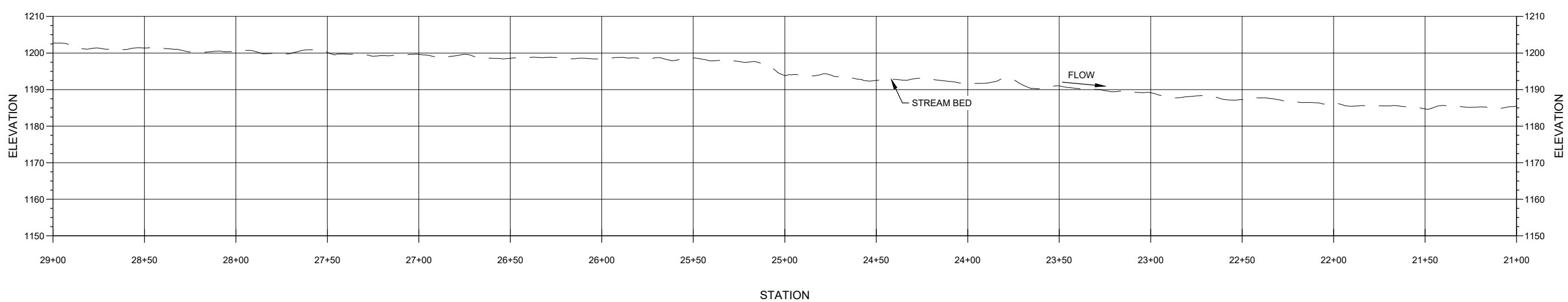
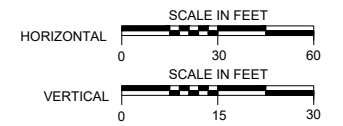
DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**SITE B  
STREAM  
MITIGATION  
PLAN AND  
PROFILE  
(3 OF 4)**

SHEET  
**M.4**



PLAN VIEW



PROFILE VIEW

THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

ENGINEER'S SEAL

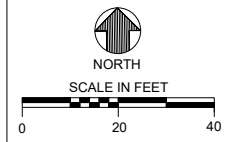
REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**SITE B  
STREAM  
MITIGATION  
PLAN AND  
PROFILE  
(4 OF 4)**

SHEET  
**M.5**





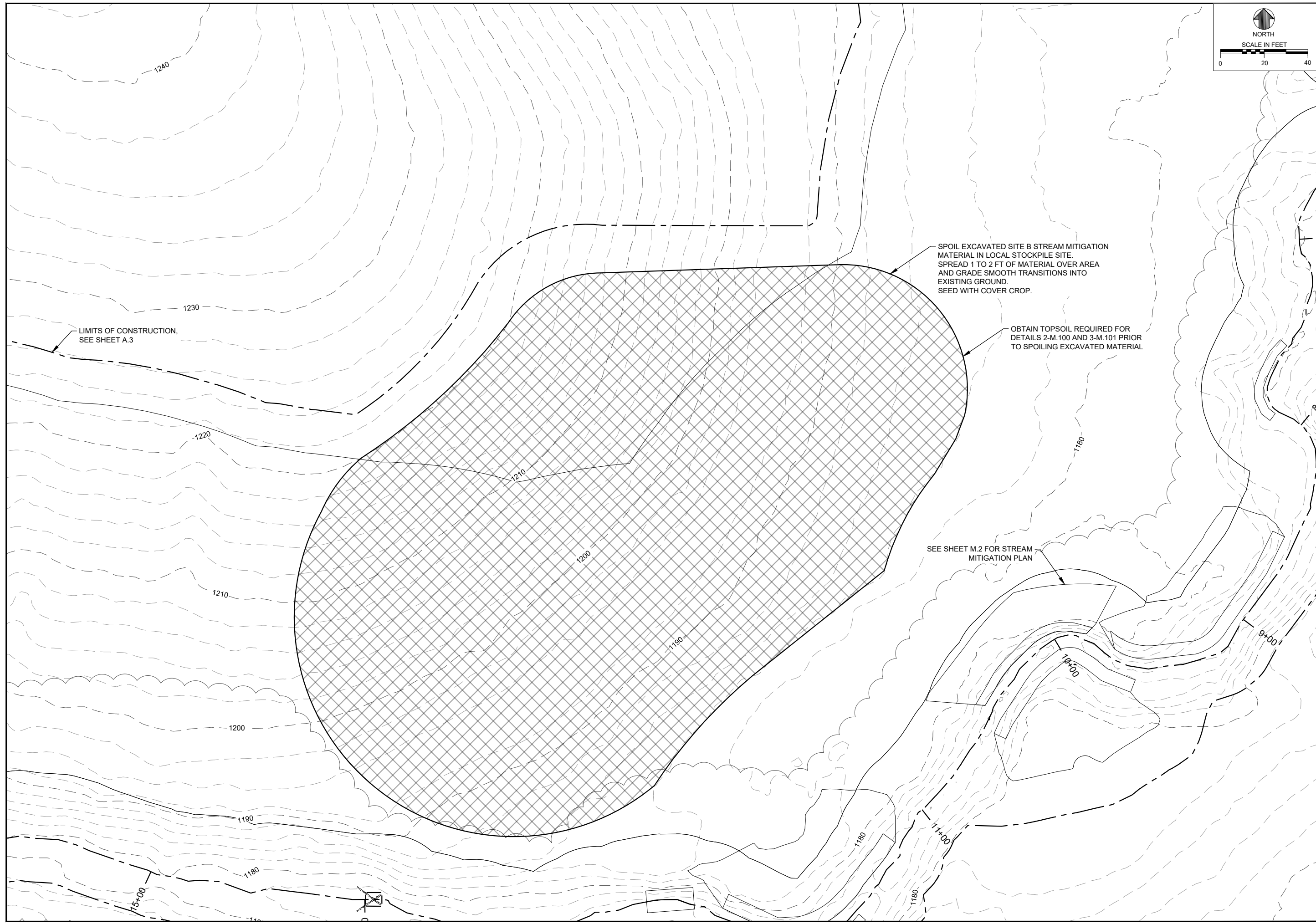
ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**SITE B  
STREAM  
MITIGATION  
SPOILS PLAN**

SHEET  
**M.6**

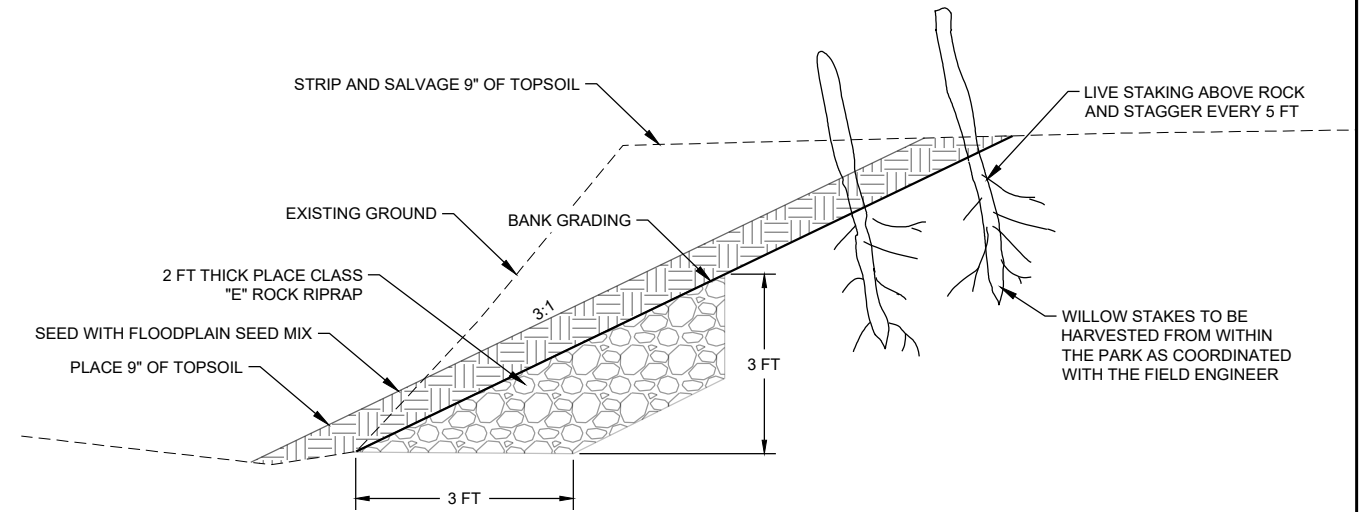
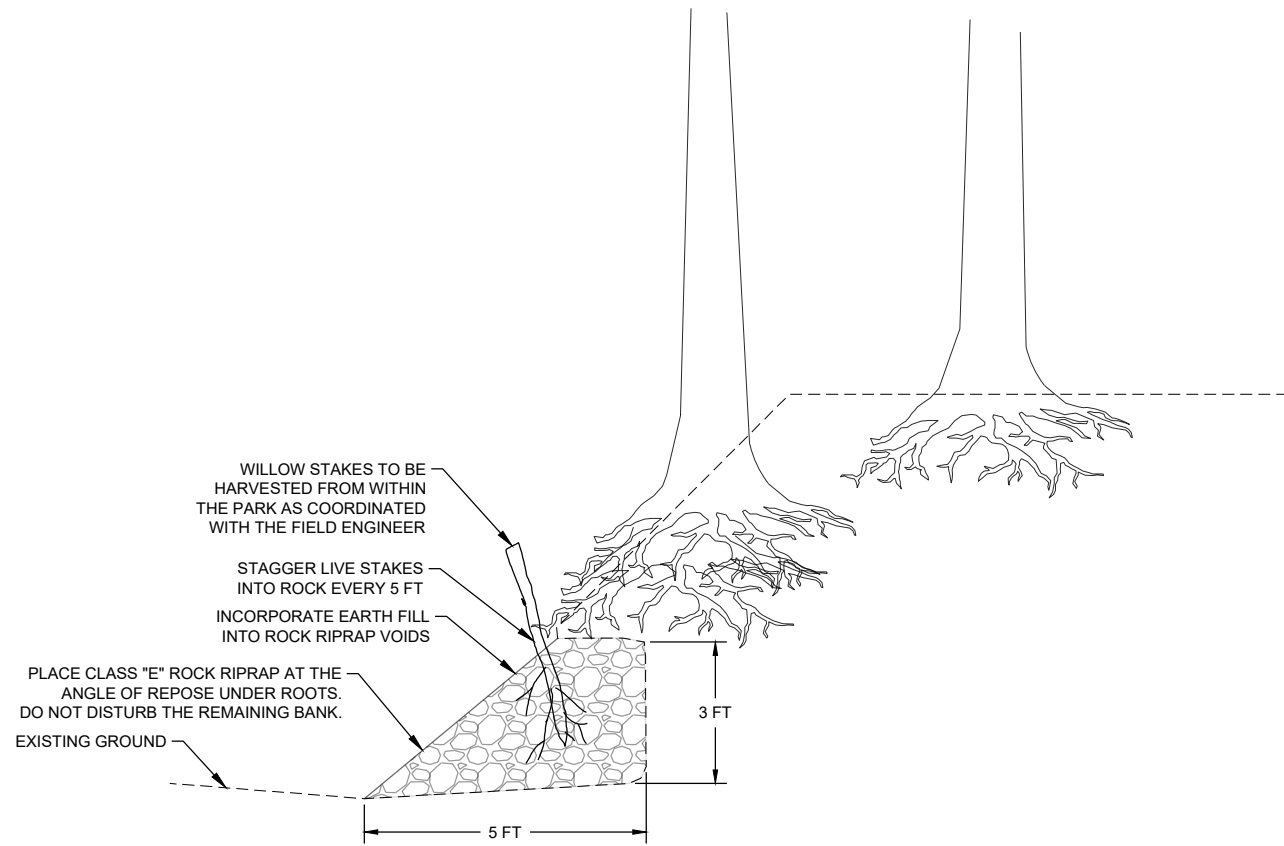


LIMITS OF CONSTRUCTION,  
SEE SHEET A.3

SPOIL EXCAVATED SITE B STREAM MITIGATION  
MATERIAL IN LOCAL STOCKPILE SITE.  
SPREAD 1 TO 2 FT OF MATERIAL OVER AREA  
AND GRADE SMOOTH TRANSITIONS INTO  
EXISTING GROUND.  
SEED WITH COVER CROP.

OBTAIN TOPSOIL REQUIRED FOR  
DETAILS 2-M.100 AND 3-M.101 PRIOR  
TO SPOILING EXCAVATED MATERIAL

SEE SHEET M.2 FOR STREAM  
MITIGATION PLAN



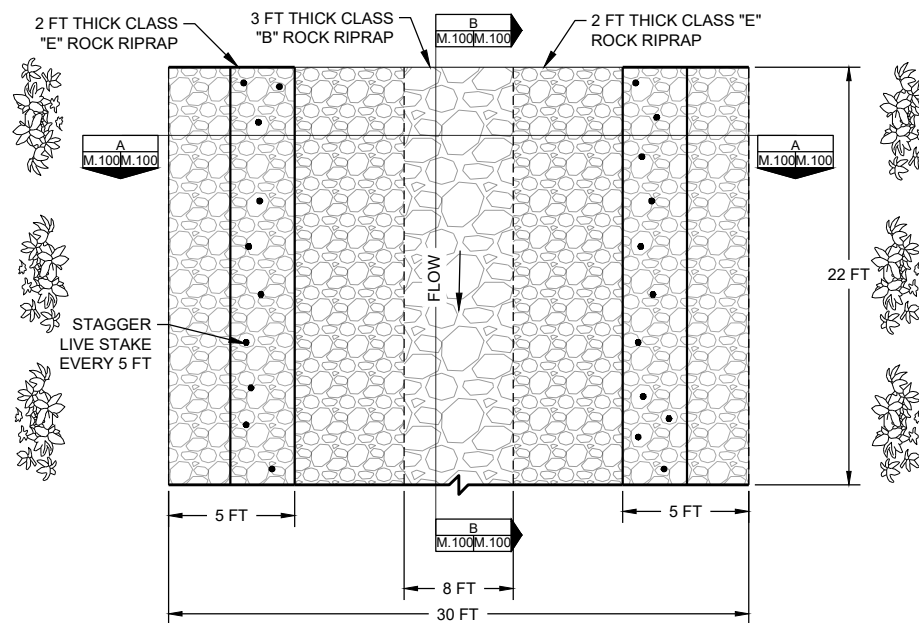
NOTE: SALVAGE AND REPLACE TOPSOIL FROM EXISTING BANKLINE. IF INSUFFICIENT QUANTITY LOCALLY, CONTRACTOR TO OBTAIN TOPSOIL FROM SPOILS AREA SHOWN ON M.6

STREAM BANK STABILIZATION DETAIL 1  
NOT TO SCALE

1  
M.100

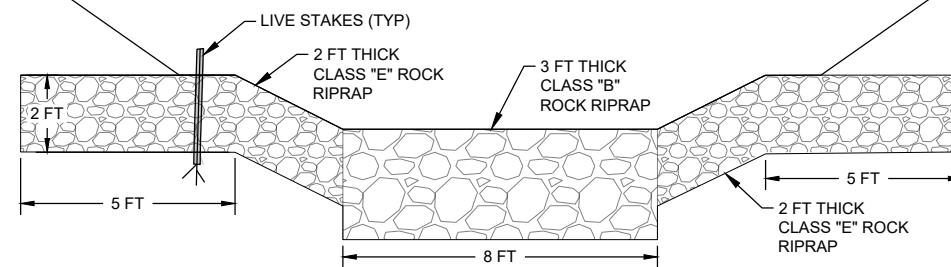
STREAM BANK STABILIZATION DETAIL 2  
NOT TO SCALE

2  
M.100



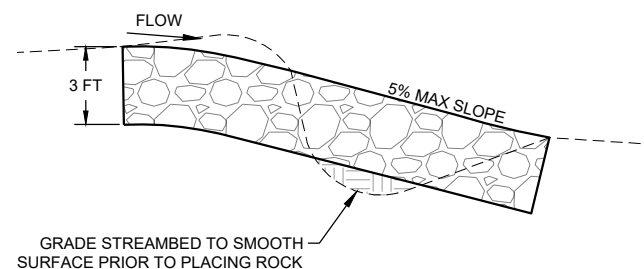
CONSTRUCTED ROCK RIFFLE PLAN VIEW

3  
M.100



CONSTRUCTED ROCK RIFFLE CROSS SECTION

A  
M.100



CONSTRUCTED ROCK RIFFLE PROFILE AT HEADCUTS

B  
M.100

ENGINEER'S SEAL

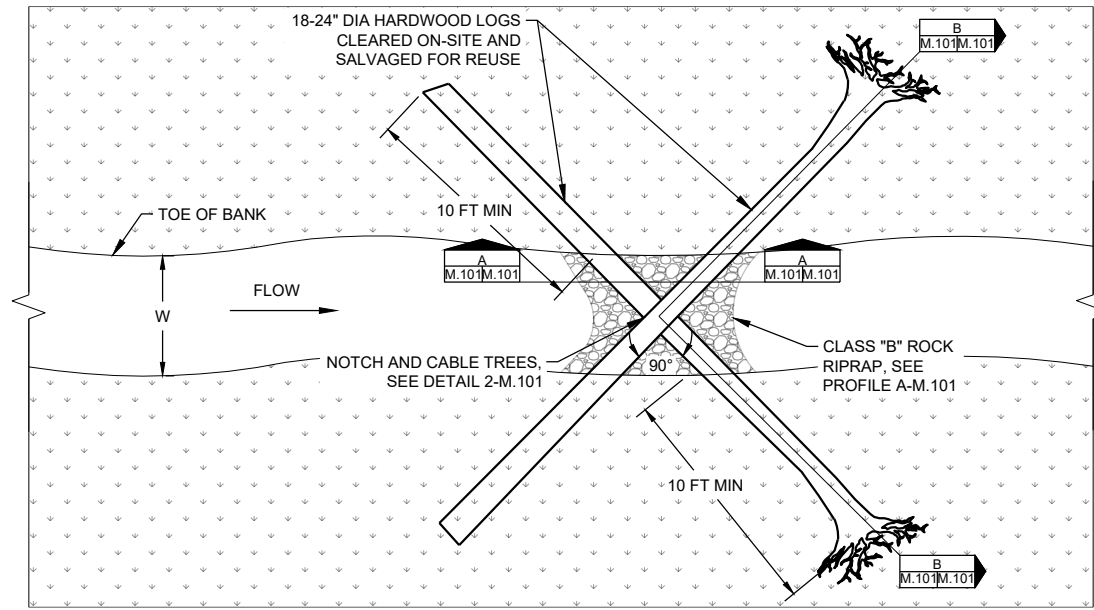
REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

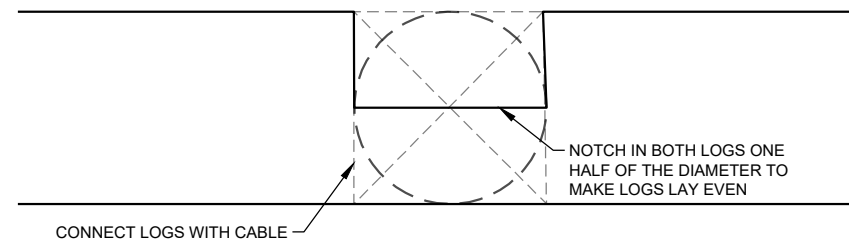
TITLE  
**STREAM STABILIZATION DETAILS**

SHEET  
**M.100**

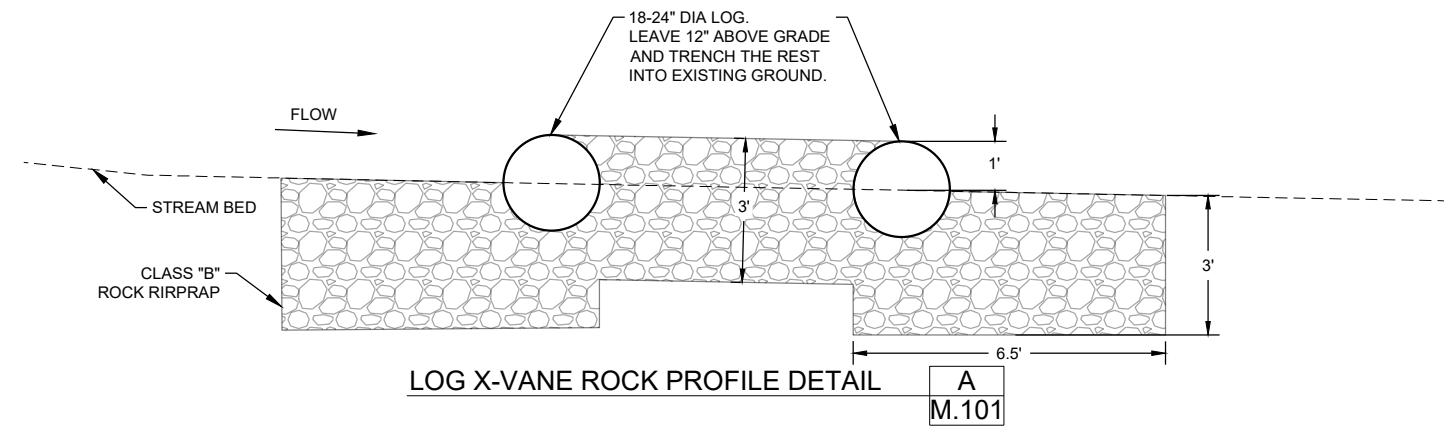




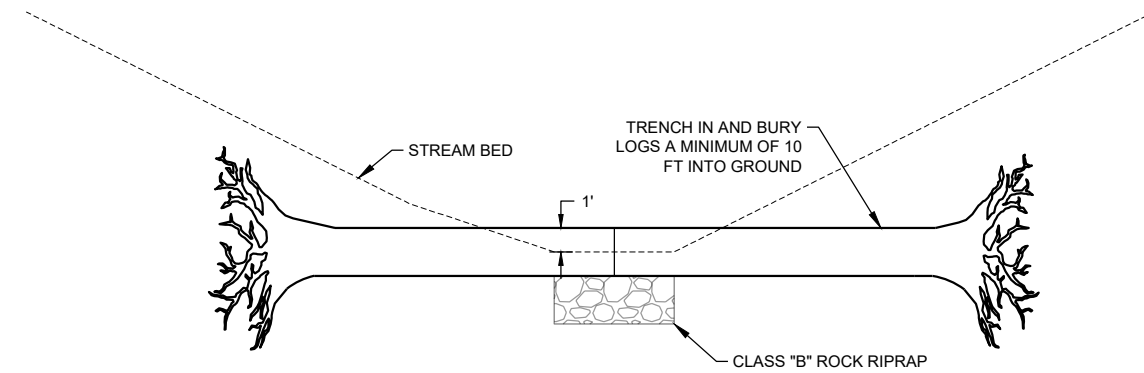
LOG X-VANE PLAN VIEW DETAIL 1  
M.101



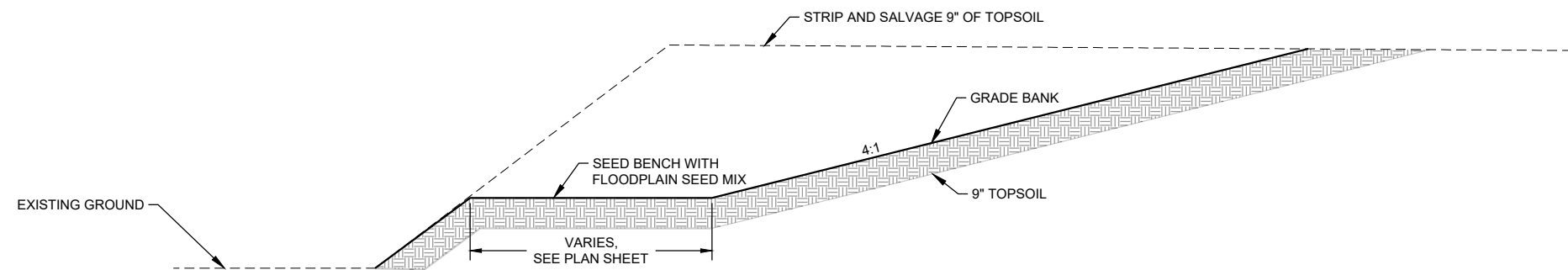
LOG CONNECTION DETAIL 2  
M.101



LOG X-VANE ROCK PROFILE DETAIL A  
M.101



LOG X-VANE CROSS SECTION B  
M.101



FLOODPLAIN BENCH GRADING DETAIL 3  
M.101

NOTE: SALVAGE AND REPLACE TOPSOIL FROM EXISTING BANKLINE. IF INSUFFICIENT QUANTITY LOCALLY, CONTRACTOR TO OBTAIN TOPSOIL FROM SPOILS AREA SHOWN ON M.6

ENGINEER'S SEAL

REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**STREAM MITIGATION DETAILS**



**STORMWATER POLLUTION PREVENTION PLAN**

ALL CONTRACTORS/SUBCONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN A MANNER THAT MINIMIZES EROSION AND PREVENTS SEDIMENTS FROM LEAVING THE PROJECT SITE OR ENTERING NEW OR EXISTING STORM WATER SYSTEMS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE AND IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THEIR ENTIRE CONTRACT. THIS RESPONSIBILITY SHALL BE FURTHER SHARED WITH SUBCONTRACTORS WHOSE WORK IS A SOURCE OF POTENTIAL POLLUTION AS DEFINED IN THIS SWPPP.

EROSION CONTROL IS A LUMP SUM PAYMENT AND INCLUDES ALL EROSION CONTROL ITEMS EXCEPT FOR HYDROMULCH, WHICH HAVE A LINE ITEM IN THE BID FORM. CONTRACTOR IS RESPONSIBLE FOR PLACEMENT, CLEAN OUT, AND MAINTENANCE OF ALL SWPPP ITEMS AND REMOVAL ONCE ENGINEER'S APPROVAL IS PROVIDED.

**1. SITE DESCRIPTION**

THIS SWPPP IS FOR THE CONSTRUCTION OF WATERSHED AND LAKE IMPROVEMENTS AT THREE MILE LAKE IN TOWNSHIP T73 N, RANGE 29 W, SECTIONS 19, 30, AND 31, AND TOWNSHIP T73 N, RANGE 30 W, SECTIONS 25. THIS PROJECT CONSISTS OF THE DREDGING OF TWO WATERSHED PONDS/EARTH IMPOUNDMENTS, ONE SPOILS BASIN, CONSTRUCTION OF TWO WATERSHED PONDS/EARTH IMPOUNDMENTS, STREAM MITIGATION, AND INCIDENTAL WORK AS REQUIRED BY THE PLANS AND/OR THE DNR CONSTRUCTION INSPECTOR.

**POTENTIAL SOURCES OF POLLUTION:**

SITE SOURCES OF POLLUTION GENERATED AS A RESULT OF THIS WORK RELATE TO SILTS AND SEDIMENT WHICH MAY BE TRANSPORTED AS A RESULT OF A STORM EVENT. HOWEVER, THIS SWPPP PROVIDES CONVEYANCE FOR OTHER (NON-PROJECT RELATED) OPERATIONS. THESE OTHER OPERATIONS HAVE STORM WATER RUNOFF, THE REGULATION OF WHICH IS BEYOND THE CONTROL OF THIS SWPPP. POTENTIALLY THIS RUNOFF CAN CONTAIN VARIOUS POLLUTANTS RELATED TO SITE-SPECIFIC LAND USES. EXAMPLES ARE:

**RURAL AGRICULTURAL ACTIVITIES:**

RUNOFF FROM AGRICULTURAL LAND USE CAN POTENTIALLY CONTAIN CHEMICALS INCLUDING HERBICIDES, PESTICIDES, FUNGICIDES AND FERTILIZERS.

**2. CONTROLS**

AT DOWNGRADIENT LOCATIONS WHERE RUNOFF CAN MOVE FROM EACH CONSTRUCTION SITE, CONTROLS SHALL BE PLACED ALONG THE PERIMETER OF THE AREAS TO BE DISTURBED PRIOR TO BEGINNING GRADING, EXCAVATION OR CLEARING AND GRUBBING OPERATIONS. CONTROLS INCLUDE SILT FENCE, STRAW WADDLE (OR APPROVED EQUIVALENTS BY FIELD ENGINEER) AS LAID OUT ON THE SITE PLAN SHEETS. VEGETATION IN AREAS NOT NEEDED FOR CONSTRUCTION SHALL BE PRESERVED.

CONSTRUCTION ENTRANCES TO BE PLACED AT ALL LOCATIONS WHERE EQUIPMENT ENTERS AND EXITS EACH PROJECT SITE FROM PARK ROADS IN ORDER TO REDUCE SEDIMENT TRACK OUT. ANY SEDIMENT TRACK OUT THAT DOES OCCUR MUST BE REMOVED AND SPOILED ON SITE.

TEMPORARY STABILIZING SEEDING SHALL BE COMPLETED AS THE DISTURBED AREAS ARE CONSTRUCTED. IF CONSTRUCTION ACTIVITY IS NOT PLANNED TO OCCUR IN A DISTURBED AREA FOR AT LEAST 21 DAYS, THE AREA SHALL BE STABILIZED BY TEMPORARY SEEDING OR MULCHING WITHIN 14 DAYS. OTHER STABILIZING METHODS SHALL BE USED OUTSIDE THE SEEDING TIME PERIOD. TEMPORARY SEEDING AND MULCHING SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT. UPON REACHING FINAL GRADES, HYDROMULCH WILL BE PLACED ON SLOPES AS INDICATED ON PLANS.

AS THE WORK PROGRESSES, ADDITIONAL EROSION CONTROL ITEMS MAY BE REQUIRED AS DETERMINED BY THE CONTRACTOR AFTER FIELD INVESTIGATION. THE CONTRACTOR WILL COMPLETE THE CONSTRUCTION WITH THE ESTABLISHMENT OF PERMANENT PERENNIAL VEGETATION OF ALL DISTURBED AREAS AND HYDROMULCH IN SPECIFIED LOCATIONS.

**OTHER CONTROLS:**

CONTRACTOR DISPOSAL OF UNUSED CONSTRUCTION MATERIALS AND CONSTRUCTION MATERIAL WASTES SHALL COMPLY WITH APPLICABLE STATE AND LOCAL WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEM REGULATIONS. IN THE EVENT OF A CONFLICT WITH OTHER GOVERNMENTAL LAWS, RULES AND REGULATIONS, THE MORE RESTRICTIVE LAWS, RULES OR REGULATIONS SHALL APPLY.

**APPROVED STATE OR LOCAL PLANS:**

DURING THE COURSE OF THIS CONSTRUCTION, IT IS POSSIBLE THAT SITUATIONS WILL ARISE WHERE UNKNOWN MATERIALS WILL BE ENCOUNTERED. WHEN SUCH SITUATIONS ARE ENCOUNTERED, THEY WILL BE HANDLED ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS IN EFFECT AT THE TIME.

**3. MAINTENANCE**

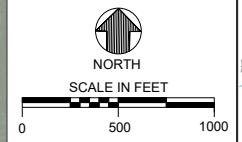
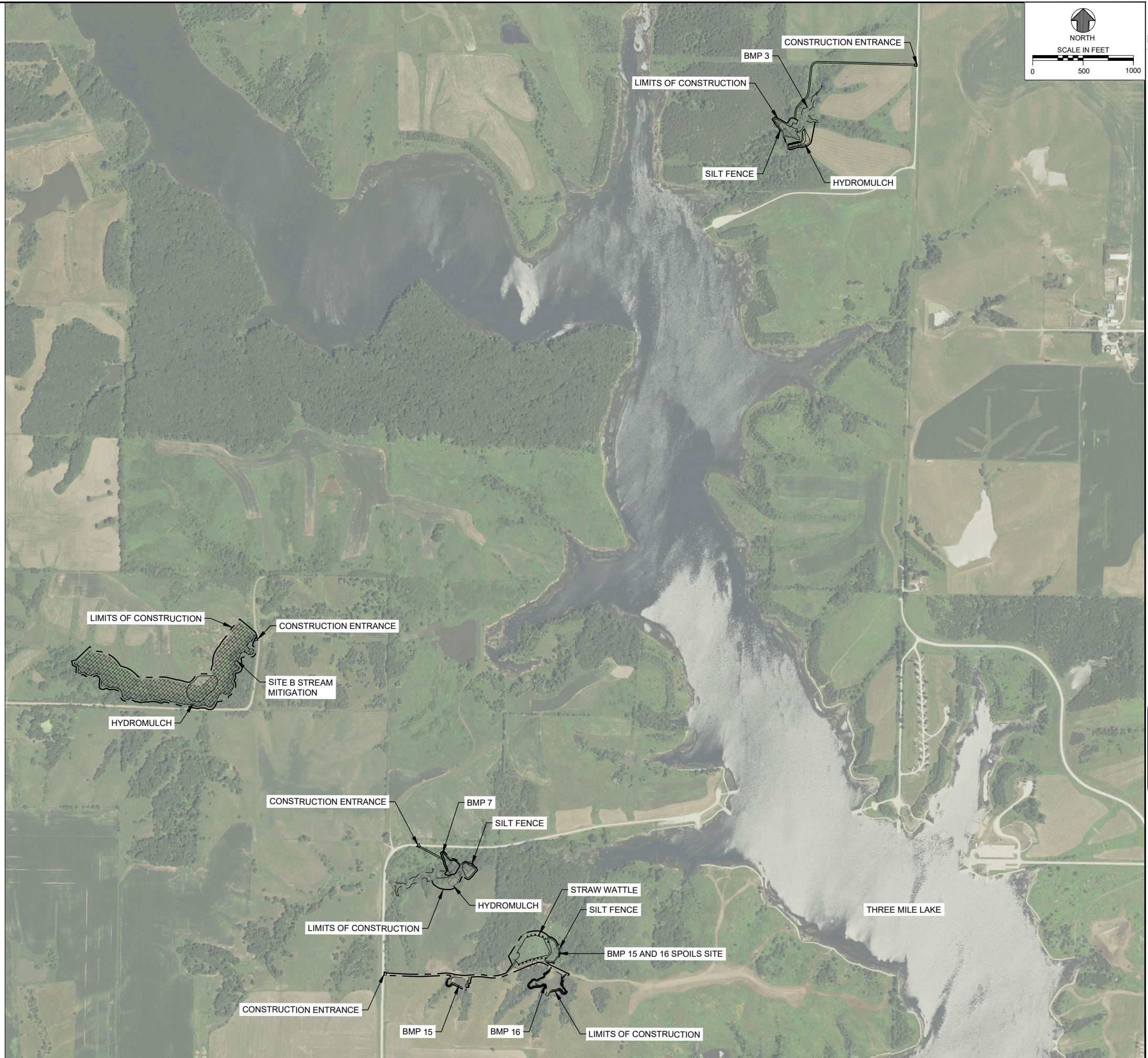
THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL TEMPORARY EROSION CONTROL MEASURES IN PROPER WORKING ORDER, INCLUDING CLEANING, REPAIRING, OR REPLACING THEM THROUGHOUT THE CONTRACT PERIOD. CLEANING OF SILT CONTROL DEVICES SHALL BEGIN WHEN THE FEATURES HAVE LOST 50% OF THEIR CAPACITY.

**4. INSPECTIONS**

INSPECTIONS SHALL BE MADE JOINTLY BY THE CONTRACTOR AND THE CONTRACTING AUTHORITY EVERY SEVEN CALENDAR DAYS AND AFTER EACH RAIN EVENT THAT IS 1/2" OR GREATER. THE CONTRACTOR SHALL IMMEDIATELY BEGIN CORRECTIVE ACTION ON ALL DEFICIENCIES FOUND. THE FINDINGS OF THIS INSPECTION SHALL BE RECORDED IN THE PROJECT DIARY. THIS SWPPP MAY BE REVISED BASED ON THE FINDINGS OF THE INSPECTION. THE CONTRACTOR SHALL IMPLEMENT ALL REVISIONS. ALL CORRECTIVE ACTIONS SHALL BE COMPLETED WITHIN 3 CALENDAR DAYS OF THE INSPECTION.

**5. NON-STORM DISCHARGES**

THIS INCLUDES SUBSURFACE DRAINS (I.E. LONGITUDINAL AND STANDARD SUBDRAINS), SLOPE DRAINS AND BRIDGE END DRAINS. THE VELOCITY OF THE DISCHARGE FROM THESE FEATURES MAY BE CONTROLLED BY THE USE OF ROLLED EROSION CONTROL, OR RIPRAP.



**FYRA**  
ENGINEERING  
100 Court Avenue, Suite 202  
Des Moines, Iowa 50309  
515.444.5393  
www.fyraengineering.com

THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

ENGINEER'S SEAL

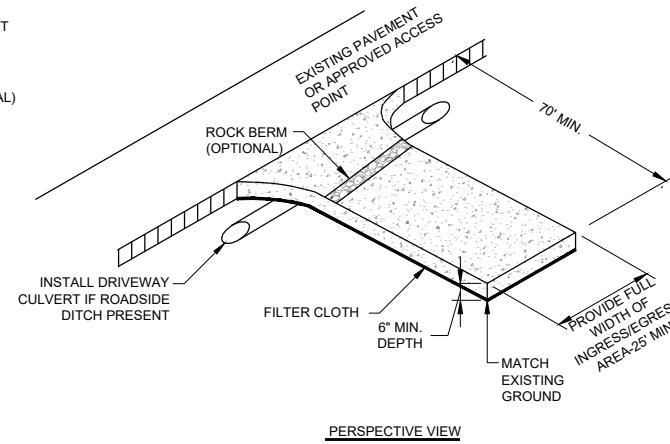
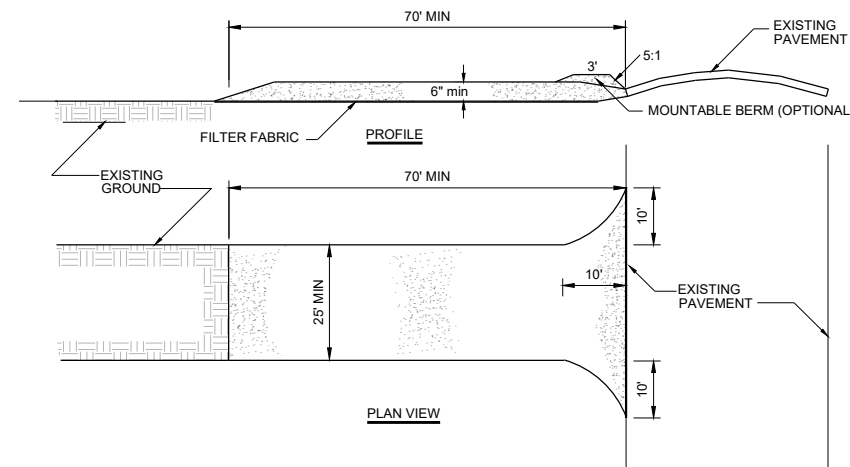
REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
**SWPP PLAN**

SHEET  
**S.1**





**FILTER FABRIC SPECIFICATIONS**

PROPERTY	TEST PROCEDURE	MIN. FABRIC VALUE	
		LIGHT DUTY ENTRANCE	HEAVY DUTY ENTRANCE
GRAB TENSILE STRENGTH	ASTM D-4632	180 LBS.	250 LBS.
GRAB ELONGATION@ FAILURE	ASTM D-4632	50%	60%
MULLEN BURST STRENGTH	ASTM D-3786	250 PSI.	380 PSI.
PUNCTURE STRENGTH	ASTM D-4833	90 LBS.	125 LBS.
APPARENT OPENING SIZE	ASTM D-4751	0.2 MM	0.2 MM
AGGREGATE DEPTH		6 IN.	10 IN.

LIGHT DUTY ENTRANCE SHALL BE DEFINED AS SITES THAT HAVE BEEN GRADED TO SUBGRADE AND WHERE MOST TRAVEL WOULD BE SINGLE AXLE VEHICLES AND AN OCCASIONAL MULTI-AXLE TRUCK.  
HEAVY DUTY ENTRANCE SHALL BE DEFINED AS SITES WITH ONLY ROUGH GRADING AND WHERE MOST TRAVEL WOULD BE MULTIAXLE VEHICLES.

**CONSTRUCTION SPECIFICATIONS**

- STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT
- LENGTH - AS REQUIRED, BUT NOT LESS THAN 70 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
- THICKNESS - NOT LESS THAN SIX (6) INCHES.
- WIDTH - TWENTY FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
- FILTER FABRIC - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER WILL NOT BE REQUIRED ON A SINGLE FAMILY RESIDENCE LOT.
- SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5H:1V SLOPES WILL BE PERMITTED.
- MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
- WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
- PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

**STABILIZED CONSTRUCTION ENTRANCE**

1  
S.100

NOT TO SCALE

THREE MILE LAKE RESTORATION PHASE 1  
IOWA DEPARTMENT OF NATURAL RESOURCES  
UNION COUNTY, IOWA  
2021

ENGINEER'S SEAL

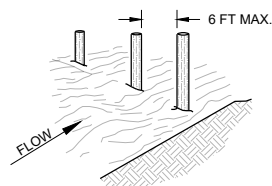
REVISIONS	
NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

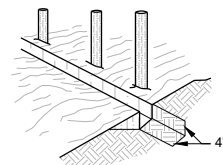
TITLE  
**SWPP  
DETAILS  
(1 OF 2)**

SHEET  
**S.100**

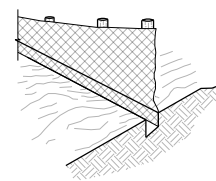
1. SET THE STAKES



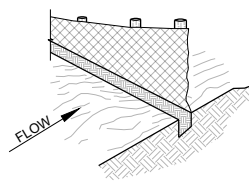
2. EXCAVATE A 4" X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES



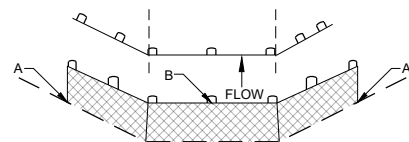
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH



4. BACKFILL AND COMPACT THE EXCAVATED SOIL



SHEET FLOW INSTALLATION  
(PERSPECTIVE VIEW)



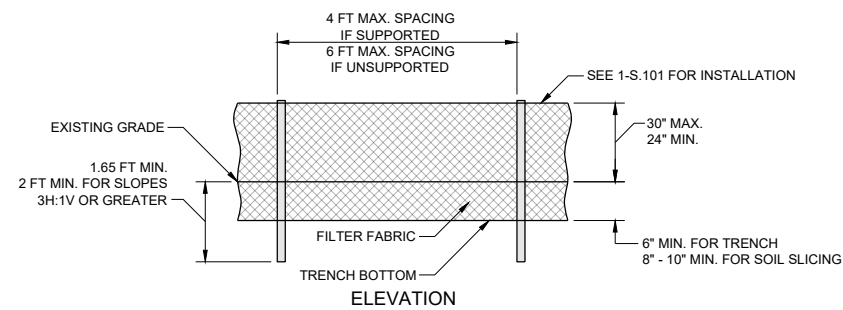
POINTS A SHOULD BE HIGHER THAN POINT B

DRAINAGEWAY INSTALLATION  
(ELEVATION)

SILT FENCE INSTALLATION  
NOT TO SCALE

1  
S.101

NOTE:  
STEEL FENCE POSTS SHOULD BE USED  
AS STAKES FOR ALL INSTALLATIONS



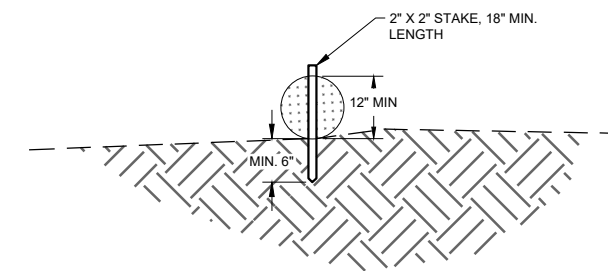
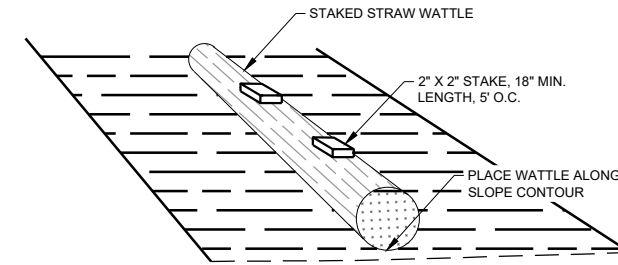
SILT FENCE FABRIC SPECIFICATIONS

PROPERTY	TEST PROCEDURE	MIN. FABRIC VALUE
GRAB TENSILE STRENGTH	ASTM D-4632	100 LBS.
GRAB ELONGATION@ FAILURE	ASTM D-4632	15%
TRAPEZOID TEAR	ASTM D-4533	70 LBS.
MULLEN BURST STRENGTH	ASTM D-3786	250 PSF
PUNCTURE STRENGTH	ASTM D-4833	50 LBS.
PERMITTIVITY	ASTM D-4491	0.07 SEC-1 MIN.
PERMEABILITY	ASTM D-4491	.005 CM/SEC
APPARENT OPENING SIZE	ASTM D-4751	0.90 MM
UV RESISTANCE(500 HRS)	ASTM D-4355	90%

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	SLOPE	MAX. SPACING ON SLOPE
10% FLATTER	10:1 OR FLATTER	300 ft.
10%<15	10:1>x<7.5:1	150 ft.
15%<20	7.5:1>x<5:1	100 ft.
20%<30	5:1>x<3.5:1	50 ft.
30%<50	3.5:1>x<2:1	25 ft.

SILT FENCE BARRIER  
NOT TO SCALE

2  
S.101



STRAW WATTLE DETAIL  
NOT TO SCALE

3  
S.101

REVISIONS

NO.	DATE

DESIGNED BY: SEM  
DRAWN BY: CKW  
QA / QC BY: MKS  
PROJECT NO.: 007-20-01  
DATE: 08.10.2021

TITLE  
SWPP  
DETAILS  
(2 OF 2)

SHEET  
S.101