

BADGER MILL CREEK
STREAM RESTORATION

FOR THE

LAND & WATER RESOURCES DEPARTMENT
DANE COUNTY, WISCONSIN
JULY 2020



DANE COUNTY,
WISCONSIN



DRAWING TITLE	SHEET NO.
TITLE PAGE	AB0
CONSTRUCTION ACCESS	AB1
ALIGNMENT DATA	AB2
PROJECT A PLANS	A1-A8
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LAND & WATER
RESOURCES
DEPARTMENT

TITLE SHEET

PROJECTS A & B

CITY OF VERONA, DANE COUNTY, WI

NO.	REVISION	DATE	BY
1	GRADING AREA B & INSTREAM DETAILS	9/1/20	TMN
2	GRADING & INSTREAM DETAILS	11/17/20	TMN
3	INSTREAM STRUCTURES & INSTREAM DETAILS	4/26/21	TMN
DATE: 07/30/2020			
SCALE: NTS			
DRAWN BY: TMN			
CHECKED BY: JDB			
SHEET AB0			



**LAND & WATER
RESOURCES
DEPARTMENT**

CONSTRUCTION ACCESS

PROJECTS A & B

CITY OF VERONA, DANE COUNTY, WI

NO.	REVISION	DATE	BY
1	NOTES	9/1/20	TMN

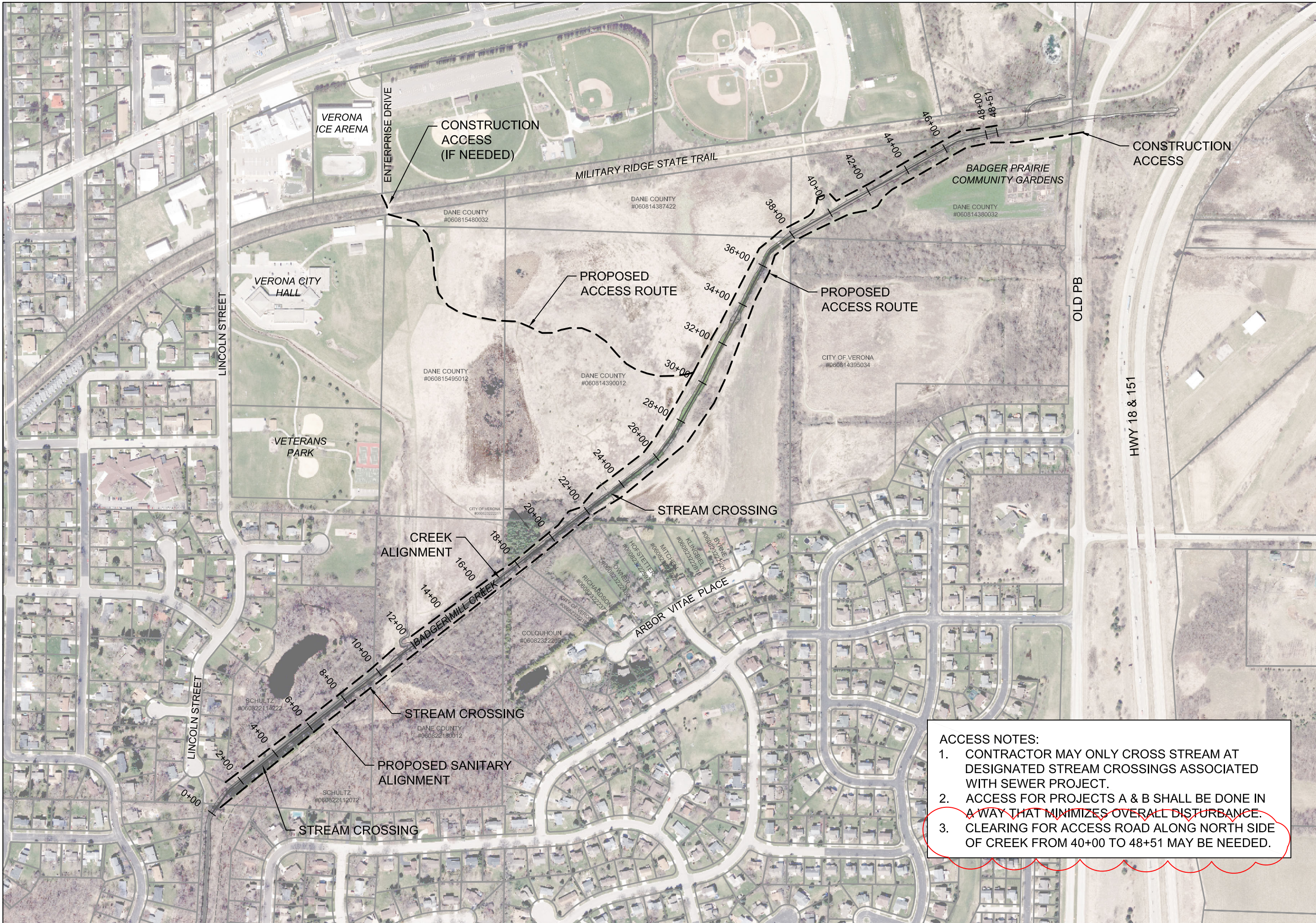
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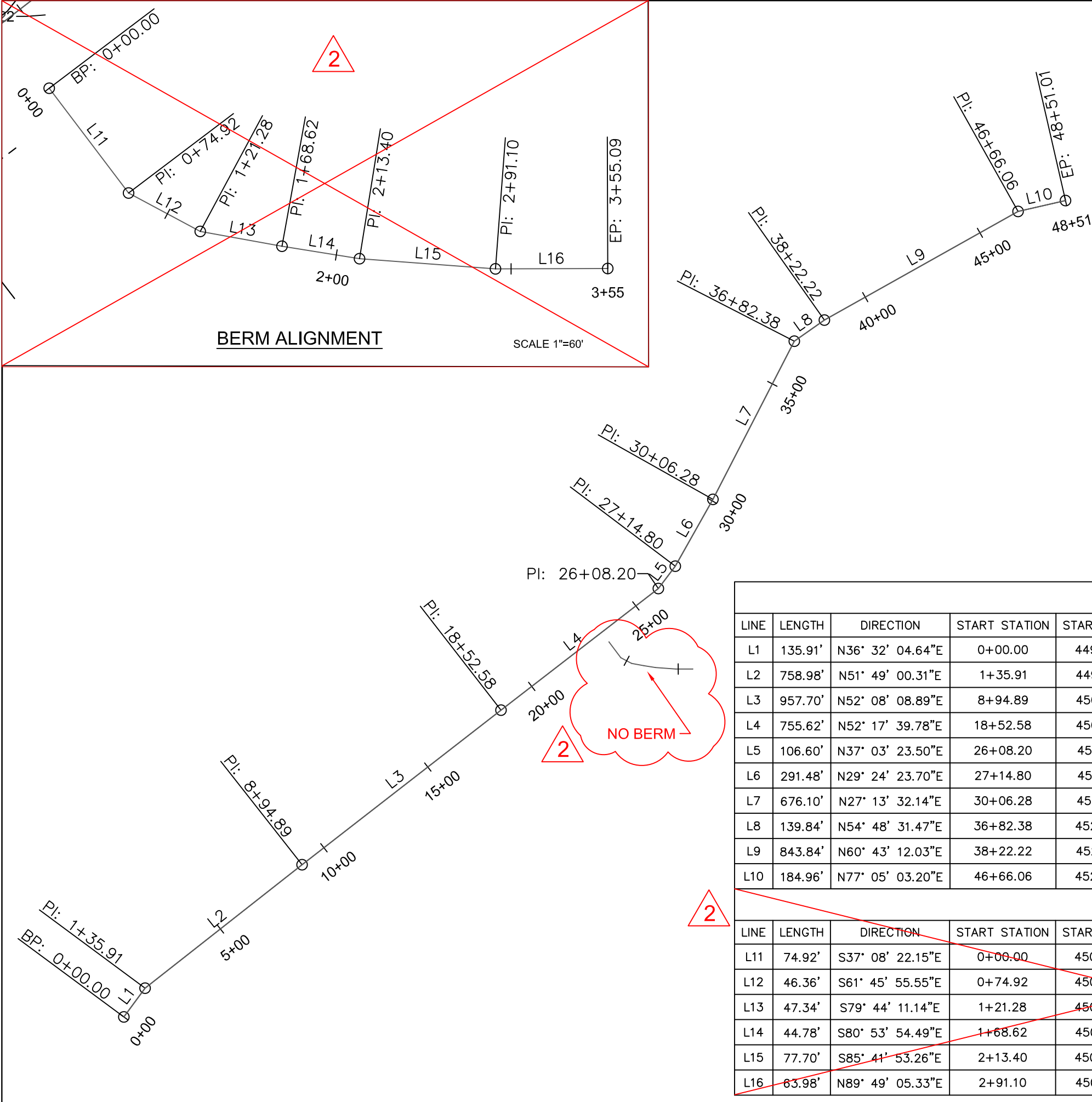
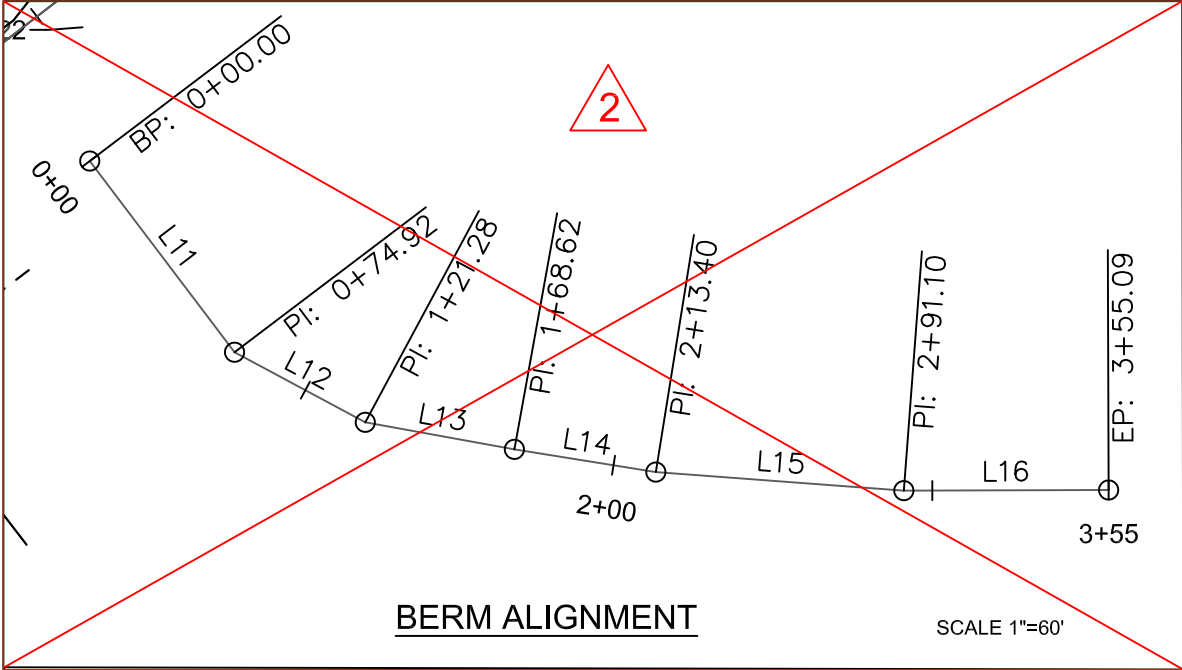
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SHEET
AB1



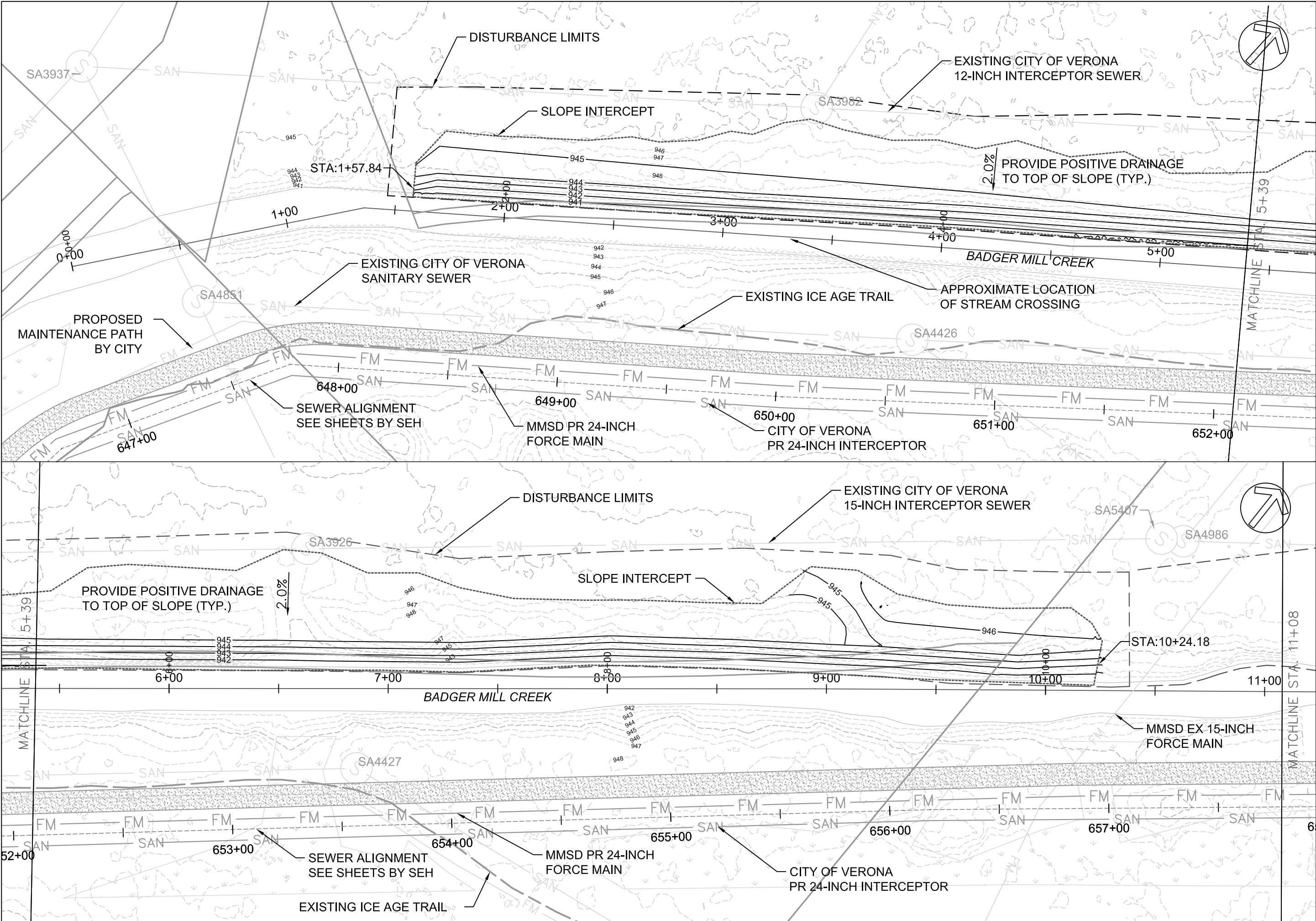


CHANNEL ALIGNMENT								
LINE	LENGTH	DIRECTION	START STATION	START NORTHING	START EASTING	END STATION	END NORTHING	END EASTING
L1	135.91'	N36° 32' 04.64"E	0+00.00	449528.9668	782528.5754	1+35.91	449638.1673	782609.4817
L2	758.98'	N51° 49' 00.31"E	1+35.91	449638.1673	782609.4817	8+94.89	450107.3529	783206.0691
L3	957.70'	N52° 08' 08.89"E	8+94.89	450107.3529	783206.0691	18+52.58	450695.1789	783962.1391
L4	755.62'	N52° 17' 39.78"E	18+52.58	450695.1789	783962.1391	26+08.20	451157.3177	784559.9557
L5	106.60'	N37° 03' 23.50"E	26+08.20	451157.3177	784559.9557	27+14.80	451242.3871	784624.1918
L6	291.48'	N29° 24' 23.70"E	27+14.80	451242.3871	784624.1918	30+06.28	451496.3146	784767.3110
L7	676.10'	N27° 13' 32.14"E	30+06.28	451496.3146	784767.3110	36+82.38	452097.5086	785076.6223
L8	139.84'	N54° 48' 31.47"E	36+82.38	452097.5086	785076.6223	38+22.22	452178.0979	785190.9019
L9	843.84'	N60° 43' 12.03"E	38+22.22	452178.0979	785190.9019	46+66.06	452590.8028	785926.9356
L10	184.96'	N77° 05' 03.20"E	46+66.06	452590.8028	785926.9356	48+51.01	452632.1440	786107.2126
BERM ALIGNMENT								
LINE	LENGTH	DIRECTION	START STATION	START NORTHING	START EASTING	END STATION	END NORTHING	END EASTING
L11	74.92'	S37° 08' 22.15"E	0+00.00	450954.2454	784372.2078	0+74.92	450894.5243	784417.4392
L12	46.36'	S61° 45' 55.55"E	0+74.92	450894.5243	784417.4392	1+21.28	450872.5927	784458.2824
L13	47.34'	S79° 44' 11.14"E	1+21.28	450872.5927	784458.2824	1+68.62	450864.1574	784504.8670
L14	44.78'	S80° 53' 54.49"E	1+68.62	450864.1574	784504.8670	2+13.40	450857.0733	784549.0867
L15	77.70'	S85° 41' 53.26"E	2+13.40	450857.0733	784549.0867	2+91.10	450851.2450	784626.5673
L16	63.98'	N89° 49' 05.33"E	2+91.10	450851.2450	784626.5673	3+55.09	450851.4481	784690.5519

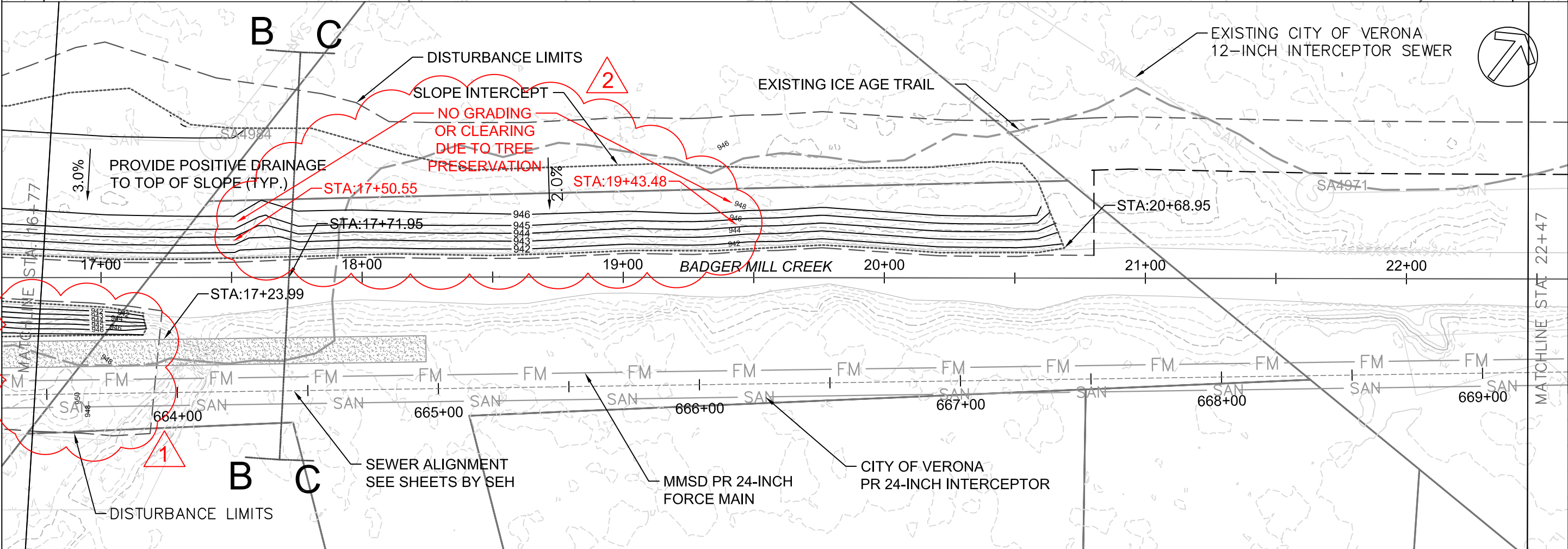
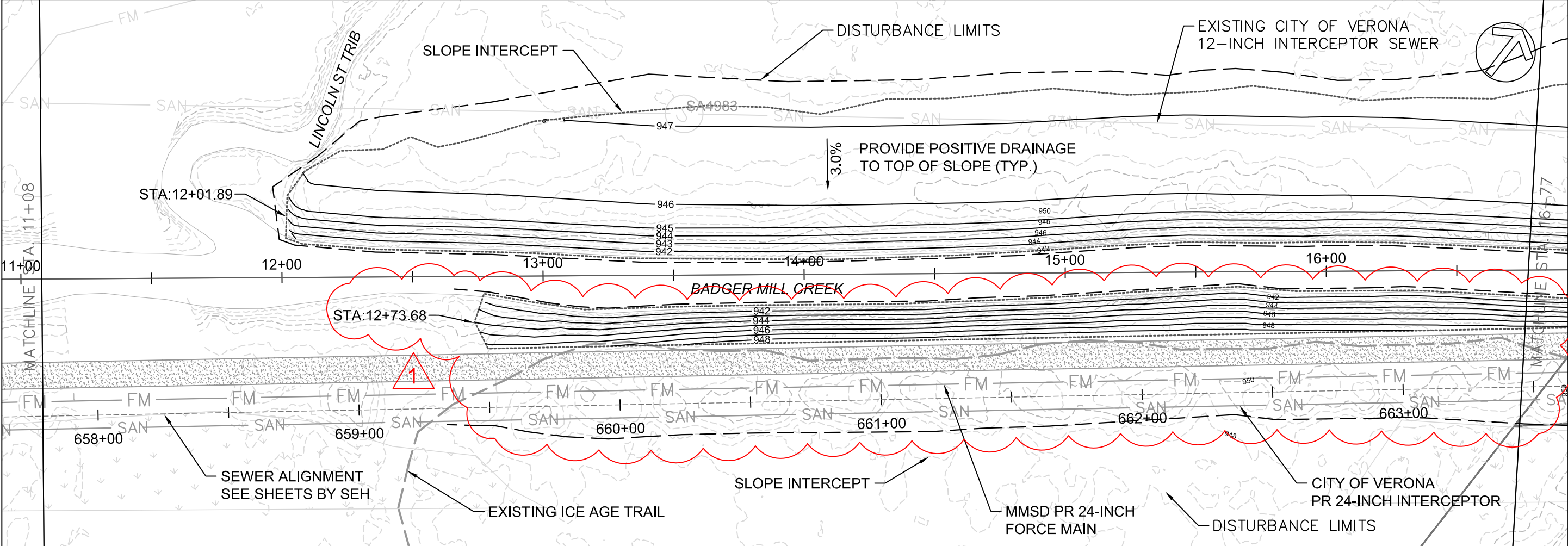
DANE COUNTY

LAND & WATER RESOURCES DEPARTMENT

ALIGNMENT DATA		PROJECTS A & B		CITY OF VERONA, DANE COUNTY, WI	
NO. REVISION	DATE BY				
2	11/17/20	NO BERM	TMN		
DATE: 07/30/2020					
SCALE: 1" = 400'					
DRAWN BY: TMN					
CHECKED BY: JDB					
SHEET AB2					



GRADING AREA A		PROJECT A		CITY OF VERONA, DANE COUNTY, WI	
NO. / REVISION	DATE BY				
DATE: 07/30/2020					
SCALE: 1" = 40'					
DRAWN BY: TMN					
CHECKED BY: JDB					
SHEET A1					

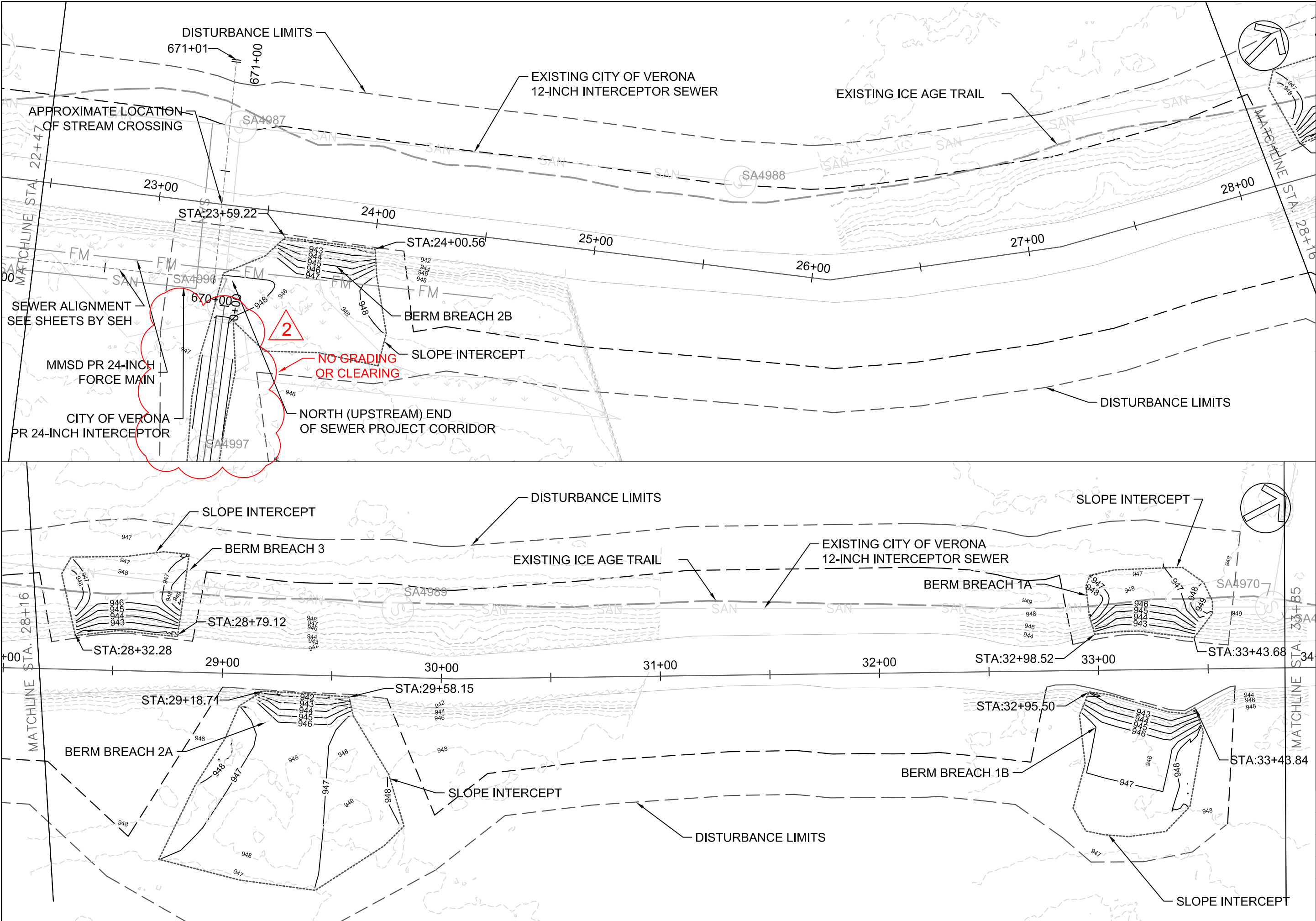


GRADING AREAS B & C

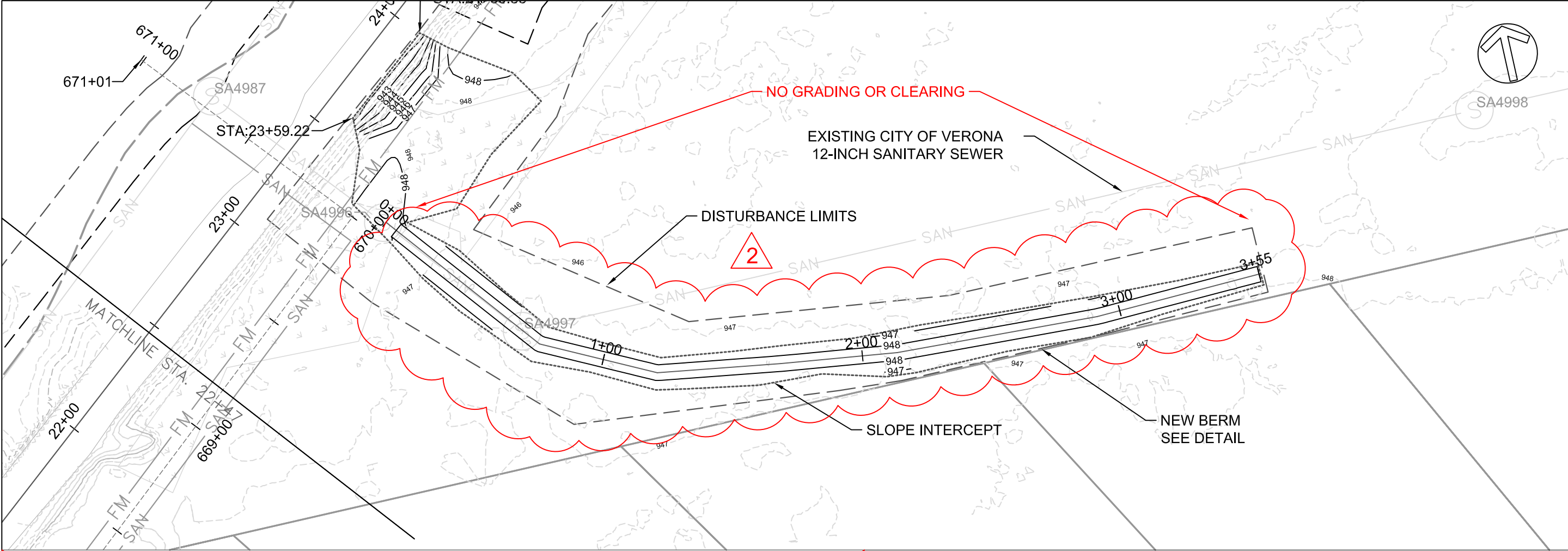
PROJECT A

CITY OF VERONA, DANE COUNTY, WI

NO.	REVISION	DATE	BY
1	GRADING AREA B	9/1/20	TMN
2	GRADING AREA C	11/7/20	TMN
DATE:		07/30/2020	
SCALE:		1" = 40'	
DRAWN BY:		TMN	
CHECKED BY:		JDB	
SHEET		A2	



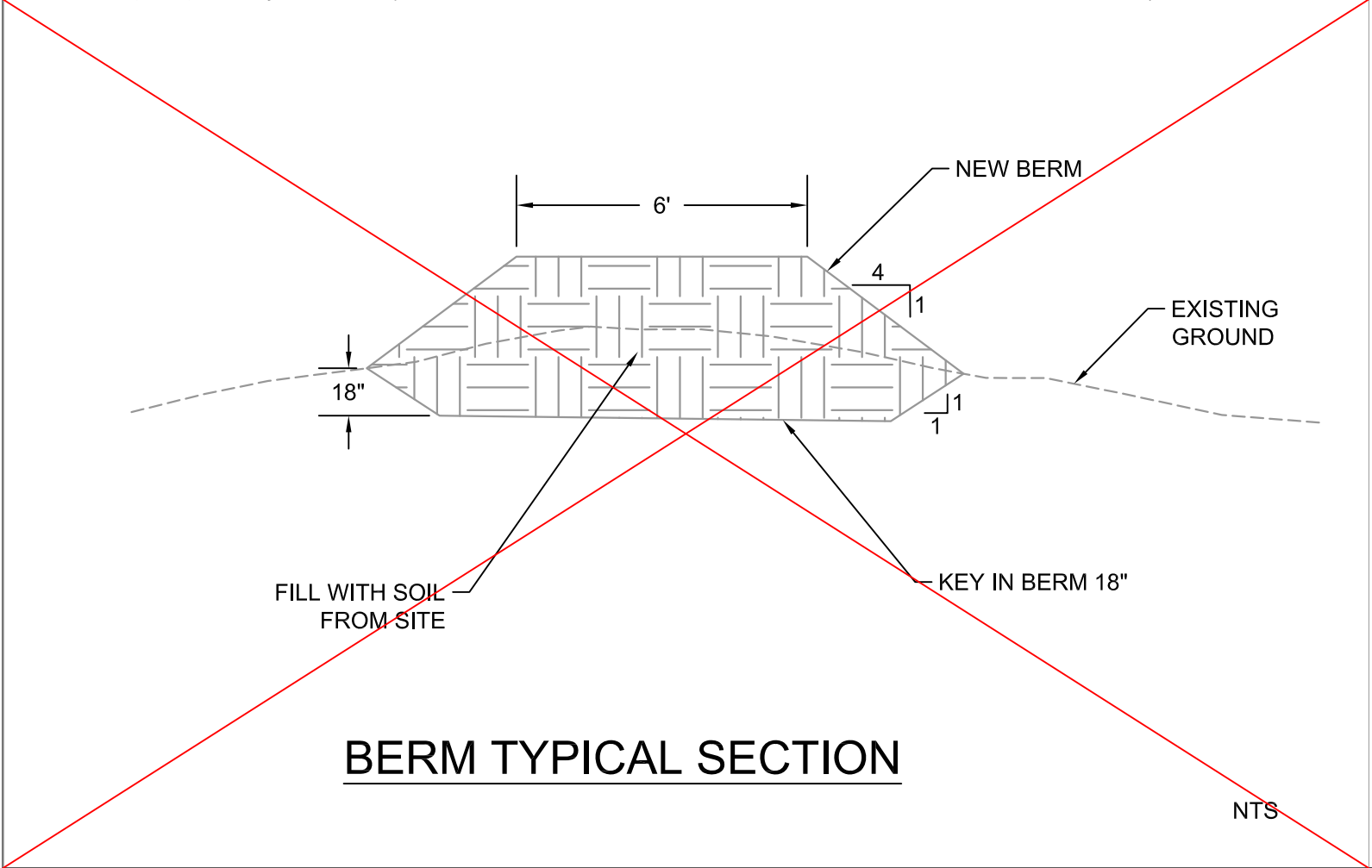
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NO. REVISION	DATE BY				
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DATE: 07/30/2020					
SCALE: 1" = 40'					
DRAWN BY: TMN					
CHECKED BY: JDB					
SHEET A3					



DANE
COUNTY

LAND & WATER
RESOURCES
DEPARTMENT

NEW BERM GRADING		PROJECT A		CITY OF VERONA, DANE COUNTY, WI	
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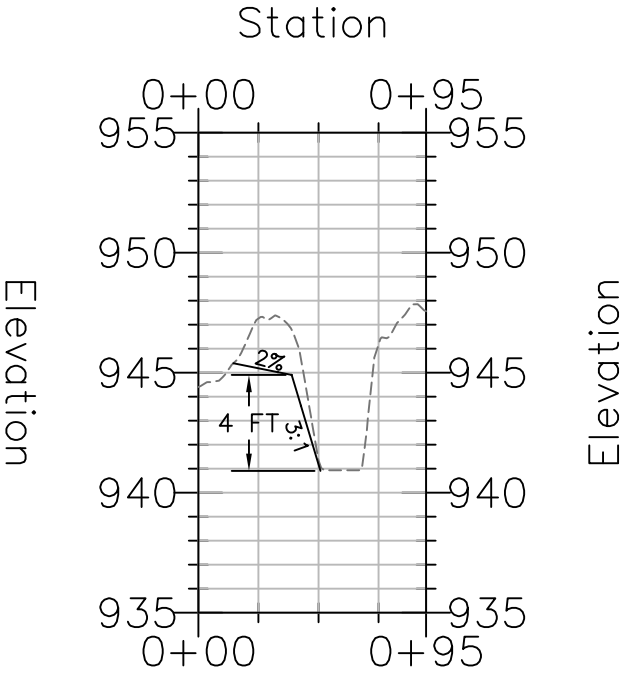


BERM TYPICAL SECTION

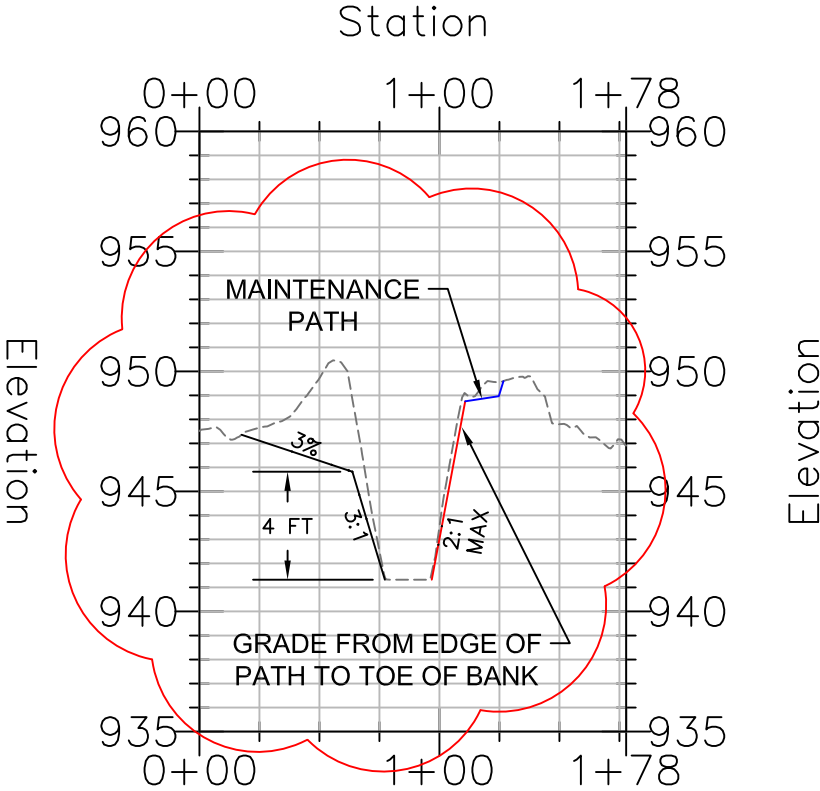
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NO.	REVISION	DATE	BY
2	NO BERM GRADING	11/17/20	TMN
DATE: 07/30/2020			
SCALE: 1" = 40'			
DRAWN BY: TMN			
CHECKED BY: JDB			
SHEET A4			

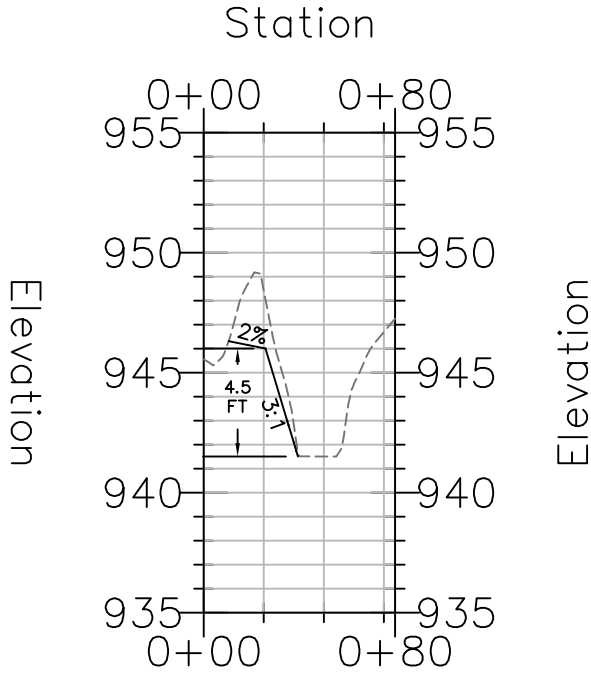
Grading Area A



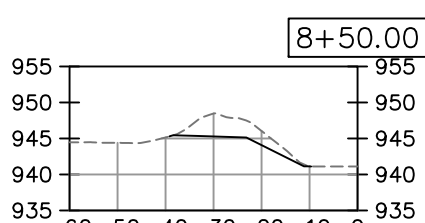
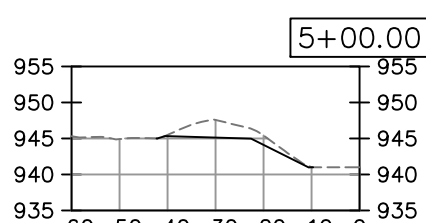
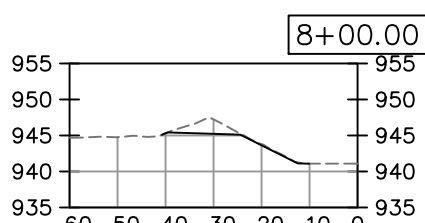
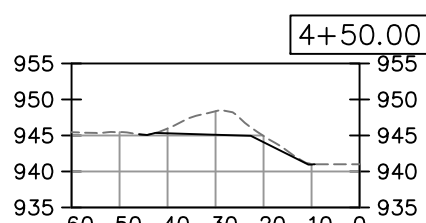
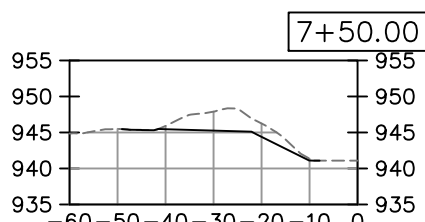
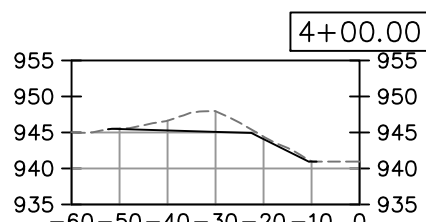
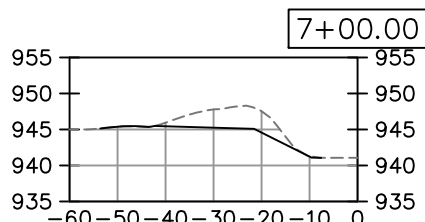
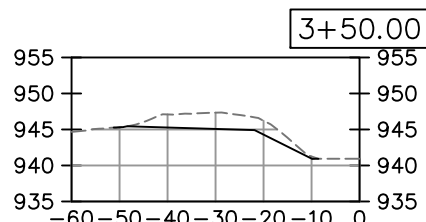
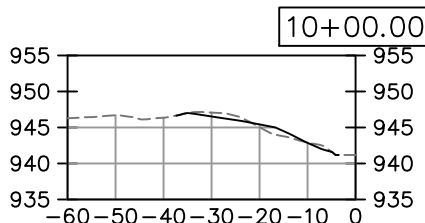
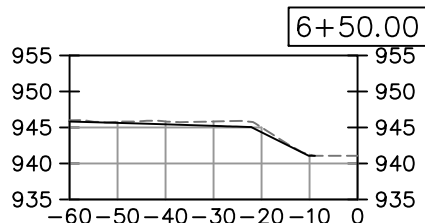
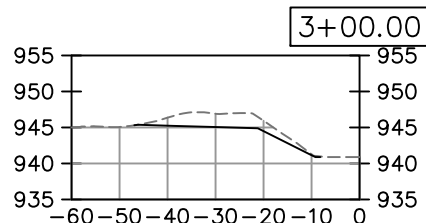
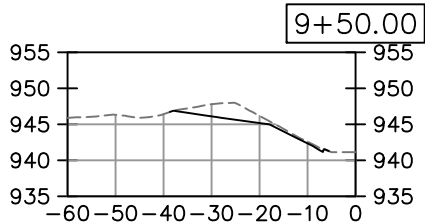
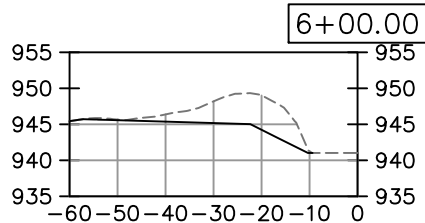
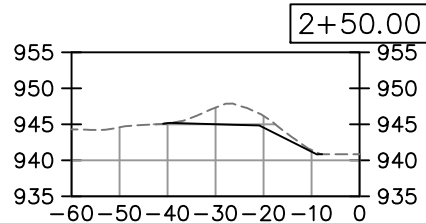
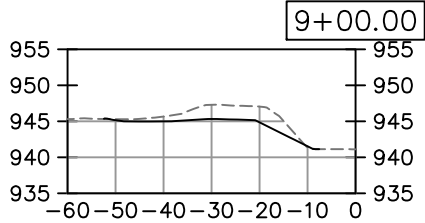
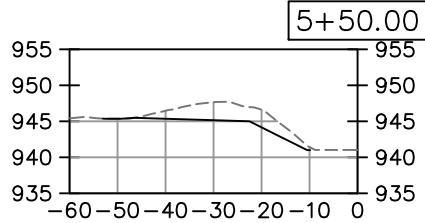
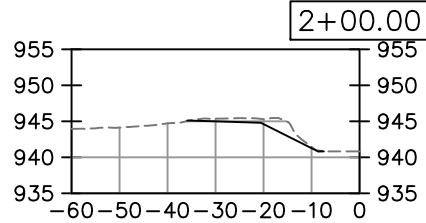
Grading Area B



Grading Area C



NO.	REVISION	DATE	BY
1	GRADING AREA B	9/1/20	TMN

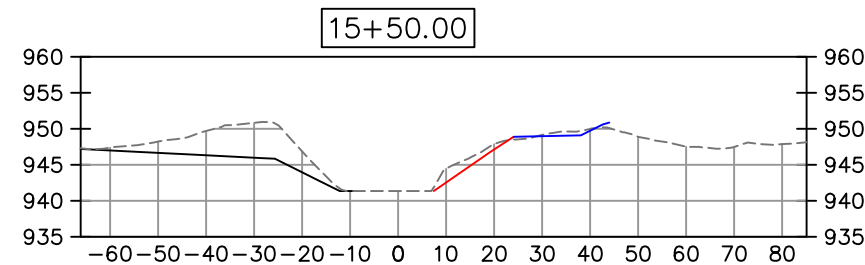
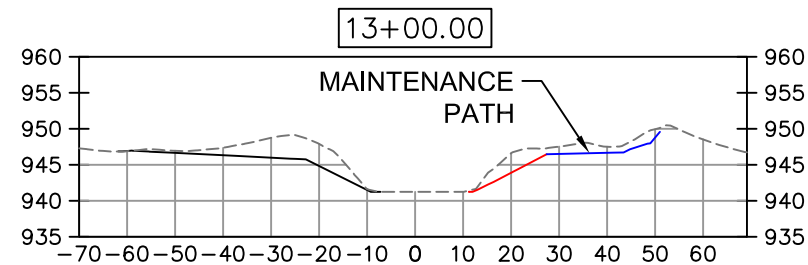
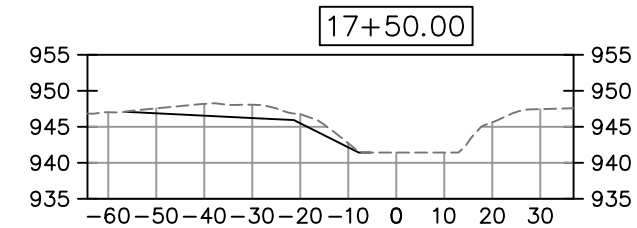
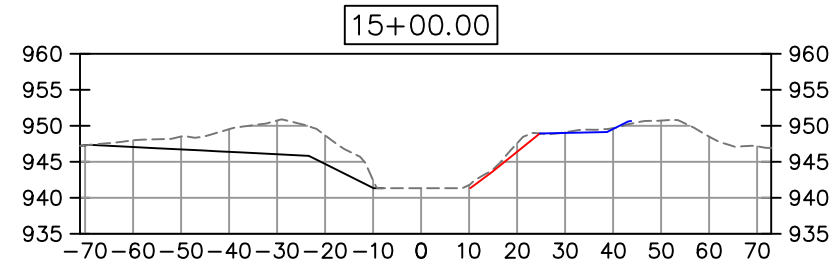
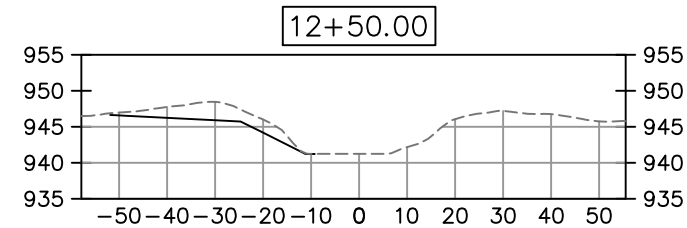


LAND & WATER
RESOURCES
DEPARTMENT

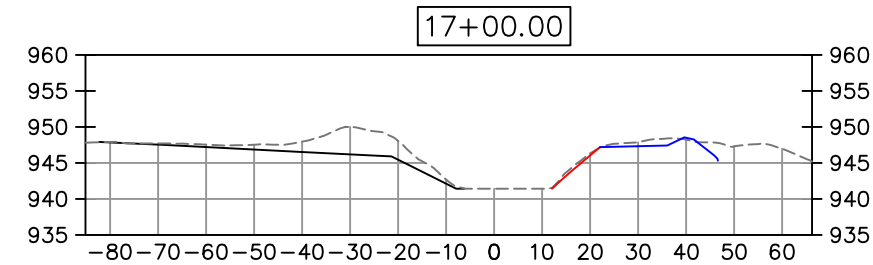
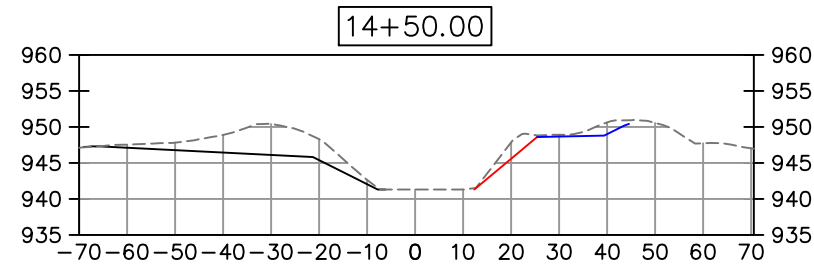
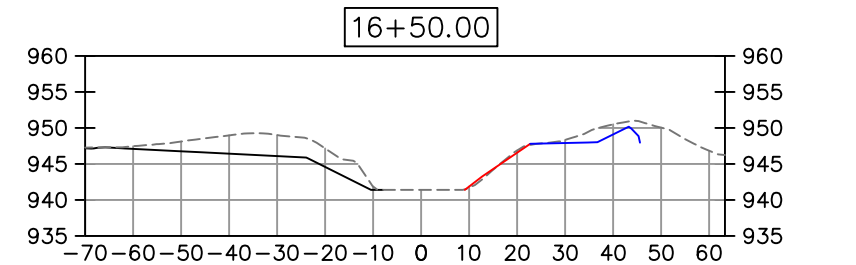
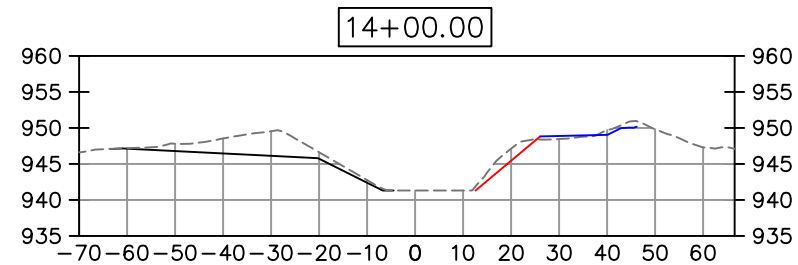
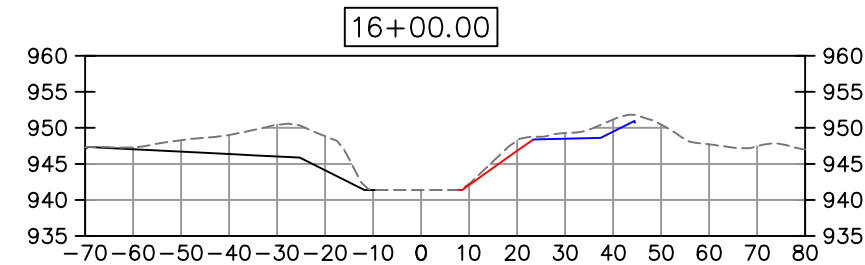
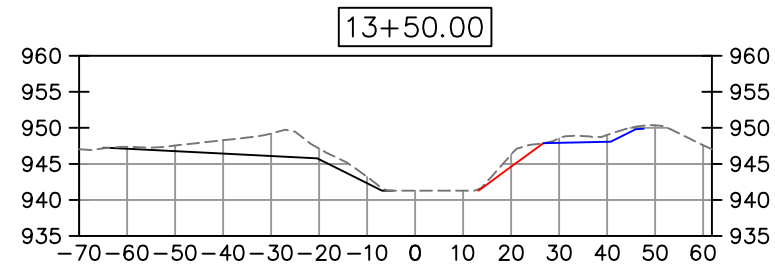
STREAMBANK GRADING AREA A SECTIONS		PROJECT A		CITY OF VERONA, DANE COUNTY, WI	
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NO.	REVISION	DATE	BY

DATE:	07/30/2020
SCALE:	1" = 40'
DRAWN BY:	TMN
CHECKED BY:	JDB
SHEET A6	



NOTE:
GRADE FROM EDGE OF MAINTENANCE PATH
TO TOE OF STREAMBANK. STREAMBANK
SIDE SLOPES SHALL BE 2:1 OR LESS.

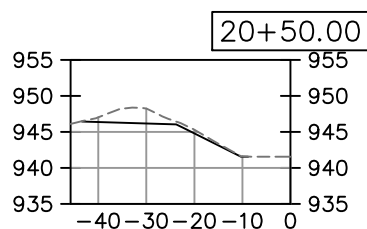
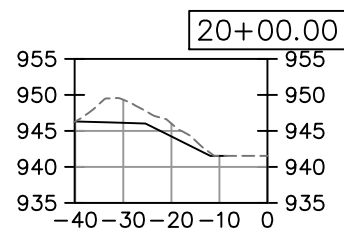
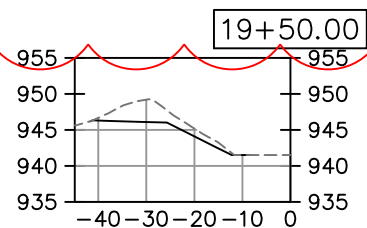
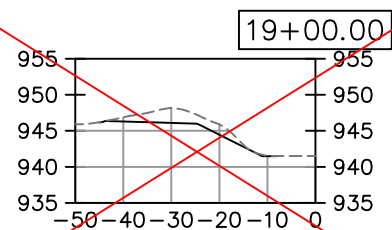
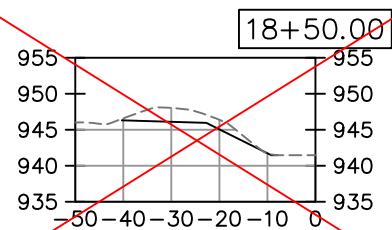
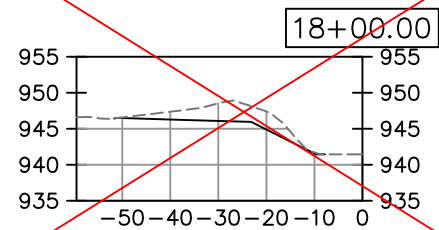


STREAMBANK GRADING AREA B SECTIONS	PROJECT A			
	CITY OF VERONA, DANE COUNTY, WI			

NO.	REVISION	DATE	BY
1	GRADING AREA B	9/1/20	TMN

DATE:	07/30/2020
SCALE:	1" = 40'
DRAWN BY:	TMN
CHECKED BY:	JDB
SHEET A7	

2

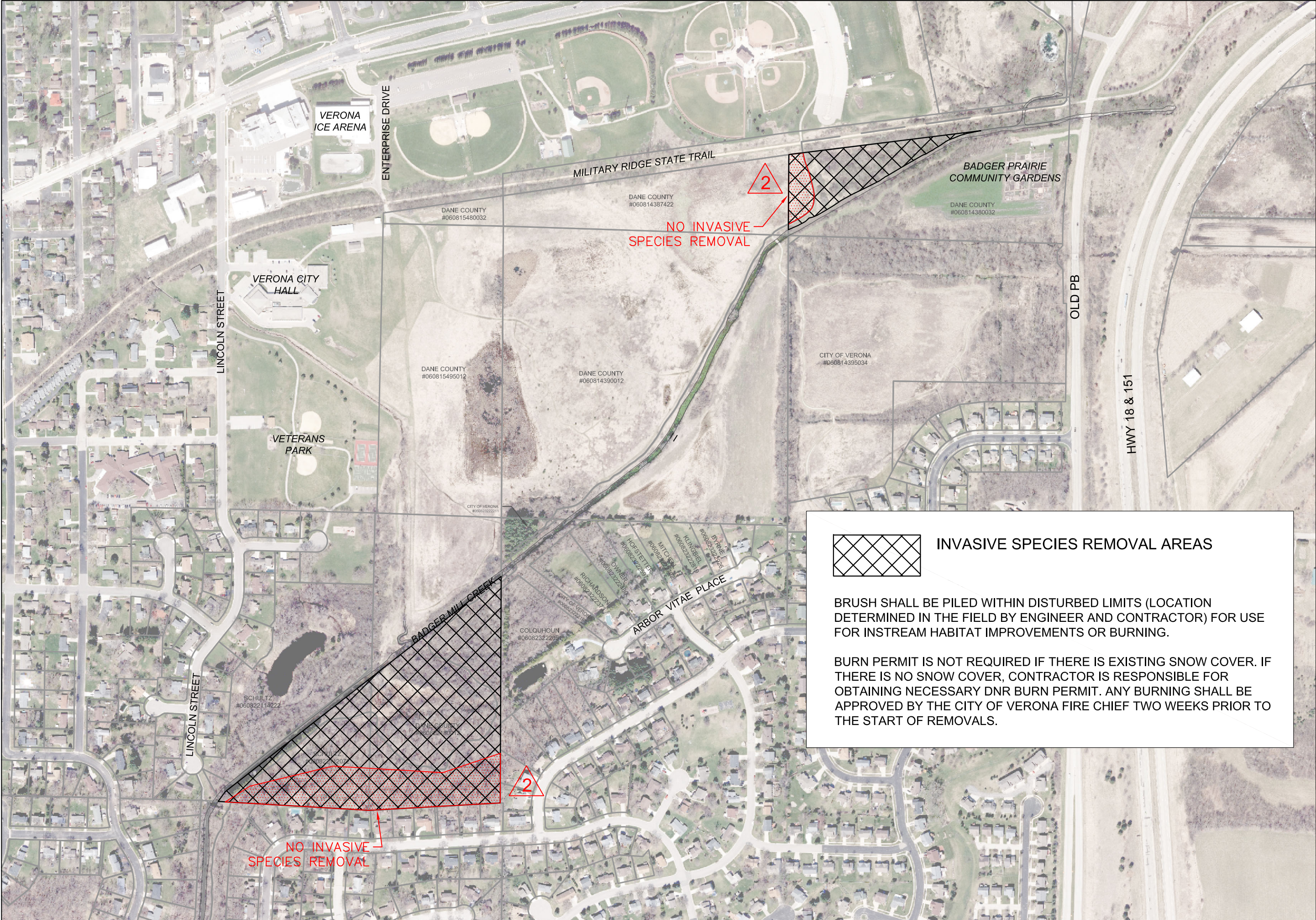


- CONSTRUCTION NOTES:
- 1. ALL GRADES SHOWN ARE FINAL SURFACE GRADES.
 - 2. EXISTING CONTOURS ARE BASED ON 2017 DANE COUNTY LIDAR.
 - 3. STRIP TOPSOIL FROM ALL AREAS TO BE EXCAVATED OR REGRADED AND STOCKPILE WITHIN DISTURBANCE LIMITS.
 - 4. SOIL USED FOR BERM SHALL BE FREE OF LARGE PARTICLES AND DEBRIS AS STATED IN SPECIFICATIONS.
 - 5. EXCAVATED SOIL NOT USED ON SITE SHALL BE REMOVED FROM THE SITE. CONTRACTOR SHALL COORDINATE WITH THE CITY OF VERONA FOR DISPOSAL LOCATION.
 - 6. CONSTRUCTION ACCESS TO THE STREAM SHALL BE DONE IN A WAY SUCH THAT DISTURBANCE IS MINIMIZED.
 - 7. EQUIPMENT WILL ONLY CROSS STREAM AT ESTABLISHED CROSSINGS.

- EROSION CONTROL NOTES:
- 1. ALL EROSION CONTROL NOTES FROM SEH PLANS APPLY TO PROJECT A.
 - 2. STREAMBANK SLOPES SHALL BE STABILIZED WITHIN THREE DAYS OF DISTURBANCE TO MINIMIZE EROSION INTO BADGER MILL CREEK.

- RESTORATION NOTES:
- 1. ALL DISTURBED AREAS SHALL BE RESTORED WITH 3" OF TOPSOIL AND SEEDED.
 - 2. PERMANENT SEED MIXES SHALL BE AS FOLLOWS:
 - WETLANDS: AGRECOL FLOODPLAIN MIX
 - UPLANDS: AGRECOL SAVANNA WOODLAND EDGE OR AGRECOL ECONOMY PRAIRIE.
 - 3. TEMPORARY SEED MIX SHALL BE AS FOLLOWS:
 - STABILIZATION AFTER OCT 15: AGRECOL WINTER WHEAT
 - STABILIZATION BEFORE OCT 15: AGRECOL ANNUAL RYEGRASS OR COMMON OATS
 - 4. ALL FIELD AND ACCESS ROADS SHALL BE RETURNED TO PRE-CONSTRUCTION CONDITION.
 - 5. AREAS WITH SLOPES EQUAL TO OR GREATER THAN 3:1 SHALL HAVE EROSION MAT CLASS I TYPE B URBAN.
 - 6. AREAS NOT RESTORED WITH EROSION MATTING SHALL BE RESTORED WITH MULCH. MULCH SHALL BE WEED-FREE AND BE INSTALLED AT A RATE OF 2 TONS PER ACRE.

STREAMBANK GRADING AREA C SECTIONS		PROJECT A		CITY OF VERONA, DANE COUNTY, WI	
NO.	REVISION	DATE	BY		
2	GRADING AREA C	11/17/20	TMN		
DATE: 07/30/2020					
SCALE: 1" = 40'					
DRAWN BY: TMN					
CHECKED BY: JDB					
SHEET A8					

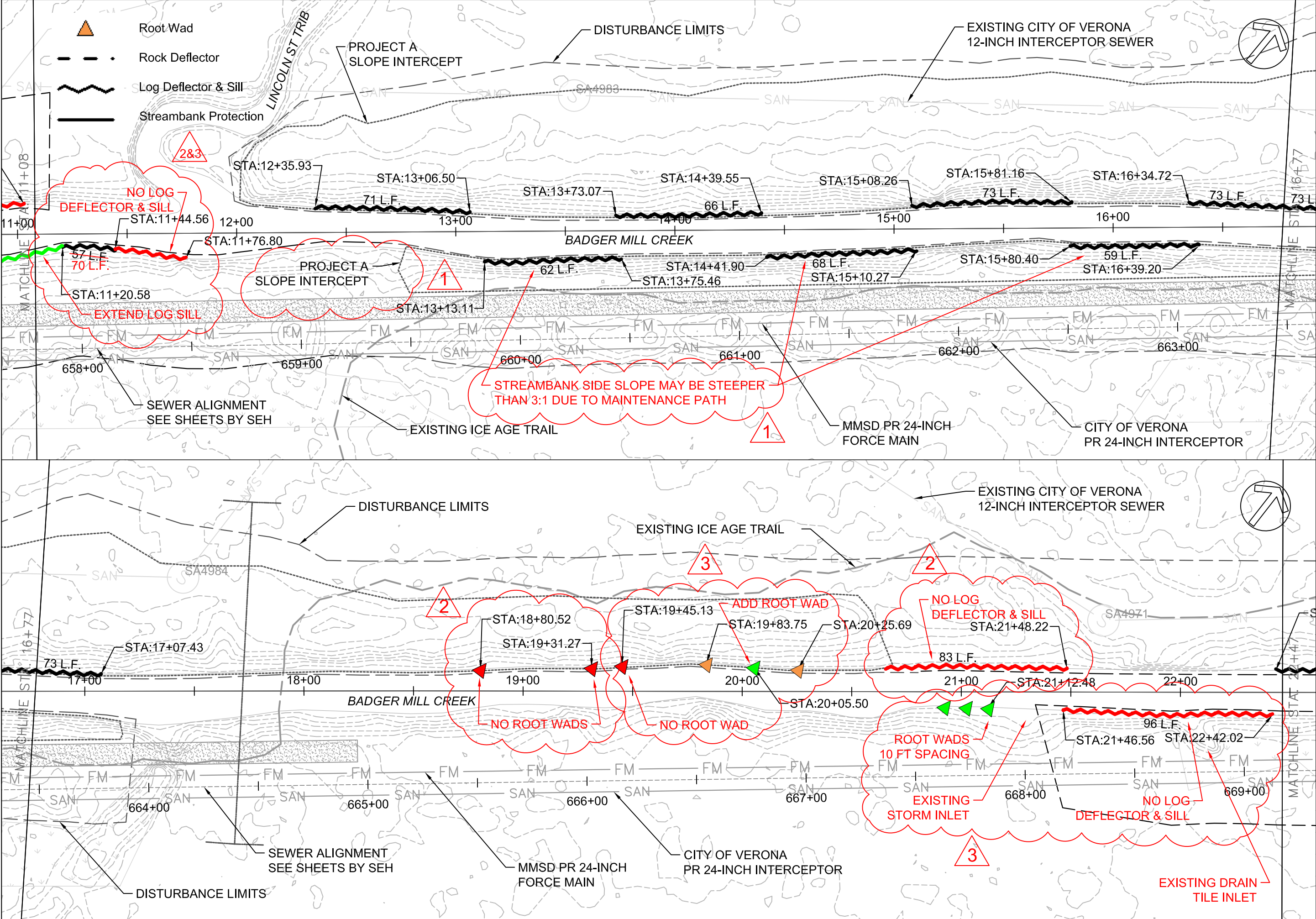


INVASIVE SPECIES REMOVAL

PROJECT B

CITY OF VERONA, DANE COUNTY, WI

NO. REVISION	DATE	BY
2	11/17/20	TMN
REDUCE INVASIVE SPECIES REMOVAL AREAS		

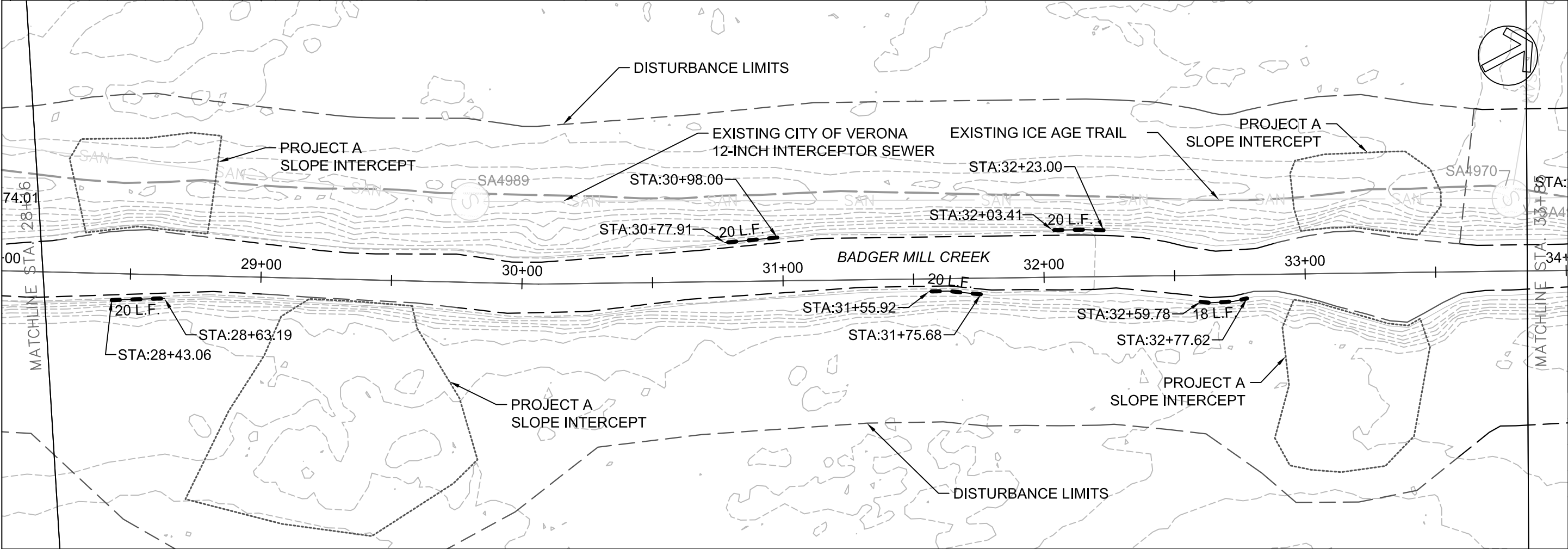
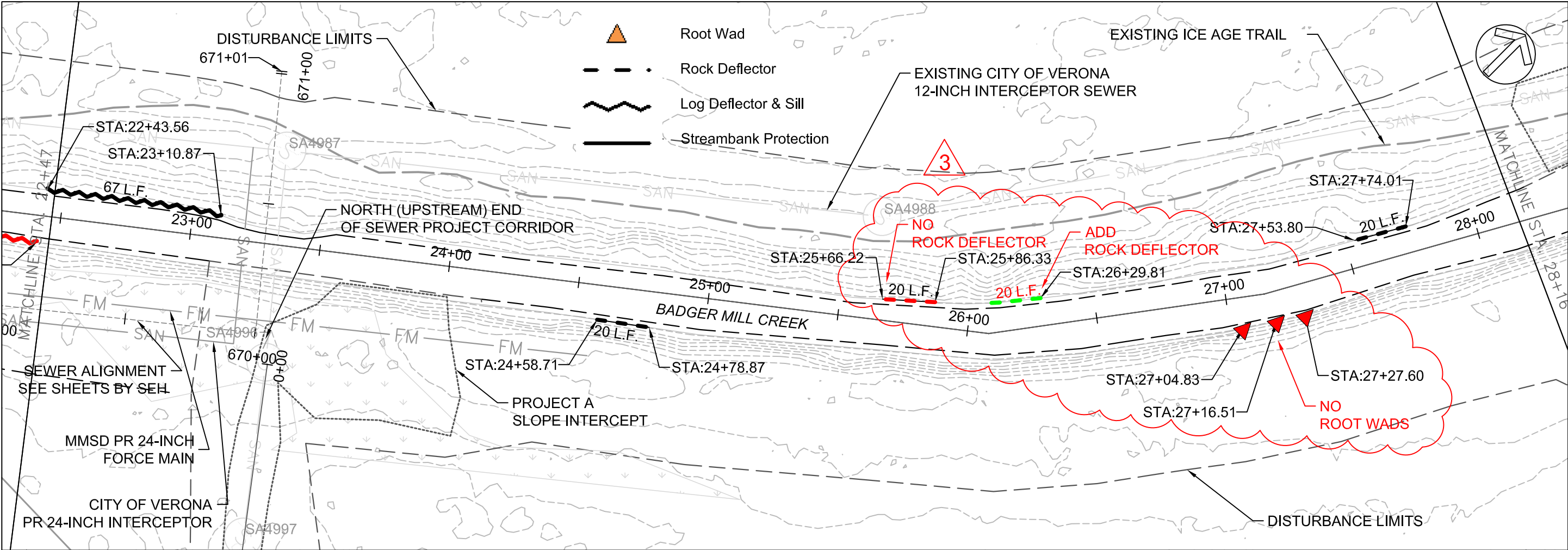


STREAM HABITAT IMPROVEMENTS

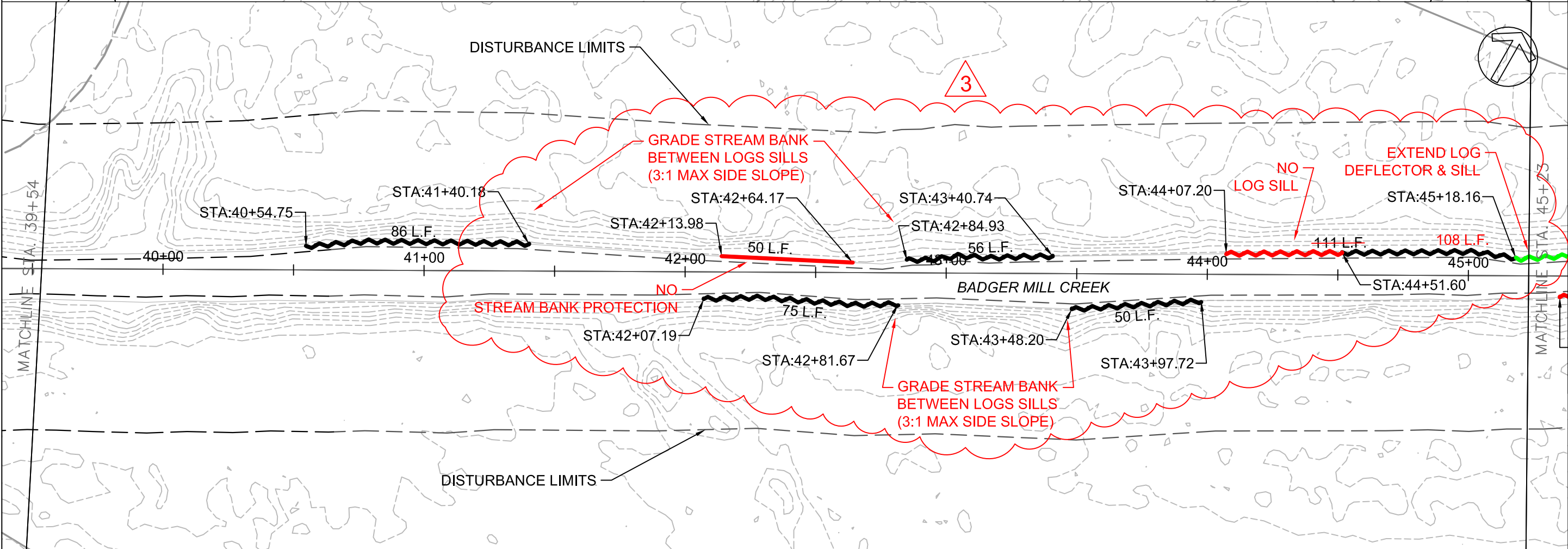
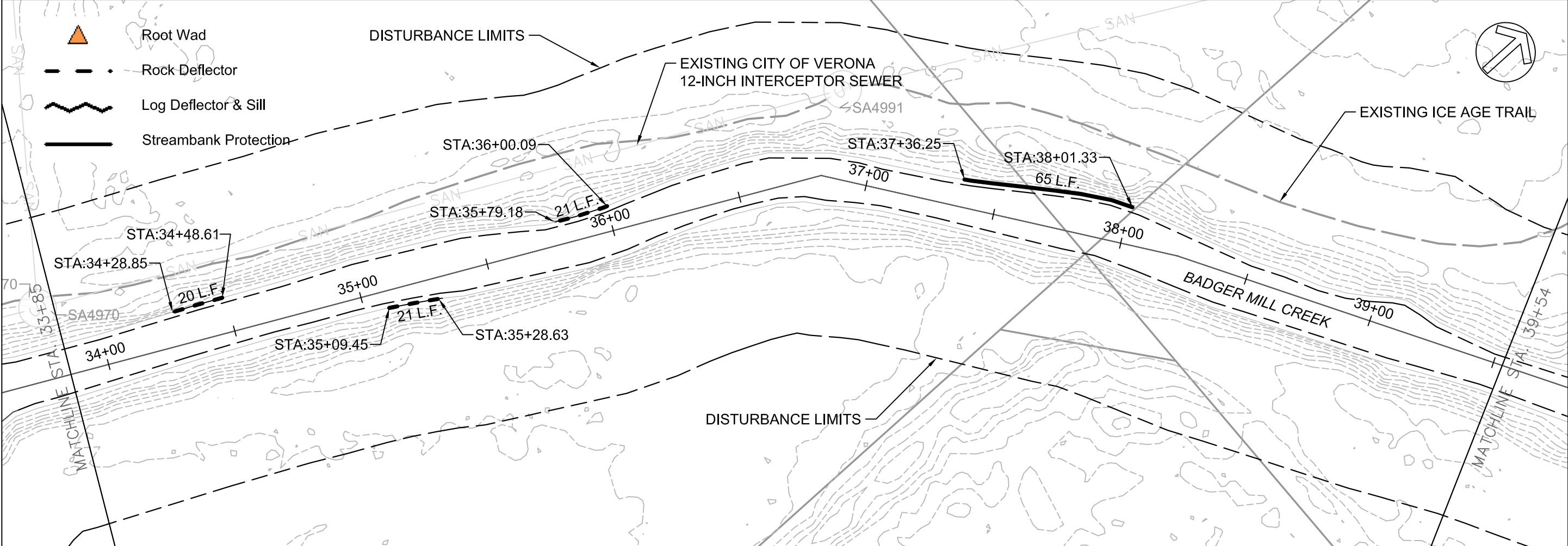
PROJECT B

CITY OF VERONA, DANE COUNTY, WI

NO.	REVISION	DATE	BY
1	GRADING AREA B	9/1/20	TMN
2	REMOVE LOG SILLS & ROOT WADS	11/17/20	TMN
3	IN STREAM MODS	4/26/21	TMN
DATE: 07/30/2020			
SCALE: 1" = 40'			
DRAWN BY: TMN			
CHECKED BY: JDB			
SHEET B2			



STREAM HABITAT IMPROVEMENTS		PROJECT B		CITY OF VERONA, DANE COUNTY, WI	
NO. / REVISION	DATE BY	IN STREAM MODS	TMN		
3	4/26/21				
DATE: 07/30/2020					
SCALE: 1" = 40'					
DRAWN BY: TMN					
CHECKED BY: JDB					
SHEET B3					



DANE COUNTY

LAND & WATER RESOURCES DEPARTMENT

STREAM HABITAT IMPROVEMENTS

PROJECT B

CITY OF VERONA, DANE COUNTY, WI

NO.	REVISION	DATE	BY
3	IN STREAM MODS	4/26/21	TMN

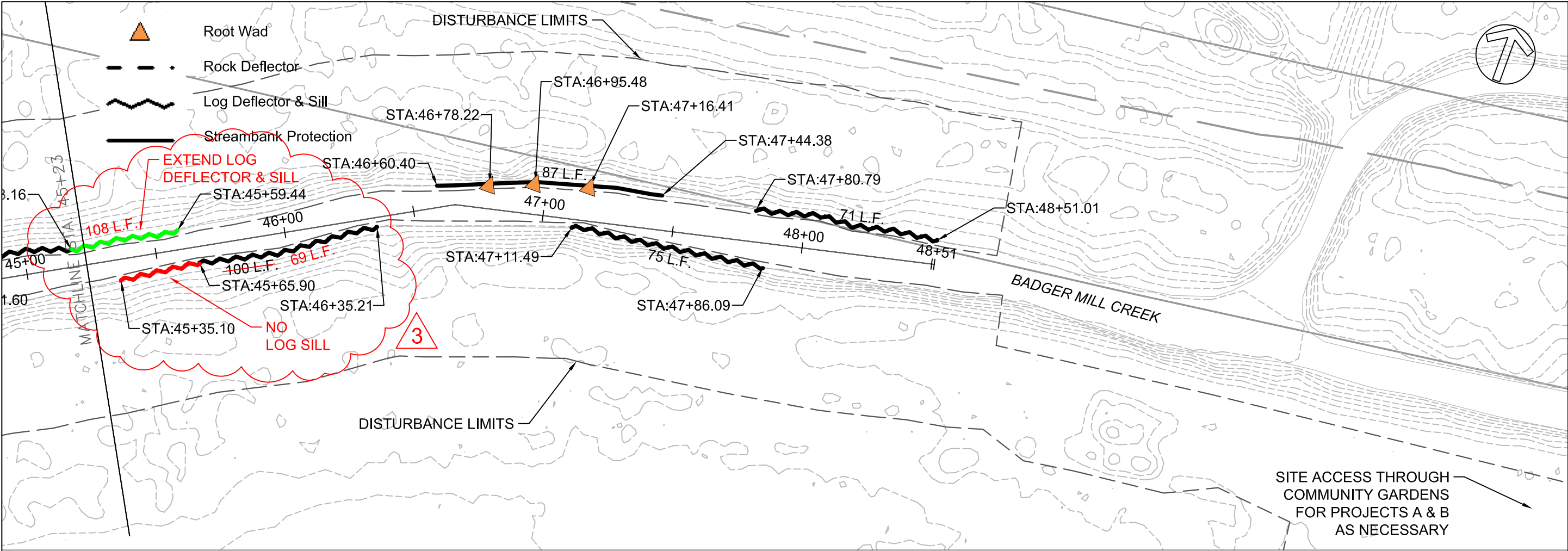
DATE: 07/30/2020

SCALE: 1" = 40'

DRAWN BY: TMN

CHECKED BY: JDB

SHEET B4



CONSTRUCTION NOTES:

1. ALL GRADES SHOWN ARE FINAL SURFACE GRADES.
2. EXISTING CONTOURS ARE BASED ON 2017 DANE COUNTY LIDAR.
3. STRIP TOPSOIL FROM ALL AREAS TO BE EXCAVATED OR REGRADED AND STOCKPILE WITHIN DISTURBANCE LIMITS.
4. SOIL USED FOR BERM SHALL BE FREE OF LARGE PARTICLES AND DEBRIS AS STATED IN SPECIFICATIONS.
5. EXCAVATED SOIL NOT USED ON SITE SHALL BE REMOVED FROM THE SITE. CONTRACTOR SHALL COORDINATE WITH THE CITY OF VERONA FOR DISPOSAL LOCATION.
6. CONSTRUCTION ACCESS TO THE STREAM SHALL BE DONE IN A WAY SUCH THAT DISTURBANCE IS MINIMIZED.
7. EQUIPMENT WILL ONLY CROSS STREAM AT ESTABLISHED CROSSINGS.
8. IN-STREAM STRUCTURES SHALL BE PLACED FROM DOWNSTREAM TO UPSTREAM.

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL NOTES FROM SEH PLANS APPLY TO PROJECT B.
2. STREAMBANK SLOPES SHALL BE STABILIZED WITHIN THREE DAYS OF DISTURBANCE TO MINIMIZE EROSION INTO BADGER MILL CREEK.

RESTORATION NOTES:

1. ALL DISTURBED AREAS SHALL BE RESTORED WITH 3" OF TOPSOIL AND SEEDED.
2. PERMANENT SEED MIXES SHALL BE AS FOLLOWS:
WETLANDS: AGRECOL FLOODPLAIN MIX
UPLANDS: AGRECOL SAVANNA WOODLAND EDGE OR AGRECOL ECONOMY PRAIRIE.
3. TEMPORARY SEED MIX SHALL BE AS FOLLOWS:
STABILIZATION AFTER OCT 15: AGRECOL WINTER WHEAT
STABILIZATION BEFORE OCT 15: AGRECOL ANNUAL RYEGRASS OR COMMON OATS
4. ALL FIELD AND ACCESS ROADS SHALL BE RETURNED TO PRE-CONSTRUCTION CONDITION.
5. AREAS WITH SLOPES EQUAL TO OR GREATER THAN 3:1 SHALL HAVE EROSION MAT CLASS I TYPE B URBAN.
6. AREAS NOT RESTORED WITH EROSION MATTING SHALL BE RESTORED WITH MULCH. MULCH SHALL BE WEED-FREE AND BE INSTALLED AT A RATE OF 2 TONS PER ACRE.
7. HOLES LEFT BY TREE REMOVAL SHALL BE FILLED TO MATCH EXISTING GRADE PRIOR TO RESTORATION.

DANE COUNTY







LAND & WATER RESOURCES DEPARTMENT

STREAM HABITAT IMPROVEMENTS

PROJECT B

CITY OF VERONA, DANE COUNTY, WI

NO.	REVISION	DATE	BY
2	RESTORATION NOTES	11/17/20	TMN
3	IN-STREAM MODS & CONSTRUCTION NOTES	4/26/21	TMN

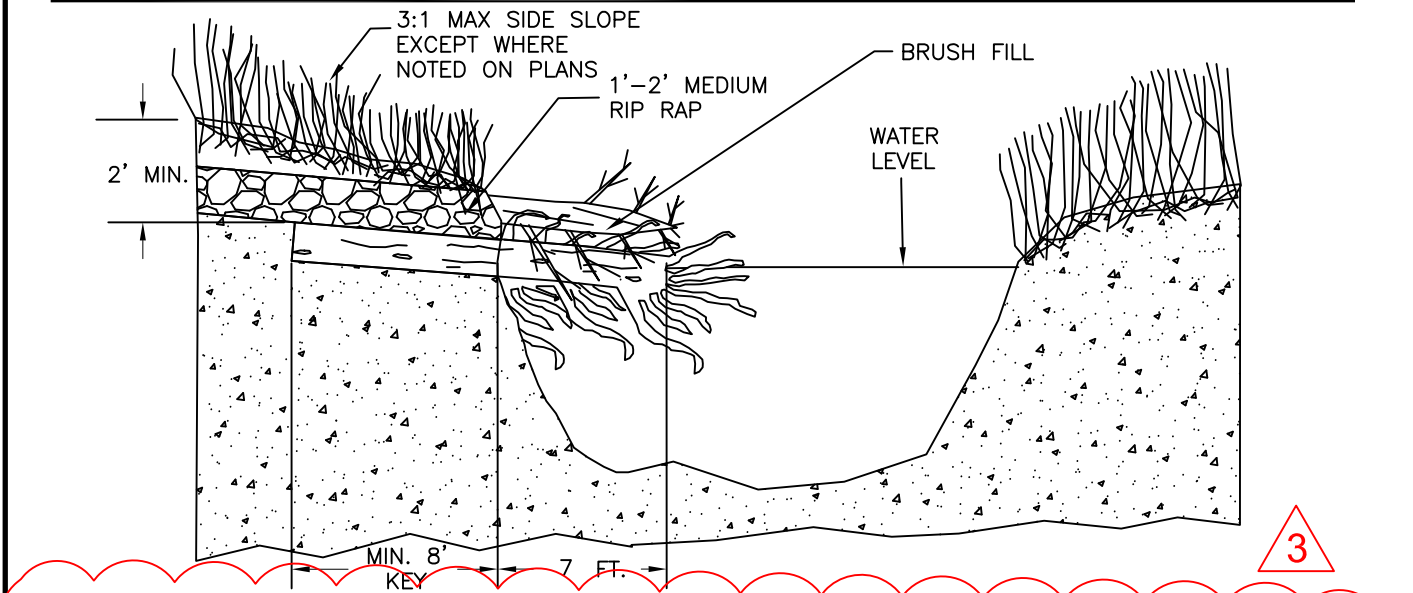
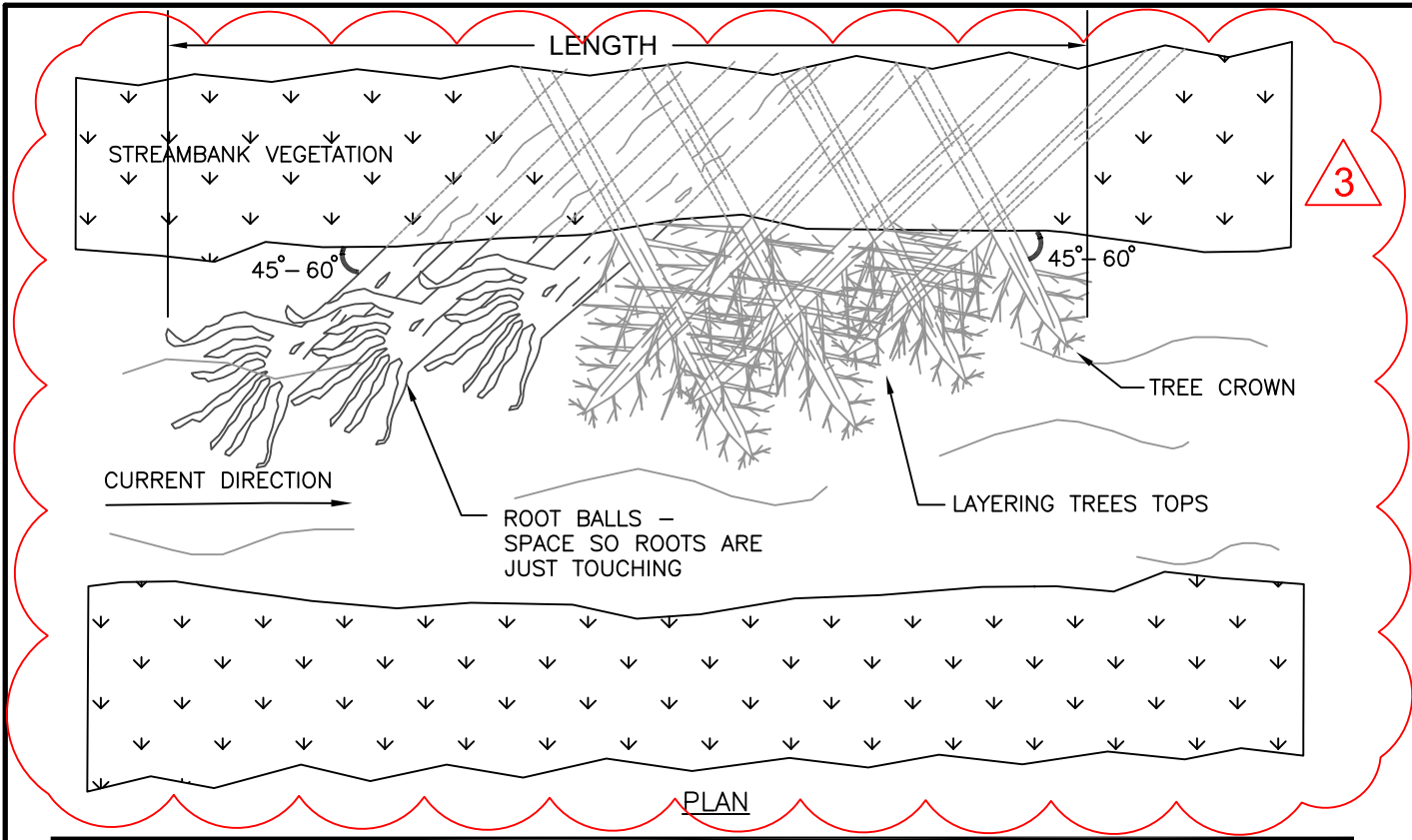
DATE: 07/30/2020

SCALE: 1" = 40'

DRAWN BY: TMN

CHECKED BY: JDB

SHEET B5

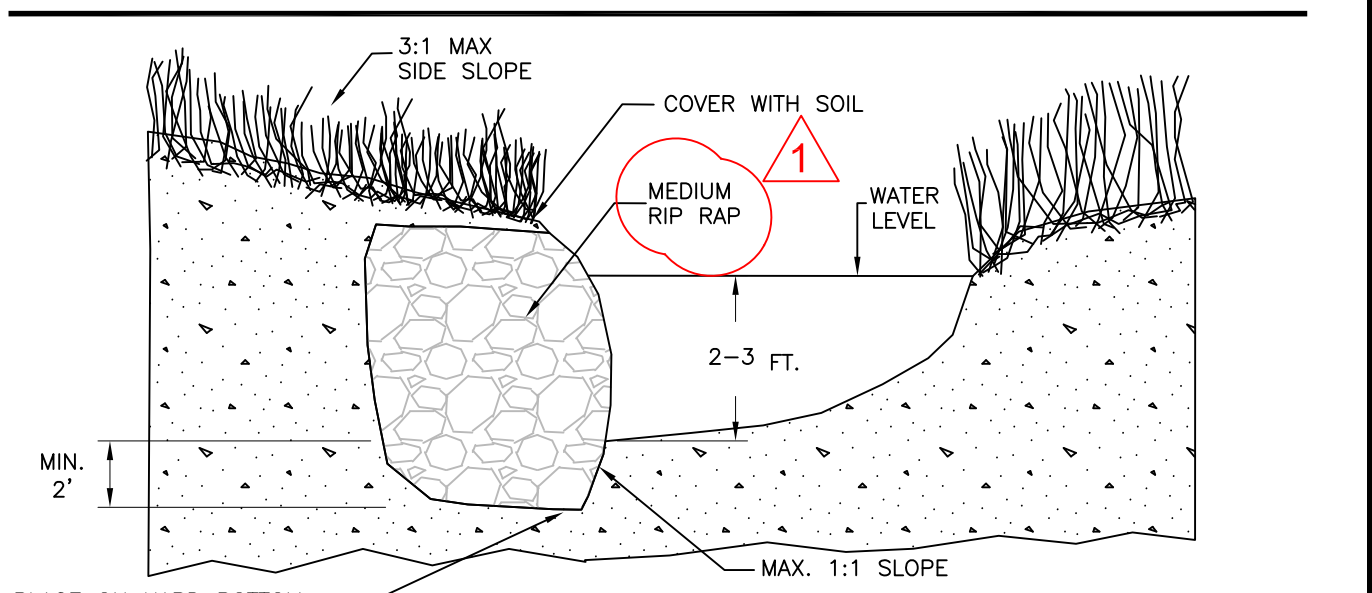
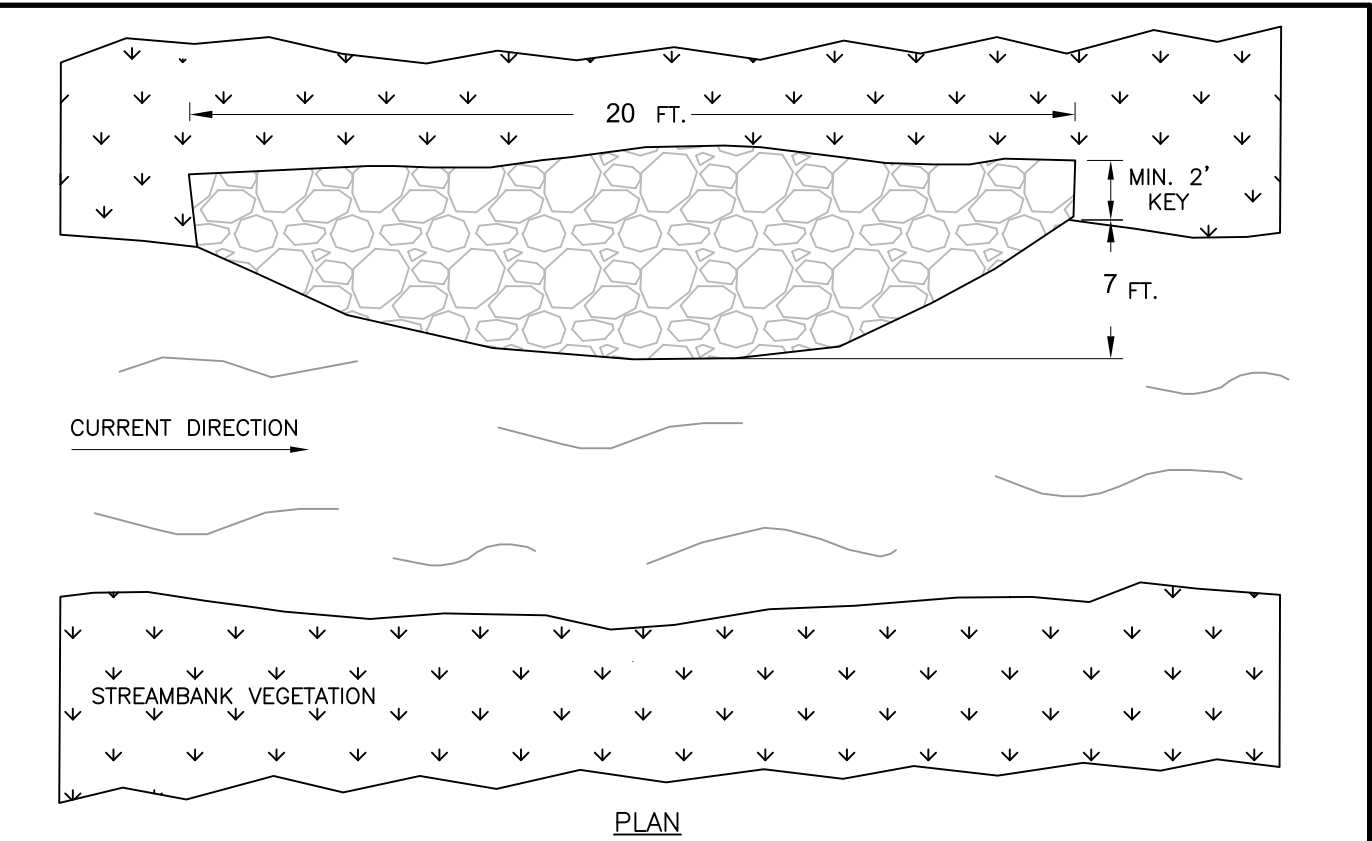


NOTES:

1. CARE SHALL BE TAKEN DURING PLACEMENT TO AVOID STREAM BANK EROSION ON OPPOSITE BANK.
2. LOG DEFLECTOR SHALL CONSIST OF THREE LOGS AT A MIN 16" DIAMETER AT BREAST HEIGHT (DBH).
3. LOG SILLS SHALL CONSIST OF ALTERNATING LAYERS OF TREE TOPS WITH A MIN 4"-6" DIAMETER. TREES SHALL BE PLACED BEHIND THE LOG DEFLECTORS AND ANCHORED IN THE STREAM BANK AND WOVEN TOGETHER DOWNSTREAM.
4. WIDOT MEDIUM RIP RAP SHALL BE USED FOR ANCHORING THE LOG DEFLECTORS AND LOG SILLS IN THE STREAM BANK.
5. THE MAJORITY OF THE LOG DEFLECTORS AND LOG SILLS SHALL BE SUBMERGED BELOW THE ORDINARY HIGH WATER MARK WITH APPROXIMATELY 15% EMERGED.
6. IF THERE IS NOT ENOUGH MATERIAL (TREE TOPS) AVAILABLE FOR THE LOG SILLS, THEN JUST PLACE LOG DEFLECTORS/ROOT BALLS ONLY.
7. BANK SLOPES ABOVE LOG DEFLECTOR-SILL COMBO SHALL BE GRADED (3:1 MAX SIDE SLOPE EXCEPT WHERE NOTED ON PLANS), COVERED WITH 3" TOPSOIL, SEEDED, AND MATTED WITH CLASS I TYPE B URBAN MAT.

LOG DEFLECTOR - SILL COMBO DETAIL

NTS



NOTES:

1. CARE SHALL BE TAKEN DURING PLACEMENT TO AVOID STREAMBANK EROSION ON OPPOSITE BANK.
2. BANK SLOPES ABOVE ROCK DEFLECTOR SHALL BE GRADED (3:1 MAX SIDE SLOPE), COVERED WITH 3" TOPSOIL, SEEDED, AND MATTED WITH CLASS I TYPE B URBAN MAT.

ROCK DEFLECTOR DETAIL

NTS

NO.	REVISION	DATE	BY
1	NOTES	9/1/20	TMN
3	LOG DEFLECTOR/SILL DETAIL & NOTES	4/26/21	TMN

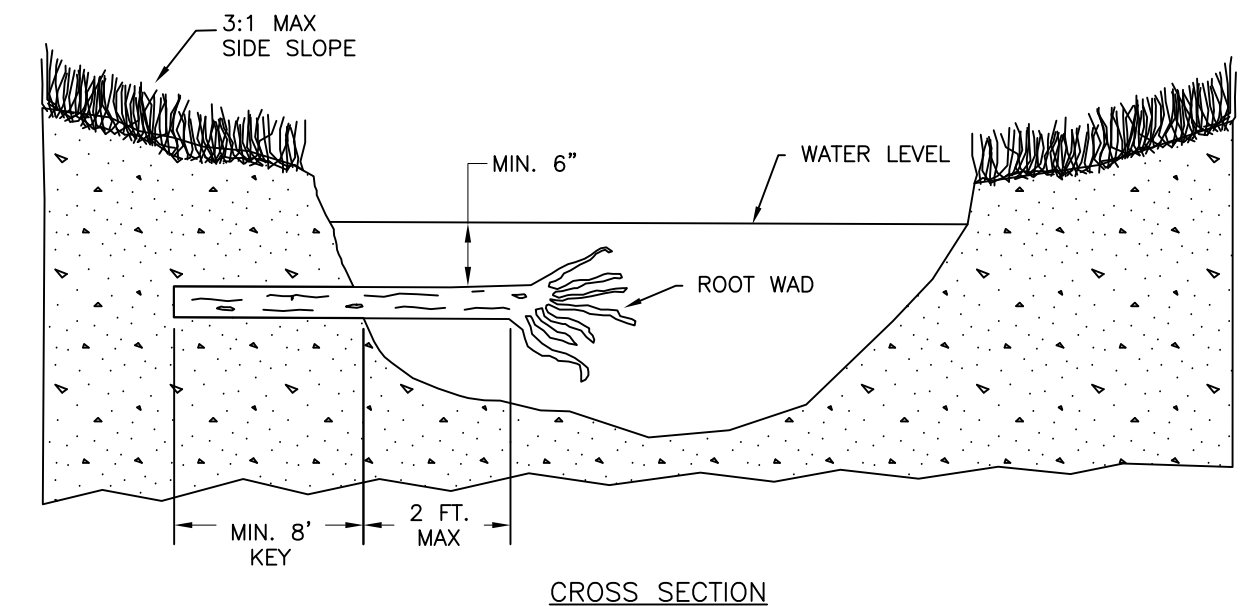
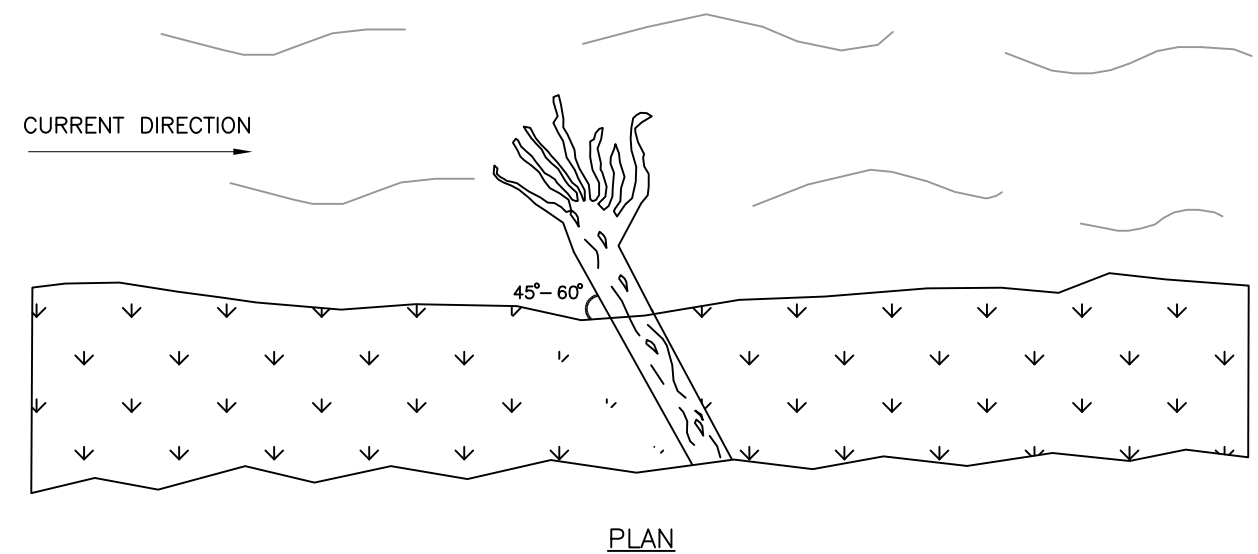
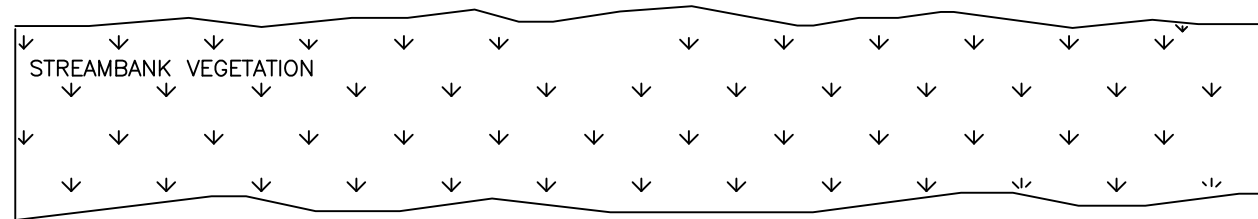
DATE: 07/30/2020

SCALE: NTS

DRAWN BY: TMN

CHECKED BY: JDB

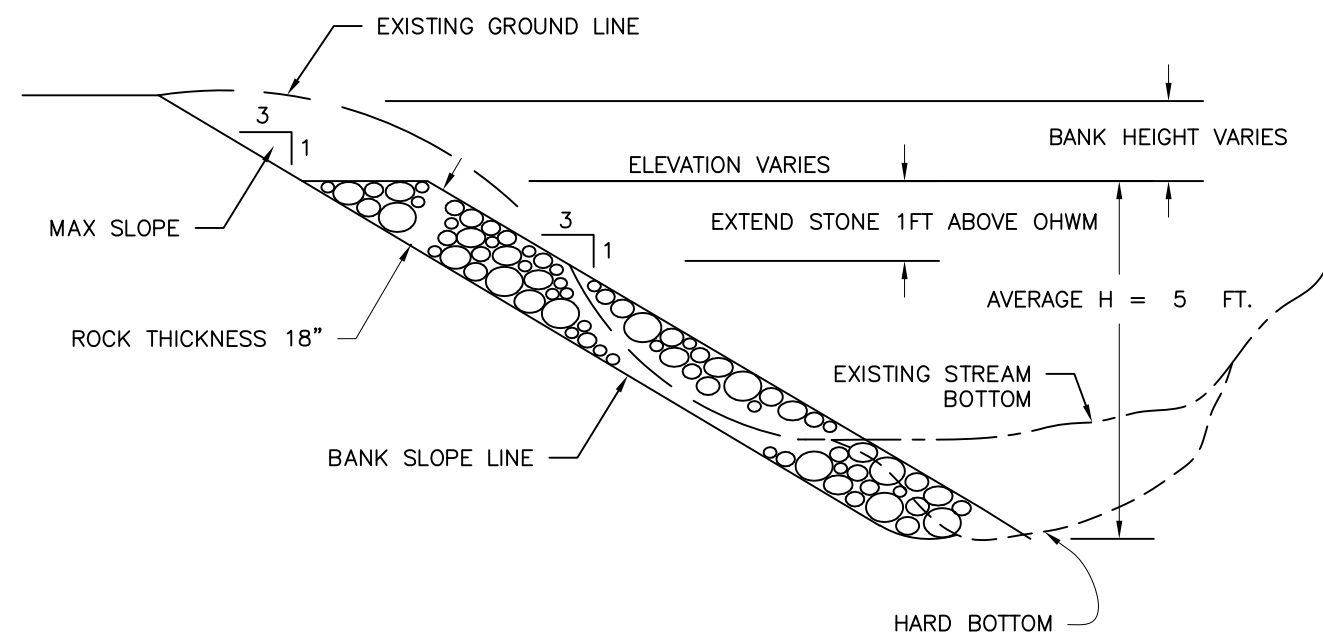
SHEET B6



- NOTES:
1. PLACE LOG AT LEAST 6 INCHES BELOW THE WATERLINE.
 2. PLACE LOG AT A 45-60 DEGREE ANGLE UPSTREAM FROM BANK.
 3. BANK SLOPES ABOVE ROOT WAD (ABOVE WATER LEVEL) SHALL BE GRADED (3:1 MAX SIDE SLOPE), COVERED WITH 3" TOPSOIL, SEEDED, AND MATTED WITH CLASS I TYPE B URBAN MAT.

ROOT WAD DETAIL

NTS



TYPICAL CROSS SECTION

- NOTES:
1. DOUBLE THE ROCK THICKNESS FOR A DISTANCE OF 5 FEET AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE RIPRAP. BLEND THE ROCK SURFACE TO MATCH THE EXISTING BANK SURFACE.
 2. TOE PROTECTION SHALL BE EXTENDED TO THE HARD BOTTOM OF THE STREAM, WHICH WILL BE BELOW THE EXISTING STREAM BOTTOM.
 3. BANK SLOPES ABOVE RIP RAP SHALL BE GRADED (3:1 MAX SIDE SLOPE), COVERED WITH 3" TOPSOIL, SEEDED, AND MATTED WITH CLASS I TYPE B URBAN MAT.

STREAMBANK PROTECTION DETAIL

NTS

NO.	REVISION	DATE	BY
1	NOTES	9/1/20	TMN

DATE: 07/30/2020

SCALE: NTS

DRAWN BY: TMN

CHECKED BY: JDB

SHEET
B7