

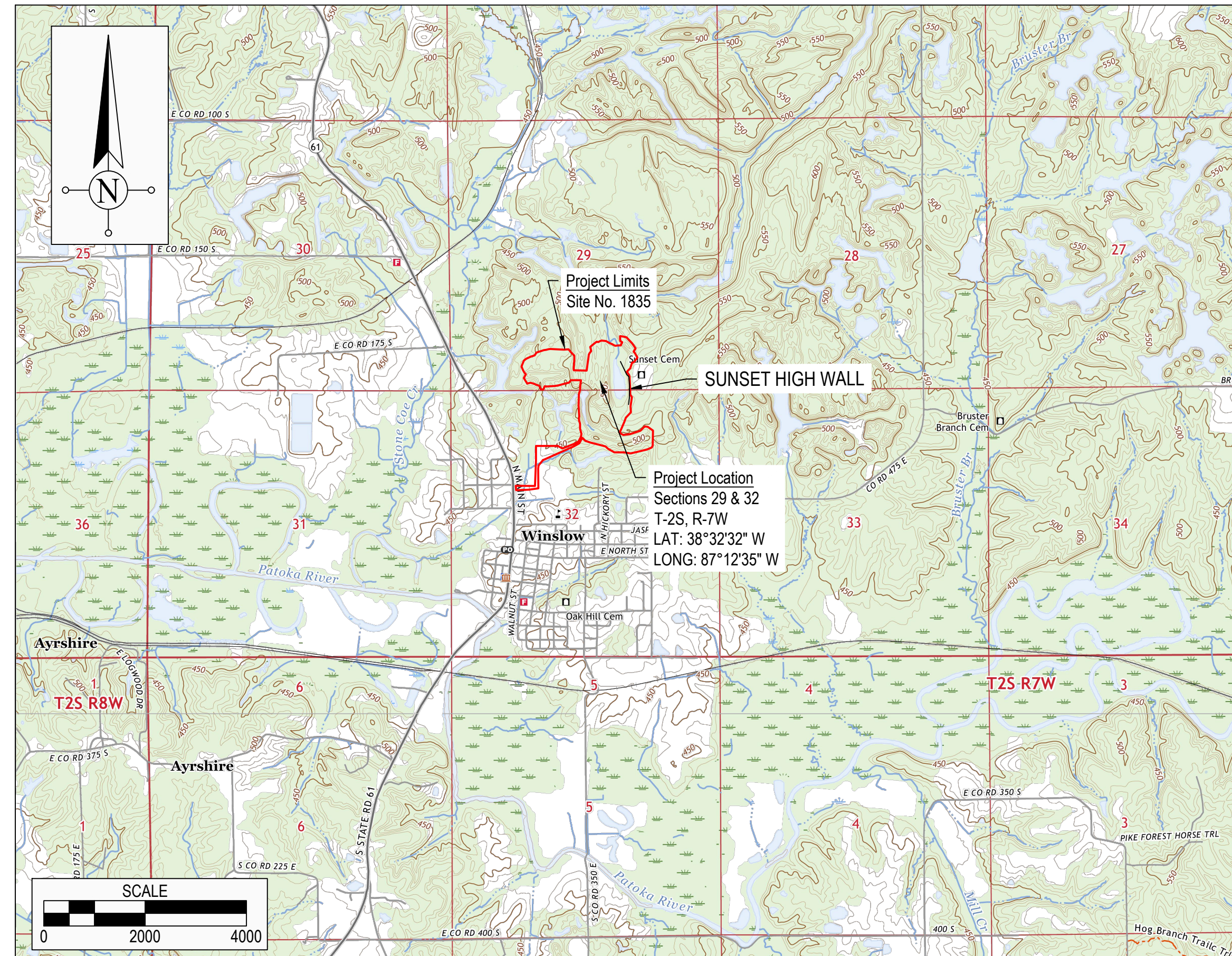
SUNSET HIGHWALL	
SITE NO.	CONTRACT NO.
1835	DEL2415208208/E008-334

STATE OF INDIANA  
INDIANA DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

ABANDONED COAL MINE  
RESTORATION

SUNSET HIGHWALL  
SITE 1835  
CONTRACT DEL2415208208/E008-334  
PIKE COUNTY

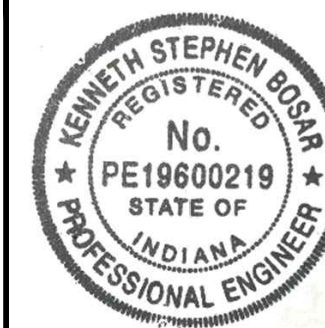
**Clear and grub, backfill highwall, construct ponds, improve drainage, and revegetate site to enhance wildlife habitat and recreation opportunities.**



**PROJECT LOCATION MAP  
AUGUSTA & WINSLOW USGS TOPOGRAPHIC QUADRANGLES (2022)**

GENERAL NOTES	
2023 AML STANDARD SPECIFICATIONS TO BE USED WITH THESE PLANS	
AN NPDES DISCHARGE PERMIT IS REQUIRED FOR THIS PROJECT	
PLANS DEVELOPED FROM INDIANA 2019 LIDAR TOPO IN NAD 83 INDIANA STATE PLANE WEST, FEET, AND GROUND SURVEY PERFORMED BY TRIMARK SURVEYING.	
INDEX	
SHEET NO.	SHEET TITLE
1	TITLE, INDEX & LOCATION MAP
2	SITE MAP
3-6	GRADING PLAN
7	GRADING PLAN - CUT/FILL ADJUSTMENT AREA
8-9	SECTIONS
10	REVEGETATION PLAN
11	DETAILS
UTILITIES	
NO UTILITIES ARE KNOWN TO EXIST NEAR THE PROJECT SITE AND NONE ARE EXPECTED TO BE AFFECTED BY THE PROPOSED CONSTRUCTION. HOWEVER, CONTRACTOR SHALL CALL IUPPS BEFORE ANY DIGGING.	
CALL BEFORE YOU DIG. INDIANA UNDERGROUND PLANT PROTECTION SERVICE (IUPPS) 1-800-382-5544 OR 811 FROM YOUR MOBILE PHONE.	

REVISIONS	
DATE	DESCRIPTION
5/03/2024	REVISED SHEETS 2, 3, 4 AND 10. SHIFTED ACCESS DRIVE NORTH, OMITTED CROSS PIPE UNDER ACCESS DRIVE AND ADDED WETLAND SEED MIX.
6/04/2024	ADDED RIFFLES TO STREAMS ON SHEETS 3, 4 AND 5 AND RIFFLE DETAIL TO SHEET 11



PLANS PREPARED BY:	PATRIOT ENGINEERING	317-576-8058 PHONE NUMBER
CERTIFIED BY:	<i>Kenneth Bishar</i>	6/04/2024 DATE
APPROVED FOR LETTING:	DIVISION OF RECLAMATION	DATE

SCALE	SHEET
AS NOTED	1 of 11
PROJECT	SITE
E008-334	1835



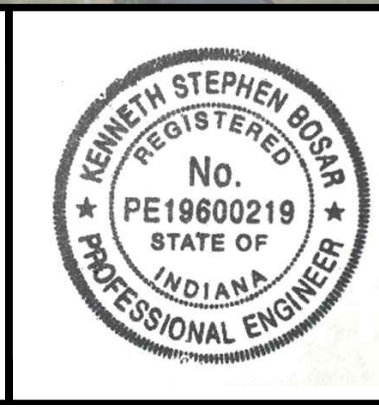


REVISIONS	
DATE	DESCRIPTION
5/03/2024	SHIFTED ACCESS DRIVE NORTH 260' AND ADJUSTED PROJECT LIMITS.

**LEGEND**

- EXISTING WATER AREA
- SHEET INDEX
- AML SITE FEATURE
- PROJECT LIMITS

**Patriot Engineering & Environmental, Inc.**



RECOMMENDED FOR APPROVAL:		5/03/2024 DATE
DESIGNED BY	K.S.B.	DRAWN BY
		J.D.D.

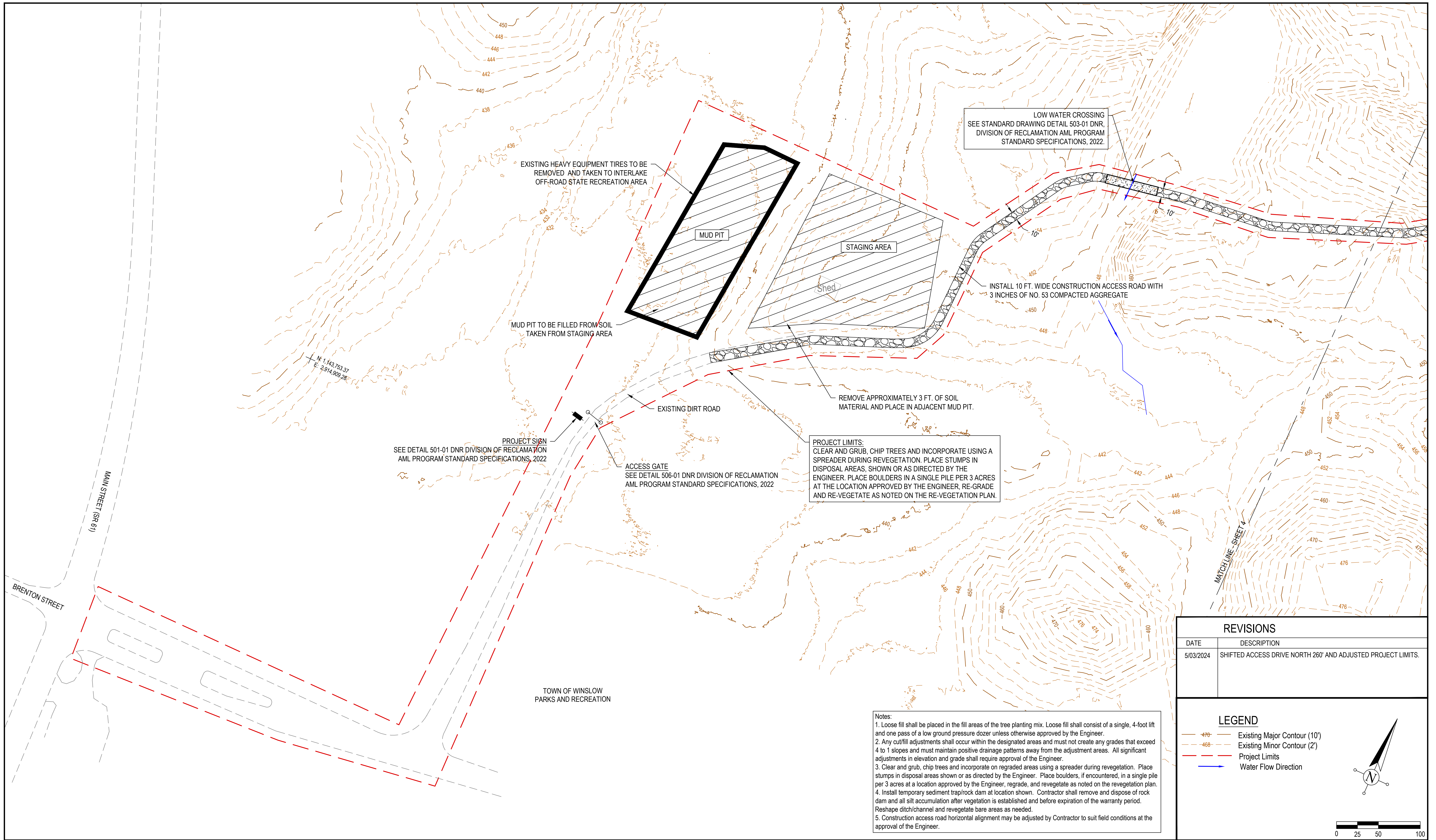
DATE MADE	5/03/2024
DATE REVISED	

**Site Map**

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

SCALE	1" = 200'
PROJECT	E008-334
SHEET	2 of 11
SITE	1835



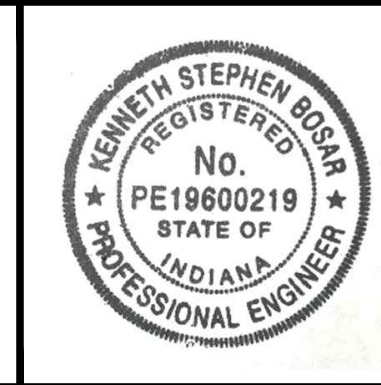


REVISIONS	
DATE	DESCRIPTION
5/03/2024	SHIFTED ACCESS DRIVE NORTH 260' AND ADJUSTED PROJECT LIMITS.

**LEGEND**

- Existing Major Contour (10')
- Existing Minor Contour (2')
- Project Limits
- Water Flow Direction

**Patriot Engineering & Environmental, Inc.**



RECOMMENDED FOR APPROVAL:		5/03/2024
		DATE
DESIGNED BY	DRAWN BY	DATE REVISED
K.S.B.	J.D.D.	

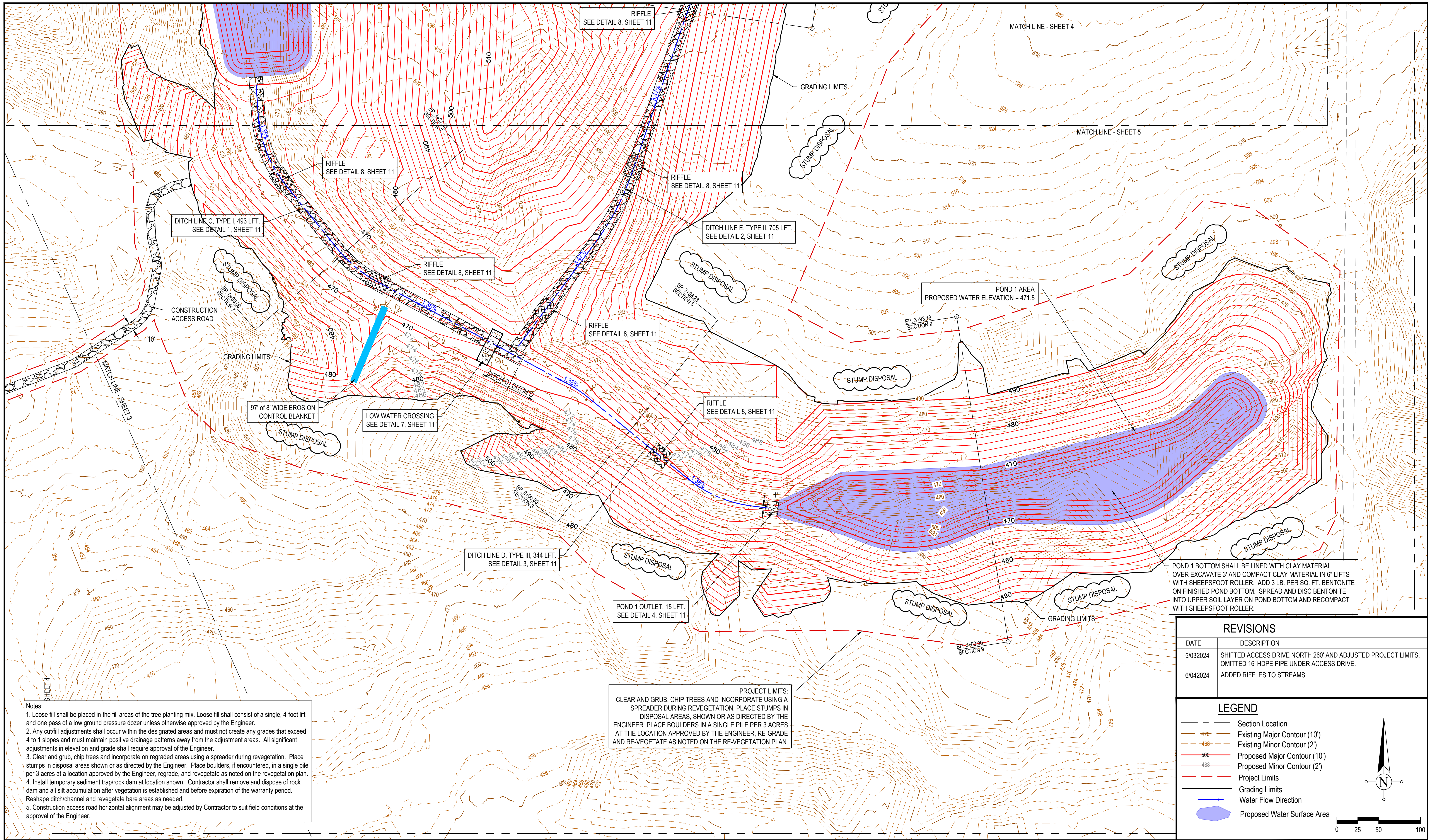
DATE MADE	5/03/2024
DATE REVISED	

**Grading Plan**

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

SCALE	1" = 50'
SHEET	3 of 11
PROJECT	E008-334
SITE	1835





Notes:

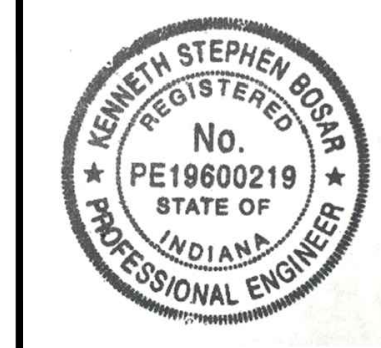
- Loose fill shall be placed in the fill areas of the tree planting mix. Loose fill shall consist of a single, 4-foot lift and one pass of a low ground pressure dozer unless otherwise approved by the Engineer.
- Any cut/fill adjustments shall occur within the designated areas and must not create any grades that exceed 4 to 1 slopes and must maintain positive drainage patterns away from the adjustment areas. All significant adjustments in elevation and grade shall require approval of the Engineer.
- Clear and grub, chip trees and incorporate on regraded areas using a spreader during revegetation. Place stumps in disposal areas shown or as directed by the Engineer. Place boulders, if encountered, in a single pile per 3 acres at a location approved by the Engineer, regrade, and revegetate as noted on the revegetation plan.
- Install temporary sediment trap/rock dam at location shown. Contractor shall remove and dispose of rock dam and all silt accumulation after vegetation is established and before expiration of the warranty period. Reshape ditch/channel and revegetate bare areas as needed.
- Construction access road horizontal alignment may be adjusted by Contractor to suit field conditions at the approval of the Engineer.

PROJECT LIMITS:  
 CLEAR AND GRUB, CHIP TREES AND INCORPORATE USING A SPREADER DURING REVEGETATION. PLACE STUMPS IN DISPOSAL AREAS, SHOWN OR AS DIRECTED BY THE ENGINEER. PLACE BOULDERS IN A SINGLE PILE PER 3 ACRES AT THE LOCATION APPROVED BY THE ENGINEER. RE-GRADE AND RE-VEGETATE AS NOTED ON THE RE-VEGETATION PLAN.

POND 1 BOTTOM SHALL BE LINED WITH CLAY MATERIAL. OVER EXCAVATE 3' AND COMPACT CLAY MATERIAL IN 6" LIFTS WITH SHEEPSFOOT ROLLER. ADD 3 LB. PER SQ. FT. BENTONITE ON FINISHED POND BOTTOM. SPREAD AND DISC BENTONITE INTO UPPER SOIL LAYER ON POND BOTTOM AND RECOMPACT WITH SHEEPSFOOT ROLLER.

REVISIONS	
DATE	DESCRIPTION
5/03/2024	SHIFTED ACCESS DRIVE NORTH 260' AND ADJUSTED PROJECT LIMITS. OMITTED 16" HDPE PIPE UNDER ACCESS DRIVE.
6/04/2024	ADDED RIFFLES TO STREAMS

LEGEND	
	Section Location
	Existing Major Contour (10')
	Existing Minor Contour (2')
	Proposed Major Contour (10')
	Proposed Minor Contour (2')
	Project Limits
	Grading Limits
	Water Flow Direction
	Proposed Water Surface Area



RECOMMENDED FOR APPROVAL:		6/04/2024
DESIGNED BY	K.S.B.	DRAWN BY
		J.D.D.

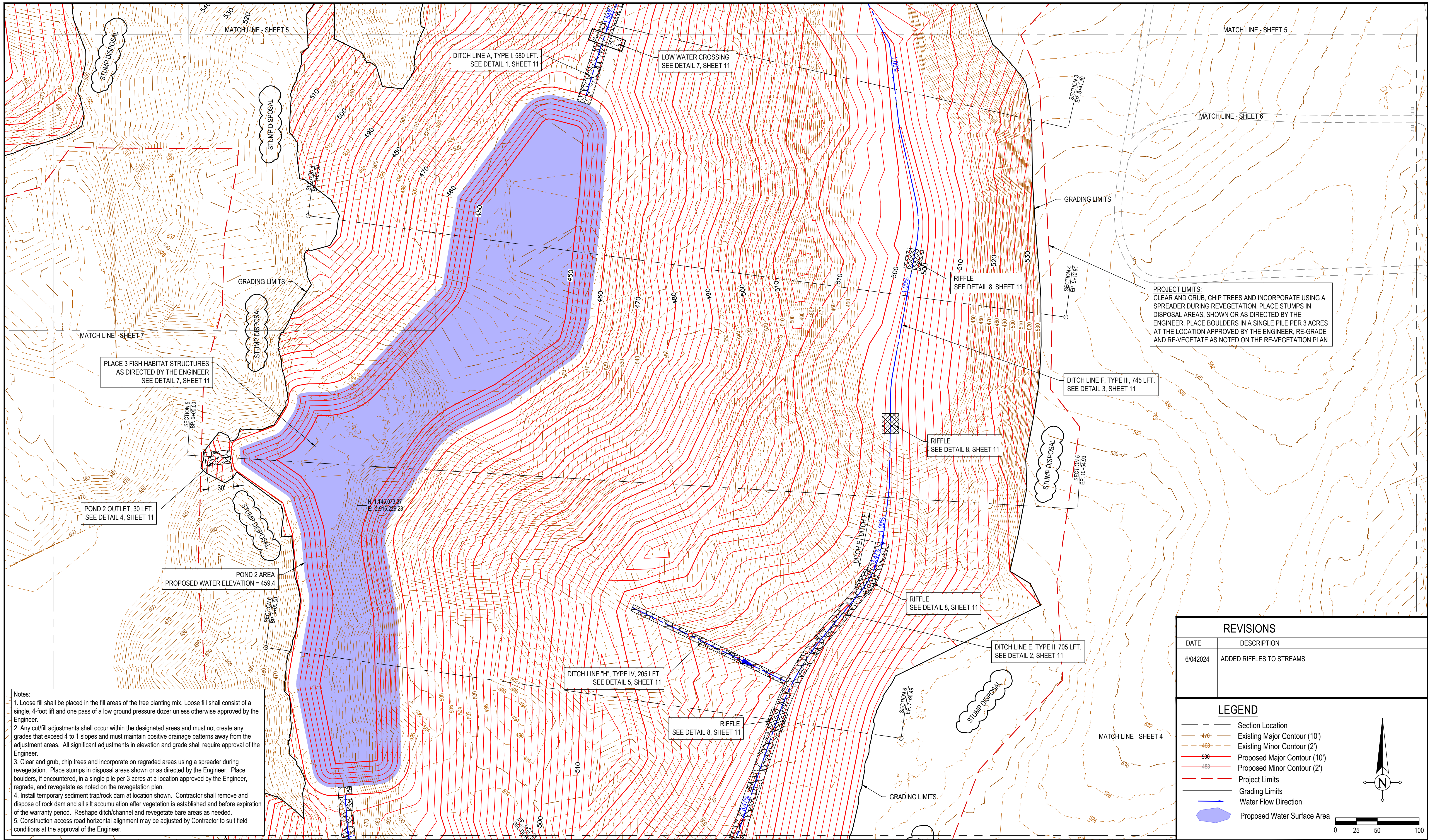
DATE MADE	6/04/2024
DATE REVISED	

**Grading Plan**

STATE OF INDIANA  
 DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF RECLAMATION

SCALE	1" = 50'	SHEET	4 of 11
PROJECT	E008-334	SITE	1835





**PROJECT LIMITS:**  
 CLEAR AND GRUB, CHIP TREES AND INCORPORATE USING A SPREADER DURING REVEGETATION. PLACE STUMPS IN DISPOSAL AREAS, SHOWN OR AS DIRECTED BY THE ENGINEER. PLACE BOULDERS IN A SINGLE PILE PER 3 ACRES AT THE LOCATION APPROVED BY THE ENGINEER, RE-GRADE AND RE-VEGETATE AS NOTED ON THE RE-VEGETATION PLAN.

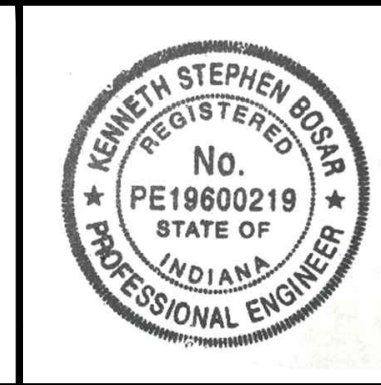
- Notes:**
- Loose fill shall be placed in the fill areas of the tree planting mix. Loose fill shall consist of a single, 4-foot lift and one pass of a low ground pressure dozer unless otherwise approved by the Engineer.
  - Any cut/fill adjustments shall occur within the designated areas and must not create any grades that exceed 4 to 1 slopes and must maintain positive drainage patterns away from the adjustment areas. All significant adjustments in elevation and grade shall require approval of the Engineer.
  - Clear and grub, chip trees and incorporate on regraded areas using a spreader during revegetation. Place stumps in disposal areas shown or as directed by the Engineer. Place boulders, if encountered, in a single pile per 3 acres at a location approved by the Engineer, regrade, and revegetate as noted on the revegetation plan.
  - Install temporary sediment trap/rock dam at location shown. Contractor shall remove and dispose of rock dam and all silt accumulation after vegetation is established and before expiration of the warranty period. Reshape ditch/channel and revegetate bare areas as needed.
  - Construction access road horizontal alignment may be adjusted by Contractor to suit field conditions at the approval of the Engineer.

REVISIONS	
DATE	DESCRIPTION
6/04/2024	ADDED RIFFLES TO STREAMS

**LEGEND**

- Section Location
- Existing Major Contour (10')
- Existing Minor Contour (2')
- Proposed Major Contour (10')
- Proposed Minor Contour (2')
- Project Limits
- Grading Limits
- Water Flow Direction
- Proposed Water Surface Area

**Patriot Engineering & Environmental, Inc.**



RECOMMENDED FOR APPROVAL:	<i>K.S.B.</i>	6/04/2024
		DATE
DESIGNED BY	K.S.B.	
DRAWN BY	J.D.D.	

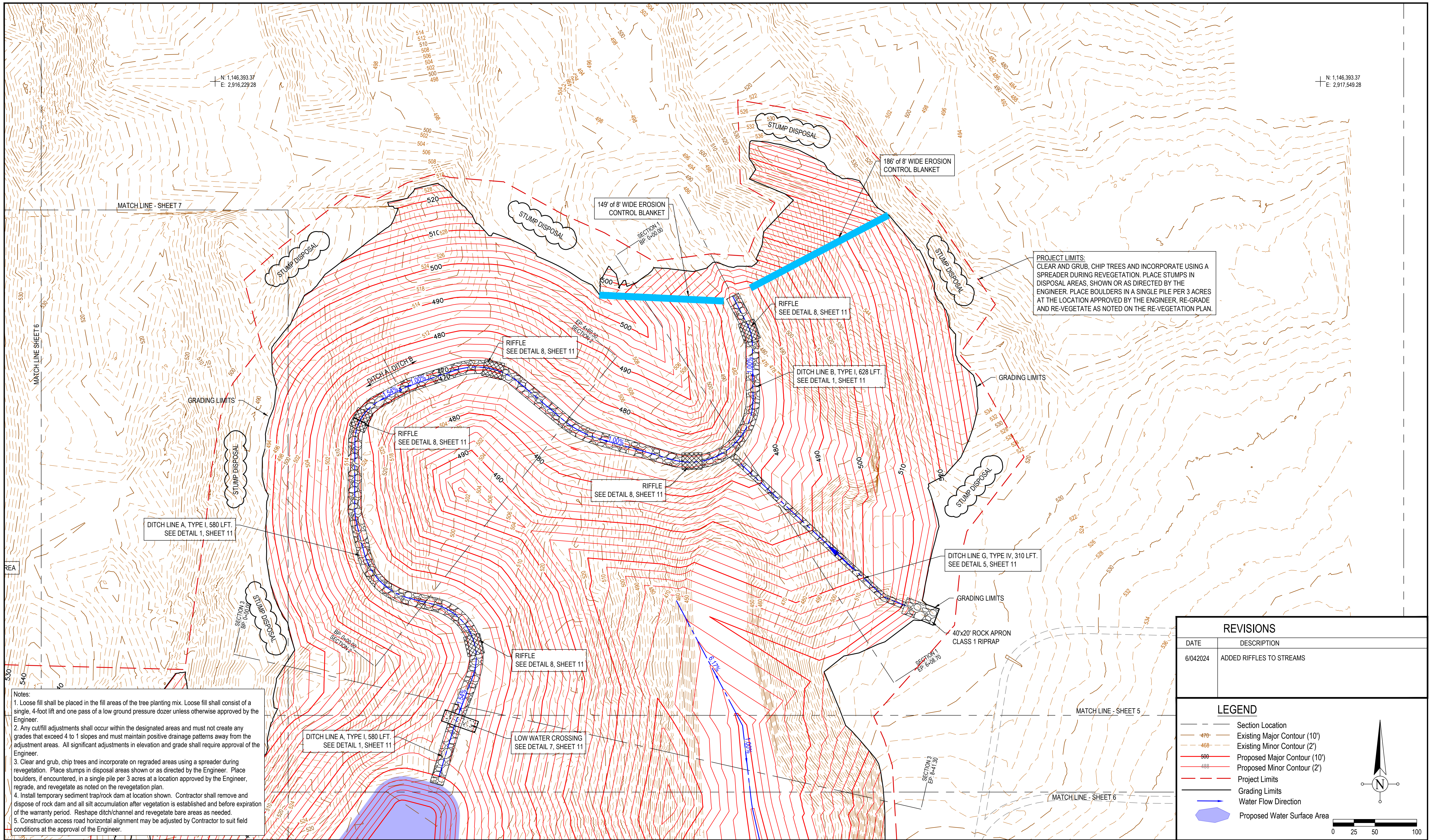
DATE MADE	6/04/2024
DATE REVISED	

**Grading Plan**

STATE OF INDIANA  
 DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF RECLAMATION

SCALE	1" = 50'
SHEET	5 of 11
PROJECT	E008-334
SITE	1835





N: 1,146,393.37  
E: 2,916,229.28

N: 1,146,393.37  
E: 2,917,549.28

PROJECT LIMITS:  
CLEAR AND GRUB, CHIP TREES AND INCORPORATE USING A SPREADER DURING REVEGETATION. PLACE STUMPS IN DISPOSAL AREAS, SHOWN OR AS DIRECTED BY THE ENGINEER. PLACE BOULDERS IN A SINGLE PILE PER 3 ACRES AT THE LOCATION APPROVED BY THE ENGINEER. RE-GRADE AND RE-VEGETATE AS NOTED ON THE RE-VEGETATION PLAN.

DITCH LINE A, TYPE I, 580 LFT.  
SEE DETAIL 1, SHEET 11

DITCH LINE A, TYPE I, 580 LFT.  
SEE DETAIL 1, SHEET 11

LOW WATER CROSSING  
SEE DETAIL 7, SHEET 11

DITCH LINE G, TYPE IV, 310 LFT.  
SEE DETAIL 5, SHEET 11

Notes:  
1. Loose fill shall be placed in the fill areas of the tree planting mix. Loose fill shall consist of a single, 4-foot lift and one pass of a low ground pressure dozer unless otherwise approved by the Engineer.  
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4. Install temporary sediment trap/rock dam at location shown. Contractor shall remove and dispose of rock dam and all silt accumulation after vegetation is established and before expiration of the warranty period. Reshape ditch/channel and revegetate bare areas as needed.  
5. Construction access road horizontal alignment may be adjusted by Contractor to suit field conditions at the approval of the Engineer.

REVISIONS	
DATE	DESCRIPTION
6/04/2024	ADDED RIFFLES TO STREAMS

**LEGEND**

- Section Location
- Existing Major Contour (10')
- Existing Minor Contour (2')
- Proposed Major Contour (10')
- Proposed Minor Contour (2')
- Project Limits
- Grading Limits
- Water Flow Direction
- Proposed Water Surface Area

**Patriot Engineering & Environmental, Inc.**

RECOMMENDED FOR APPROVAL:	<i>Kamran</i>	6/04/2024
DESIGNED BY	K.S.B.	DRAWN BY
		J.D.D.

DATE MADE	6/04/2024
DATE REVISED	

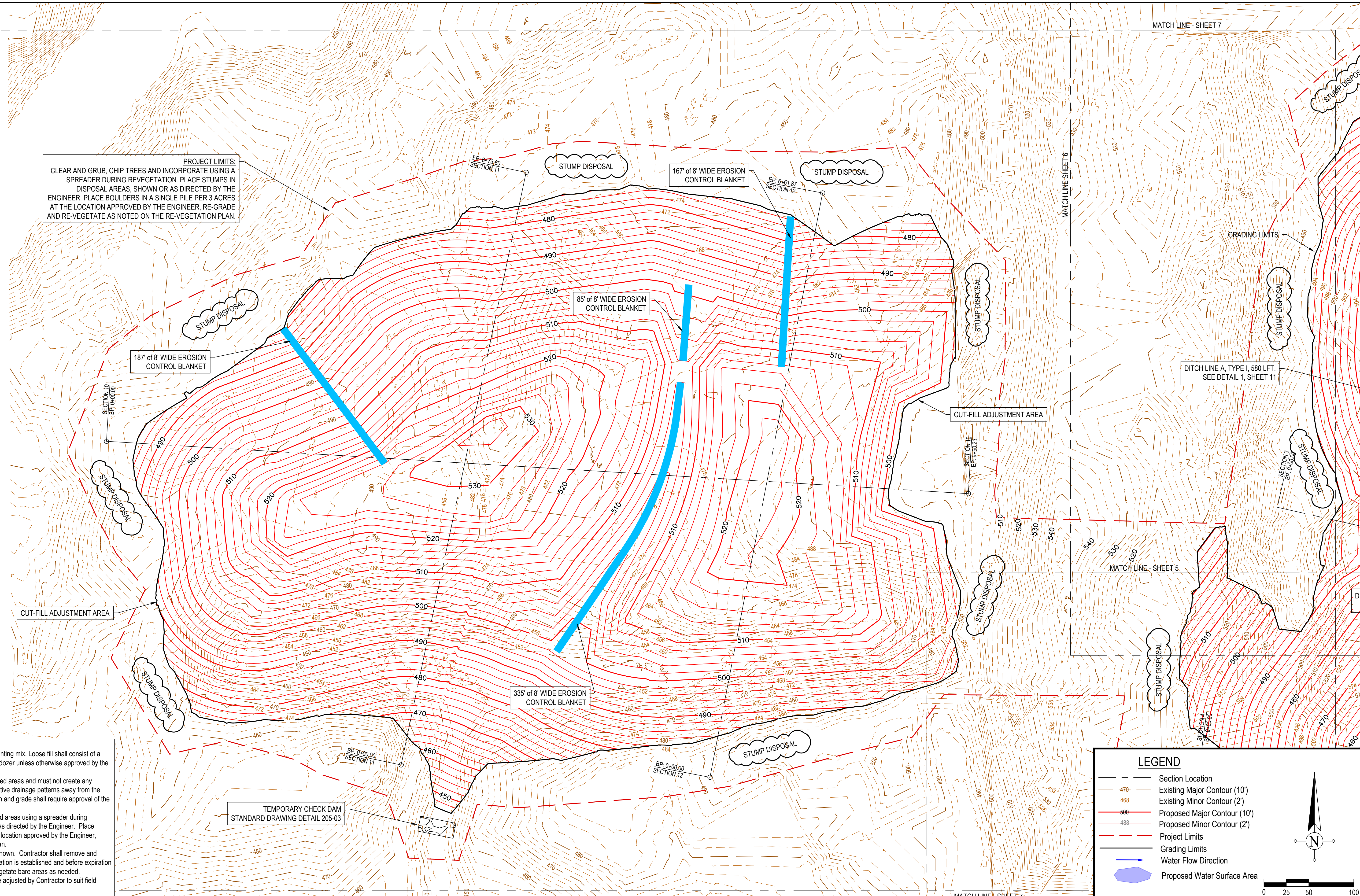
**Grading Plan**

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

SCALE	1" = 50'	SHEET	6 of 11
PROJECT	E008-334	SITE	1835



**PROJECT LIMITS:**  
 CLEAR AND GRUB, CHIP TREES AND INCORPORATE USING A SPREADER DURING REVEGETATION. PLACE STUMPS IN DISPOSAL AREAS, SHOWN OR AS DIRECTED BY THE ENGINEER. PLACE BOULDERS IN A SINGLE PILE PER 3 ACRES AT THE LOCATION APPROVED BY THE ENGINEER, RE-GRADE AND RE-VEGETATE AS NOTED ON THE RE-VEGETATION PLAN.

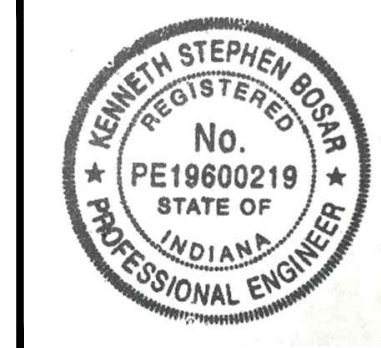


**Notes:**  
 1. Loose fill shall be placed in the fill areas of the tree planting mix. Loose fill shall consist of a single, 4-foot lift and one pass of a low ground pressure dozer unless otherwise approved by the Engineer.  
 2. Any cut/fill adjustments shall occur within the designated areas and must not create any grades that exceed 4 to 1 slopes and must maintain positive drainage patterns away from the adjustment areas. All significant adjustments in elevation and grade shall require approval of the Engineer.  
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 5. Construction access road horizontal alignment may be adjusted by Contractor to suit field conditions at the approval of the Engineer.

TEMPORARY CHECK DAM  
 STANDARD DRAWING DETAIL 205-03

**LEGEND**

- Section Location
- Existing Major Contour (10')
- Existing Minor Contour (2')
- Proposed Major Contour (10')
- Proposed Minor Contour (2')
- Project Limits
- Grading Limits
- Water Flow Direction
- Proposed Water Surface Area



RECOMMENDED FOR APPROVAL:	<i>K.S.B.</i>	9/22/2023
		DATE
DESIGNED BY	K.S.B.	
DRAWN BY	J.D.D.	

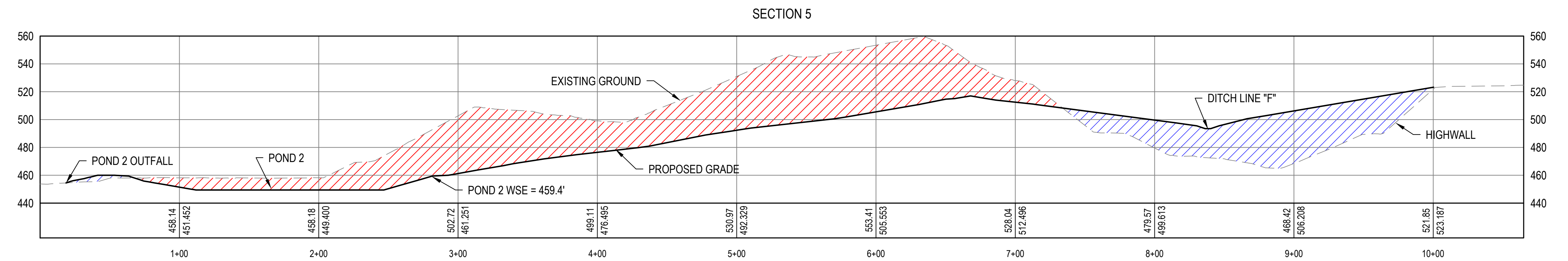
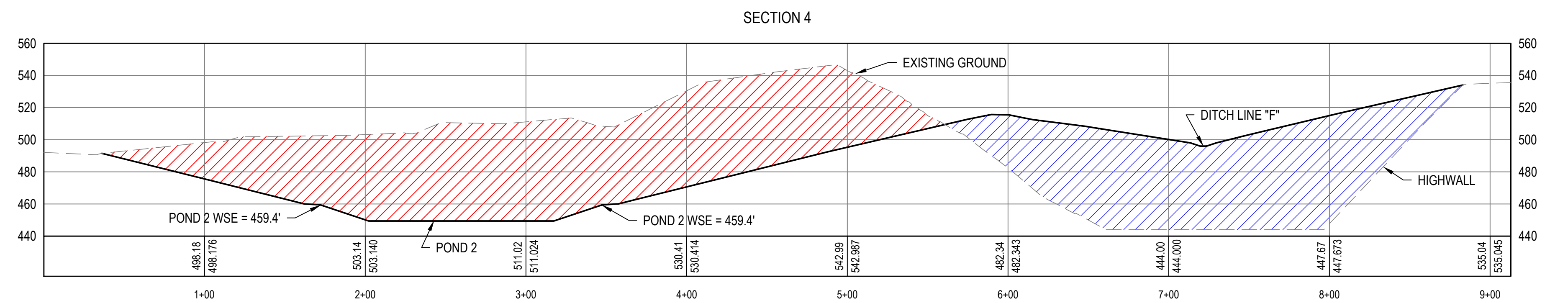
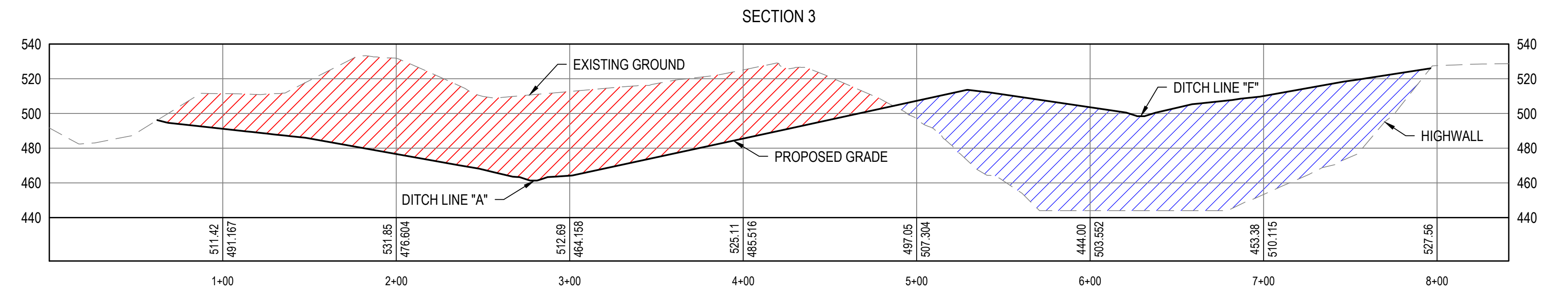
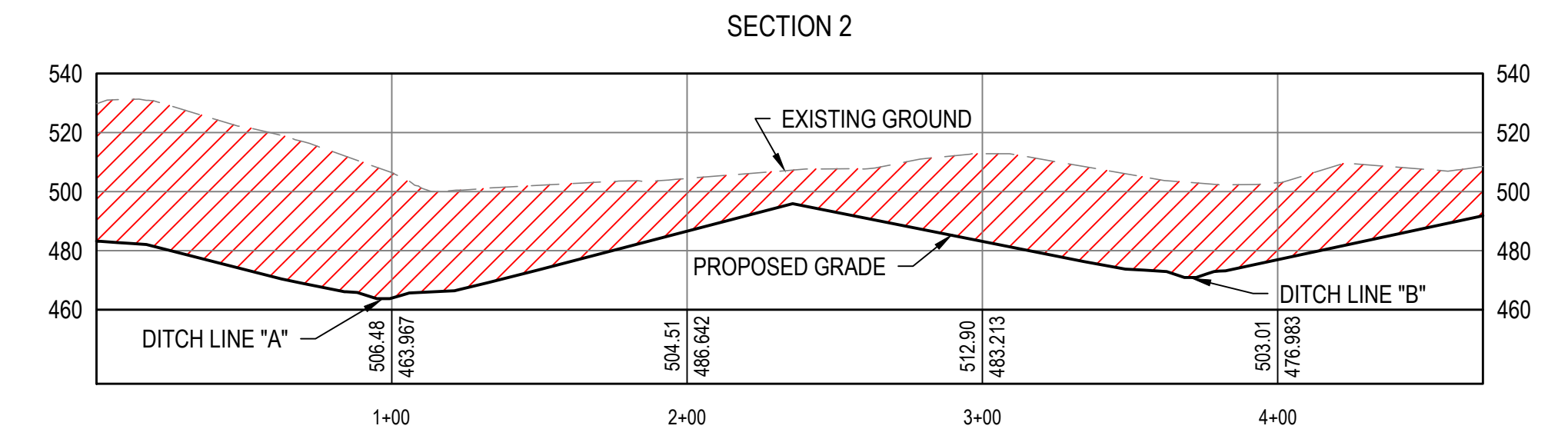
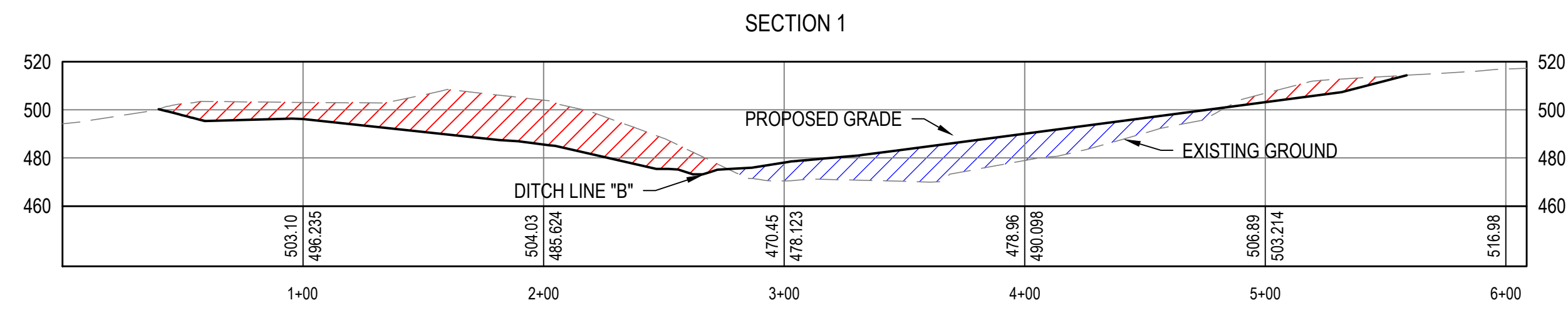
DATE MADE	9/22/2023
DATE REVISED	

**Grading Plan - Cut/Fill Adjustment Area**

STATE OF INDIANA  
 DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF RECLAMATION

SCALE	1" = 50'
SHEET	7 of 11
PROJECT	E008-334
SITE	1835





LEGEND  
 CUT AREA  
 FILL AREA



RECOMMENDED FOR APPROVAL: *K.S.B.* 9/22/2023  
DATE

DESIGNED BY  
K.S.B.

DRAWN BY  
J.D.D.

DATE MADE  
9/22/2023

DATE REVISED

Sections

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

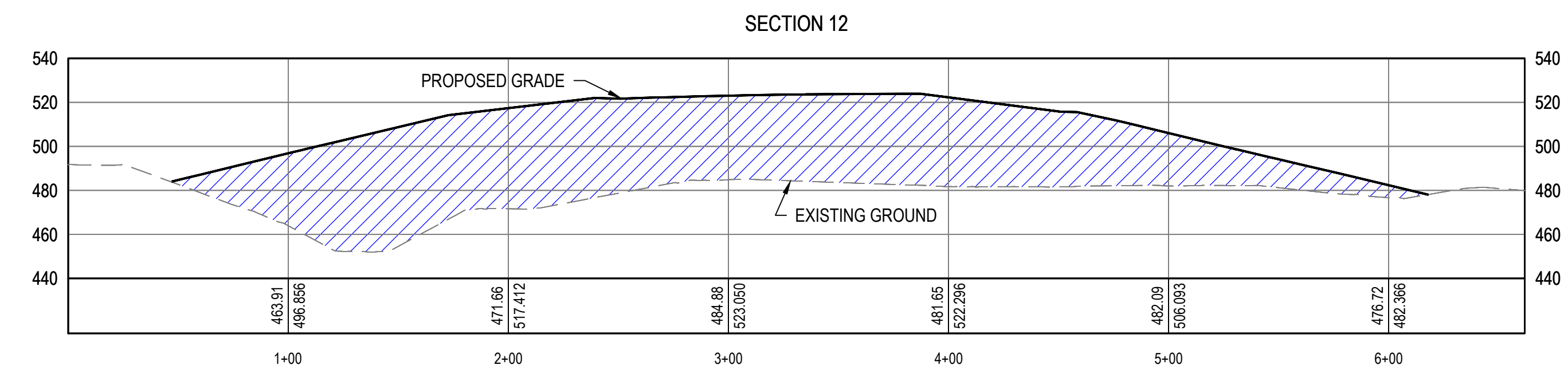
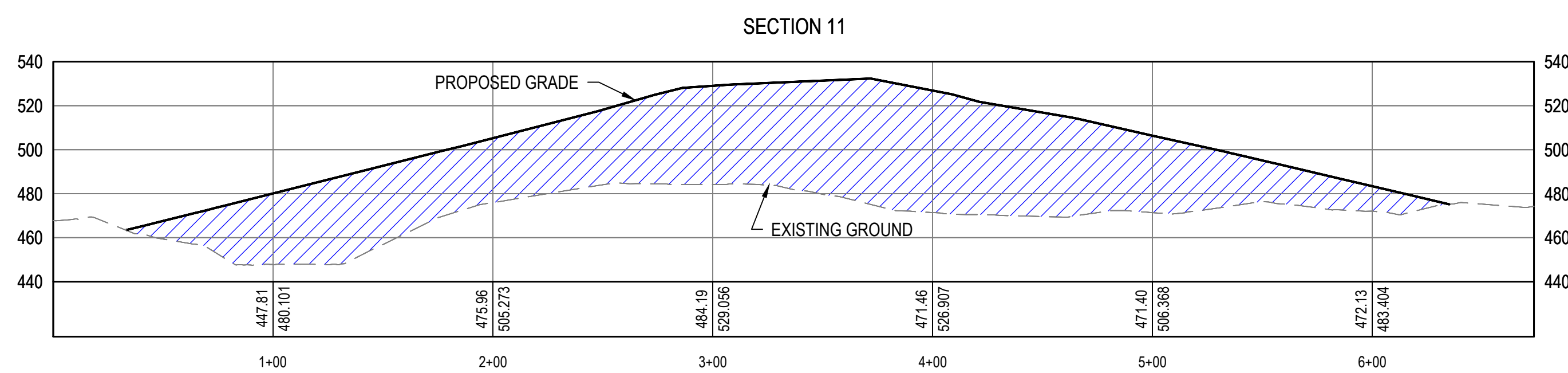
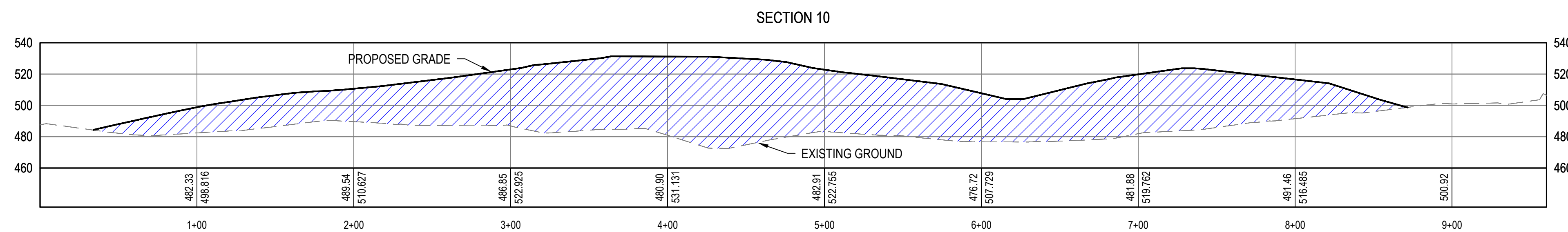
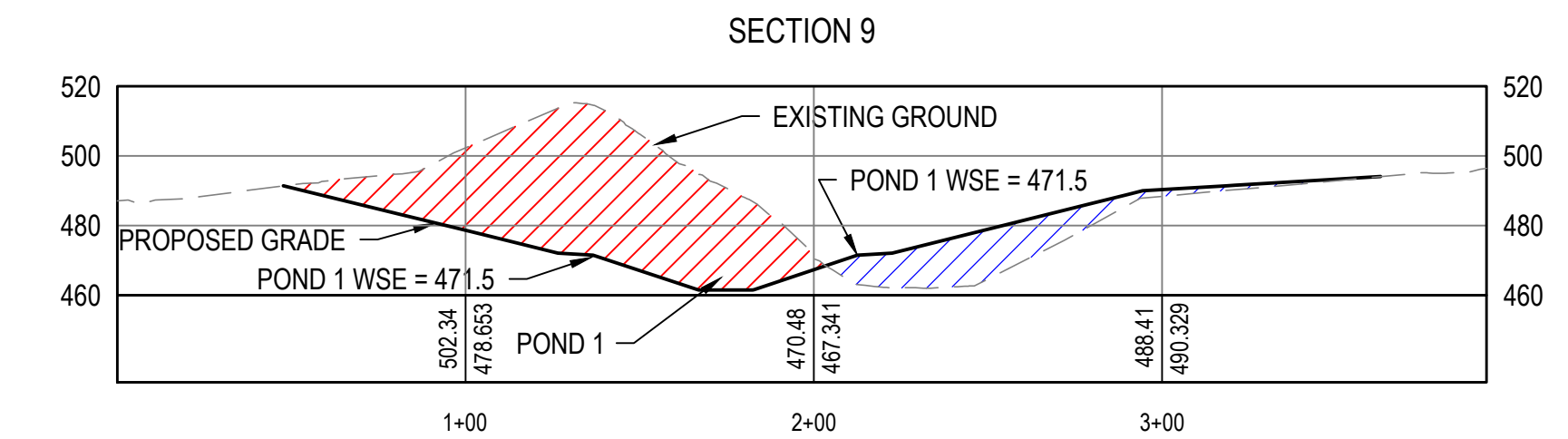
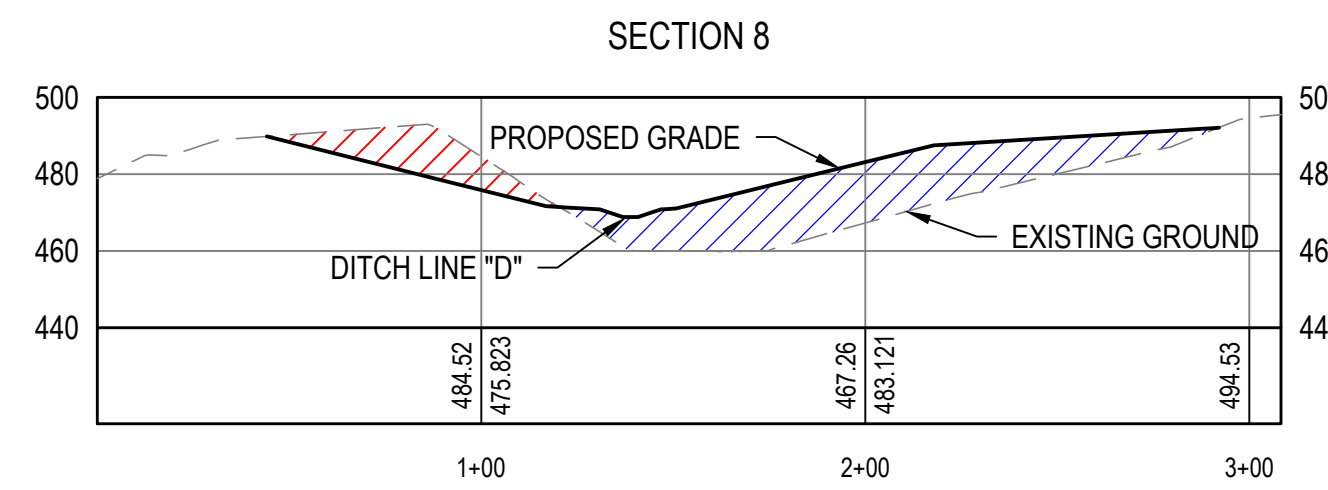
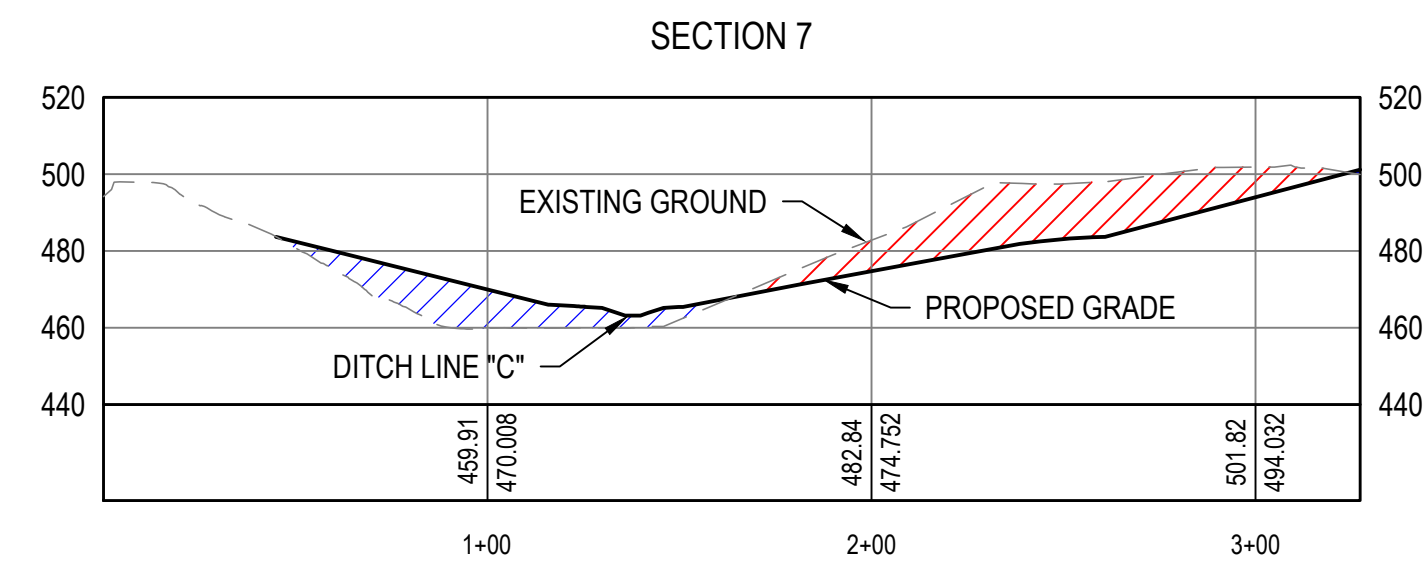
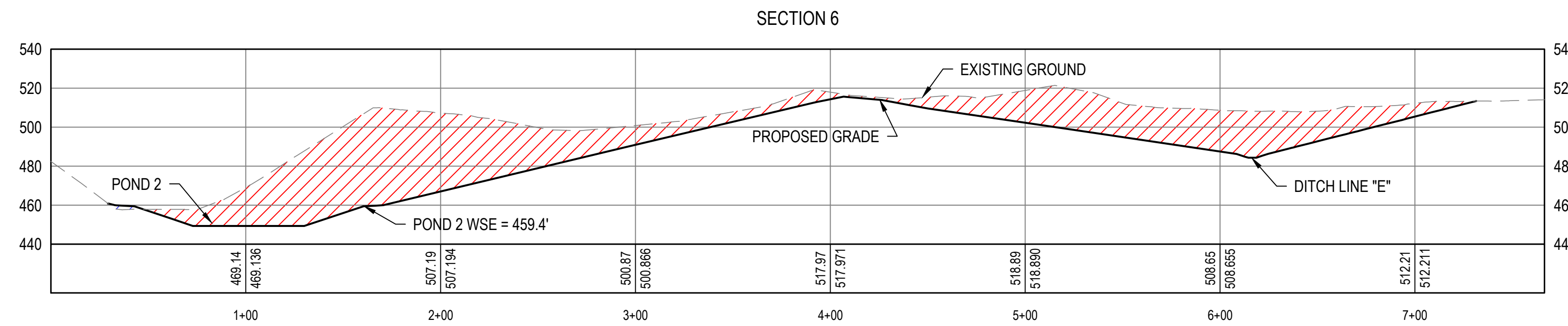
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PROJECT  
E008-334

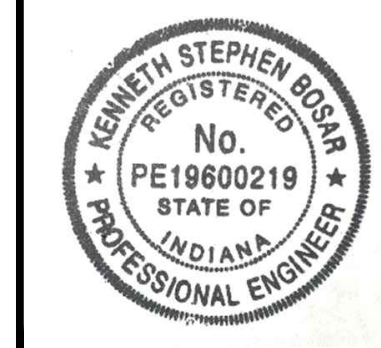
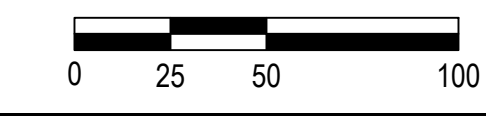
SHEET  
8 of 11

SITE





LEGEND  
 CUT AREA  
 FILL AREA



RECOMMENDED FOR APPROVAL: *Kamran* 9/22/2023  
 DATE

DESIGNED BY  
 K.S.B.

DRAWN BY  
 J.D.D.

DATE MADE  
 9/22/2023

DATE REVISED

Sections  
 STATE OF INDIANA  
 DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF RECLAMATION

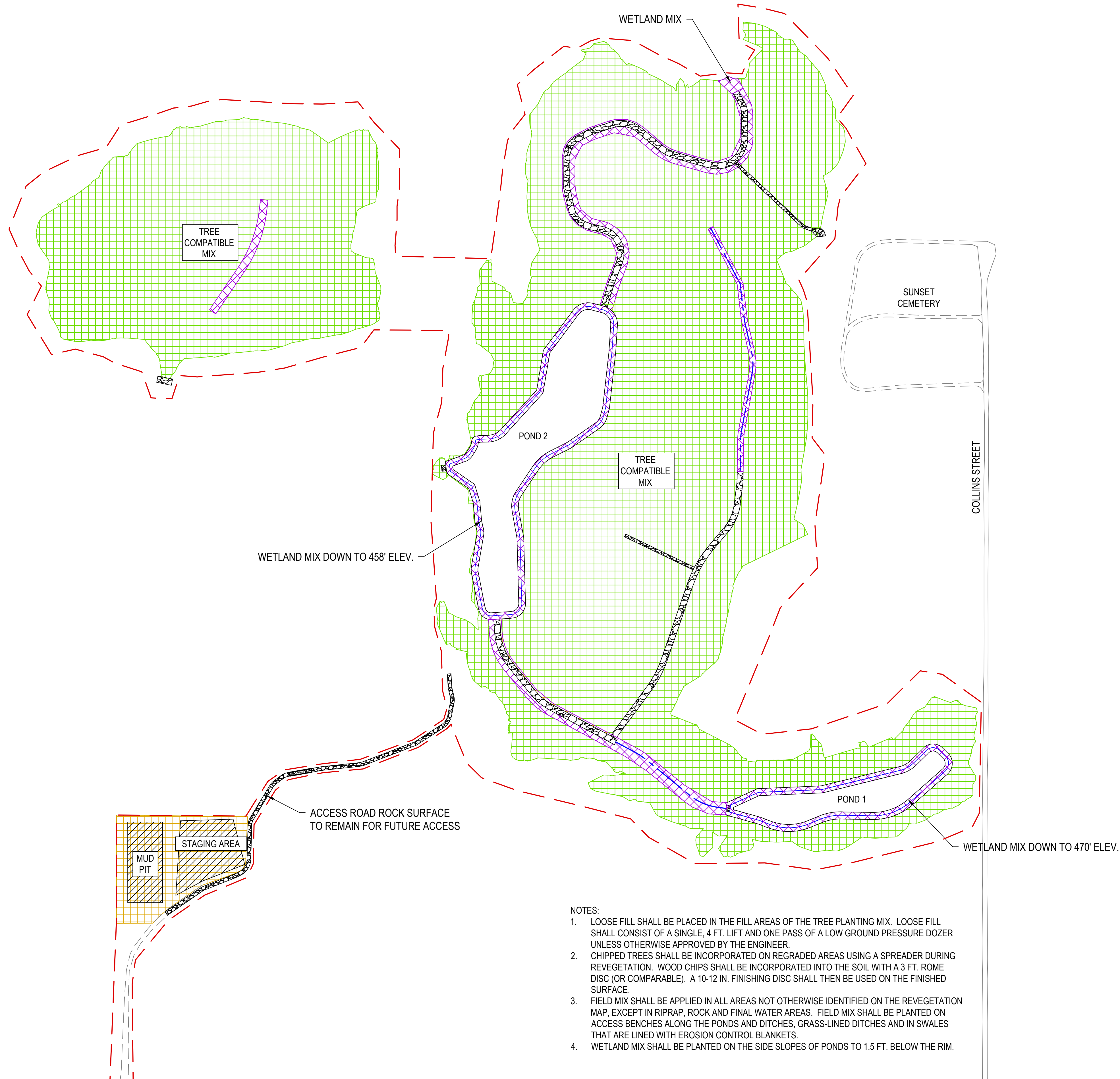
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PROJECT  
 E008-334

SHEET  
 9 of 11

SITE



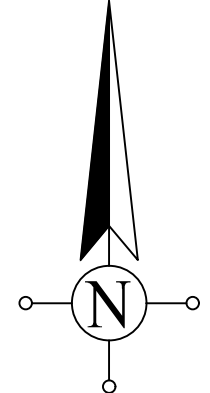



SEED MIXES	
FIELD MIX	
SEED	lbs/ac
Common Oat (Avena Sativa)	50
Little Bluestem (Schizachyrium scoparium)	5
Orchard Grass (Dactylis glomerata)	5
Perennial Ryegrass (Lolium perenne)	8
Smooth Brome (Bromus inermis)	5
Switchgrass (Panicum virgatum)	5
Weeping Lovegrass (Eragrostis curvula)	2
Red Clover (Trifolium pratense)	8
TREE COMPATIBLE MIX	
SEED	lbs/ac
Common Oat (Avena Sativa)	50
Alfalfa (Medicago Sativa)	3
Switchgrass, cave-in-rock (Panicum virgatum)	2
Partridge pea (Chamaecrista fasciculata)	1
WETLAND MIX	
Permanent Grass/Sedge	
SEED	PLS oz/ac
Fox Sedge (Carex vulpinoidea)	6
Blunt Spikerush (Eleocharis obtusa)	1
Virginia Wildrye (Elymus virginicus)	48
Common Rush (Juncus effuses)	5
Green Bulrush (Scirpus atrovirens)	5
Woolgrass (Scirpus cyperinus)	4
Softstem Bulrush (Scirpus validus)	5
Forbs	
SEED	PLS oz/ac
American Water Plantain (Alisma subcordatum)	4
Swamp Milkweed (Asclepias incarnata)	2
Nodding Beggartick (Bidens cernua)	4
Allegheny Monkeyflower (Minimulus ringens)	1
Broadleaf Arrowhead (Sagittaria latifolia)	6
Swamp Verbena (Verbena hastata)	2

REVISIONS	
DATE	DESCRIPTION
5/03/2024	CHANGED THE SEED AREAS IN THE CHANNELS AND PONDS FROM 'FIELD MIX' TO 'WETLAND MIX'. ADDED WETLAND MIX SEED DESCRIPTION. ADDED WETLAND MIX AT CUT/FILL ADJUSTMENT AREA CHANGED NOTE 4. ADJUSTED PROJECT LIMITS AND ACCESS DRIVE LOCATION

**LEGEND**

- GRADING LIMITS
- - - PROJECT LIMITS
- - - GRASS DITCH LINE
- PAVED ROAD/DRIVE
- - - UN-PAVED ROAD/DRIVE
- PROPOSED WATER
- SITE ACCESS
- STAGING AREA
- RIPRAP FEATURE
- FIELD MIX
- TREE MIX
- WETLAND MIX





- NOTES:**
- LOOSE FILL SHALL BE PLACED IN THE FILL AREAS OF THE TREE PLANTING MIX. LOOSE FILL SHALL CONSIST OF A SINGLE, 4 FT. LIFT AND ONE PASS OF A LOW GROUND PRESSURE DOZER UNLESS OTHERWISE APPROVED BY THE ENGINEER.
  - CHIPPED TREES SHALL BE INCORPORATED ON REGRADED AREAS USING A SPREADER DURING REVEGETATION. WOOD CHIPS SHALL BE INCORPORATED INTO THE SOIL WITH A 3 FT. ROME DISC (OR COMPARABLE). A 10-12 IN. FINISHING DISC SHALL THEN BE USED ON THE FINISHED SURFACE.
  - FIELD MIX SHALL BE APPLIED IN ALL AREAS NOT OTHERWISE IDENTIFIED ON THE REVEGETATION MAP, EXCEPT IN RIPRAP, ROCK AND FINAL WATER AREAS. FIELD MIX SHALL BE PLANTED ON ACCESS BENCHES ALONG THE PONDS AND DITCHES, GRASS-LINED DITCHES AND IN SWALES THAT ARE LINED WITH EROSION CONTROL BLANKETS.
  - WETLAND MIX SHALL BE PLANTED ON THE SIDE SLOPES OF PONDS TO 1.5 FT. BELOW THE RIM.



**Patriot Engineering & Environmental, Inc.**



RECOMMENDED FOR APPROVAL:		5/03/2024 DATE
DESIGNED BY	K.S.B.	DRAWN BY
		J.D.D.

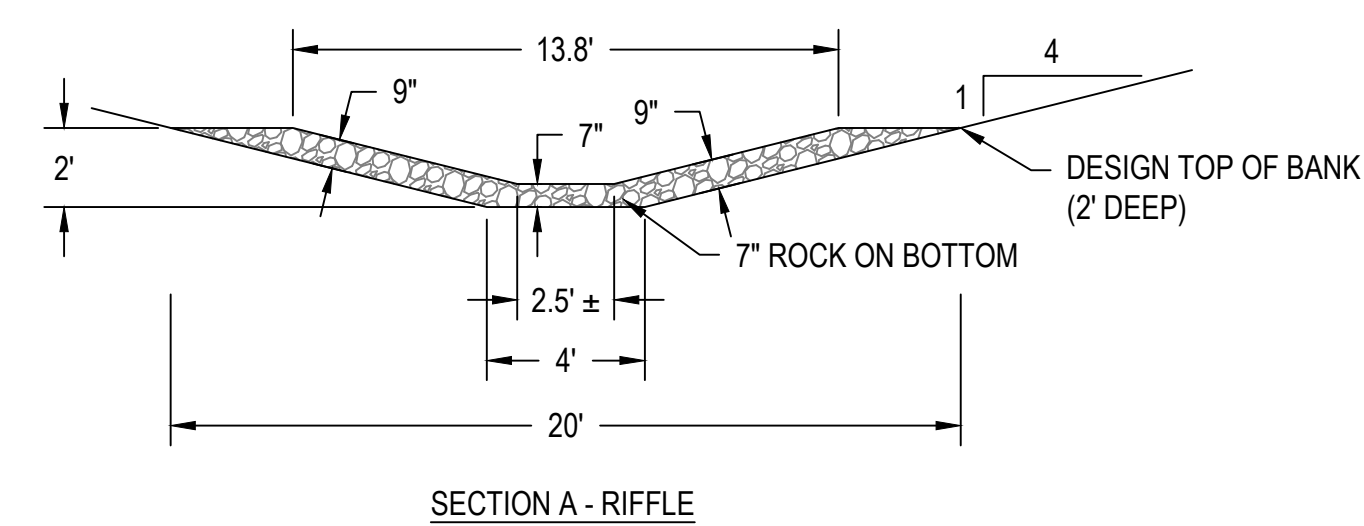
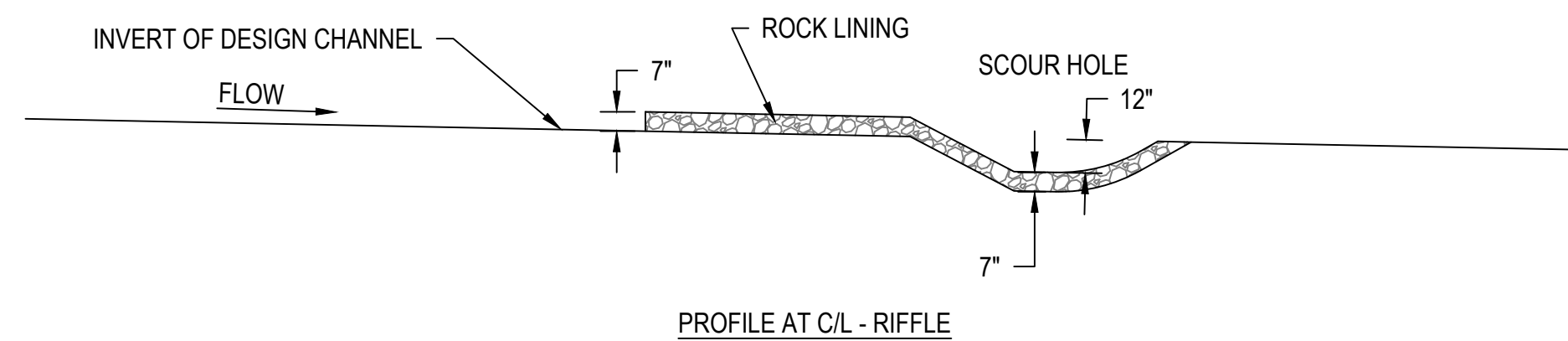
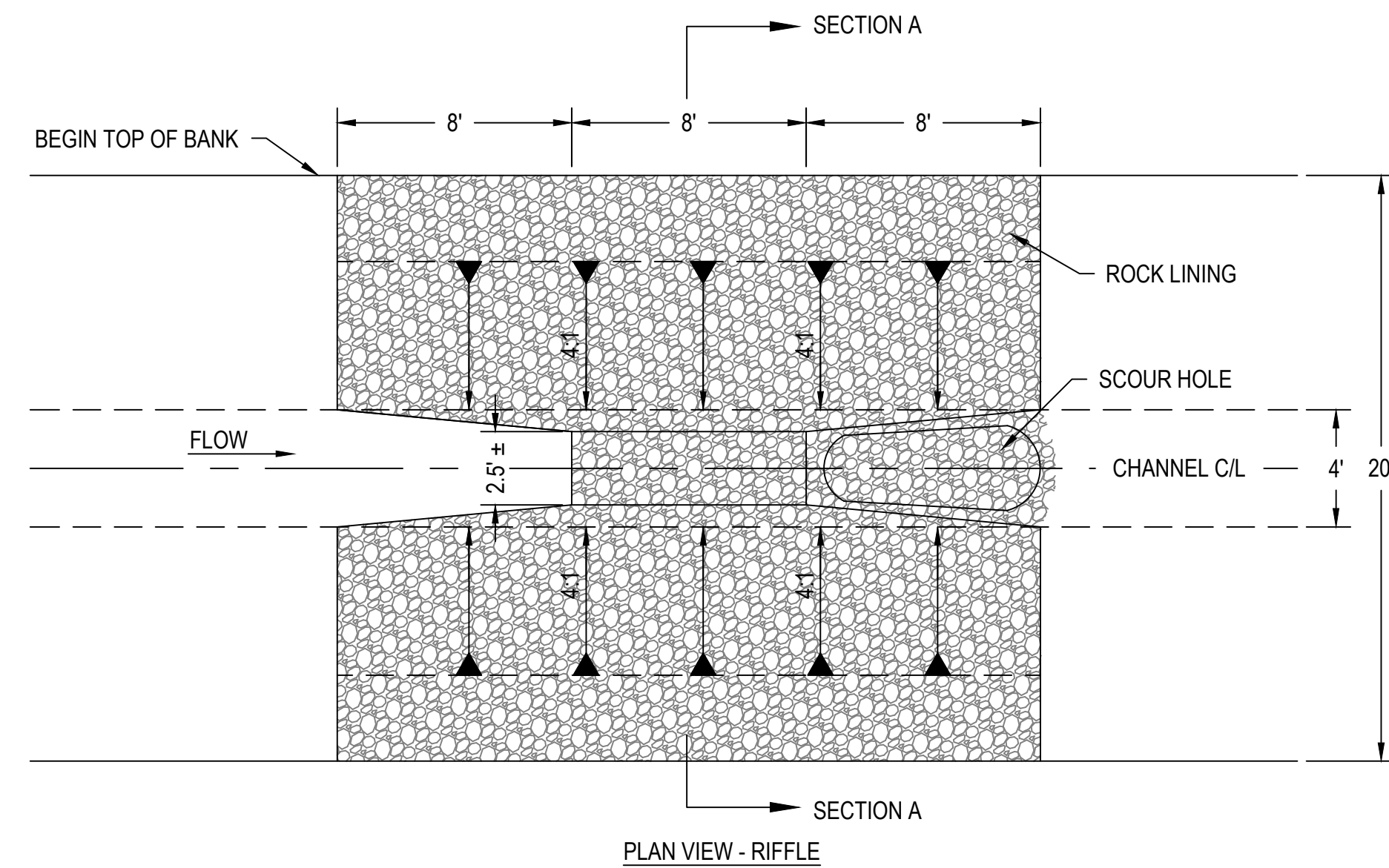
DATE MADE	5/03/2024
DATE REVISED	

**Revegetation Plan**

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

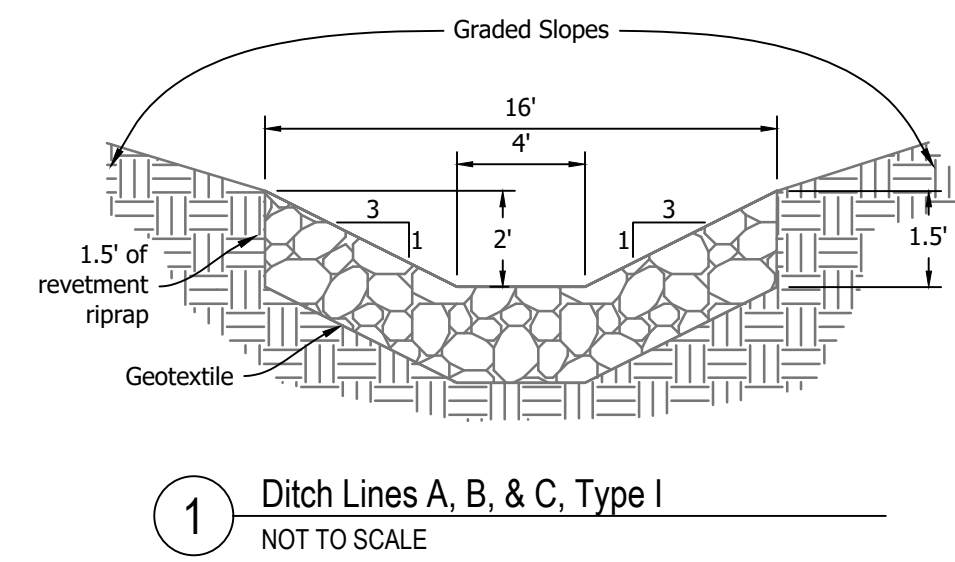
SCALE	1" = 150'
PROJECT	E008-XXX
SHEET	10 of 11
SITE	1835



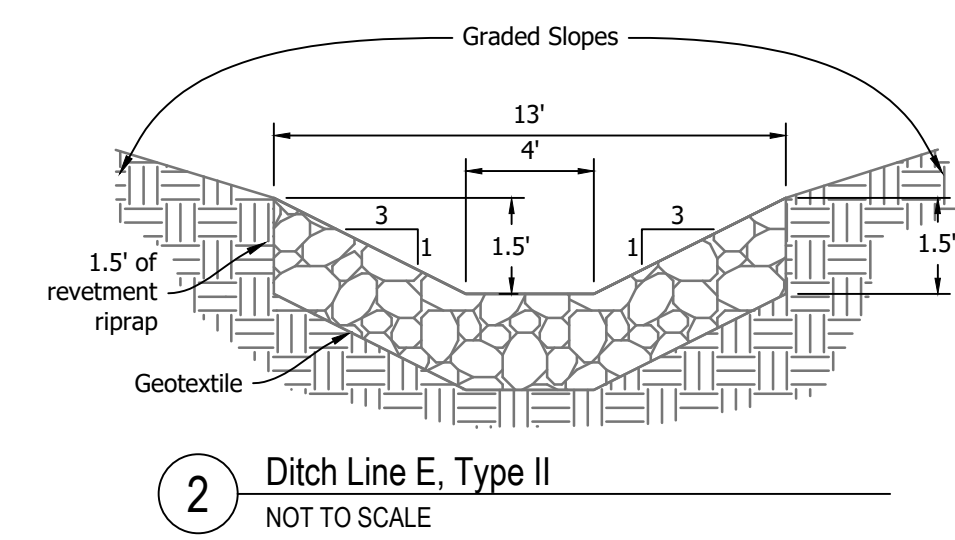


NOTE:  
ROCK LINING SHALL BE UNIFORM A RIPRAP IN ACCORDANCE WITH AML PROGRAM - STANDARD SPECIFICATION 601.03

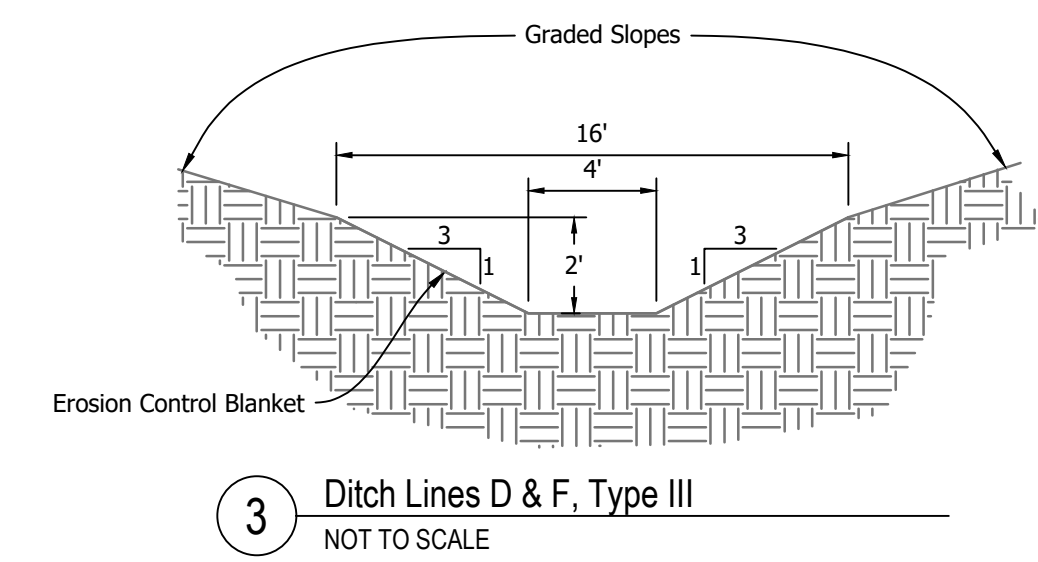
8 RIFFLE  
1" = 5'



1 Ditch Lines A, B, & C, Type I  
NOT TO SCALE

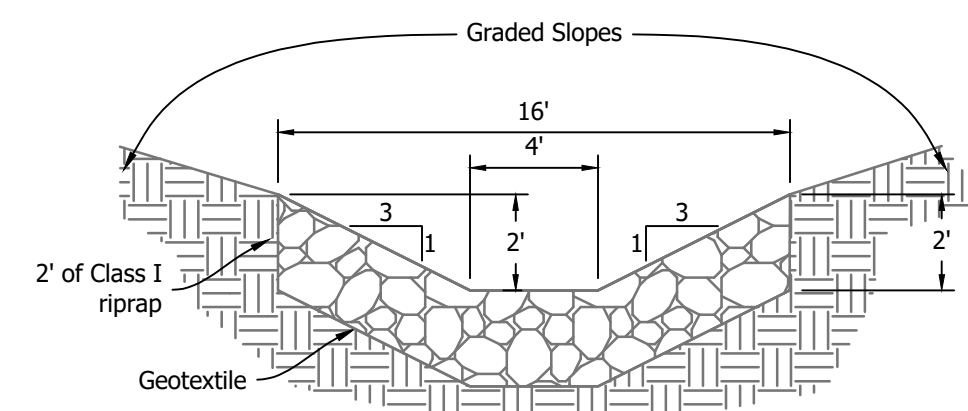


2 Ditch Line E, Type II  
NOT TO SCALE

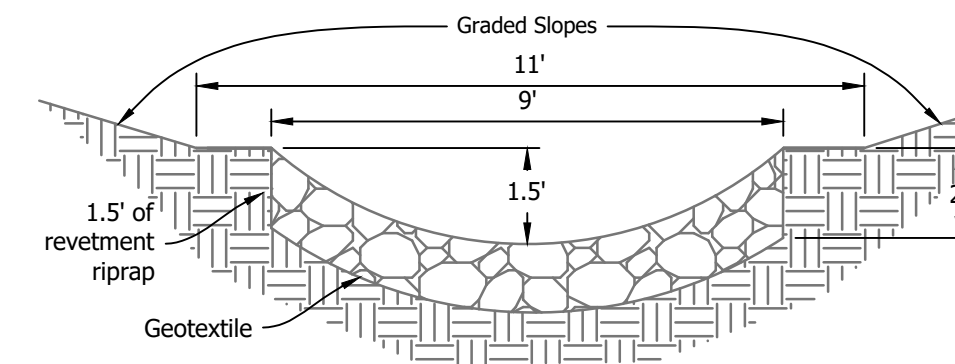


3 Ditch Lines D & F, Type III  
NOT TO SCALE

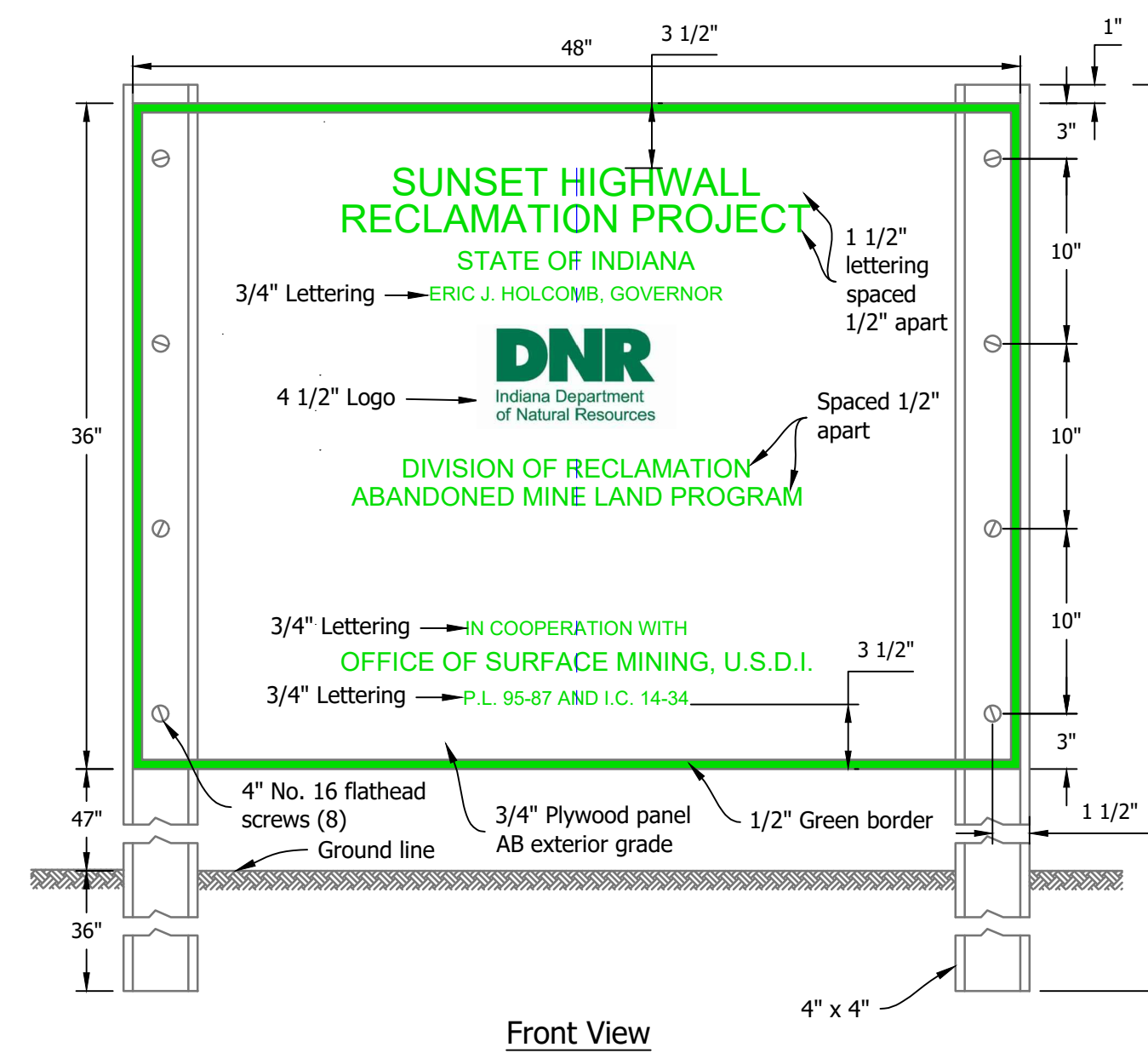
NOTE  
PLANT FIELD MIX ON DITCH  
BOTTOM AND SIDE SLOPES.



4 Pond Outlet Structures 1 & 2  
NOT TO SCALE

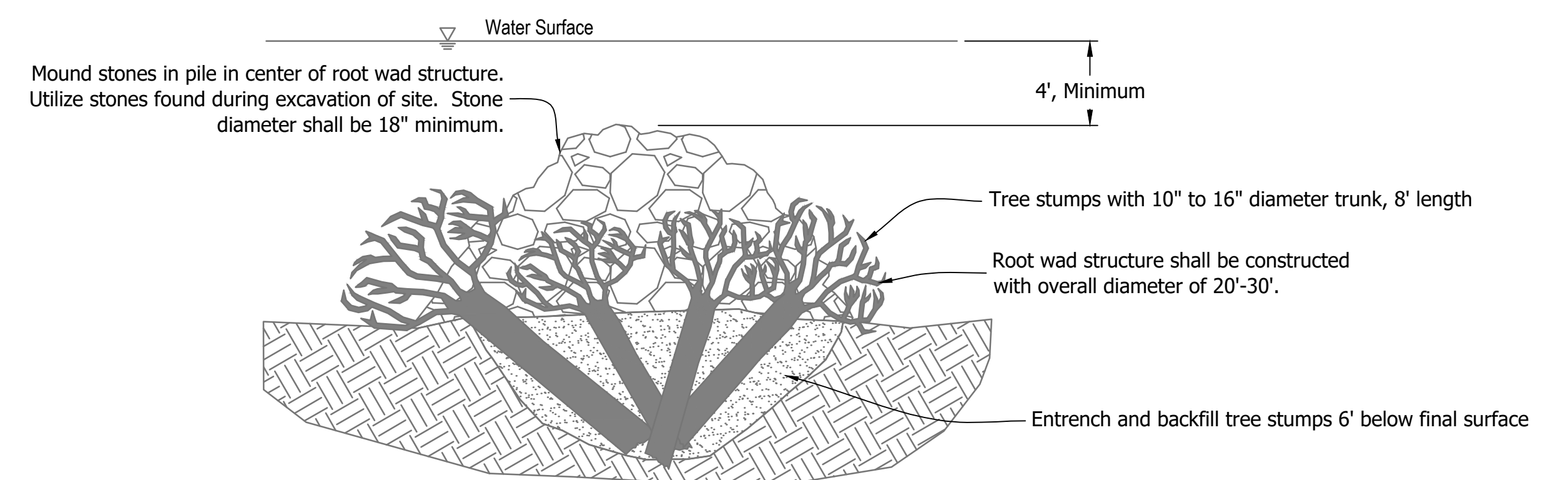


5 Ditch Line G & H, Type IV  
NOT TO SCALE



Notes:  
1. Yellow background on front and back  
2. 1" Green lettering, spaced at 1" apart unless otherwise noted

6 Project Sign  
NOT TO SCALE



7 Fish Habitat Structure - Root Wad Hump  
NOT TO SCALE

REVISIONS	
DATE	DESCRIPTION
6/04/2024	ADDED RIFFLE DETAIL 8



RECOMMENDED FOR APPROVAL: *K.S.B.* 9/04/2024 DATE

DESIGNED BY  
K.S.B.

DRAWN BY  
J.D.D

DATE MADE  
6/04/2024

DATE REVISED

Details

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF RECLAMATION

SCALE  
AS NOTED

PROJECT  
E008-334

SHEET  
11 of 11

SITE  
1835