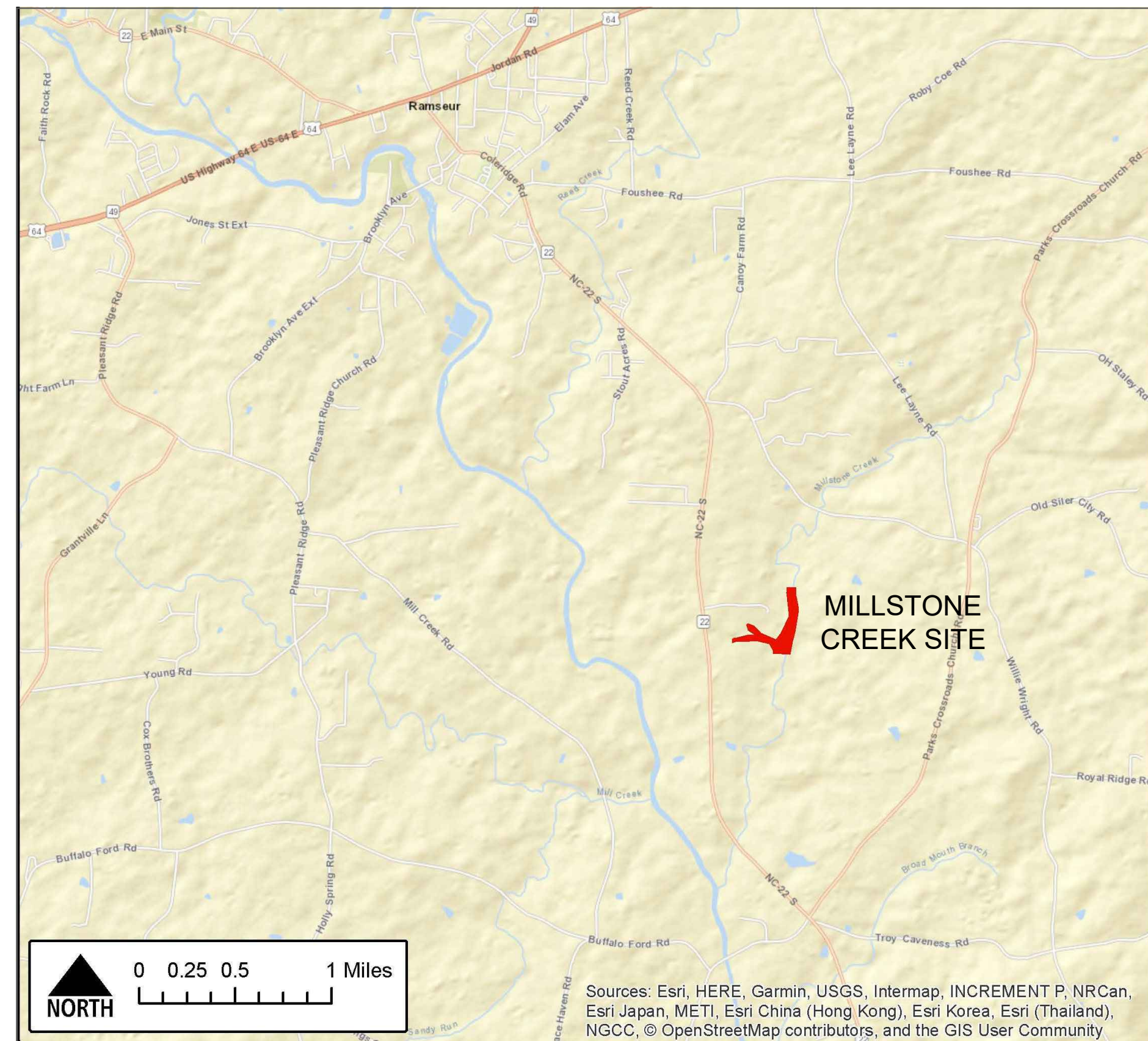


# NC DEPARTMENT OF ENVIRONMENTAL QUALITY - DIVISION OF MITIGATION SERVICES

## MILLSTONE CREEK MITIGATION SITE - PHASE 2

# RECORD DRAWINGS

**RANDOLPH COUNTY, NORTH CAROLINA**  
**SCO# 20-22021-01B; NCDMS IMS# 204; USACE AID: SAW-2019-01363**  
**LAT: 35.696683 LONG:-79.623956**

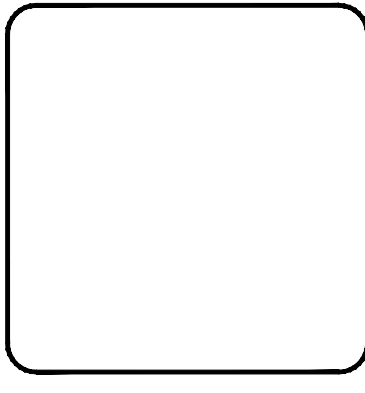
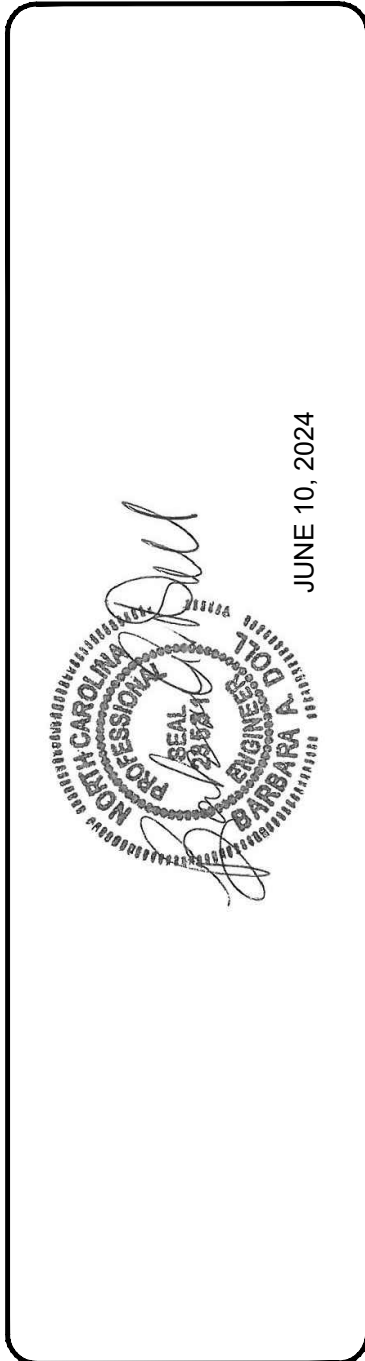


<b>PROJECT DIRECTORY</b>	
<b>OWNER:</b>	<b>NORTH CAROLINA DIVISION OF MITIGATION SERVICES</b>
	MELONIE ALLEN 217 WEST JONES STREET RALEIGH, NC 27603 919.707.8540 melonie.allen@ncdenr.gov
<b>ENGINEER:</b>	<b>NORTH CAROLINA STATE UNIVERSITY</b>
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<b>SURVEYOR:</b>	<b>STANTEC</b>
	DAVID ALLEY, PLS ONE WEST FOURTH STREET SUITE 820 WINSTON-SALEM, NC 27101 743.444.5246
<b>SHEET INDEX</b>	
TITLE SHEET	1.1
PROJECT OVERVIEW	2.1
PLAN AND PROFILE SHEETS	4.1
RE-VEGETATION PLAN	5.1

**AS-BUILT & RECORD  
DRAWINGS**  
**June 10, 2024**

MILLSTONE CREEK  
 NC DMS MITIGATION SITE  
 RANDOLPH COUNTY  
 PHASE 2

TITLE 1.1


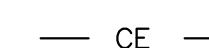




NC STATE






DESIGN: JLP, BAD	PROJECT: MILLSTONE CREEK
DRAWN: JKF	SCALE: AS NOTED
APPROVED: BAD	DATE: JUNE 10, 2024
PROJECT #	SCO# 20-22021-01B
PHASE #	2

**STANDARD LINES AND SYMBOLS**









**PRECONSTRUCTION FEATURES**


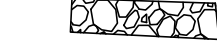



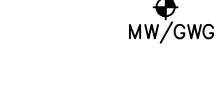

-  EXISTING TOB
-  EXISTING CONSERVATION EASEMENT
-  EXISTING EASEMENT FENCING APPROXIMATE LOCATION
-  EXISTING GATE

**DESIGN FEATURES**

-  DESIGN REGENERATIVE STORMWATER CONVEYANCE
-  DESIGN ENHANCEMENT 2
-  DESIGN LOG SILL
-  DESIGN REGENERATIVE STORMWATER CONVEYANCE CHANNEL
-  DESIGN CONSTRUCTED RIFFLE

**AS-BUILT FEATURES**

-  AS-BUILT THALWEG
-  AS-BUILT TOP OF BANK
-  AS-BUILT TOE OF BANK
-  AS-BUILT SURVEY LIMIT
-  AS-BUILT GATE
-  AS-BUILT CONTOURS
-  AS-BUILT LOG SILL
-  AS-BUILT REGENERATIVE STORMWATER CONVEYANCE CHANNEL

-  BRUSH HABITAT FEATURE
-  AS-BUILT CONSTRUCTED RIFFLE
-  MONITORING CROSS SECTION
-  VEG PLOT
-  PHOTO POINT
-  MONITORING WELL/ GROUNDWATER GAUGE
-  CONTROL POINT

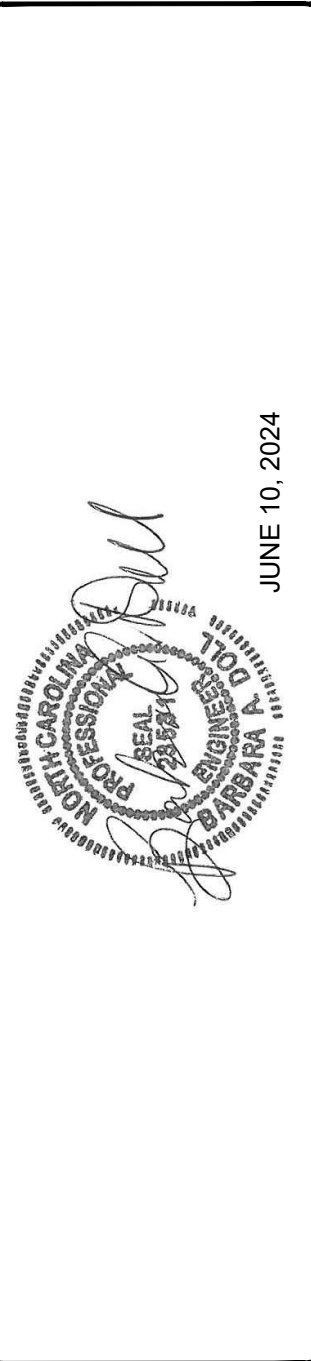
**CONTROL POINTS**

POINT NO.	NORTHING(Y)	EASTING(X)	ELEV(Z)	DESCRIPTION
1	709432.11	1814267.16	469.769	TLS#1NL
2	709005.28	1814573.92	462.591	TLS#2NL
3	709098.44	1814902.49	443.691	TLS#3NL
4	708694.19	1815046.77	438.284	TLS#4NL
5	708593.88	1815321.16	431.151	TLS#5NL
6	709193.14	1815191.97	437.679	TLS#6NL
7	709060.41	1815494.85	442.400	TLS#7NL
9	709762.36	1815629.26	447.277	TLS#9NL
10	710108.00	1815387.34	439.149	TLS#10NL

NOTE: AS-BUILT SURVEY COMPLETED FEB-MAR 2024

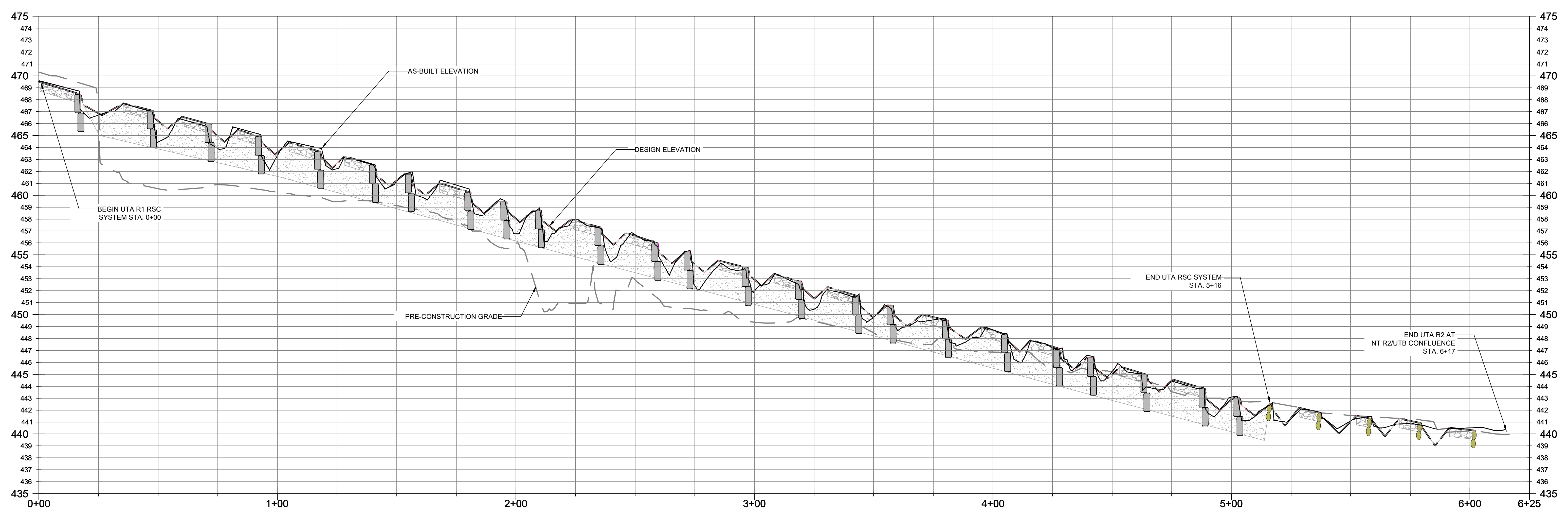
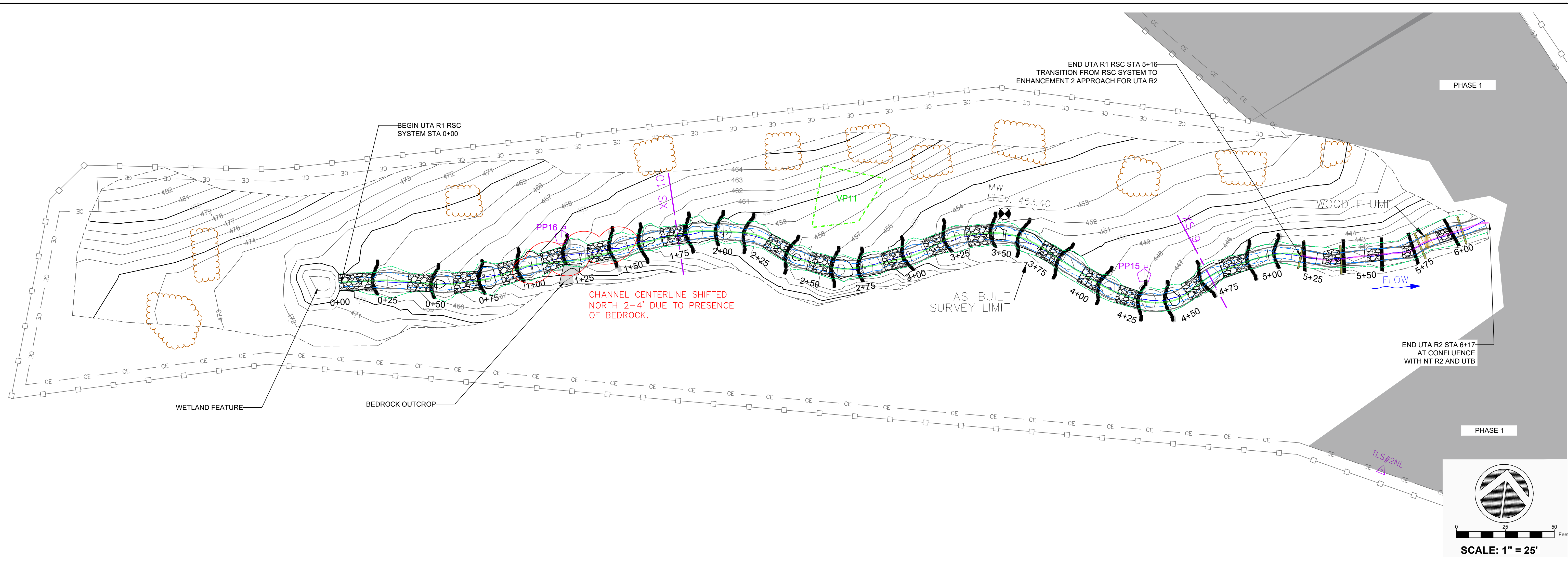
MILLSTONE CREEK  
NC DMS MITIGATION SITE  
RANDOLPH COUNTY  
PHASE 2

PROJECT OVERVIEW 2.1



**NC STATE**

DESIGN: JLP, BAD	PROJECT: MILLSTONE CREEK
DRAWN: JKF	SCALE: AS NOTED
APPROVED: BAD	DATE: JUNE 10, 2024
PROJECT #	SC0# 20-22021-01B
PHASE #	2



MILLSTONE CREEK  
 NC DMS MITIGATION SITE  
 RANDOLPH COUNTY  
 PHASE 2

UTA: PLAN - PROFILE 4.1

JUNE 10, 2024

NC STATE

**NC STATE**

PROJECT: MILLSTONE CREEK  
 DESIGN: JLP/BAD  
 DRAWN: JJK  
 APPROVED: BAD  
 SCALE: AS NOTED  
 DATE: JUNE 10, 2024  
 PROJECT # SC0# 20-22021-01B  
 PHASE # 2

Temporary Seeding Schedule and Rates		
Date	Type	Application Rate (lbs/acre)
Jan 1 – May 1	Rye Grain	120
	Ground Agricultural Limestone	2,000
	10-10-10 Fertilizer	750
	Straw Mulch	4,000
May 1 – Aug 15	German Millet	40
	Ground Agricultural Limestone	2,000
	10-10-10 Fertilizer	750
	Straw Mulch	4,000
Aug 15 – Dec 30	Rye Grain	120
	Ground Agricultural Limestone	2,000
	10-10-10 Fertilizer	750
	Straw Mulch	4,000

Permanent Seeding Rates		
Wetland Seed Mix – 20 lbs per acre		
Species	Common Name	Percent
<i>Bidens aristosa</i>	Showy tickseed	7
<i>Carex vulpinoidea</i>	Fox sedge	12
<i>Dichanthelium clandestinum</i>	Deertongue	8
<i>Elymus virginicus</i>	Virginia wildrye	20
<i>Juncus effusus</i>	Soft rush	4
<i>Panicum dichotomiflorum</i>	Smooth panicgrass	14
<i>Panicum rigidulum</i>	Redtop panicgrass	8
<i>Panicum virgatum</i>	Switchgrass	23
<i>Polygonum pennsylvanicum</i>	Pennsylvania smartweed	2
<i>Sparganium americanum</i>	Eastern bur reed	2
		100

Streambank and Floodplain Seed Mix – 20 lbs per acre		
Species	Common Name	Percent
<i>Agrostis perennans</i>	Autumn bentgrass	15
<i>Andropogon gerardii</i>	Big bluestem	10
<i>Coreopsis lanceolata</i>	Lanceleaf coreopsis	10
<i>Elymus virginicus</i>	Virginia wildrye	20
<i>Juncus effusus</i>	Soft rush	5
<i>Panicum virgatum</i>	Switchgrass	15
<i>Rudbeckia hirta</i>	Blackeyed susan	10
<i>Schizachyrium scoparium</i>	Little bluestem	5
<i>Sorghastrum nutans</i>	Indian grass	5
<i>Tripsacum dactyloides</i>	Eastern gamagrass	5
		100

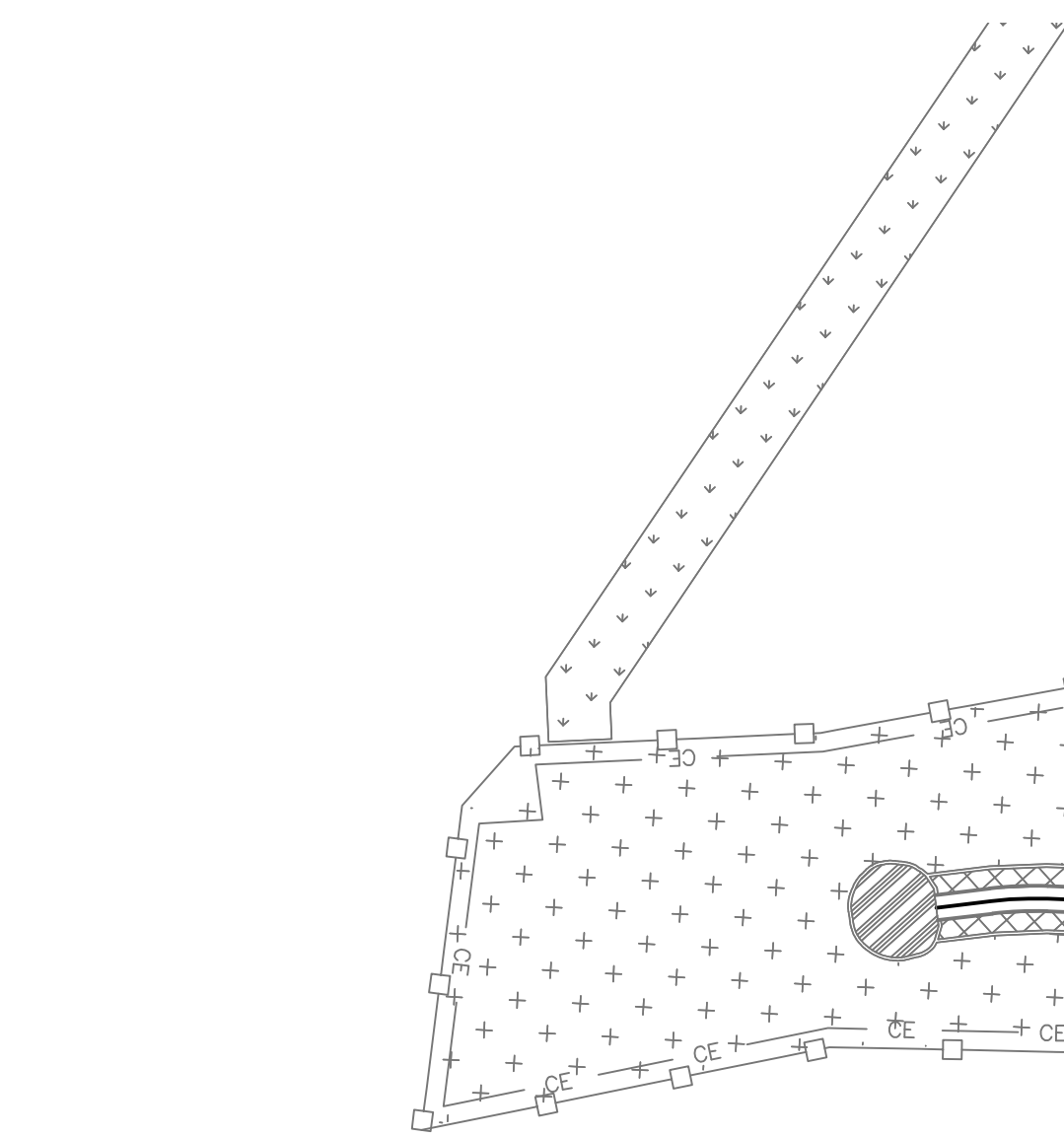
Upland Hardwood Forest – 20 lbs per acre		
Species	Common Name	Percent
<i>Achillea millefolium</i>	Common yarrow	10
<i>Agrostis perennans</i>	Autumn bentgrass	6
<i>Asclepias tuberosa</i>	Butterfly weed	1
<i>Bidens aristosa</i>	Showy tickseed sunflower	11
<i>Chamaecrista fasciculata</i>	Partridge pea	10
<i>Coreopsis lanceolata</i>	Lance-leaf coreopsis	10
<i>Echinacea purpurea</i>	Purple coneflower	4
<i>Elymus virginicus</i>	Virginia wildrye	6
<i>Gaillardia pulchella</i>	Indian blanket	8
<i>Helianthus angustifolius</i>	Swamp sunflower	2
<i>Helianthus maximiliani</i>	Maximilian's sunflower	2
<i>Monarda punctata</i>	Spotted beebalm	2
<i>Rudbeckia hirta</i>	Blackeyed susan	6
<i>Schizachyrium scoparium</i>	Little bluestem	4
<i>Sorghastrum nutans</i>	Indian grass	6
<i>Symphotrichum pilosum</i>	Heath aster	1
<i>Tridens flavus</i>	Purpletop	4
<i>Tripsacum dactyloides</i>	Eastern gamagrass	6
<i>Verbena hastata</i>	Blue vervain	1
		100

Pasture Seed Mix – 60 lbs per acre		
Species	Common Name	Percent
<i>Dactylis glomerata</i>	Orchard Grass	50
<i>Schendonorus phoenix</i>	KY 31 Tall Fescue	50
		100

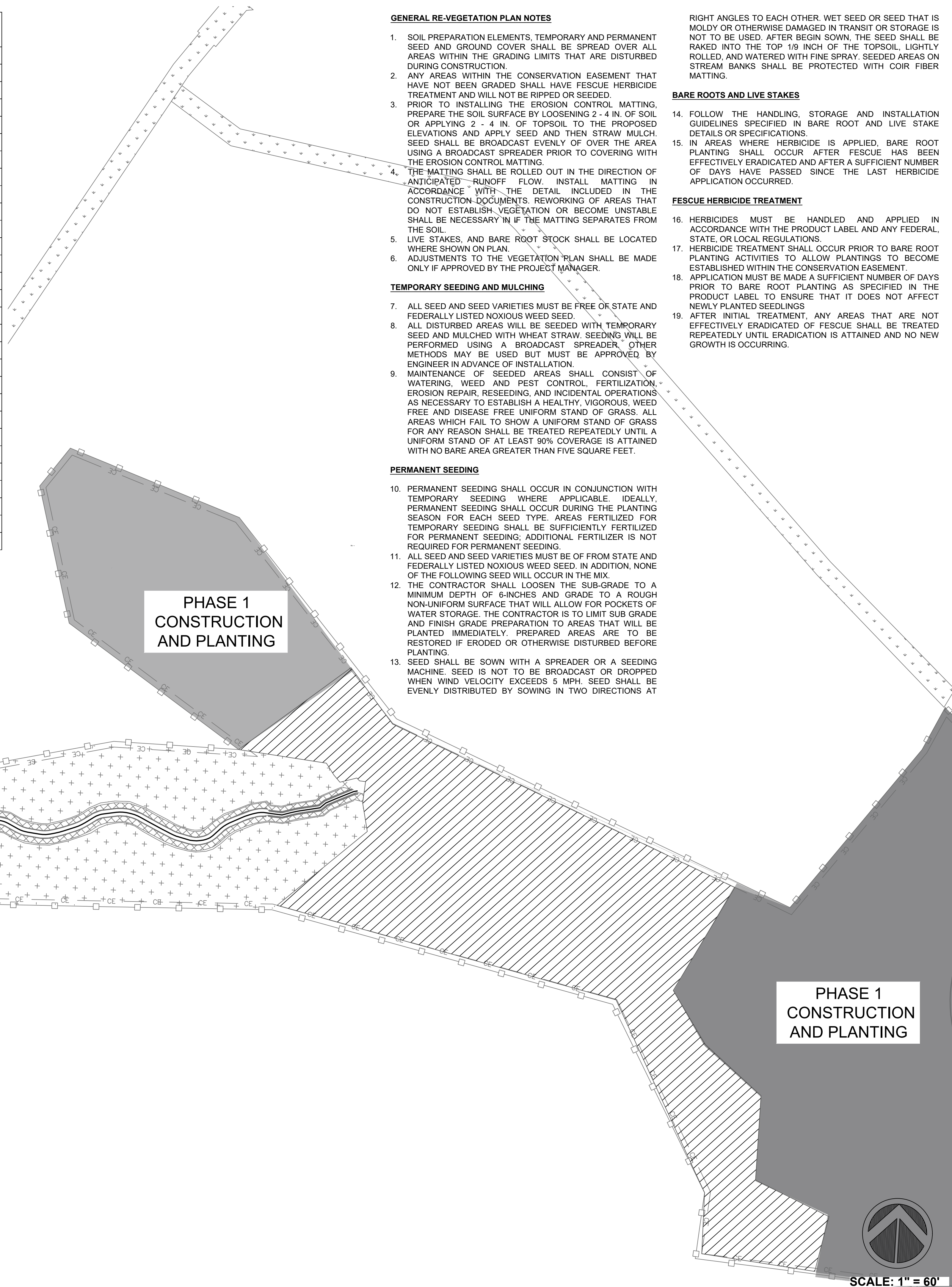
Vegetation Area	Streambank		Upland Hardwood Forest		Supplemental Planting Zone		Total
Area (acres)	0.2		2		2.7		4.9
Density	2,800		680		200		-
Species	# planted	% total	# planted	% total	# planted	% total	# planted
*Silky dogwood ( <i>Cornus amomum</i> )	140	25					140
*Silky willow ( <i>Salix sericea</i> )	140	25					140
*Elderberry ( <i>Sambucus canadensis</i> )	140	25					140
Yellowroot ( <i>Xanthorhiza simplicissima</i> )	56	10					56
**Buttonbush ( <i>Cephalanthus occidentalis</i> )	84	15					84
Tag alder ( <i>Alnus serrulata</i> )							0
River Birch ( <i>Betula nigra</i> )							0
Ironwood ( <i>Carpinus caroliniana</i> )							0
Water oak ( <i>Quercus nigra</i> )							0
Inkberry ( <i>Ilex glabra</i> )							0
Tulip poplar ( <i>Liriodendron tulipifera</i> )							0
Sycamore ( <i>Plantanus occidentalis</i> )							0
Black gum ( <i>Nyssa sylvatica</i> )							0
Swamp Chestnut Oak ( <i>Quercus michauxii</i> )							0
Possumhaw ( <i>Viburnum nudum</i> )							0
Willow oak ( <i>Quercus phellos</i> )			68	5	27	5	95
White oak ( <i>Quercus alba</i> )			204	15	81	15	285
Black Cherry ( <i>Prunus serotina</i> )			136	10	54	10	190
Red Bud ( <i>Cercis canadensis</i> )			136	10	54	10	190
Persimmon ( <i>Diospyros virginiana</i> )			136	10	54	10	190
Overcup Oak ( <i>Quercus lyrata</i> )			136	10	54	10	190
Sassafras ( <i>Sassafras albidum</i> )			68	5	27	5	95
Red Oak ( <i>Quercus rubra</i> )			204	15	81	15	285
Chestnut Oak ( <i>Quercus prinus</i> )			136	10	54	10	190
American Beech ( <i>Fagus grandifolia</i> )			136	10	54	10	190
<b>Total</b>	<b>560</b>	<b>100</b>	<b>1,360</b>	<b>100</b>	<b>540</b>	<b>100</b>	<b>2,460</b>

\*Provide as live stakes

\*\*Provide as live stakes on streambanks and bareroot in floodplain zone



- STREAMBANK
- UPLAND HARDWOOD FOREST
- WETLAND  
0.02 AC (1,053 SF)
- PASTURE  
0.50 AC (21,635 SF)
- SUPPLEMENTAL PLANTING ZONE



**GENERAL RE-VEGETATION PLAN NOTES**

- SOIL PREPARATION ELEMENTS, TEMPORARY AND PERMANENT SEED AND GROUND COVER SHALL BE SPREAD OVER ALL AREAS WITHIN THE GRADING LIMITS THAT ARE DISTURBED DURING CONSTRUCTION.
  - ANY AREAS WITHIN THE CONSERVATION EASEMENT THAT HAVE NOT BEEN GRADED SHALL HAVE FESCUE HERBICIDE TREATMENT AND WILL NOT BE RIPPED OR SEEDED.
  - PRIOR TO INSTALLING THE EROSION CONTROL MATTING, PREPARE THE SOIL SURFACE BY LOOSENING 2 - 4 IN. OF SOIL OR APPLYING 2 - 4 IN. OF TOPSOIL TO THE PROPOSED ELEVATIONS AND APPLY SEED AND THEN STRAW MULCH. SEED SHALL BE BROADCAST EVENLY OVER THE AREA USING A BROADCAST SPREADER PRIOR TO COVERING WITH THE EROSION CONTROL MATTING.
  - THE MATTING SHALL BE ROLLED OUT IN THE DIRECTION OF ANTICIPATED RUNOFF FLOW. INSTALL MATTING IN ACCORDANCE WITH THE DETAIL INCLUDED IN THE CONSTRUCTION DOCUMENTS. REWORKING OF AREAS THAT DO NOT ESTABLISH VEGETATION OR BECOME UNSTABLE SHALL BE NECESSARY IF THE MATTING SEPARATES FROM THE SOIL.
  - LIVE STAKES, AND BARE ROOT STOCK SHALL BE LOCATED WHERE SHOWN ON PLAN.
  - ADJUSTMENTS TO THE VEGETATION PLAN SHALL BE MADE ONLY IF APPROVED BY THE PROJECT MANAGER.
- TEMPORARY SEEDING AND MULCHING**
- ALL SEED AND SEED VARIETIES MUST BE FREE OF STATE AND FEDERALLY LISTED NOXIOUS WEED SEED.
  - ALL DISTURBED AREAS WILL BE SEEDED WITH TEMPORARY SEED AND MULCHED WITH WHEAT STRAW. SEEDING WILL BE PERFORMED USING A BROADCAST SPREADER. OTHER METHODS MAY BE USED BUT MUST BE APPROVED BY ENGINEER IN ADVANCE OF INSTALLATION.
  - MAINTENANCE OF SEEDED AREAS SHALL CONSIST OF WATERING, WEED AND PEST CONTROL, FERTILIZATION, EROSION REPAIR, RESEEDING, AND INCIDENTAL OPERATIONS AS NECESSARY TO ESTABLISH A HEALTHY, VIGOROUS, WEED FREE AND DISEASE FREE UNIFORM STAND OF GRASS. ALL AREAS WHICH FAIL TO SHOW A UNIFORM STAND OF GRASS FOR ANY REASON SHALL BE TREATED REPEATEDLY UNTIL A UNIFORM STAND OF AT LEAST 90% COVERAGE IS ATTAINED WITH NO BARE AREA GREATER THAN FIVE SQUARE FEET.
- PERMANENT SEEDING**
- PERMANENT SEEDING SHALL OCCUR IN CONJUNCTION WITH TEMPORARY SEEDING WHERE APPLICABLE. IDEALLY, PERMANENT SEEDING SHALL OCCUR DURING THE PLANTING SEASON FOR EACH SEED TYPE. AREAS FERTILIZED FOR TEMPORARY SEEDING SHALL BE SUFFICIENTLY FERTILIZED FOR PERMANENT SEEDING; ADDITIONAL FERTILIZER IS NOT REQUIRED FOR PERMANENT SEEDING.
  - ALL SEED AND SEED VARIETIES MUST BE OF FROM STATE AND FEDERALLY LISTED NOXIOUS WEED SEED. IN ADDITION, NONE OF THE FOLLOWING SEED WILL OCCUR IN THE MIX.
  - THE CONTRACTOR SHALL LOOSEN THE SUB-GRADE TO A MINIMUM DEPTH OF 6-INCHES AND GRADE TO A ROUGH NON-UNIFORM SURFACE THAT WILL ALLOW FOR POCKETS OF WATER STORAGE. THE CONTRACTOR IS TO LIMIT SUB GRADE AND FINISH GRADE PREPARATION TO AREAS THAT WILL BE PLANTED IMMEDIATELY. PREPARED AREAS ARE TO BE RESTORED IF ERODED OR OTHERWISE DISTURBED BEFORE PLANTING.
  - SEED SHALL BE SOWN WITH A SPREADER OR A SEEDING MACHINE. SEED IS NOT TO BE BROADCAST OR DROPPED WHEN WIND VELOCITY EXCEEDS 5 MPH. SEED SHALL BE EVENLY DISTRIBUTED BY SOWING IN TWO DIRECTIONS AT

RIGHT ANGLES TO EACH OTHER. WET SEED OR SEED THAT IS MOLDY OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE IS NOT TO BE USED. AFTER BEGIN SOWING, THE SEED SHALL BE RAKED INTO THE TOP 1/8 INCH OF THE TOPSOIL, LIGHTLY ROLLED, AND WATERED WITH FINE SPRAY. SEEDED AREAS ON STREAM BANKS SHALL BE PROTECTED WITH COIR FIBER MATTING.

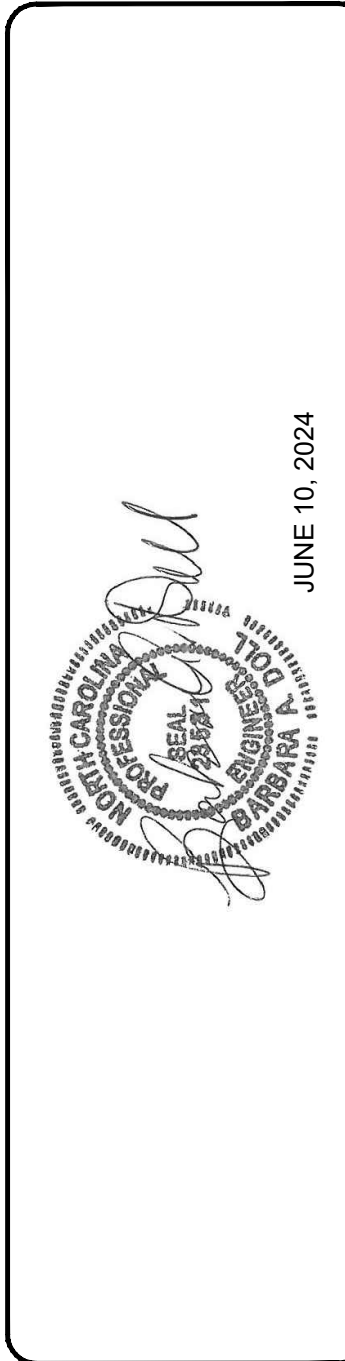
**BARE ROOTS AND LIVE STAKES**

- FOLLOW THE HANDLING, STORAGE AND INSTALLATION GUIDELINES SPECIFIED IN BARE ROOT AND LIVE STAKE DETAILS OR SPECIFICATIONS.
- IN AREAS WHERE HERBICIDE IS APPLIED, BARE ROOT PLANTING SHALL OCCUR AFTER FESCUE HAS BEEN EFFECTIVELY ERADICATED AND AFTER A SUFFICIENT NUMBER OF DAYS HAVE PASSED SINCE THE LAST HERBICIDE APPLICATION OCCURRED.

**FESCUE HERBICIDE TREATMENT**

- HERBICIDES MUST BE HANDLED AND APPLIED IN ACCORDANCE WITH THE PRODUCT LABEL AND ANY FEDERAL, STATE, OR LOCAL REGULATIONS.
- HERBICIDE TREATMENT SHALL OCCUR PRIOR TO BARE ROOT PLANTING ACTIVITIES TO ALLOW PLANTINGS TO BECOME ESTABLISHED WITHIN THE CONSERVATION EASEMENT.
- APPLICATION MUST BE MADE A SUFFICIENT NUMBER OF DAYS PRIOR TO BARE ROOT PLANTING AS SPECIFIED IN THE PRODUCT LABEL TO ENSURE THAT IT DOES NOT AFFECT NEWLY PLANTED SEEDLINGS
- AFTER INITIAL TREATMENT, ANY AREAS THAT ARE NOT EFFECTIVELY ERADICATED OF FESCUE SHALL BE TREATED REPEATEDLY UNTIL ERADICATION IS ATTAINED AND NO NEW GROWTH IS OCCURRING.

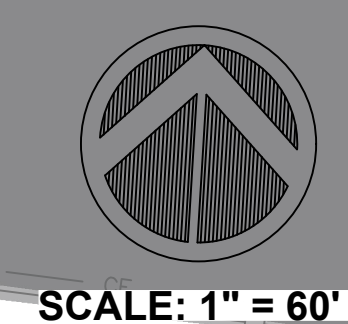
MILLSTONE CREEK  
NC DMS MITIGATION SITE  
RANDOLPH COUNTY  
PHASE 2



VEGETATION PLAN  
5.1

**NC STATE**

PROJECT: MILLSTONE CREEK  
DESIGN: ALP, BAD  
DRAWN: JKF  
APPROVED: BAD  
SCALE: AS NOTED  
DATE: JUNE 10, 2024  
PROJECT #: SC0# 20-22021-01B  
PHASE #: 2

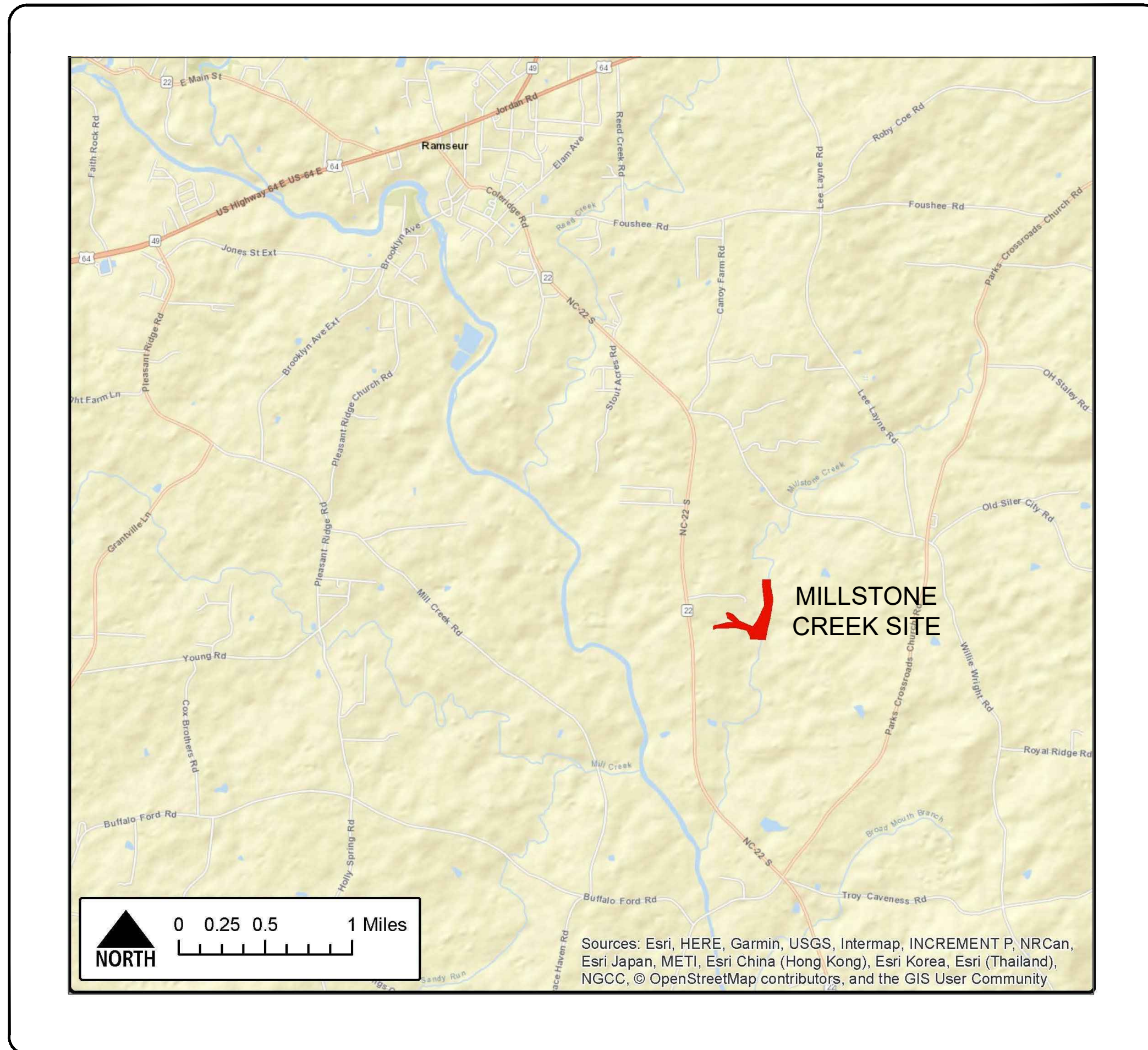


# NC DEPARTMENT OF ENVIRONMENTAL QUALITY - DIVISION OF MITIGATION SERVICES

## MILLSTONE CREEK MITIGATION SITE - PHASE 1

# RECORD DRAWINGS

**RANDOLPH COUNTY, NORTH CAROLINA**  
**SCO ID # 20-22021-01A; NCDMS IMS# 204; USACE AID: SAW-2019-01363**  
**LAT: 35.696683 LONG: -79.623956**



<b>PROJECT DIRECTORY</b>	
<b>OWNER:</b>	<b>NORTH CAROLINA DIVISION OF MITIGATION SERVICES</b>
	MELONIE ALLEN 217 WEST JONES STREET RALEIGH, NC 27603 919.707.8540 melonie.allen@ncdenr.gov
<b>ENGINEER:</b>	<b>NORTH CAROLINA STATE UNIVERSITY</b>
	BARBARA A. DOLL, PHD, PE CAMPUS BOX 7625 RALEIGH, NC 27695 919.515.5287 bdoll@ncsu.edu
	JONATHAN L. PAGE, PE CAMPUS BOX 7625 RALEIGH, NC 27695 919.515.8595 jlp@ncsu.edu
<b>SURVEYOR:</b>	<b>TURNER LAND SURVEYING</b>
	DAVID S. TURNER, PLS PO BOX 148 SWANNANOVA, NC 26778 919.827.0745
<b>SHEET INDEX</b>	
TITLE SHEET	1.1
PROJECT OVERVIEW	2.1
PLAN AND PROFILE SHEETS	4.1
RE-VEGETATION PLAN	5.1

I, DAVID S. TURNER, AS A DULY REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF NORTH CAROLINA, HEREBY CERTIFY THAT THE SURVEY DATA SHOWN ON THIS DRAWING, WAS OBTAINED UNDER MY SUPERVISION, IS AN ACCURATE AND COMPLETE REPRESENTATION OF WHAT WAS CONSTRUCTED IN THE FIELD, AND THAT THE PHYSICAL DIMENSIONS OR ELEVATIONS SHOWN THIS ARE AS-BUILT CONDITIONS EXCEPT WHERE OTHERWISE NOTED HEREON. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 2nd DAY OF FEBRUARY, 2022.

*David S. Turner*  
 DAVID S. TURNER, P.L.S. #L-4551

I, DAVID S. TURNER, CERTIFY THAT THE AS-BUILT TOPOGRAPHIC SURVEY FOR THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE AND TAKEN FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT THIS AS-BUILT TOPOGRAPHIC SURVEY WAS PERFORMED AT THE 95 PERCENT CONFIDENCE LEVEL TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS FOR A TOPOGRAPHIC SURVEY TO THE HORIZONTAL ACCURACY OF CLASS A AND THE VERTICAL ACCURACY WHEN APPLICABLE TO CLASS C STANDARD, AND THAT THE ORIGINAL DATA WAS OBTAINED IN AUG-OCT 2021; THAT THE SURVEY WAS COMPLETED ON 8 OCTOBER 2021; AND ALL COORDINATES ARE BASED ON NAD83 (2011) AND ALL ELEVATIONS ARE BASED ON NAVD83. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 2nd DAY OF FEBRUARY, 2022.

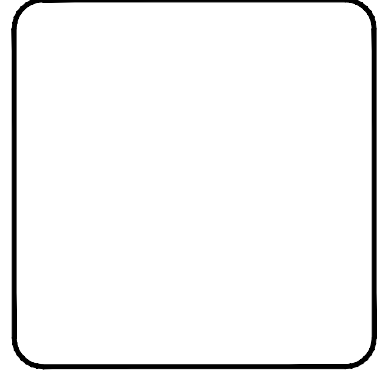
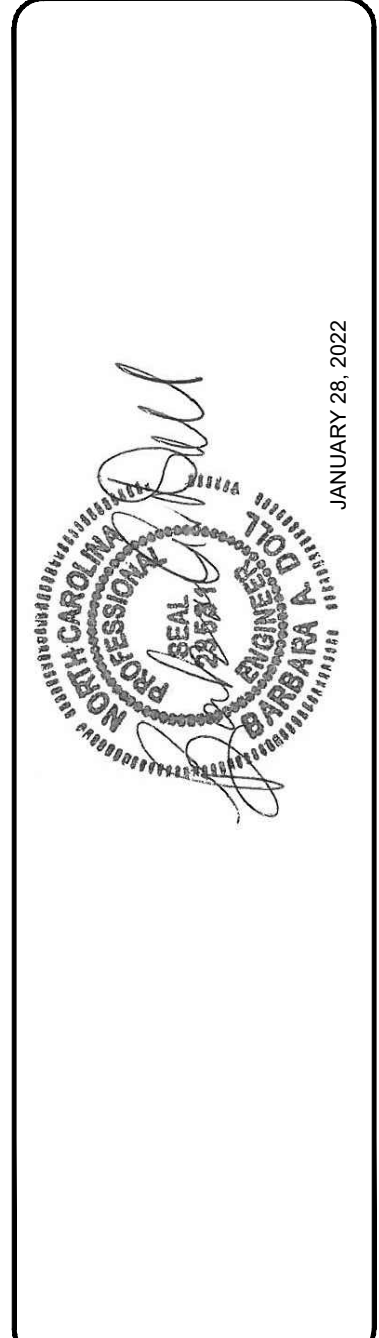
*David S. Turner*  
 DAVID S. TURNER, P.L.S. #L-4551

**AS-BUILT & RECORD  
 DRAWINGS  
 JANUARY 28, 2022**

MILLSTONE CREEK  
 NC DMS MITIGATION SITE  
 RANDOLPH COUNTY, NC  
 PHASE 1

TITLE

1.1



**NC STATE**

DRAWN: JLP, JLF  
 DESIGN: BAD, JLP  
 CHECK: BAD  
 APPROVED: BAD

PROJECT NAME: MILLSTONE CREEK MITIGATION SITE  
 SCALE: AS NOTED  
 DATE: JANUARY 28, 2022

SCO ID # 20-22021-01A  
 PHASE # 1

# STANDARD LINES AND SYMBOLS

## PRECONSTRUCTION FEATURES

- EXISTING TOB
- EXISTING CONSERVATION EASEMENT
- EXISTING PROPERTY LINE
- EXISTING EASEMENT FENCING
- EXISTING WETLANDS
- EXISTING BUILDING FOOTPRINT
- EXISTING GATE

## DESIGN FEATURES

- DESIGN REGENERATIVE STORMWATER CONVEYANCE
- DESIGN ENHANCEMENT 1
- DESIGN RESTORATION
- DESIGN WETLAND ENHANCEMENT
- DESIGN CHANNEL CENTERLINE
- DESIGN BANKFULL
- DESIGN LOG SILL
- DESIGN BRUSH TOE WITH SOIL GEOLIFT
- DESIGN LOG VANE WITH BOULDER J-HOOK
- DESIGN REGENERATIVE STORMWATER CONVEYANCE CHANNEL
- DESIGN LOG RIFFLE
- DESIGN CONSTRUCTED RIFFLE

## AS-BUILT FEATURES

- AS-BUILT THALWEG
- AS-BUILT TOP OF BANK
- AS-BUILT SURVEY LIMIT
- AS-BUILT FENCE
- AS-BUILT GATE
- AS-BUILT CONTOURS
- TREELINE
- TREE
- AS-BUILT LOG SILL
- AS-BUILT BRUSH TOE WITH SOIL GEOLIFT
- AS-BUILT LOG VANE WITH BOULDER J-HOOK
- AS-BUILT FLOOD GATE

- AS-BUILT LOG RIFFLE
- AS-BUILT CONSTRUCTED RIFFLE
- AS-BUILT RIPRAP/STONE
- MONITORING CROSS SECTION
- VEG PLOT
- PHOTO POINT
- MONITORING WELL/ GROUNDWATER GAUGE
- CONTROL POINT

## CONTROL POINTS

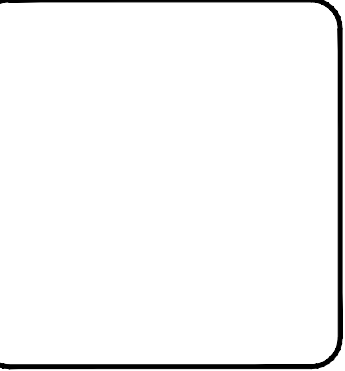
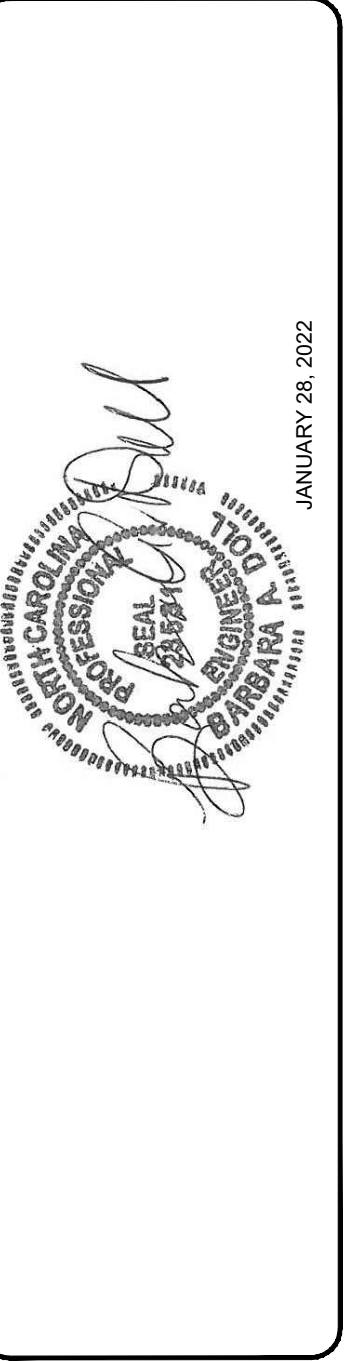
POINT NO.	NORTHING(Y)	EASTING(X)	ELEV(Z)	DESCRIPTION
1	709432.11	1814267.16	469.769	TLS#1NL
2	709005.28	1814573.92	462.591	TLS#2NL
3	709098.44	1814902.49	443.691	TLS#3NL
4	708694.19	1815046.77	438.284	TLS#4NL
5	708593.88	1815321.16	431.151	TLS#5NL
6	709193.14	1815191.97	437.679	TLS#6NL
7	709060.41	1815494.85	442.400	TLS#7NL
9	709762.36	1815629.26	447.277	TLS#9NL
10	710108.00	1815387.34	439.149	TLS#10NL

NOTE: AS-BUILT SURVEY COMPLETED AUG-OCT 2021

NOTES:  
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED

MILLSTONE CREEK  
NC DMS MITIGATION SITE  
RANDOLPH COUNTY, NC  
PHASE 1

PROJECT OVERVIEW 2.1

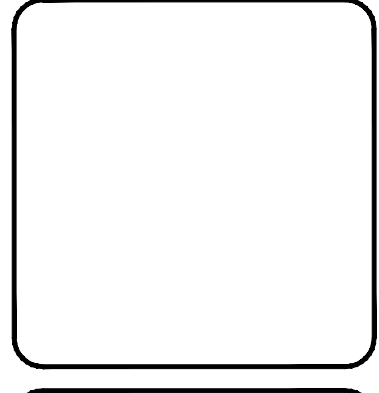
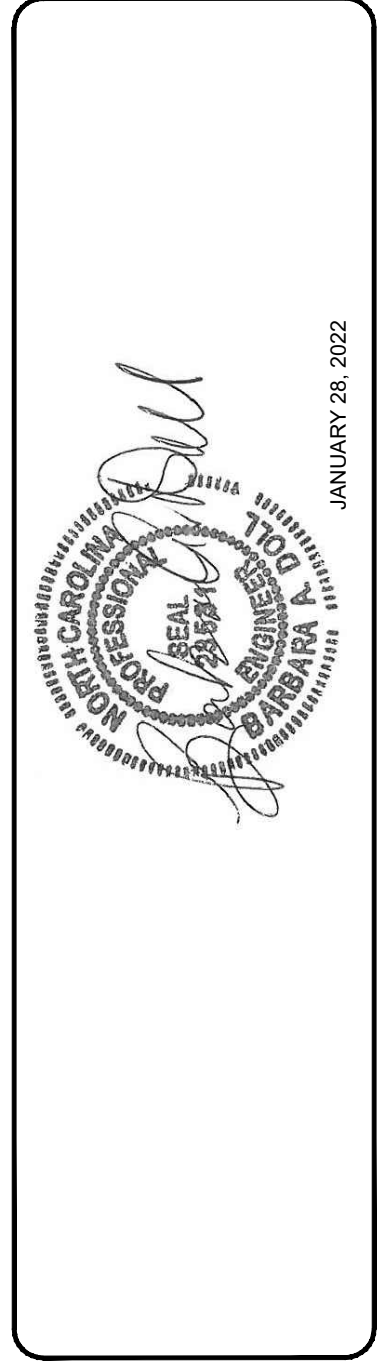


**NC STATE**

DRAWN: JLP, JLF	PROJECT: MILLSTONE CREEK
DESIGN: BAD, JLP	NAME: MITIGATION SITE
CHECK: BAD	SCALE: AS NOTED
APPROVED: BAD	DATE: JANUARY 28, 2022
SCO ID # 20-22021-01A	PHASE # 1

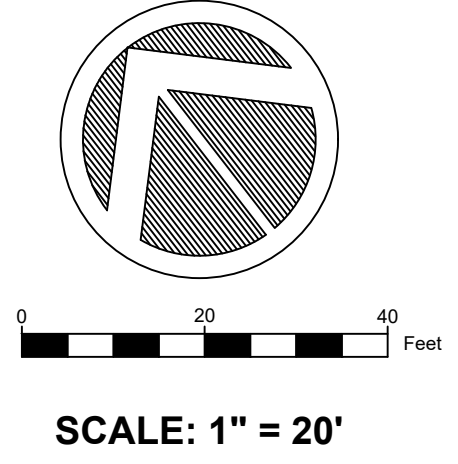
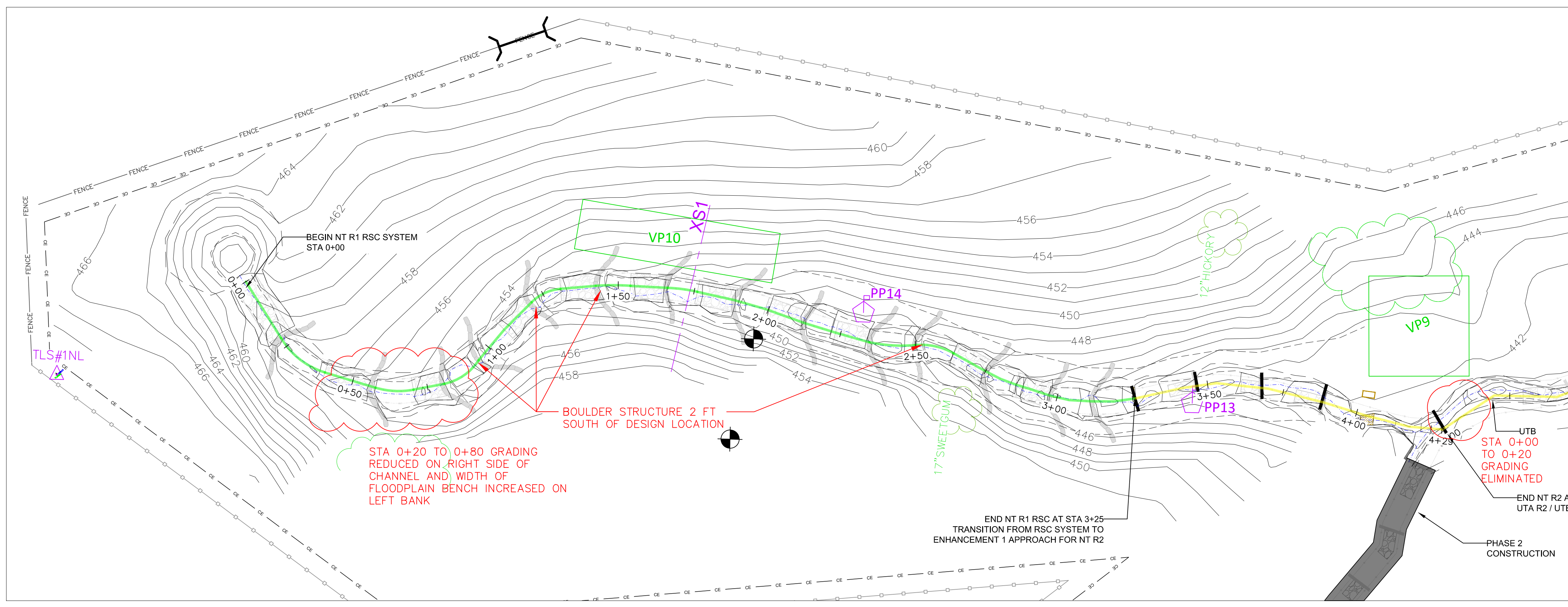


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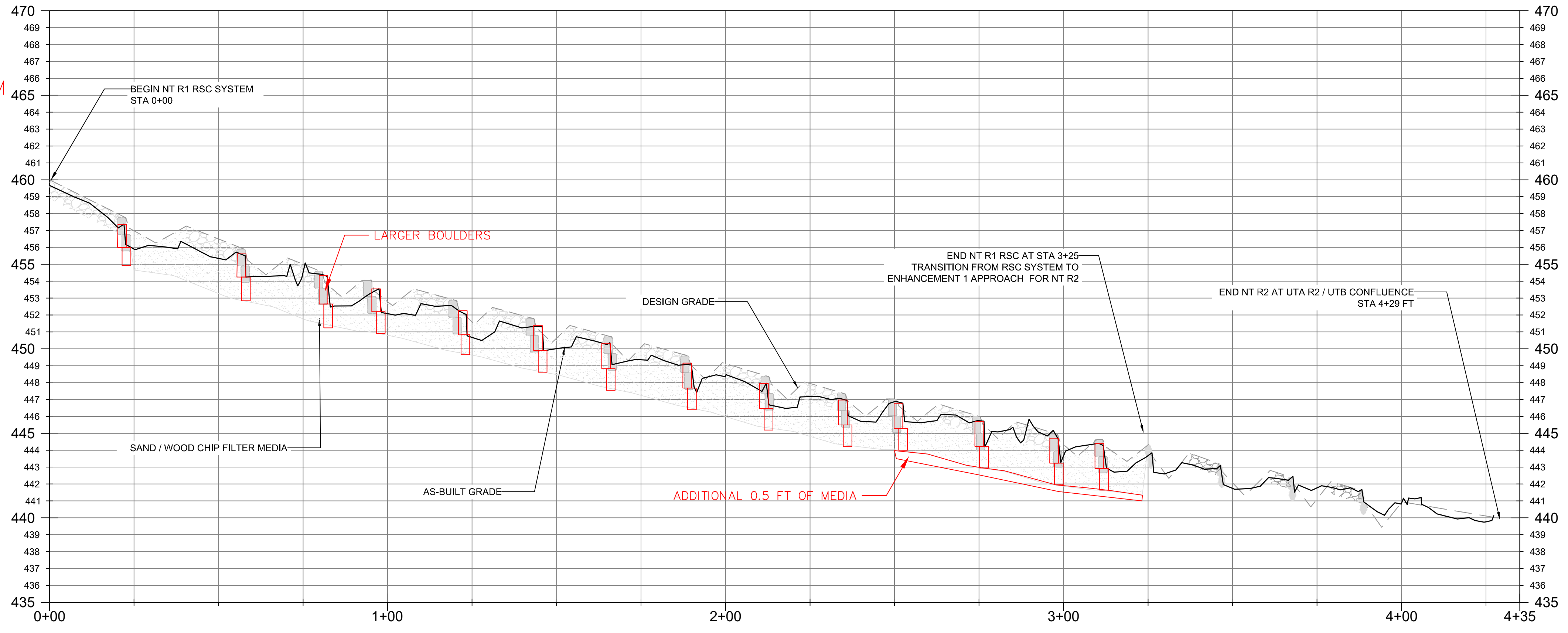
**NC STATE**

PROJECT NAME:	MILLSTONE CREEK
SCALE:	AS NOTED
DATE:	JANUARY 28, 2022
DRAWN BY:	J.P. JIF
DESIGN BY:	J.P. JIF
CHECK BY:	BAD
APPROVED BY:	BAD
SCO ID #	20-22021-01A
PHASE #	1



Professional Engineer Seal for the State of North Carolina, No. 10000, dated January 28, 2022.

- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED
  2. BOULDERS ARE LARGER THAN SPECIFIED AND EXTEND TO THE BOTTOM OF THE MEDIA TRENCH. AN ADDITIONAL 0.5 FT OF MEDIA WAS ADDED FROM STA 2+50 TO STA 3+25 TO COMPENSATE FOR THE LOSS IN MEDIA VOLUME DUE TO THE LARGER BOULDERS



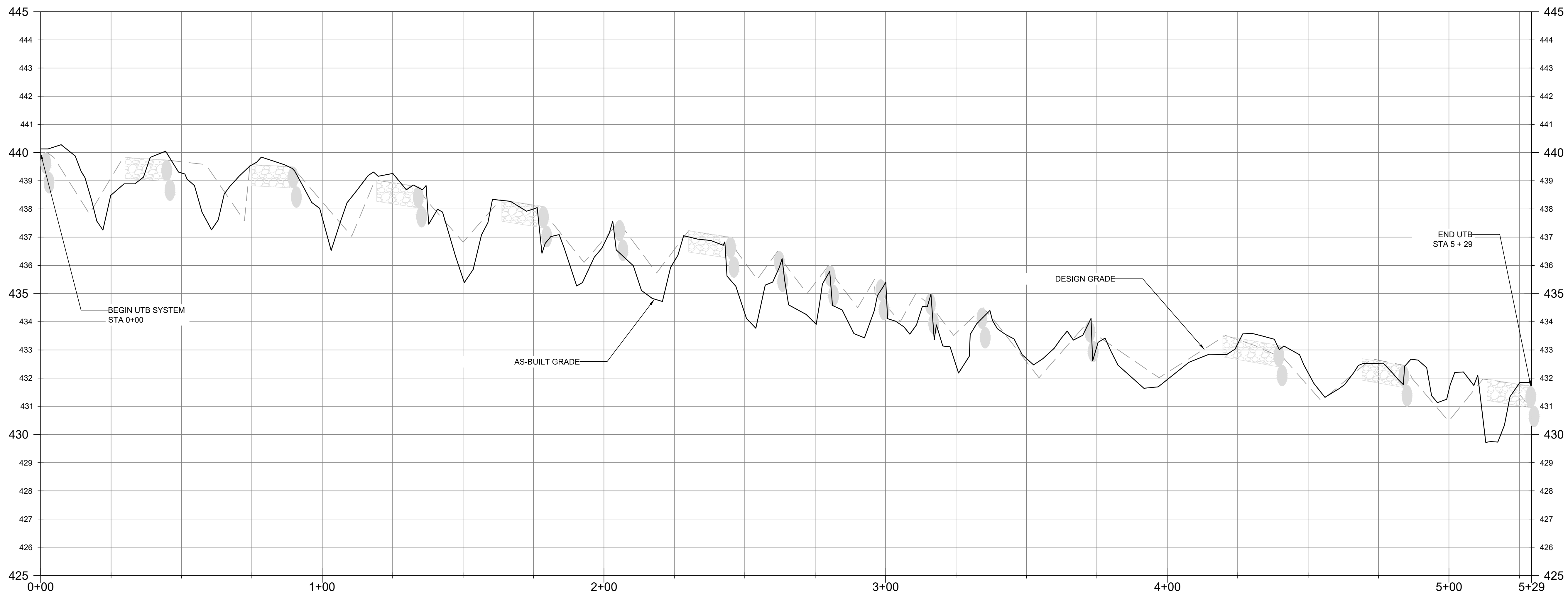
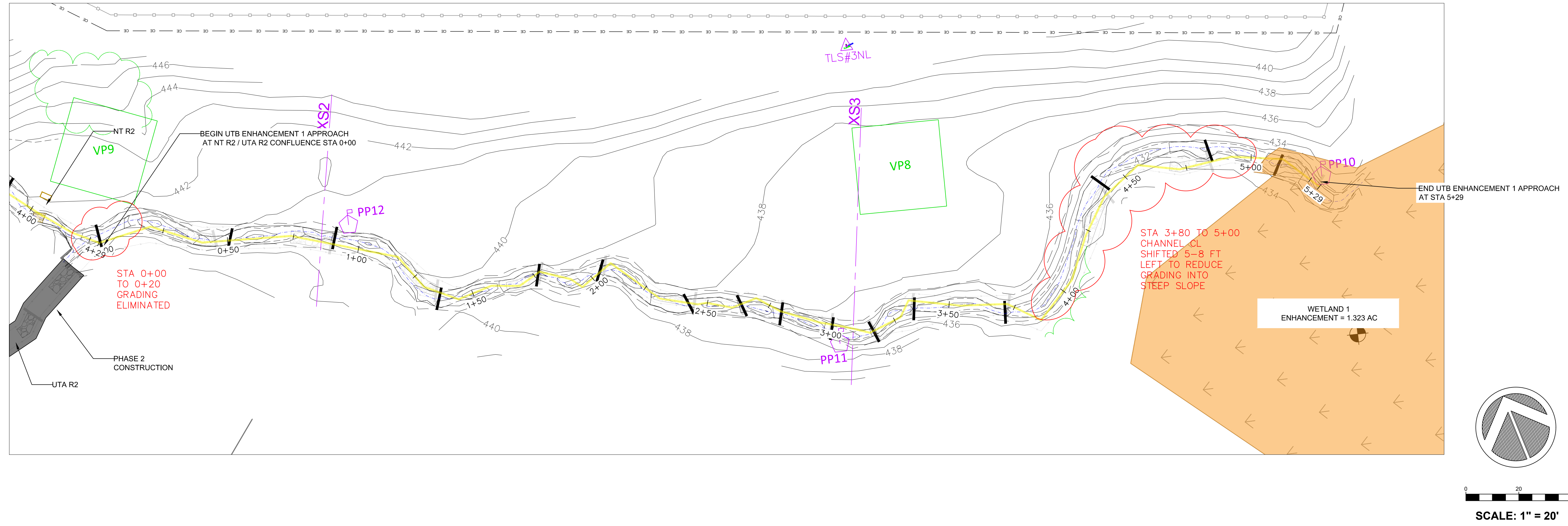
**NC STATE**

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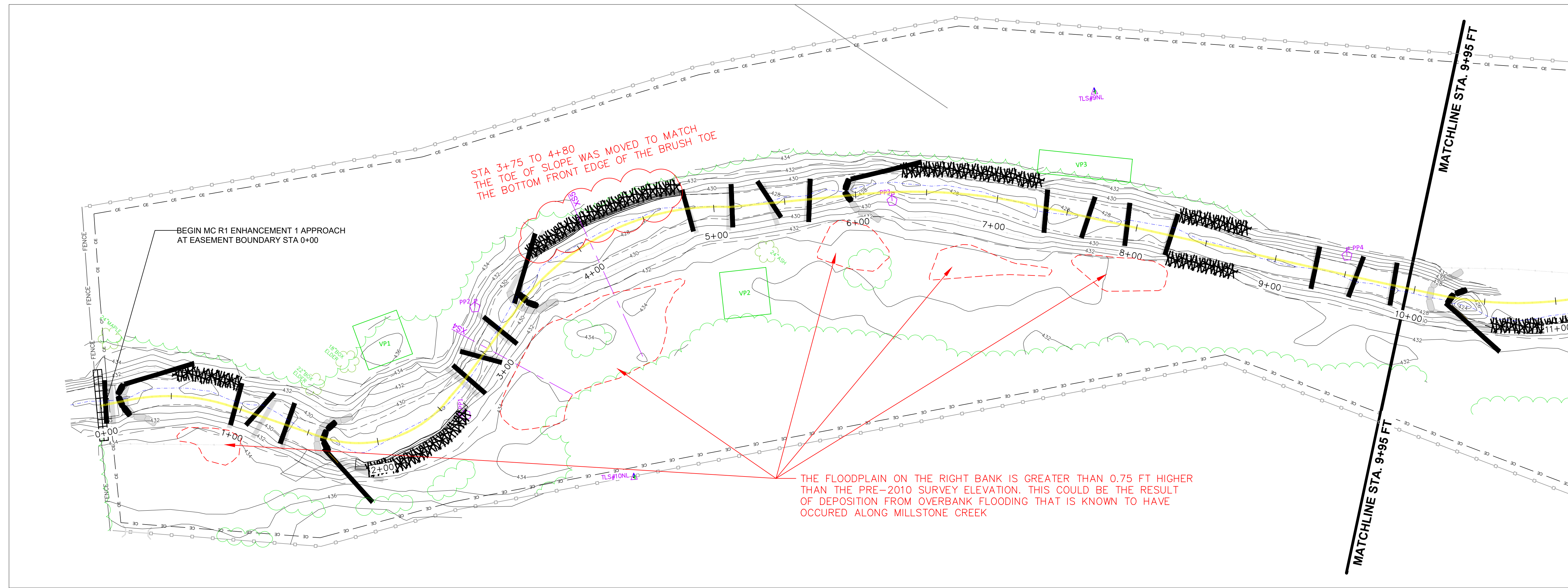
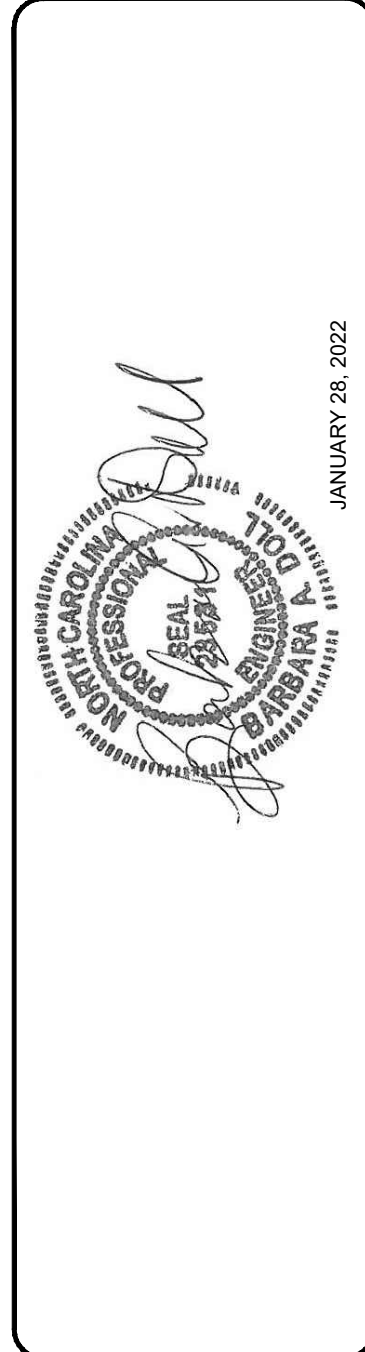


UTB: PLAN - PROFILE 4.2

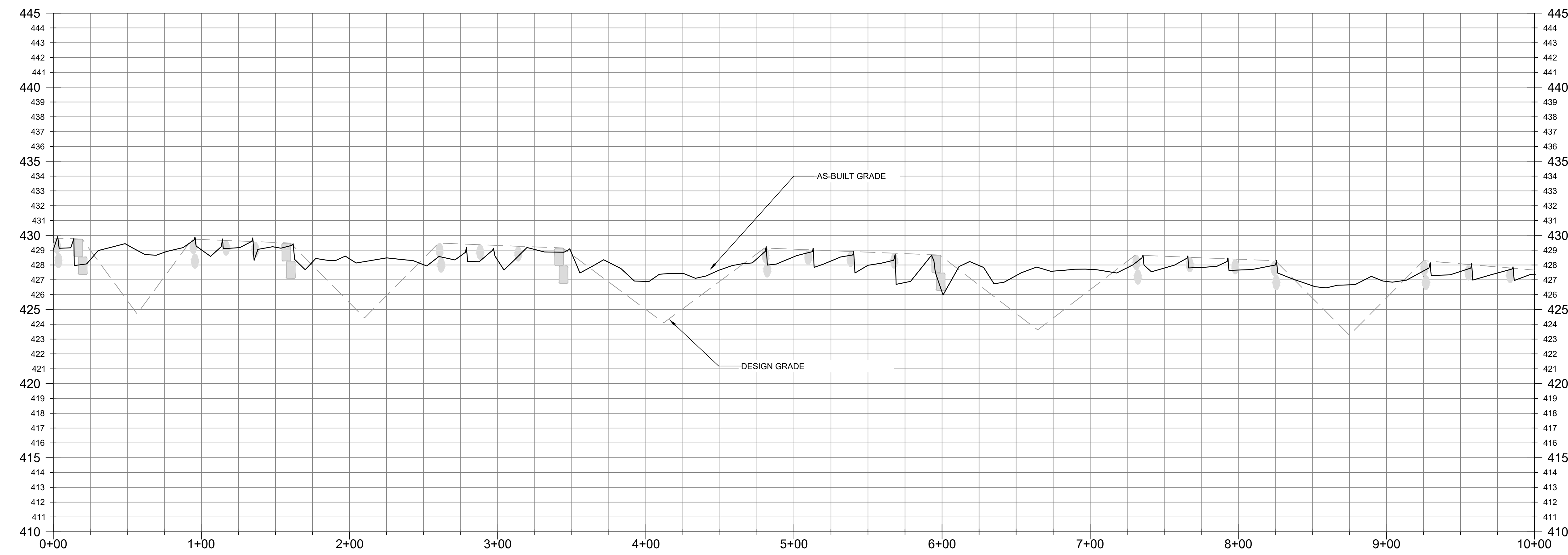


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SCO ID # 20-22021-01A  
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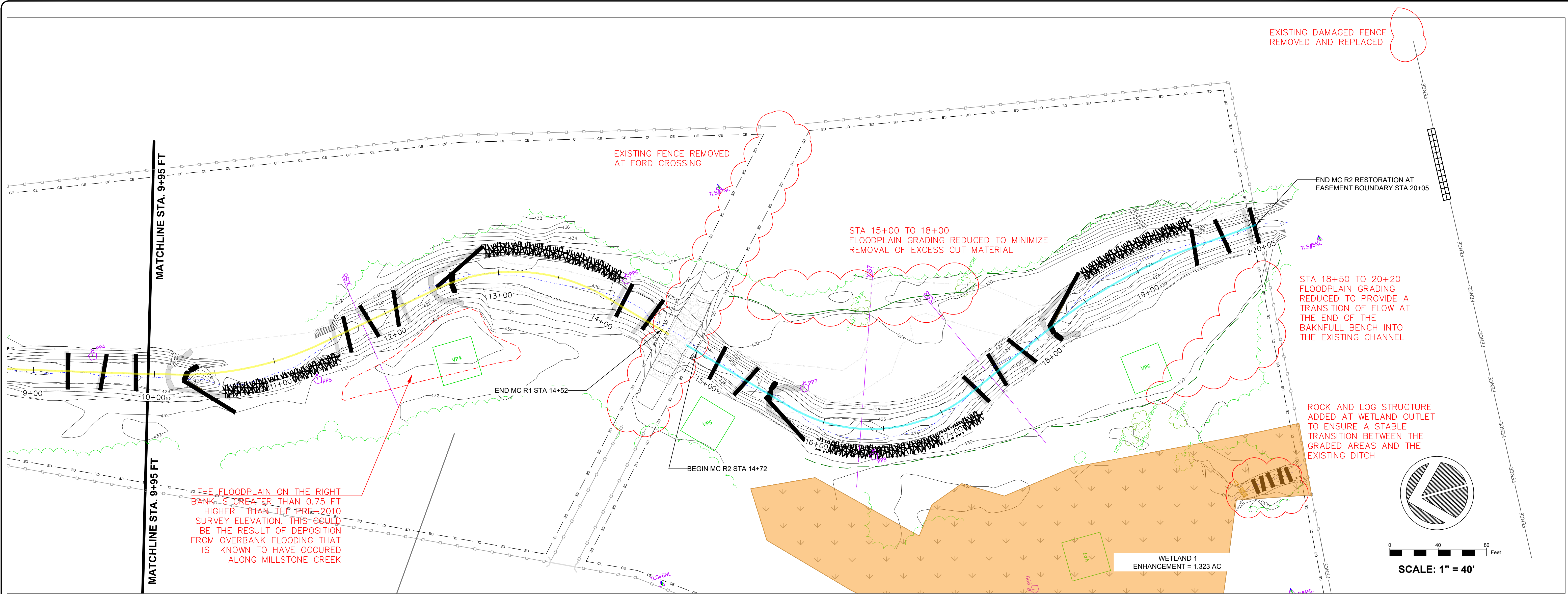


- NOTES:
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  2. ALL J-HOOKS WERE LOCATED AND ORIENTED ACCORDING TO THE DESIGN DETAIL NOT THE PLAN VIEW LOCATION
  3. ALL POOL DEPTHS WERE MODIFIED TO BE TWO (2) FT BELOW THE THALWEG FOR THE UPSTREAM PC DUE TO THE PRESENCE OF RUNNING SAND



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DESIGN: BAD, JLP	NAME: MITIGATION SITE
CHECK: BAD	SCALE: AS NOTED
APPROVED: BAD	DATE: JANUARY 28, 2022

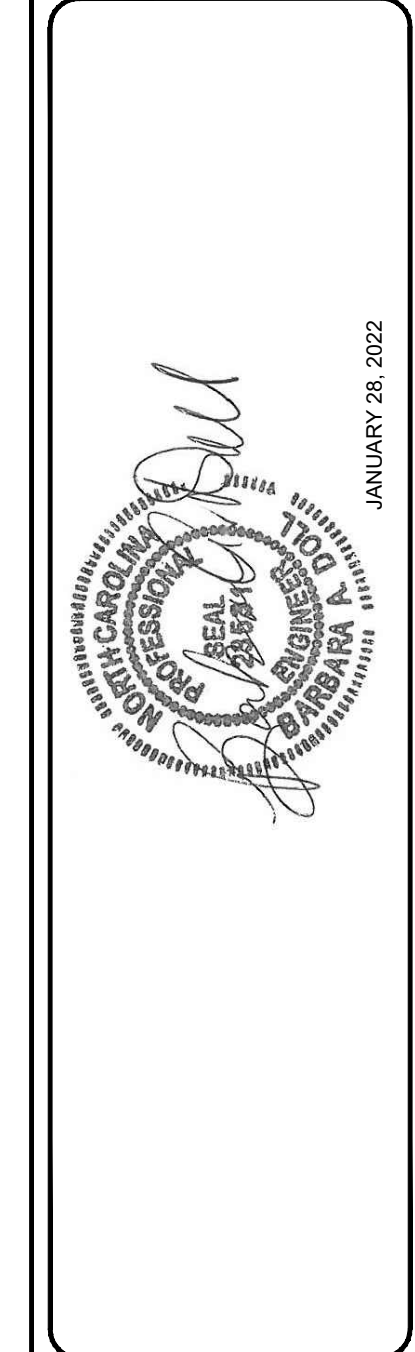
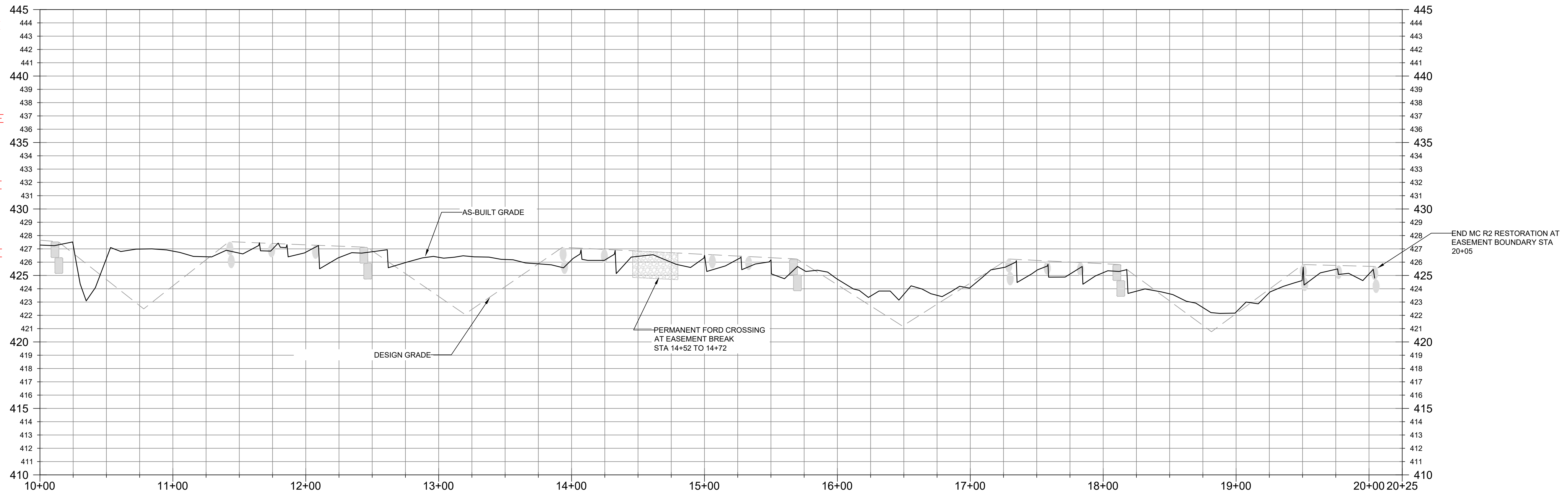
SCO ID # 20-22021-01A  
 PHASE # 1



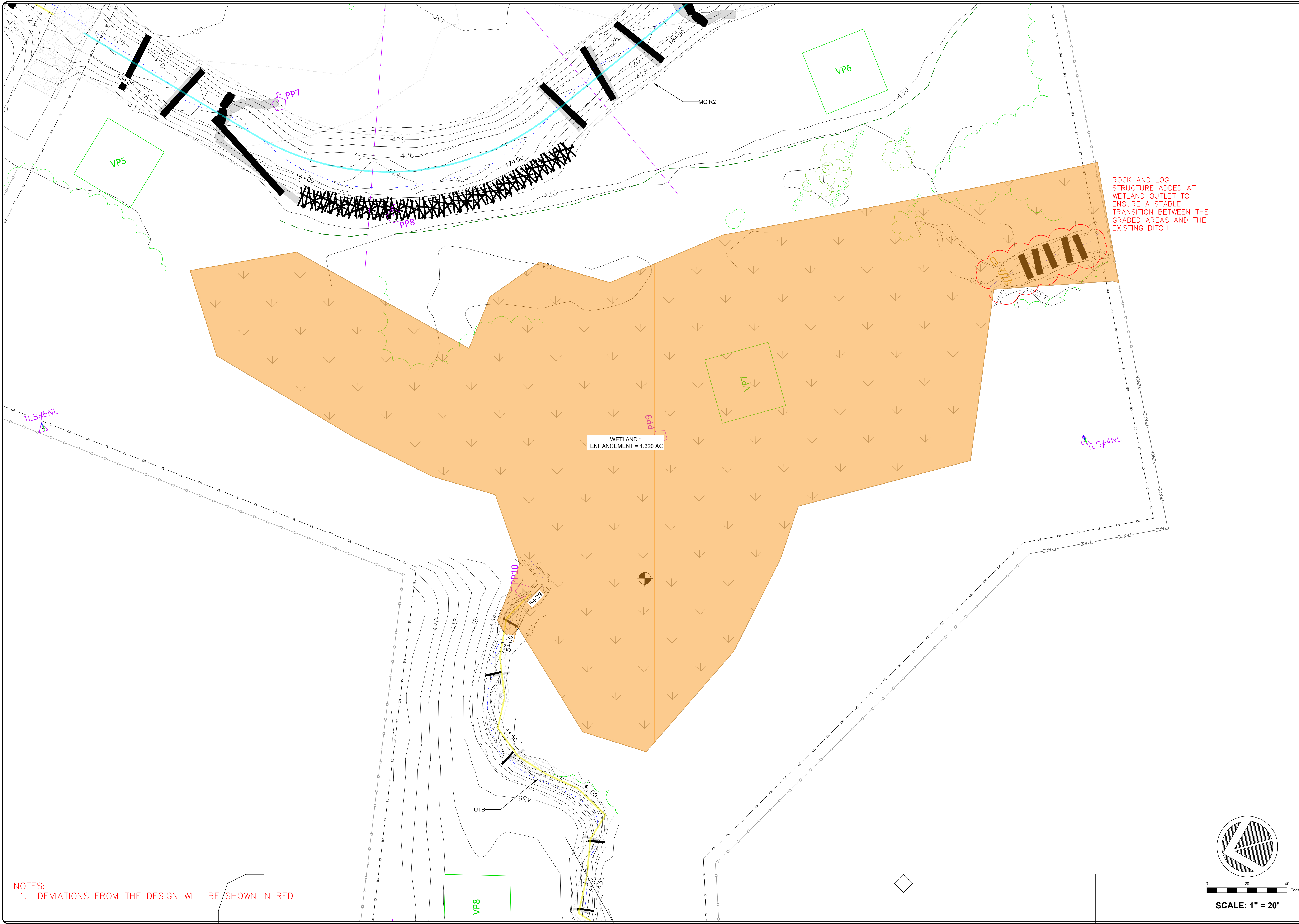
THE FLOODPLAIN ON THE RIGHT BANK IS GREATER THAN 0.75 FT HIGHER THAN THE PRE-2010 SURVEY ELEVATION. THIS COULD BE THE RESULT OF DEPOSITION FROM OVBANK FLOODING THAT IS KNOWN TO HAVE OCCURED ALONG MILLSTONE CREEK

NOTES:

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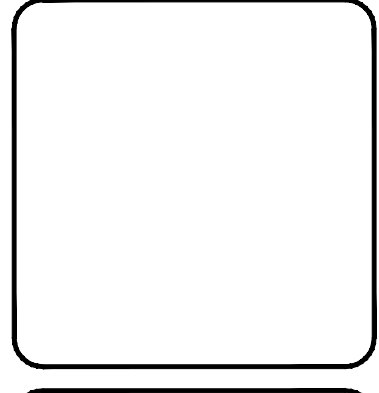
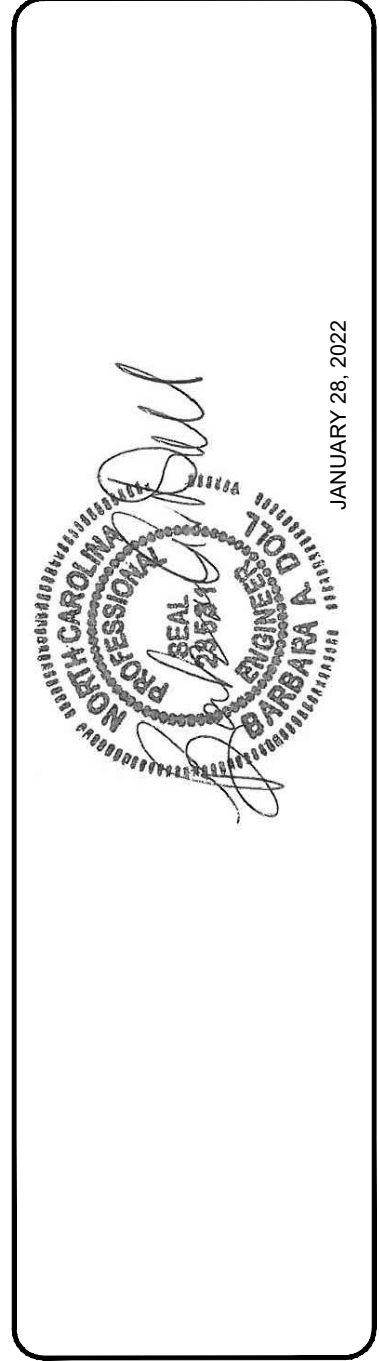
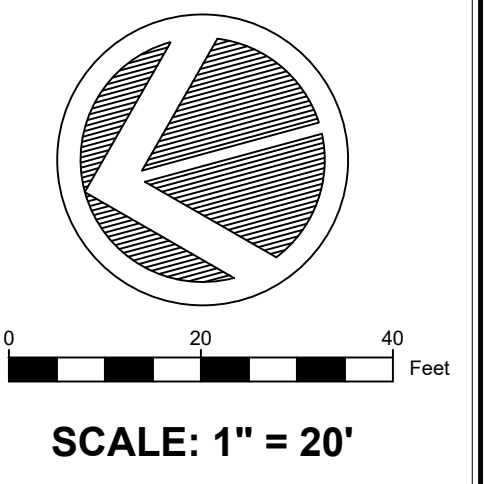


DRAWN: JLP, JLF	PROJECT: MILLSTONE CREEK	SCO ID #	20-22021-01A
DESIGN: BAD, JLP	NAME: MITIGATION SITE	PHASE #	1
CHECK: BAD	SCALE: AS NOTED		
APPROVED: BAD	DATE: JANUARY 28, 2022		



ROCK AND LOG  
STRUCTURE ADDED AT  
WETLAND OUTLET TO  
ENSURE A STABLE  
TRANSITION BETWEEN THE  
GRADED AREAS AND THE  
EXISTING DITCH

NOTES:  
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SCO ID #	20-22021-01A
PHASE #	1

Temporary Seeding Schedule and Rates		
Date	Type	Application Rate (lbs/acre)
Jan 1 – May 1	Rye Grain	120
	Ground Agricultural Limestone	2,000
	10-10-10 Fertilizer	750
	Straw Mulch	4,000
May 1 – Aug 15	German Millet	40
	Ground Agricultural Limestone	2,000
	10-10-10 Fertilizer	750
	Straw Mulch	4,000
Aug 15 – Dec 30	Rye Grain	120
	Ground Agricultural Limestone	2,000
	10-10-10 Fertilizer	750
	Straw Mulch	4,000

Permanent Seeding Rates		
Wetland Seed Mix – 20 lbs per acre		
Species	Common Name	Percent
<i>Bidens aristosa</i>	Showy tickseed	7
<i>Carex vulpinoidea</i>	Fox sedge	12
<i>Dichanthelium clandestinum</i>	Deertongue	8
<i>Elymus virginicus</i>	Virginia wildrye	20
<i>Juncus effusus</i>	Soft rush	4
<i>Panicum dichotomiflorum</i>	Smooth panicgrass	14
<i>Panicum rigidulum</i>	Redtop panicgrass	8
<i>Panicum virgatum</i>	Switchgrass	23
<i>Polygonum pensylvanicum</i>	Pennsylvania smartweed	2
<i>Sparganium americanum</i>	Eastern bur reed	2
		100

Streambank and Floodplain Seed Mix – 20 lbs per acre		
Species	Common Name	Percent
<i>Agrostis perennans</i>	Autumn bentgrass	15
<i>Andropogon gerardii</i>	Big bluestem	10
<i>Coreopsis lanceolata</i>	Lanceleaf coreopsis	10
<i>Elymus virginicus</i>	Virginia wildrye	20
<i>Juncus effusus</i>	Soft rush	5
<i>Panicum virgatum</i>	Switchgrass	15
<i>Rudbeckia hirta</i>	Blackeyed susan	10
<i>Schizachyrium scoparium</i>	Little bluestem	5
<i>Sorghastrum nutans</i>	Indian grass	5
<i>Tripsacum dactyloides</i>	Eastern gamagrass	5
		100

Upland Hardwood Forest – 20 lbs per acre		
Species	Common Name	Percent
<i>Achillea millefolium</i>	Common yarrow	10
<i>Agrostis perennans</i>	Autumn bentgrass	6
<i>Asclepias tuberosa</i>	Butterfly weed	1
<i>Bidens aristosa</i>	Showy tickseed sunflower	11
<i>Chamaecrista fasciculata</i>	Partridge pea	10
<i>Coreopsis lanceolata</i>	Lance-leaf coreopsis	10
<i>Echinacea purpurea</i>	Purple coneflower	4
<i>Elymus virginicus</i>	Virginia wildrye	6
<i>Gaillardia pulchella</i>	Indian blanket	8
<i>Helianthus angustifolius</i>	Swamp sunflower	2
<i>Helianthus maximiliani</i>	Maximilian's sunflower	2
<i>Monarda punctata</i>	Spotted beebalm	2
<i>Rudbeckia hirta</i>	Blackeyed susan	6
<i>Schizachyrium scoparium</i>	Little bluestem	4
<i>Sorghastrum nutans</i>	Indian grass	6
<i>Symphotrichum pilosum</i>	Heath aster	1
<i>Tridens flavus</i>	Purpletop	4
<i>Tripsacum dactyloides</i>	Eastern gamagrass	6
<i>Verbena hastata</i>	Blue vervain	1
		100

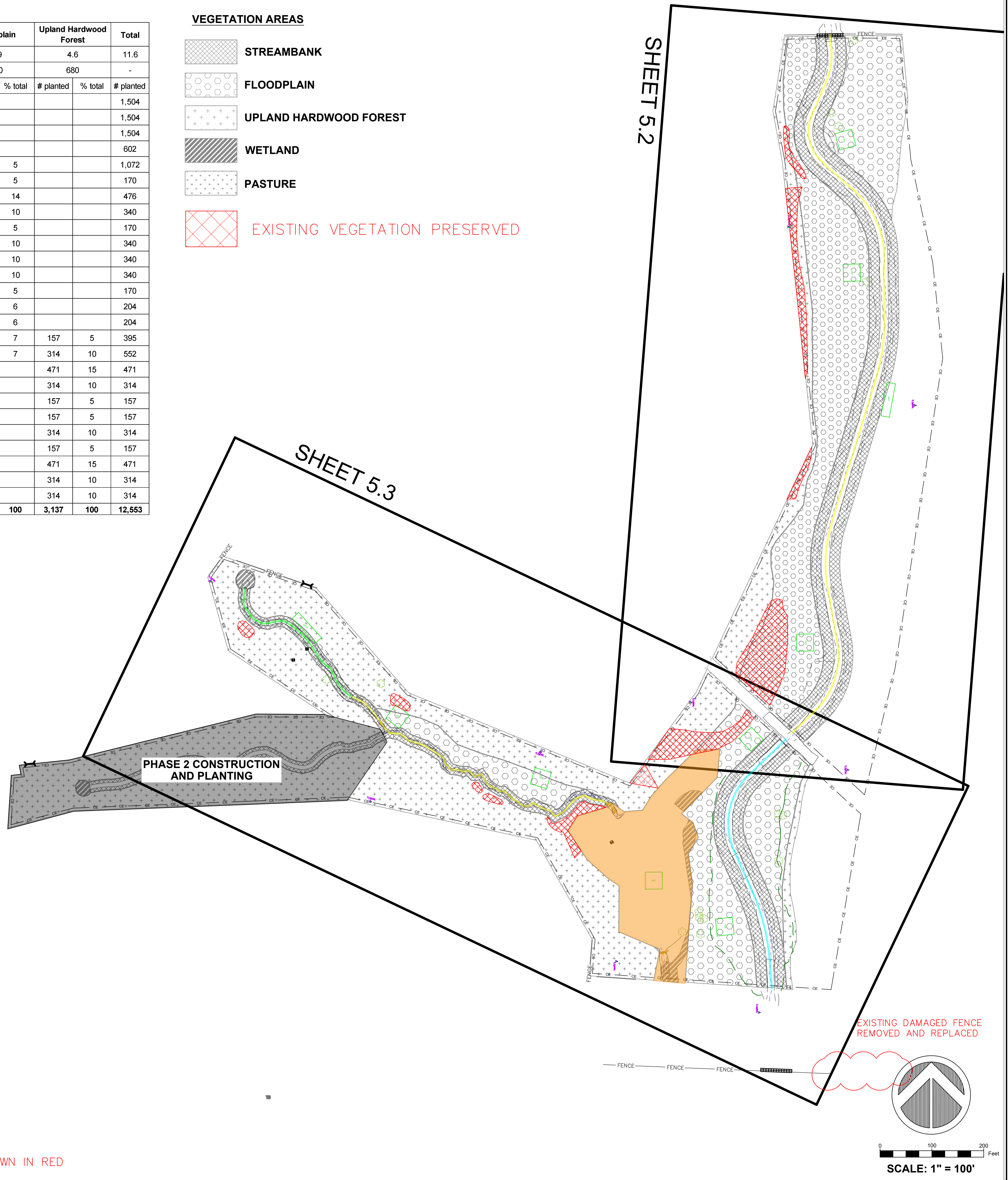
Pasture Seed Mix – 60 lbs per acre		
Species	Common Name	Percent
<i>Dactylis glomerata</i>	Orchard Grass	50
<i>Schedonorus phoenix</i>	KY 31 Tall Fescue	50
		100

Vegetation Area	Streambank	Floodplain	Upland Hardwood Forest	Total			
Area (acres)	2.1	4.9	4.6	11.6			
Density	2,800	680	680	-			
Species	# planted	% total	# planted	% total			
*Silky dogwood ( <i>Cornus amomum</i> )	1,504	25		1,504			
*Silky willow ( <i>Salix sericea</i> )	1,504	25		1,504			
*Elderberry ( <i>Sambucus canadensis</i> )	1,504	25		1,504			
Yellowroot ( <i>Xanthorhiza simplicissima</i> )	602	10		602			
**Buttonbush ( <i>Cephalanthus occidentalis</i> )	902	15	170	5	1,072		
Tag alder ( <i>Alnus serrulata</i> )		170	5	170			
River Birch ( <i>Betula nigra</i> )		476	14	476			
Ironwood ( <i>Carpinus caroliniana</i> )		340	10	340			
Water oak ( <i>Quercus nigra</i> )		170	5	170			
Inkberry ( <i>Ilex glabra</i> )		340	10	340			
Tulip poplar ( <i>Liriodendron tulipifera</i> )		340	10	340			
Sycamore ( <i>Plantanus occidentalis</i> )		340	10	340			
Black gum ( <i>Nyssa sylvatica</i> )		170	5	170			
Swamp Chestnut Oak ( <i>Quercus michauxii</i> )		204	6	204			
Possumhaw ( <i>Viburnum nudum</i> )		204	6	204			
Willow oak ( <i>Quercus phellos</i> )		238	7	157	5	395	
Black Walnut ( <i>Juglans nigra</i> )		238	7	314	10	552	
White oak ( <i>Quercus alba</i> )			471	15	471		
Black Cherry ( <i>Prunus serotina</i> )			314	10	314		
Red Bud ( <i>Cercis canadensis</i> )			157	5	157		
Persimmon ( <i>Diospyros virginiana</i> )			157	5	157		
Overcup Oak ( <i>Quercus lyrata</i> )			314	10	314		
Sassafras ( <i>Sassafras albidum</i> )			157	5	157		
Red Oak ( <i>Quercus rubra</i> )			471	15	471		
Chestnut Oak ( <i>Quercus prinus</i> )			314	10	314		
American Beech ( <i>Fagus grandifolia</i> )			314	10	314		
<b>Total</b>	<b>6,016</b>	<b>100</b>	<b>3,400</b>	<b>100</b>	<b>3,137</b>	<b>100</b>	<b>12,553</b>

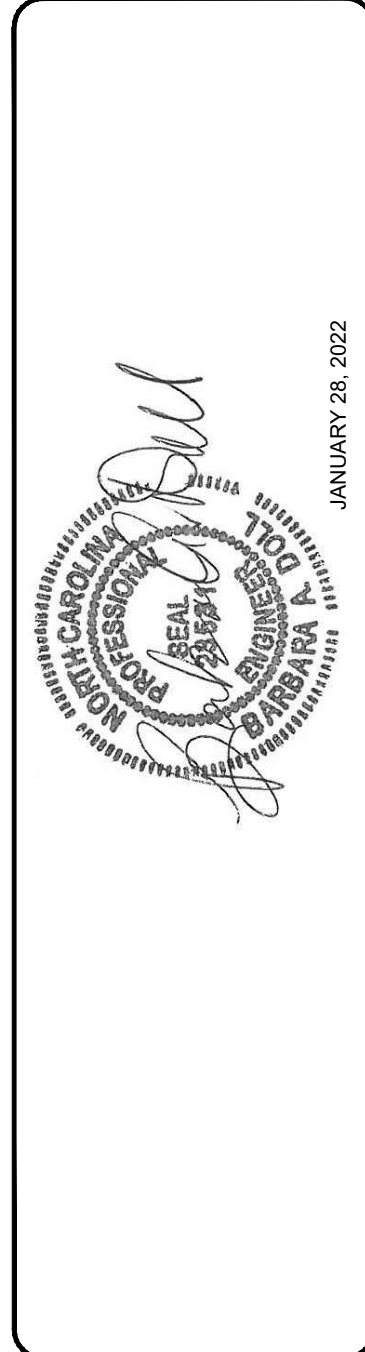
\*Provide as live stakes  
 \*\*Provide as live stakes on streambanks and bareroot in floodplain zone

**VEGETATION AREAS**

-  **STREAMBANK**
-  **FLOODPLAIN**
-  **UPLAND HARDWOOD FOREST**
-  **WETLAND**
-  **PASTURE**
-  **EXISTING VEGETATION PRESERVED**

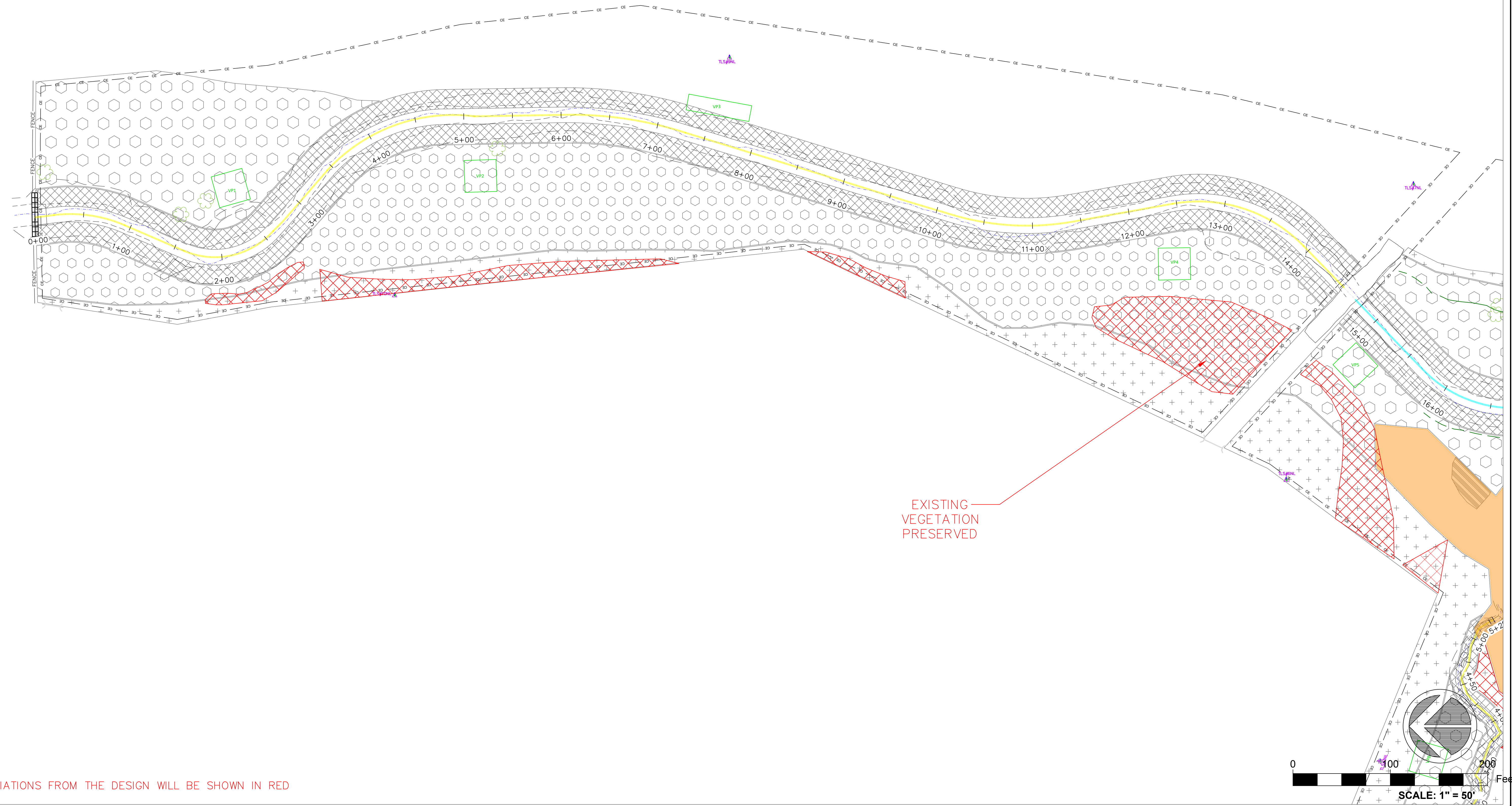


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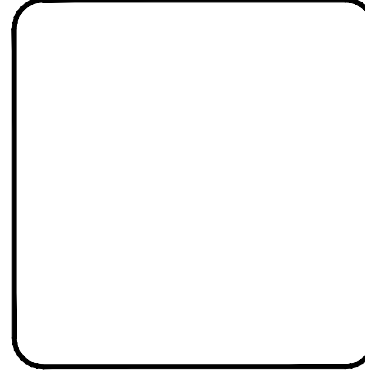
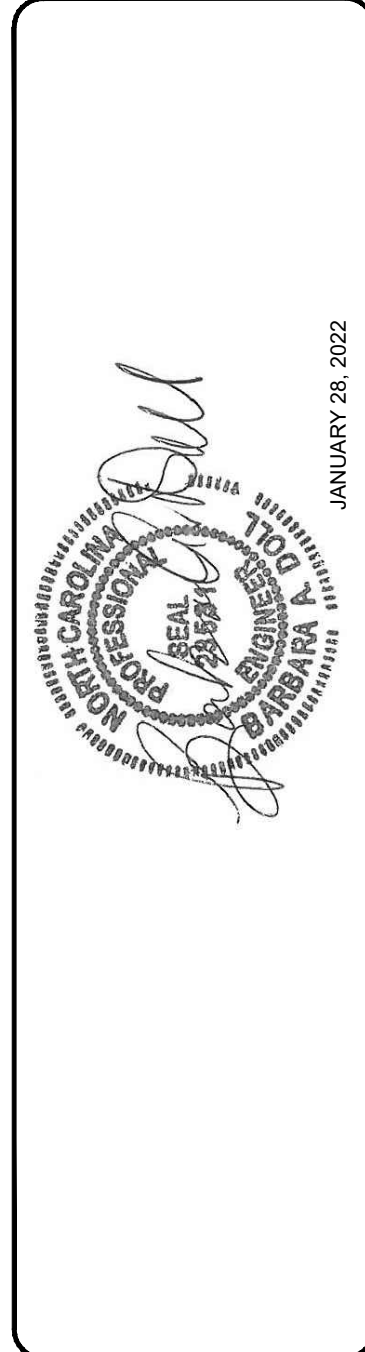


**VEGETATION AREAS**

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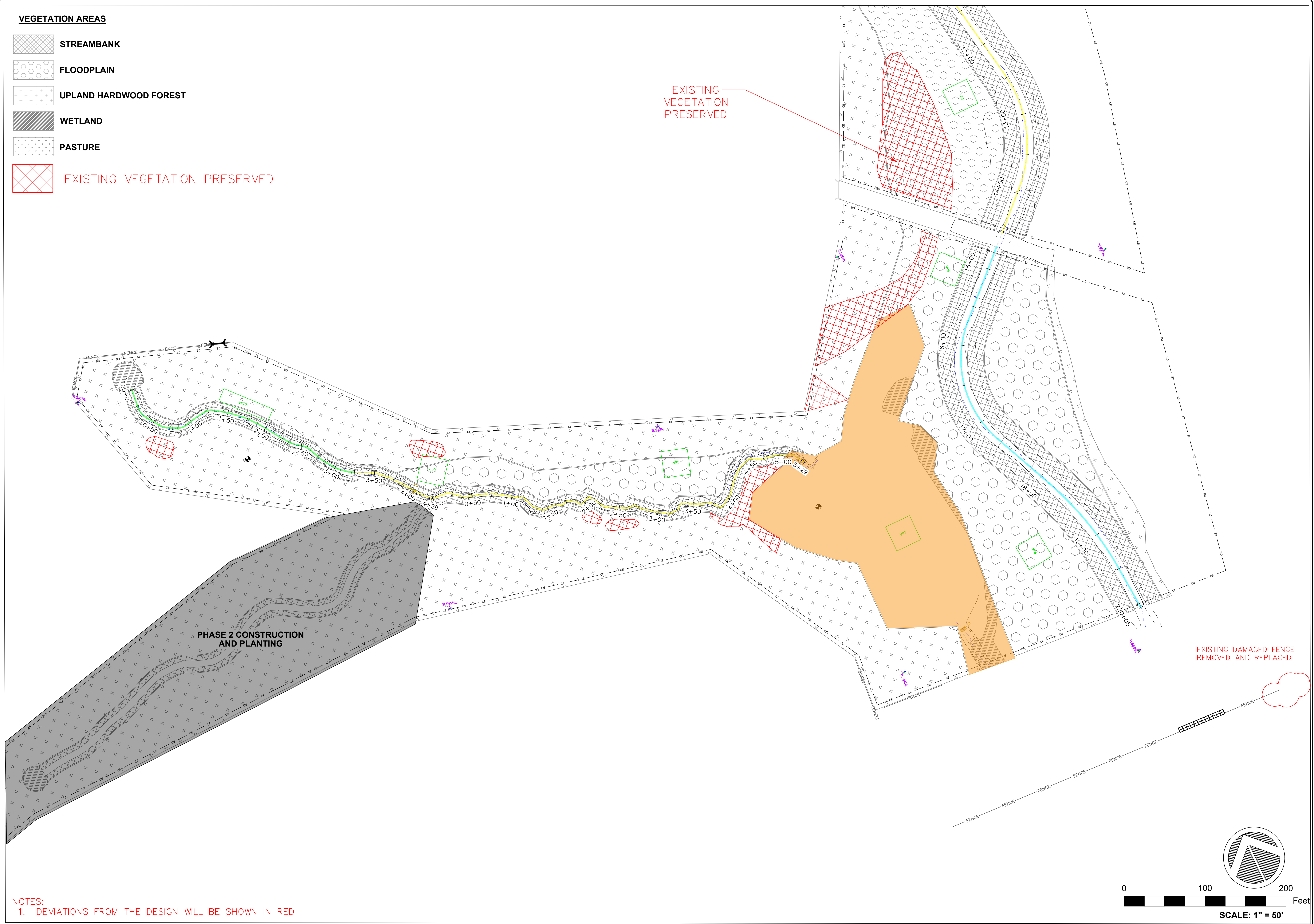


**NC STATE**

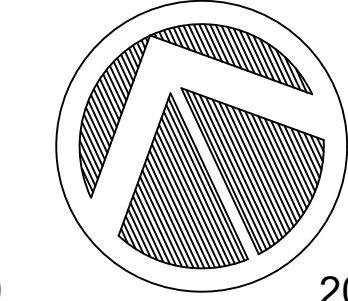
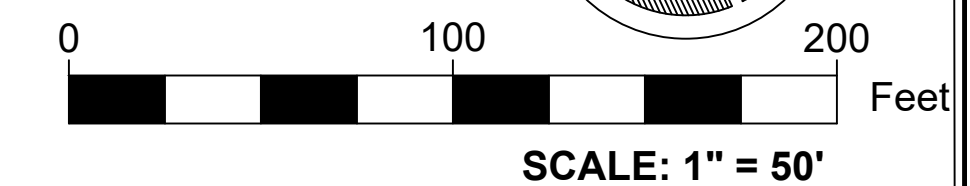
PROJECT NAME:	MILLSTONE CREEK MITIGATION SITE
SCALE:	AS NOTED
DATE:	JANUARY 28, 2022
DRAWN:	J.P. JELF
DESIGN:	BAD, J.P.
CHECK:	BAD
APPROVED:	BAD
SCO ID #	20-22021-01A
PHASE #	1

**VEGETATION AREAS**

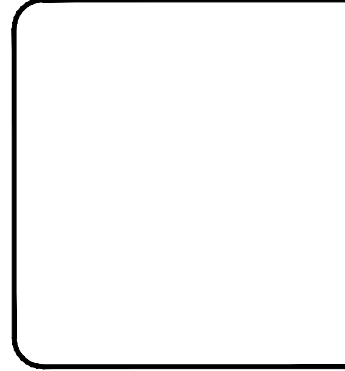
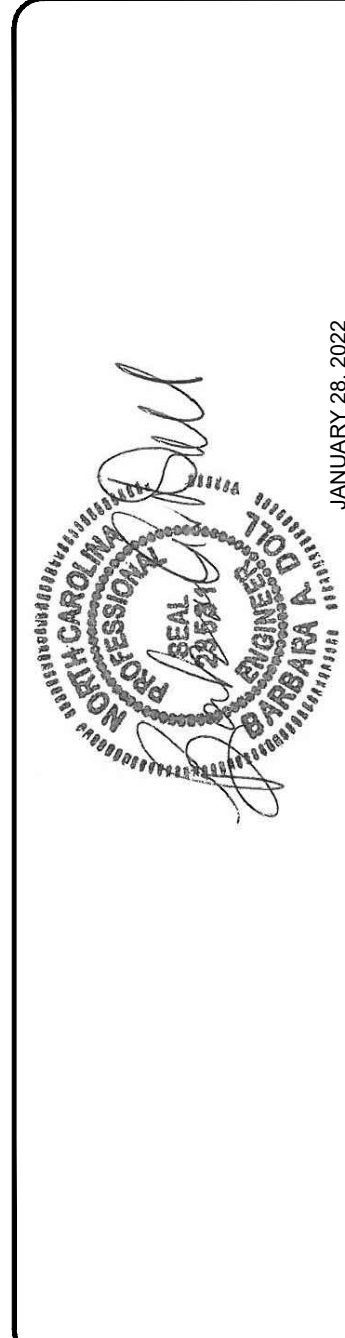
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 NC DMS MITIGATION SITE  
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VEGETATION PLAN 5.3

JANUARY 28, 2022