

# Alexander Farm Mitigation Site - Record Drawings

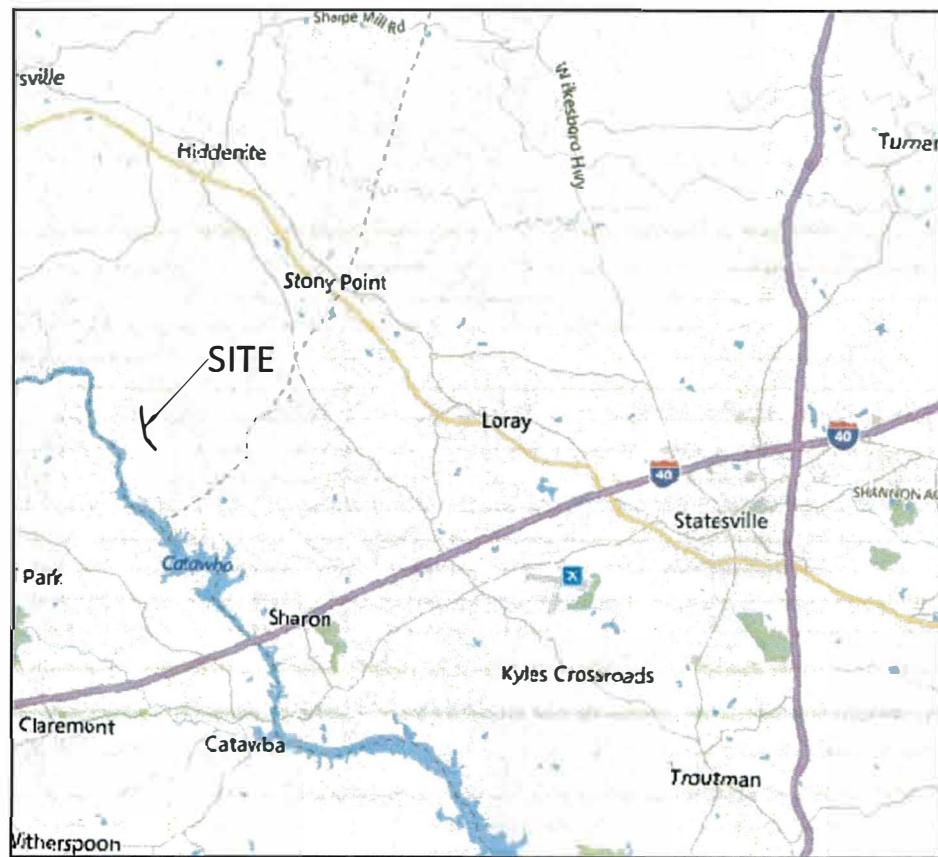
Alexander County, North Carolina

Catawba River Basin 03050101

for

NCDEQ

Division of Mitigation Services



Vicinity Map  
Not to Scale



RECORD DRAWINGS ISSUED  
AUGUST 21, 2020

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## Project Directory

**Engineering:**  
Wildlands Engineering, Inc  
License No. F-0831  
1430 South Mint Street  
Suite 104  
Charlotte, NC 28203  
Aaron Earley, PE  
704-332-7754

**Owner:**  
NC DEQ - Division of  
Mitigation Services  
5 Ravenscroft Dr, Ste. 102  
Asheville, NC 28801  
Harry Tsomides  
828-545-7057

**Pre-Construction Conditions and  
As-Built Surveying:**  
Turner Land Surveying, PLLC  
P.O. Box 148  
Swannanoa, NC 28778  
Lissa Turner, PLS  
919-827-0745

NC DEQ Contract No. 7416  
DMS Project No. 100048  
USACE ID No. SAW-2018-00451

### CERTIFICATE OF SURVEY AND ACCURACY

I, ELISABETH G. TURNER, CERTIFY THAT THE GROUND TOPOGRAPHIC SURVEY PORTION OF THIS PROJECT WAS COMPLETED UNDER MY DIRECT SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY DIRECT SUPERVISION; THAT THE RECORD DRAWINGS WERE PREPARED BY WILDLANDS ENGINEERING, INC. FROM DIGITAL FILES PROVIDED BY TURNER LAND SURVEYING, PLLC AS SHOWN ON AN AS-BUILT SURVEY FOR "WILDLANDS ENGINEERING, INC.", JOB # 18-023, DATED MAY 19, 2020; THAT THIS SURVEY WAS PERFORMED AT THE 95% CONFIDENCE LEVEL TO MEET THE FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS AND TO MEET THE REQUIREMENTS OF A TOPOGRAPHIC SURVEY TO THE ACCURACY OF CLASS A HORIZONTAL AND CLASS C VERTICAL WHERE APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAINED BETWEEN THE DATES OF MAY 9-16, 2020; THAT THE CONTOURS SHOWN AS BROKEN LINES MAY NOT MEET THE STATED STANDARD AND ALL COORDINATES ARE BASED ON NAD 83 (NSRS 2011) AND ALL ELEVATIONS ARE BASED ON NAVD 88 AND COORDINATE VALUES WERE TAKEN FROM AN EXISTING CONDITIONS TOPOGRAPHIC SURVEY PREPARED BY TURNER LAND SURVEYING, SIGNED, SEALED AND DATED ON 9/23/2020 BY ELISABETH G. TURNER, NC PLS LICENSE #4440; THAT THIS MAP MEETS THE SPECIFICATIONS FOR TOPOGRAPHIC SURVEYS AS STATED IN TITLE 21, CHAPTER 56, SECTION .1606.

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 24th DAY OF SEPTEMBER, 2020, A.D.



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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

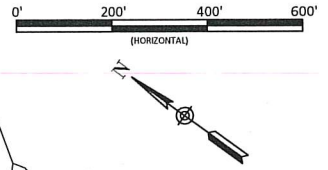
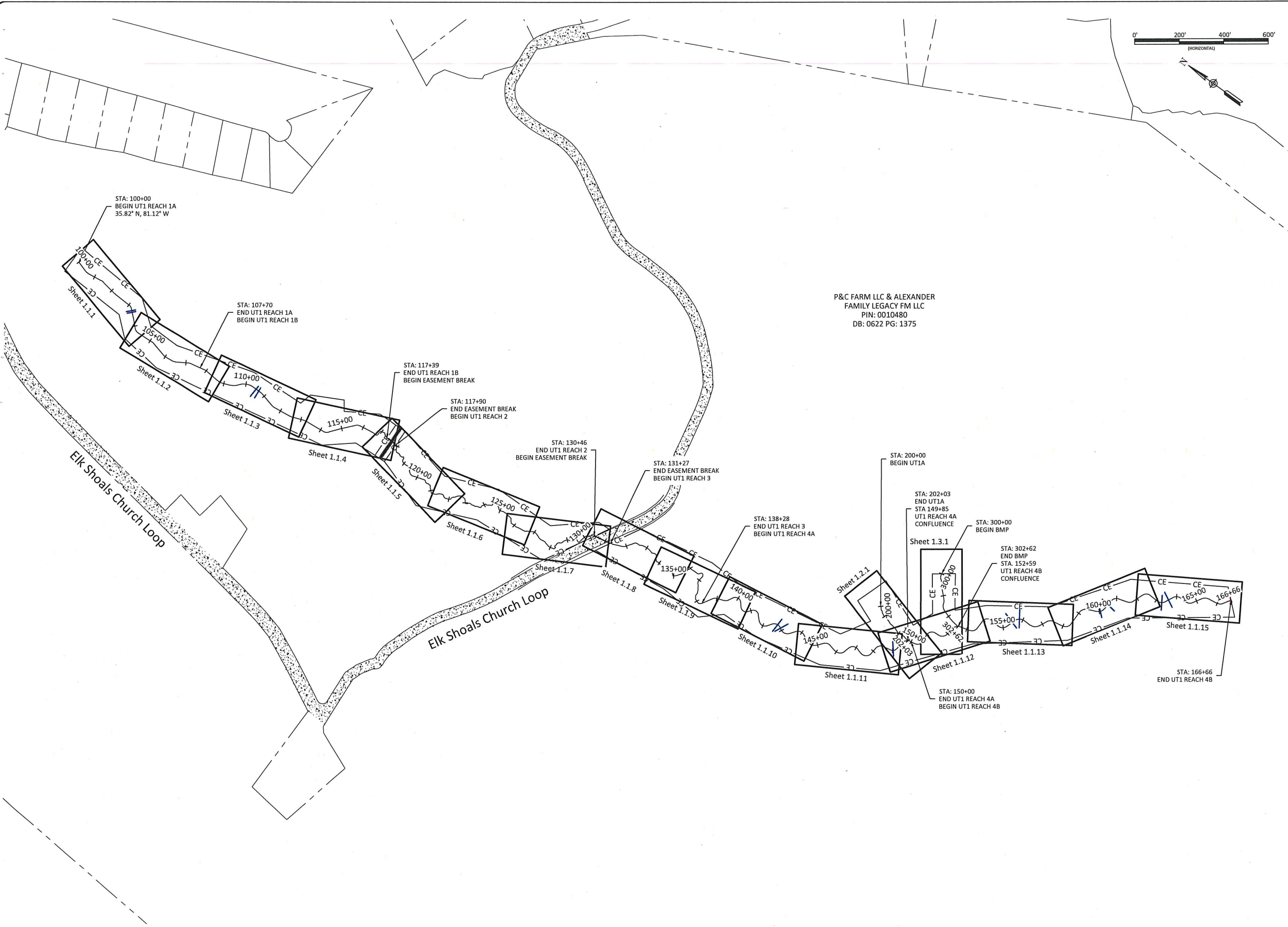
Title Sheet

Date:	08/13/2020
Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

0.1

Sheet

C:\ActiveProjects\06-02169 Alexander Farm Monitoring\Baseline-Monitoring\Plans\07169 - AB Overview.dwg August 20, 2020



P&C FARM LLC & ALEXANDER  
 FAMILY LEGACY FM LLC  
 PIN: 0010480  
 DB: 0622 PG: 1375

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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

Project Overview

Revisions:


Date: 08/13/2020  
 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
 Checked By: JCK

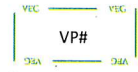
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Sheet



### As-Built Features

- CE — CE — CE — As-Built Conservation Easement
- CE-XS — CE-XS — CE-XS — As-Built Stream Crossing
- — — — — As-Built Thalweg Alignment
- — — — — As-Built Bankfull
- 100 — — — — — As-Built Major Contour
- — — — — As-Built Minor Contour
- > — — — — — As-Built Cross Section



Permanent Vegetation Monitoring Plots



Groundwater Gage



Crest Gauge



Photo Point



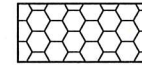
Survey Control Point



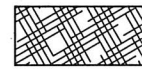
Barotroll

AS-BUILT DRAWINGS:  
Deviations from the design will be shown in red.

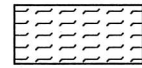
### As-Built Structures



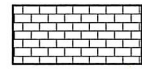
As-Built Various Constructed Riffles



As-Built Brush Toe



As-Built Vernal Pool

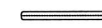


As-Built Vegetated Soil Lift

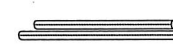


As-Built Armored Rock Stabilization/Permanent Crossing

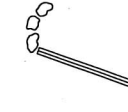
### As-Built Structures



As-Built Log Sill



As-Built Lunker Log



As-Built Log J-Hook



As-Built Log Vane



As-Built Rock Sill



As-Built Permanent Crossing



As-Built Coarse Woody Debris



As-Built Culvert

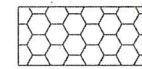
### Pre-Construction Features

- — — — — Pre-Construction Property Line
- X — X — X — Pre-Construction Fence
- FEMA FP — FEMA FP — Pre-Construction FEMA Floodplain
- — — — — Pre-Construction Storm Pipe
- — — — — Pre-Construction Bridge
- — — — — Pre-Construction Wetland
- — — — — Pre-Construction Road
- — — — — Pre-Construction Treeline

### Design Features

- 10+00 — — — — — Designed Centerline Alignment
- — — — — Designed Bankfull
- 100 — — — — — Designed Major Contour (5' Interval)
- — — — — Designed Minor Contour

### Design Structures



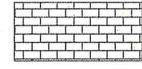
Designed Various Constructed Riffles



Designed Brush Toe



Designed Vernal Pool



Designed Vegetated Soil Lift

### Design Structures

- — — — — Designed Angled Log Sill
- — — — — Designed Lunker Log
- — — — — Designed Log J-Hook
- — — — — Designed Log Vane
- — — — — Designed Rock Sill
- — — — — Designed Permanent Crossing
- — — — — Designed Coarse Woody Debris

#### Project Notes:

Topographic survey was completed by Turner Land Surveying in October 2018.  
Parcel boundary survey was completed by Turner Land Surveying in January 2019.  
Record Drawing survey was completed by Turner Land Surveying in May 2020.

Topographic data outside Designed conservation easement supplemented with Lidar data from 2016.

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Alexander County, North Carolina

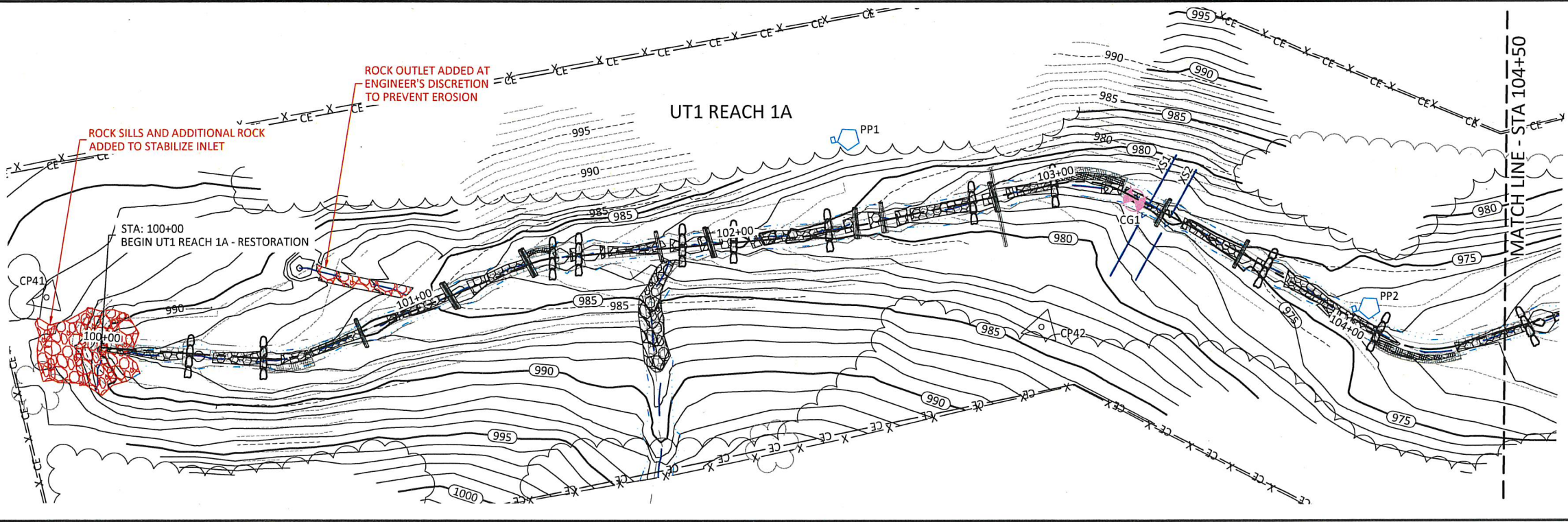
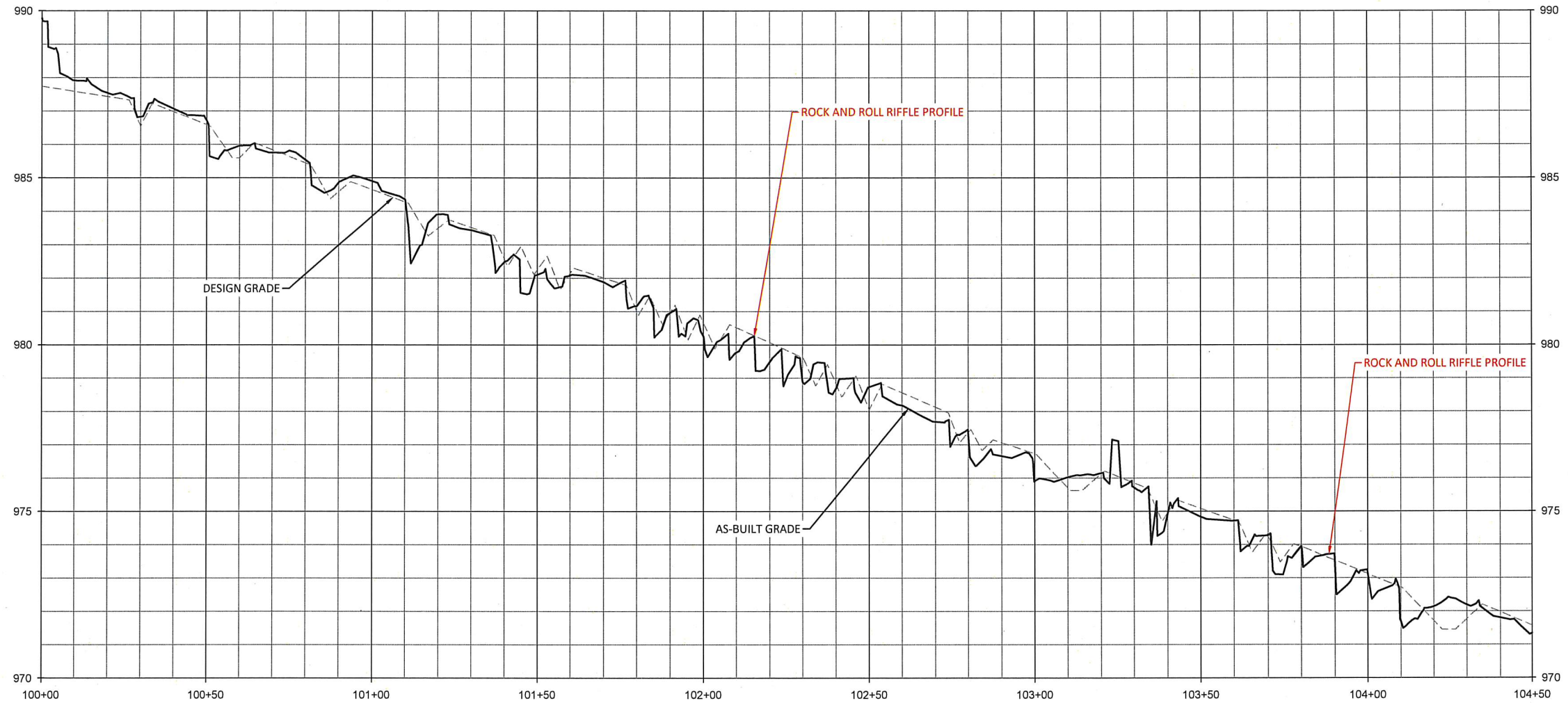
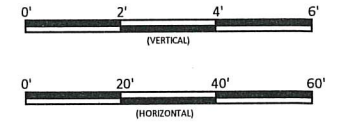
General Notes and Symbols

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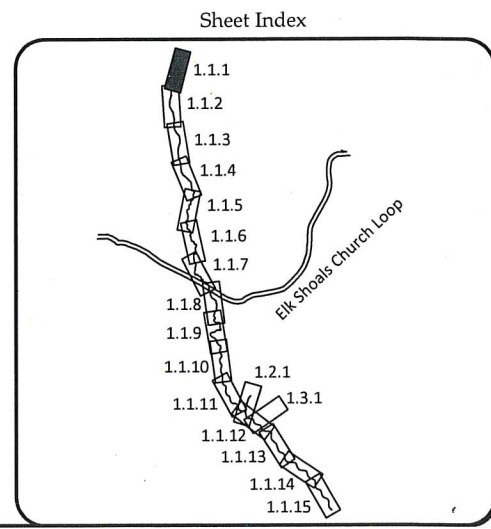
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 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
 Checked By: JCK

0.3





\*Rock and Roll Riffles contain log sills as shown in profiles.



Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

UT1 Reach 1A  
Stream Plan and Profile

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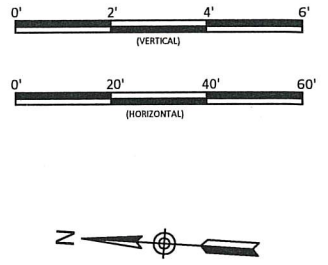
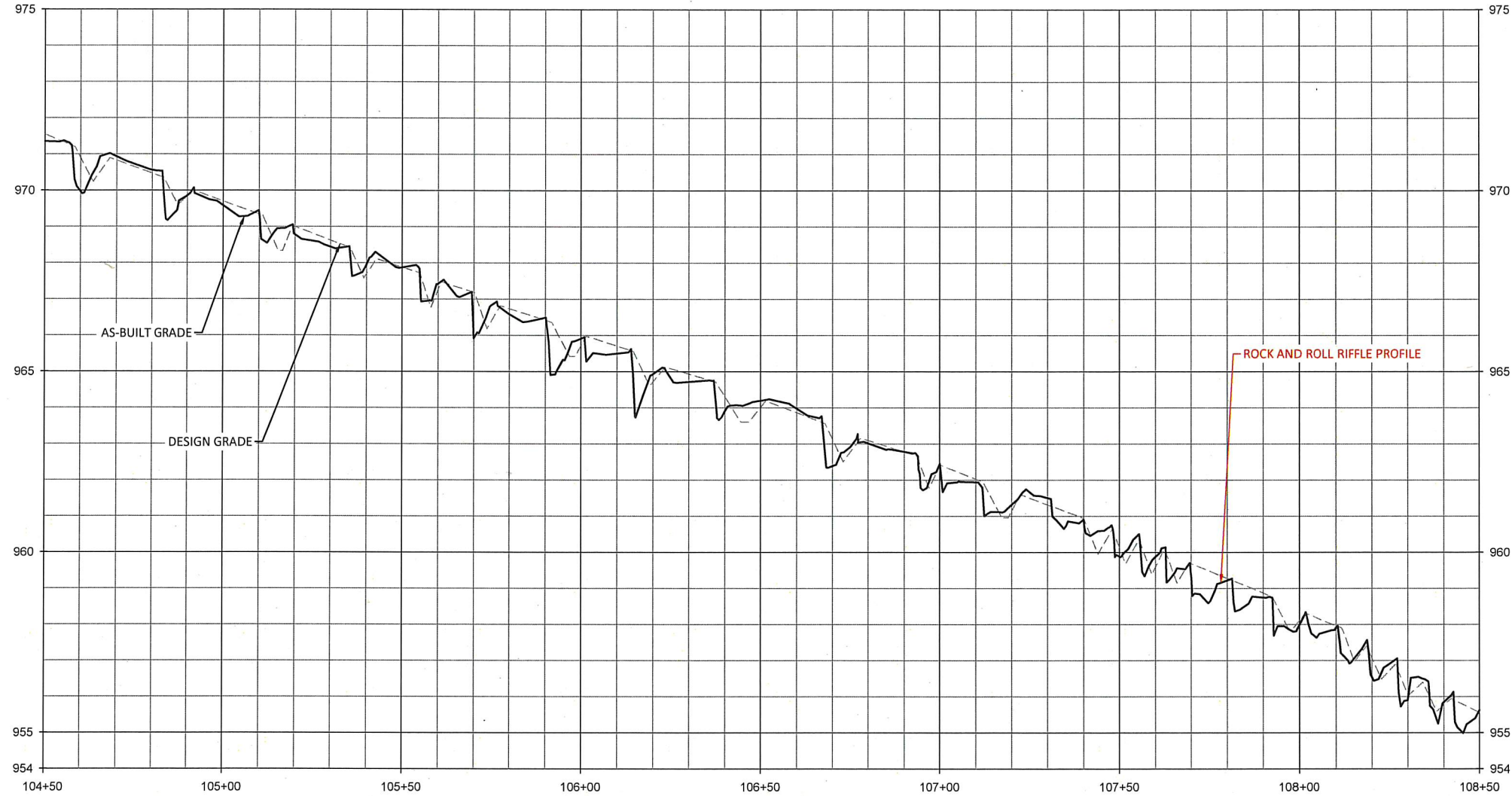

Date: 08/13/2020  
Job Number: 005-02169  
Project Engineer: ASE  
Drawn By: HCB  
Checked By: JCK

**1.1.1**

Sheet



August 20, 2020



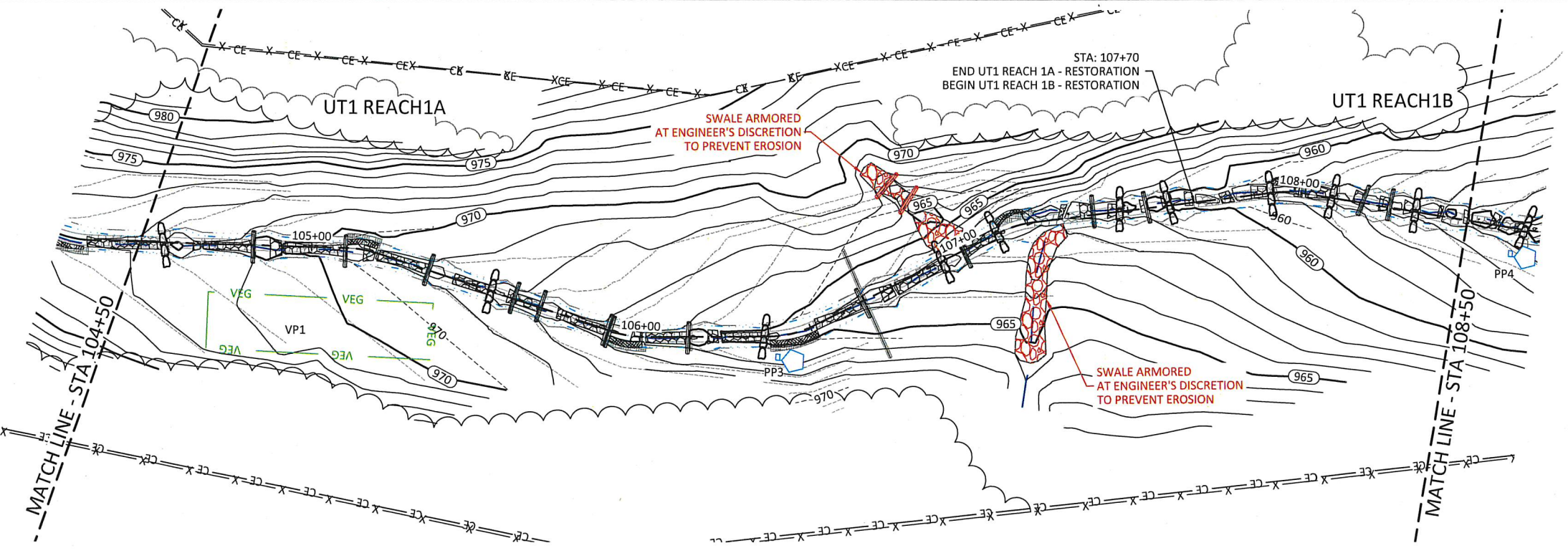
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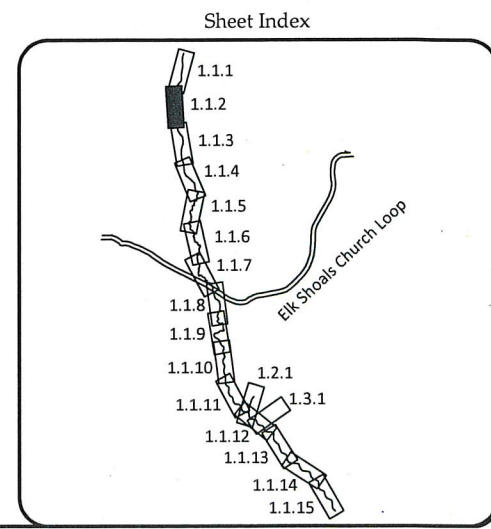
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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

UT1 Reach 1A & 1B  
Stream Plan and Profile



\*Rock and Roll Riffles contain log sills as shown in profiles.



Revisions:


Date: 08/13/2020  
Job Number: 005-02169  
Project Engineer: ASE  
Drawn By: HCB  
Checked By: JCK

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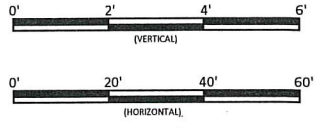
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August 30, 2020

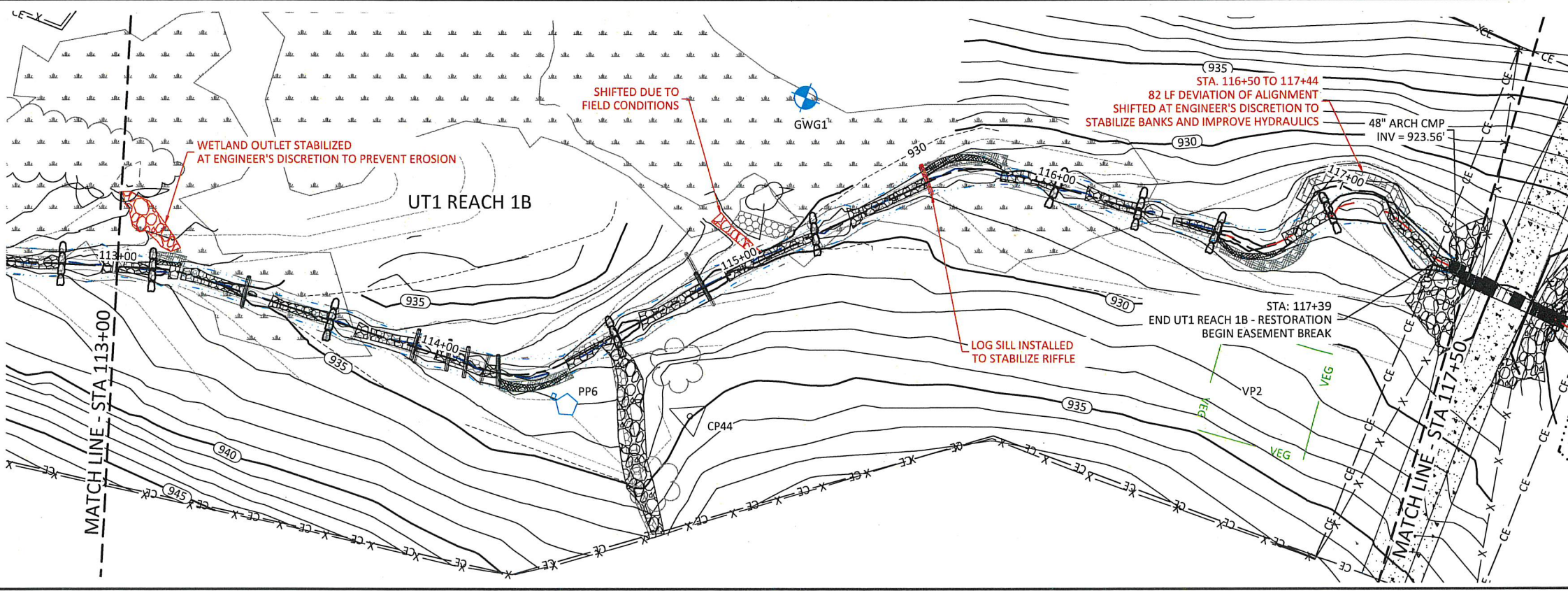


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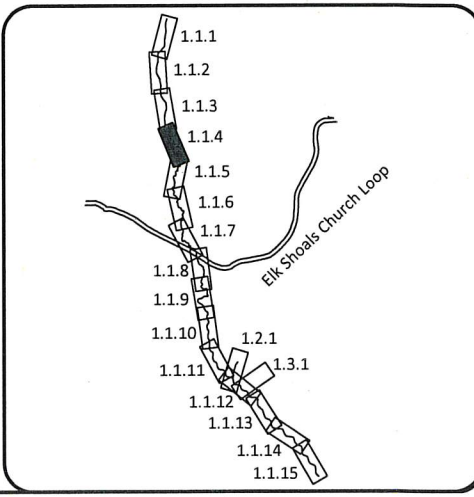
Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 1B  
 Stream Plan and Profile



\*Rock and Roll Riffles contain log sills as shown in profiles.

Sheet Index



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 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
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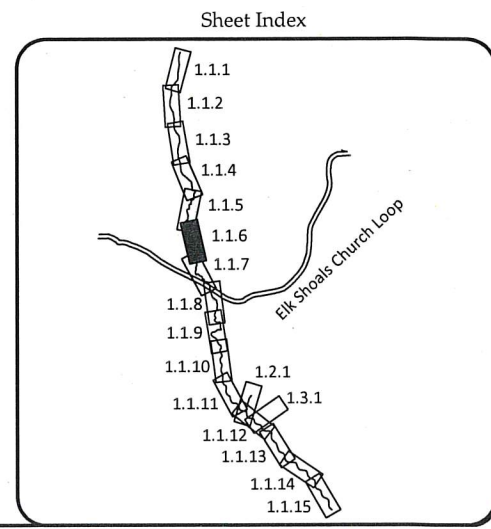
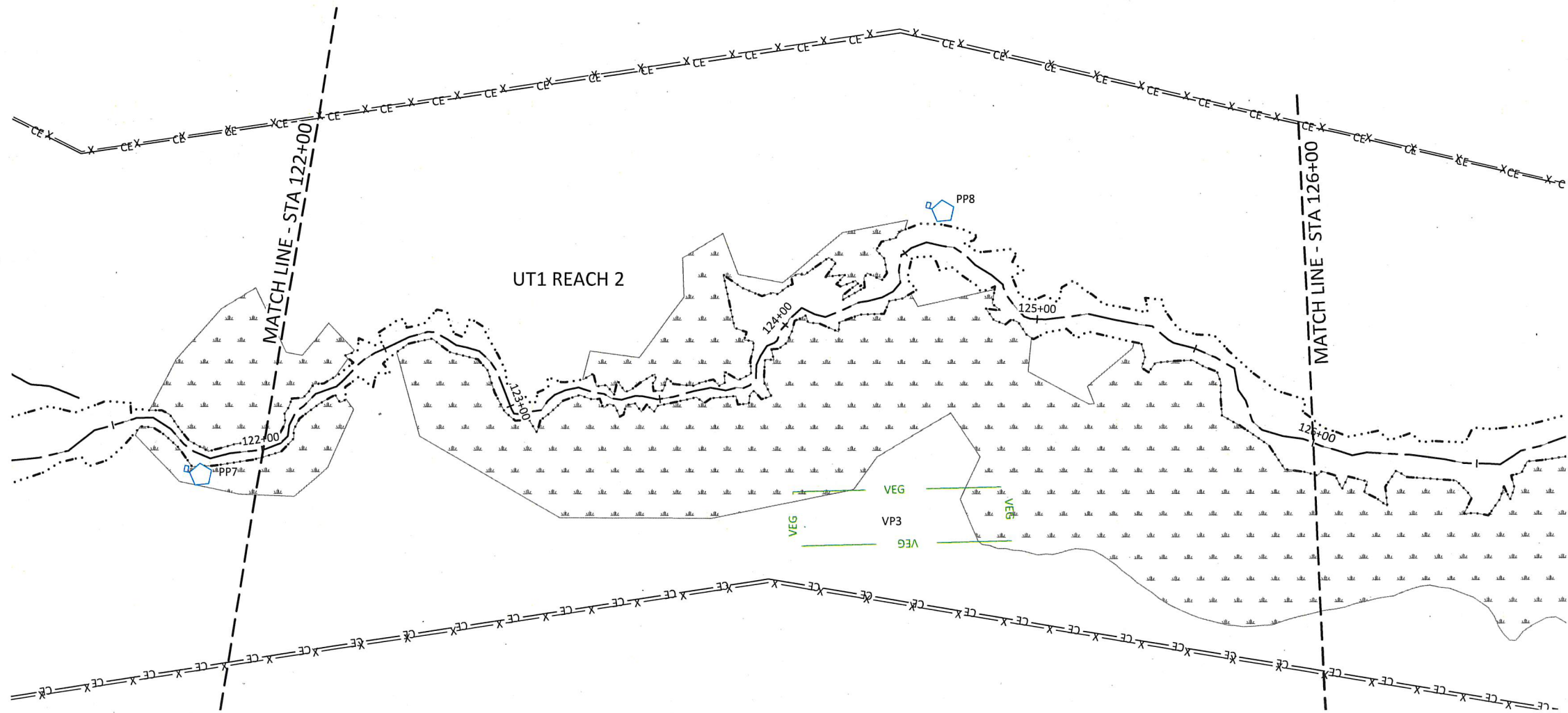
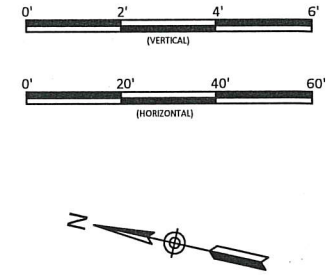
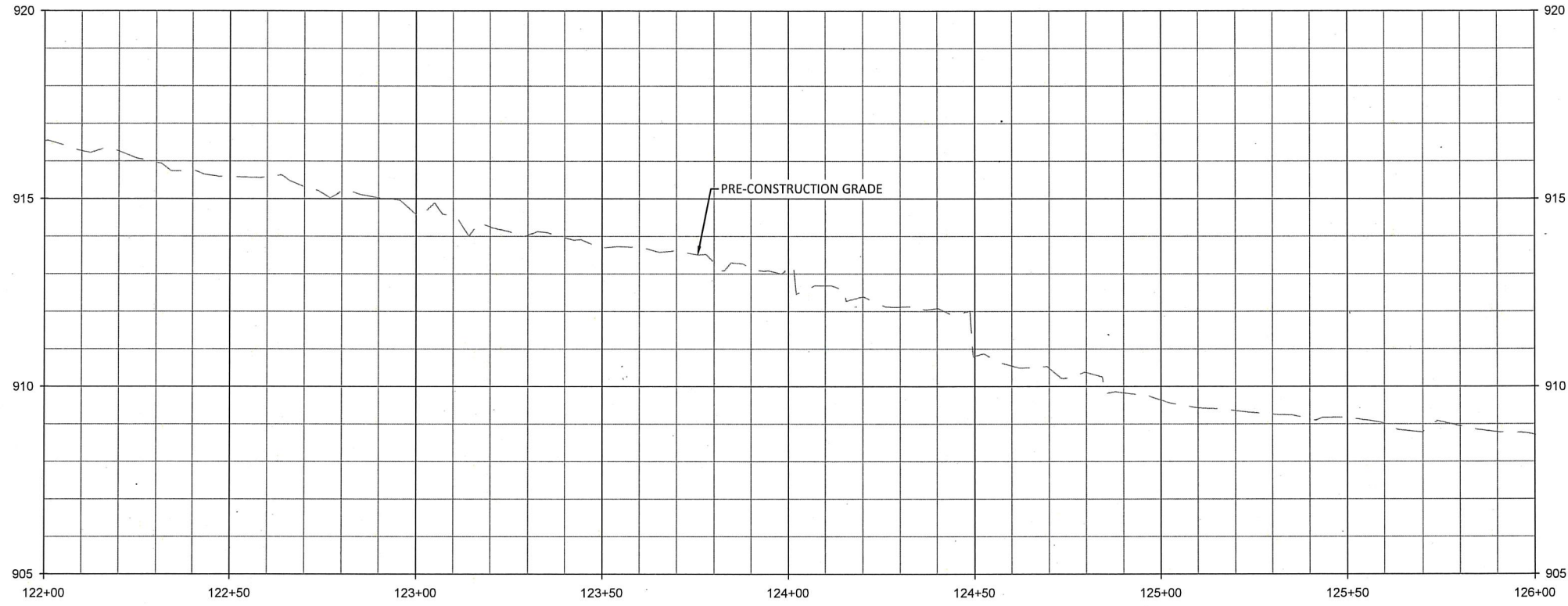
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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 2  
 Stream Plan and Profile

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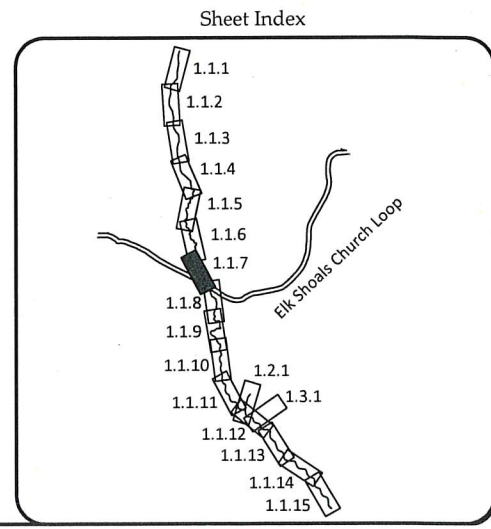
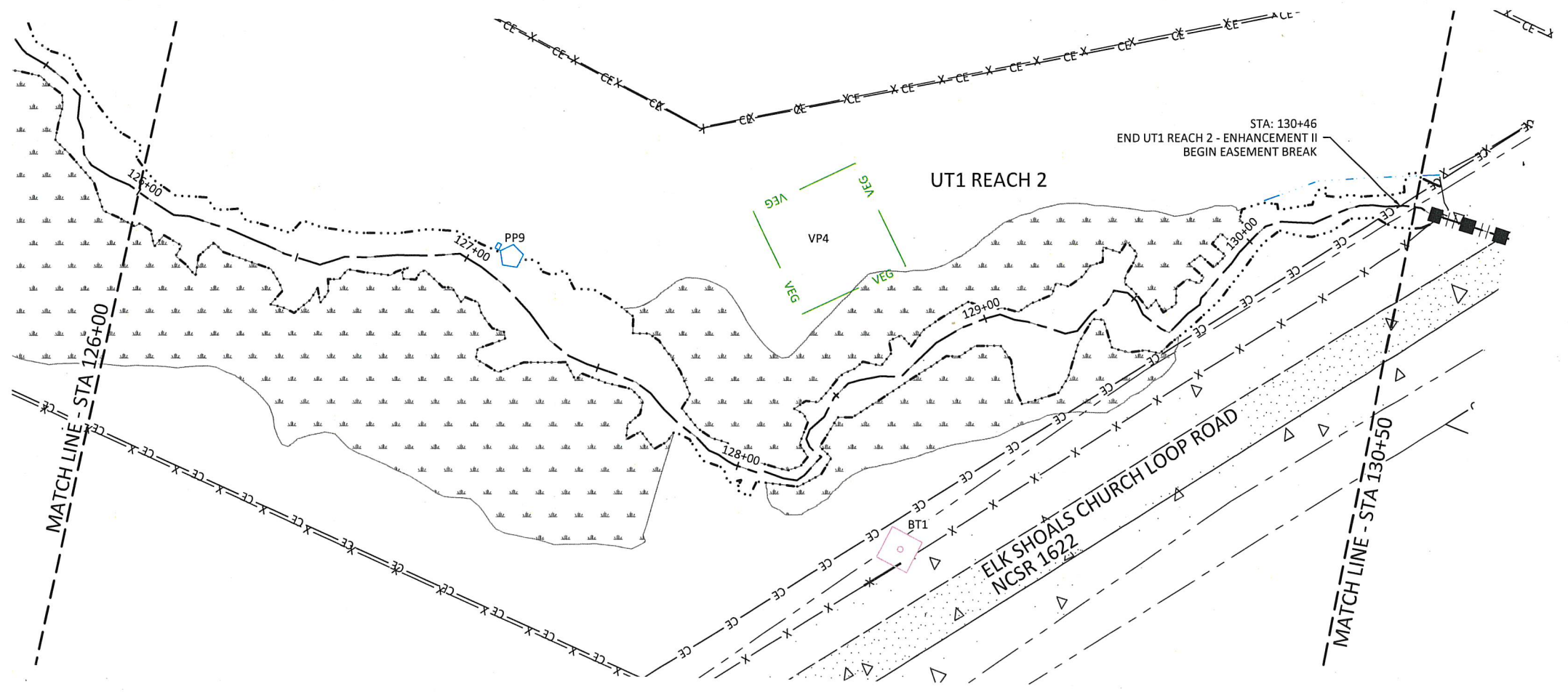
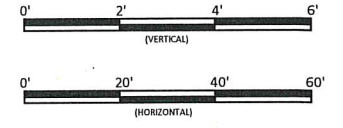
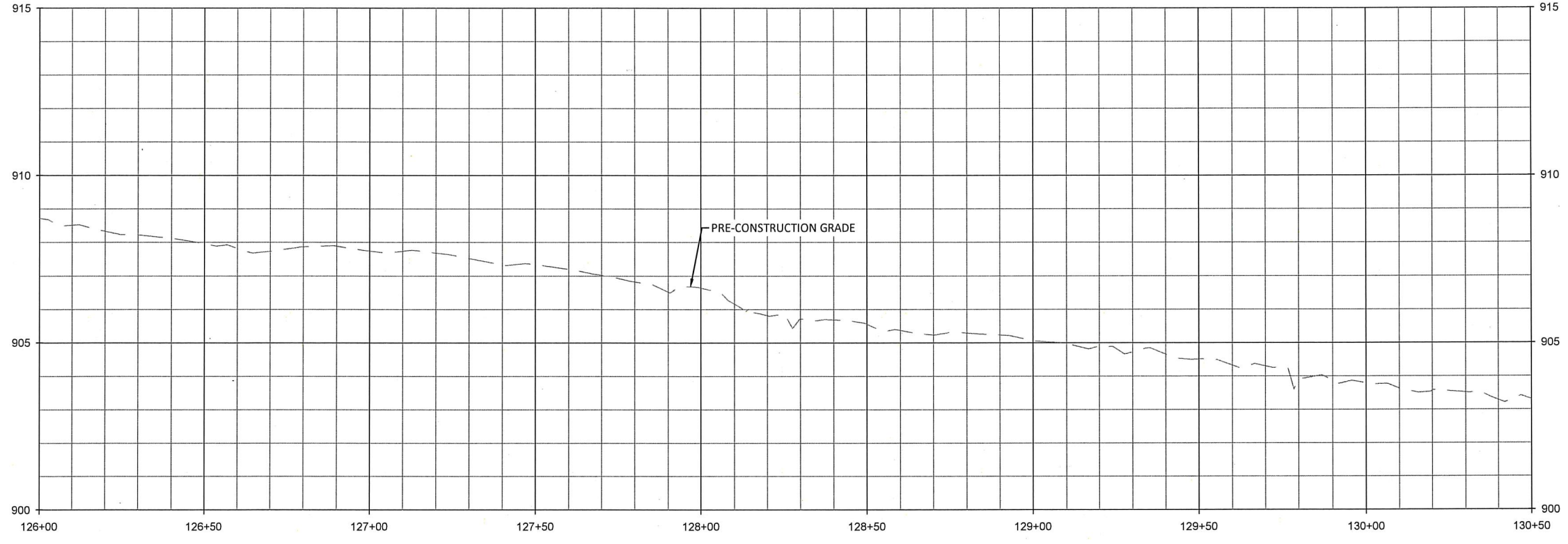


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 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
 Checked By: JCK

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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

UT1 Reach 2  
Stream Plan and Profile

Revisions:


Date: 08/13/2020

Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

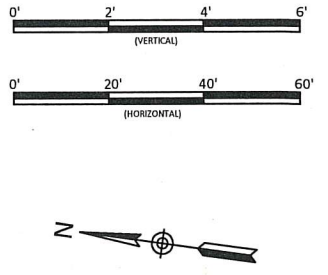
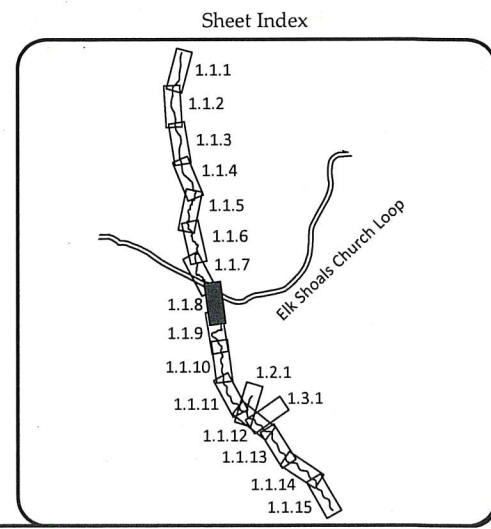
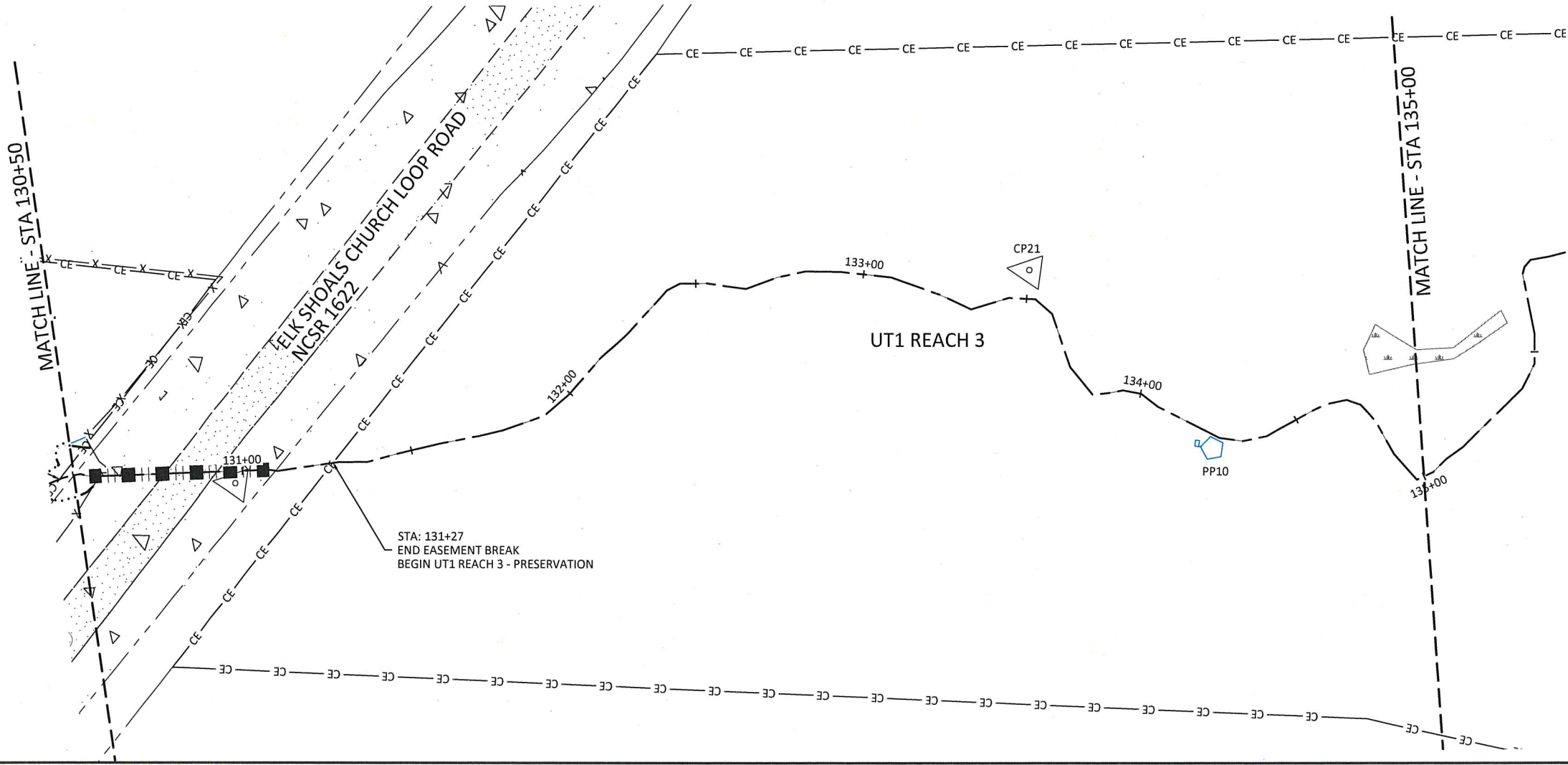
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Date: 08/13/2020

Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

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Revisions:

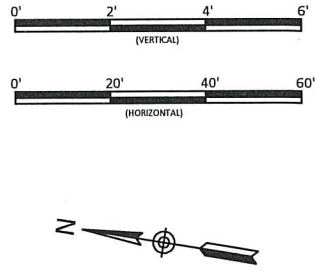
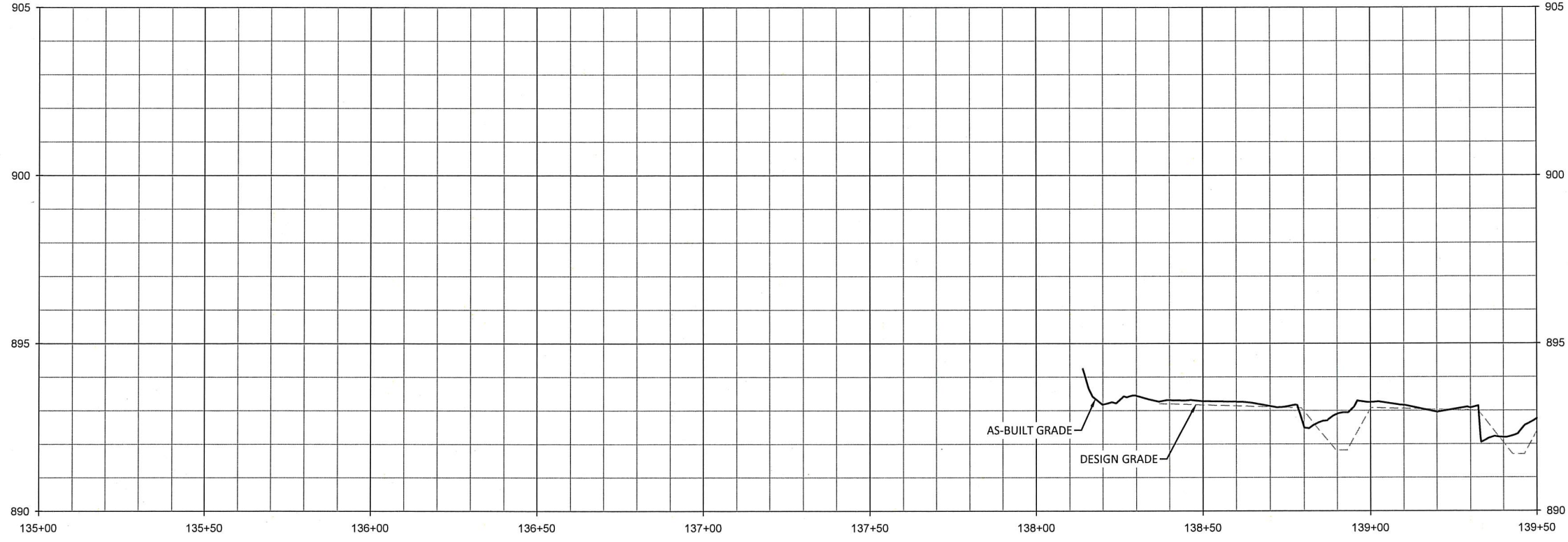

Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

UT1 Reach 3  
Stream Plan and Profile

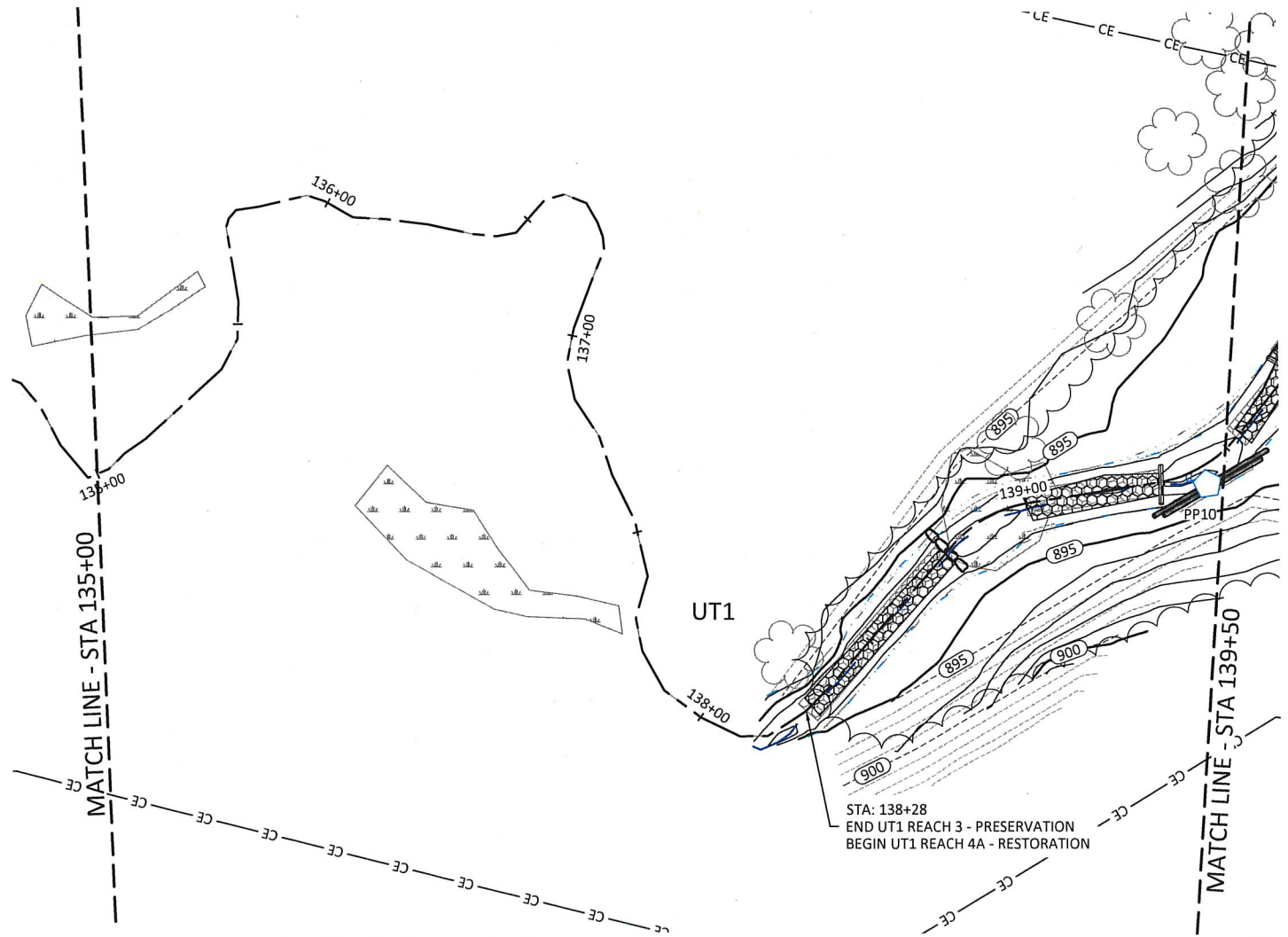


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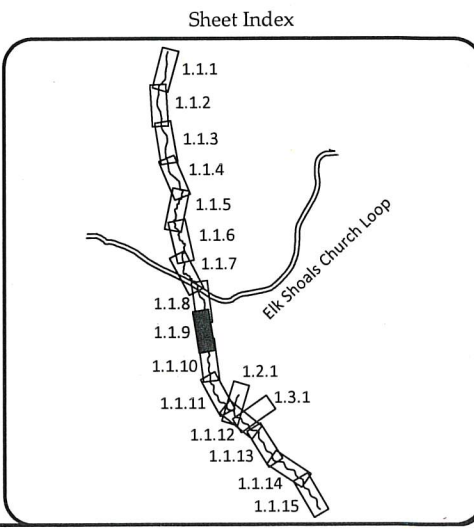
August 20, 2020



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\*Rock and Roll Riffles contain log sills as shown in profiles.



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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

UT1 Reach 3 & 4A  
Stream Plan and Profile

Revisions:

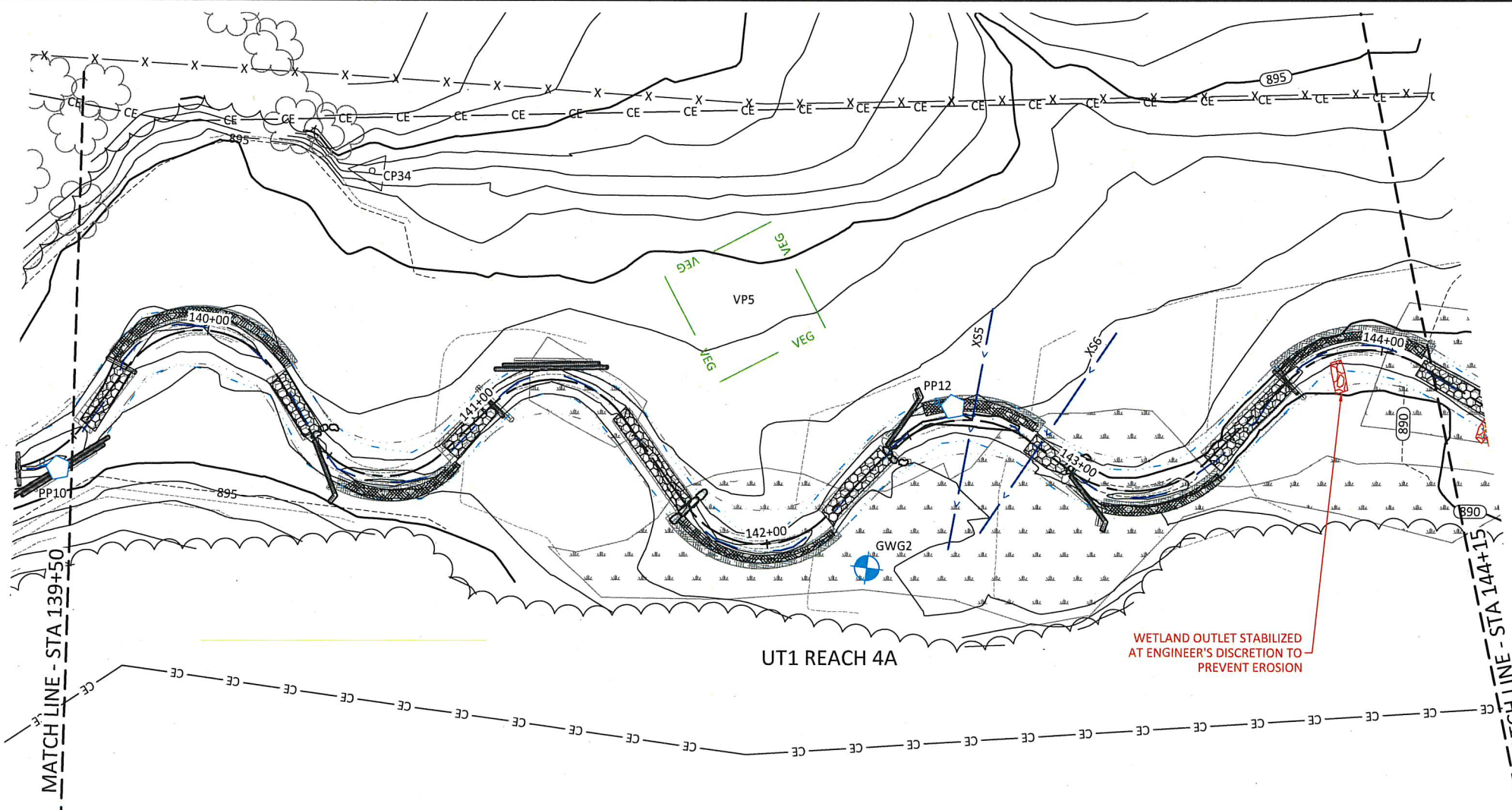
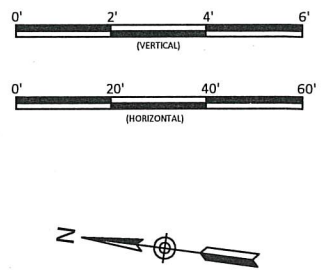
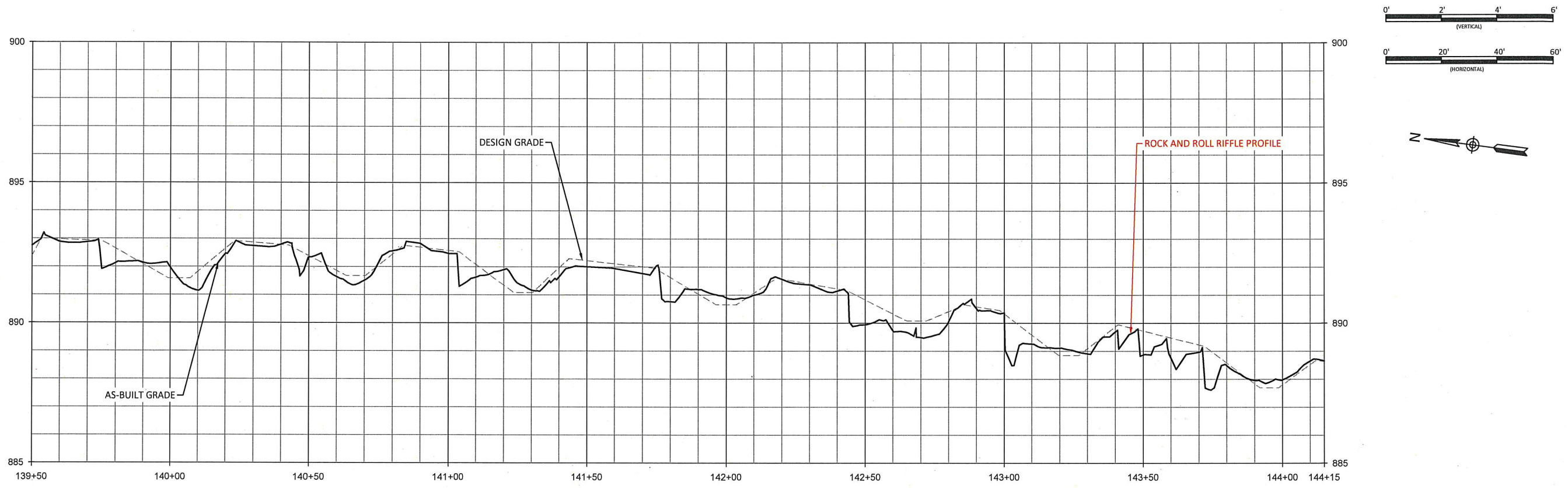

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Job Number: 005-02169  
Project Engineer: ASE  
Drawn By: HCB  
Checked By: JCK

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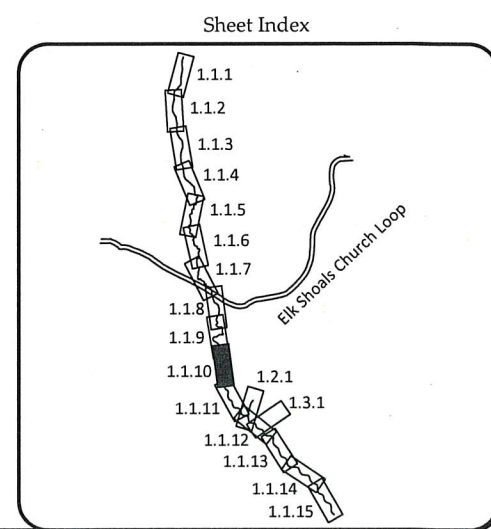
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 August 20, 2020



\*Rock and Roll Riffles contain log sills as shown in profiles.



Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 4A  
 Stream Plan and Profile



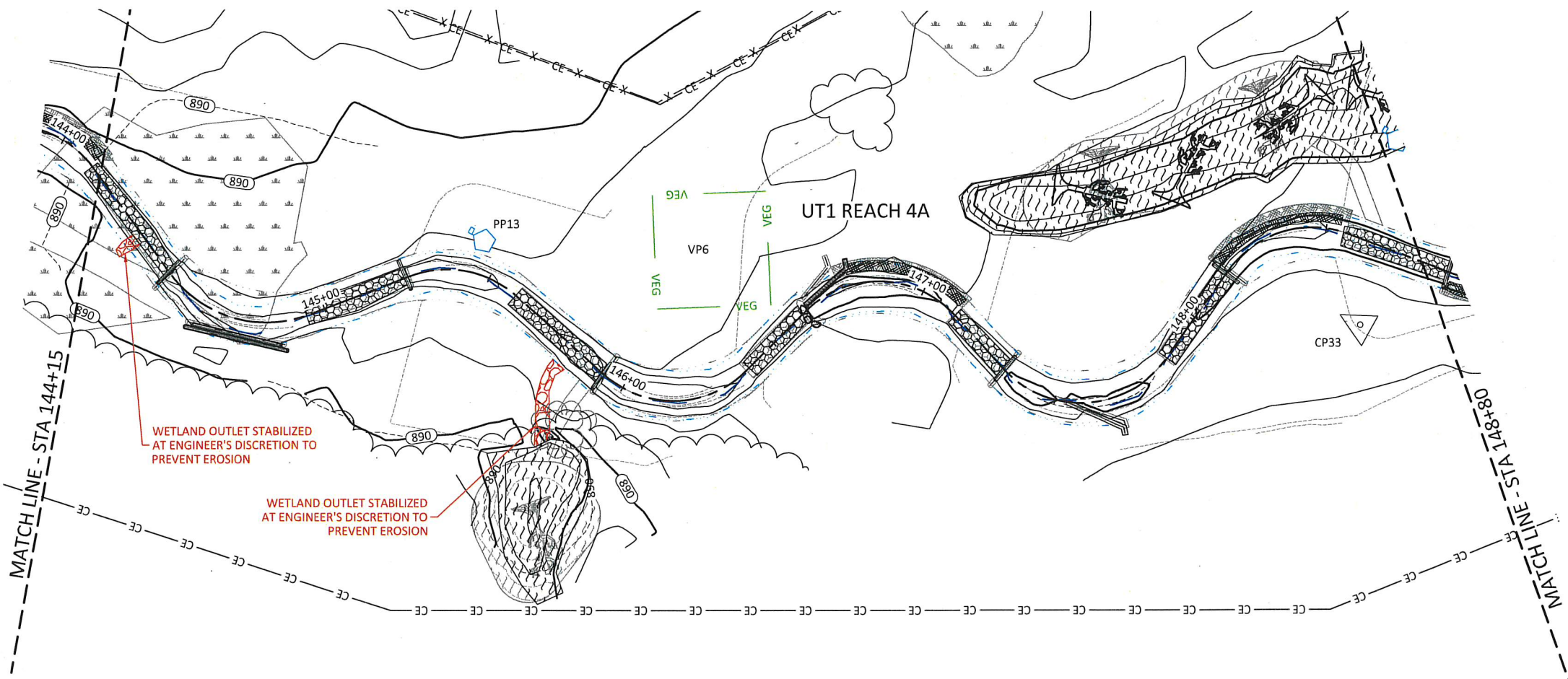
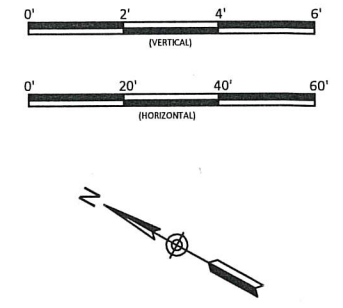
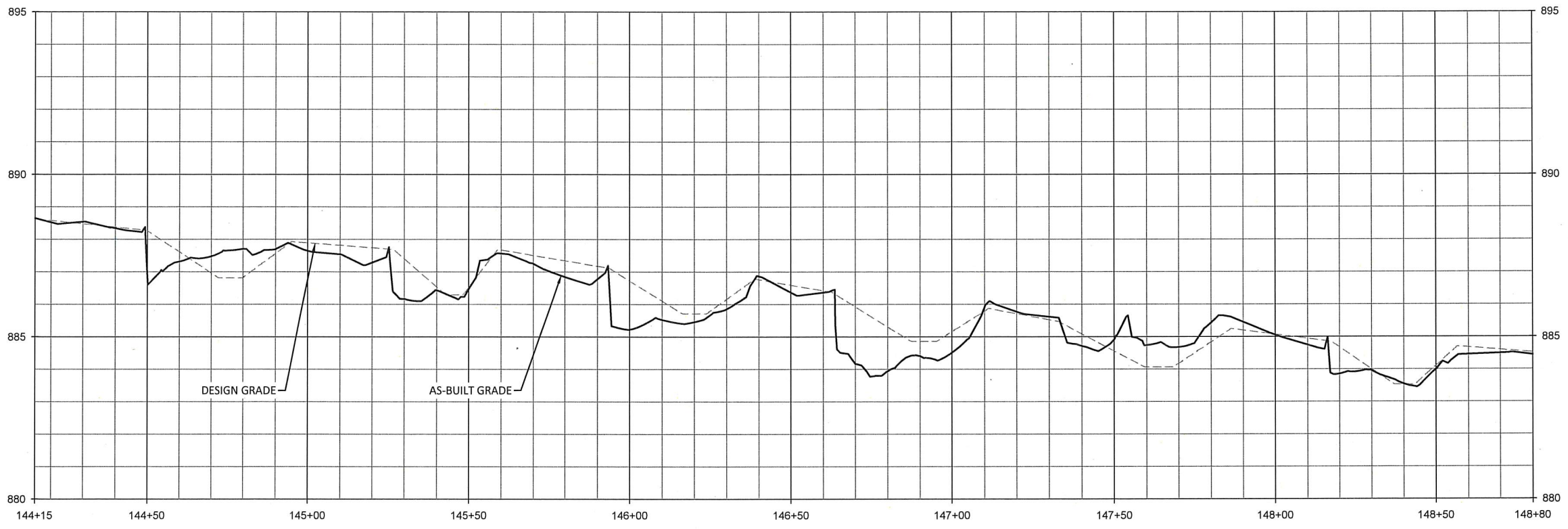
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Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK
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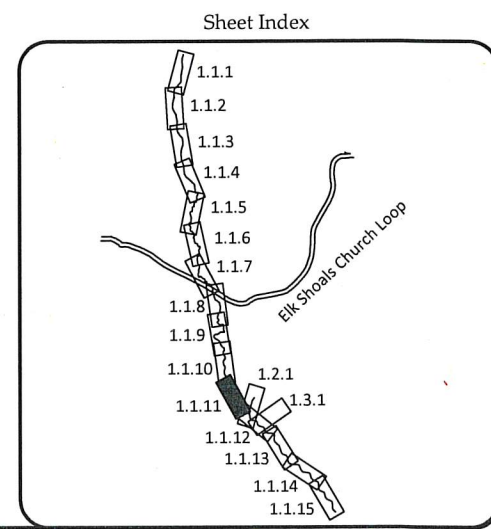


August 30, 2020

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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 4A  
 Stream Plan and Profile

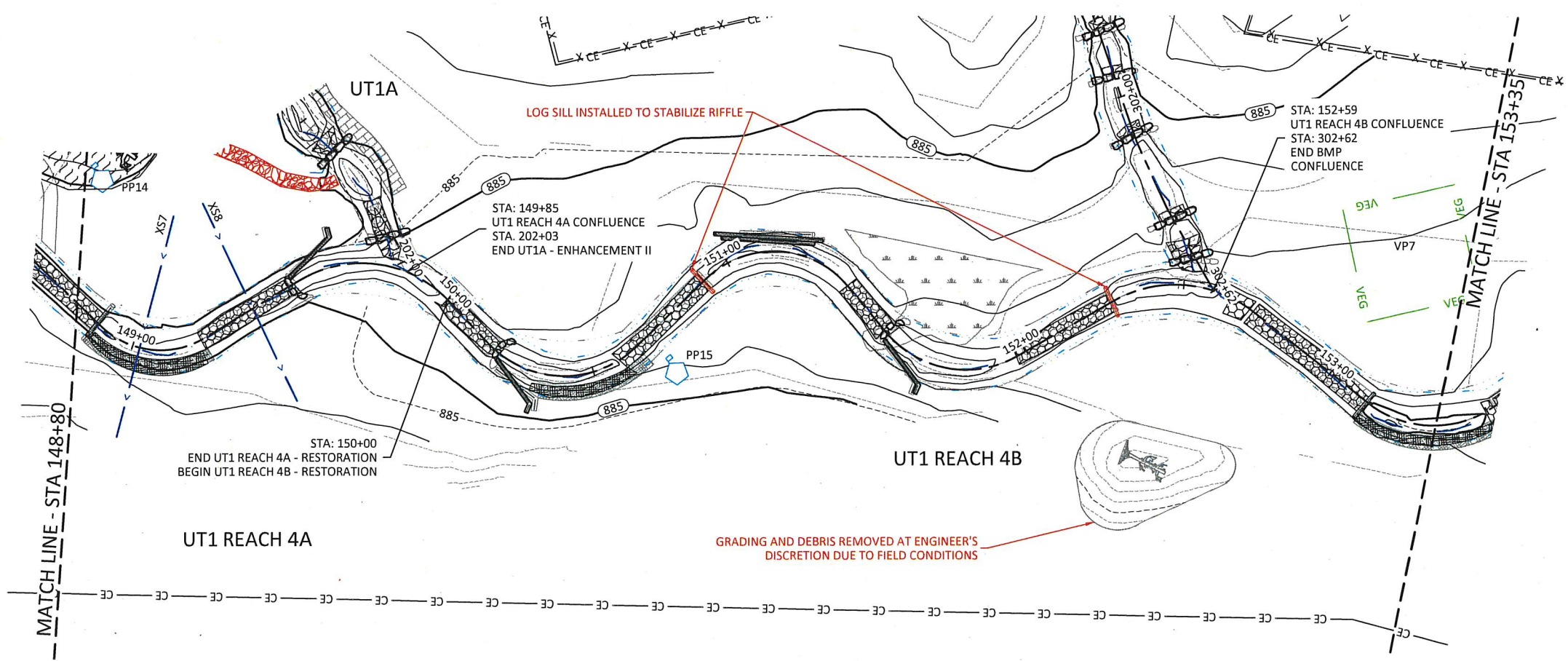
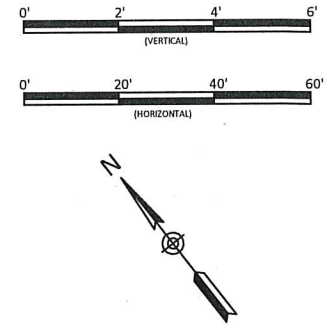
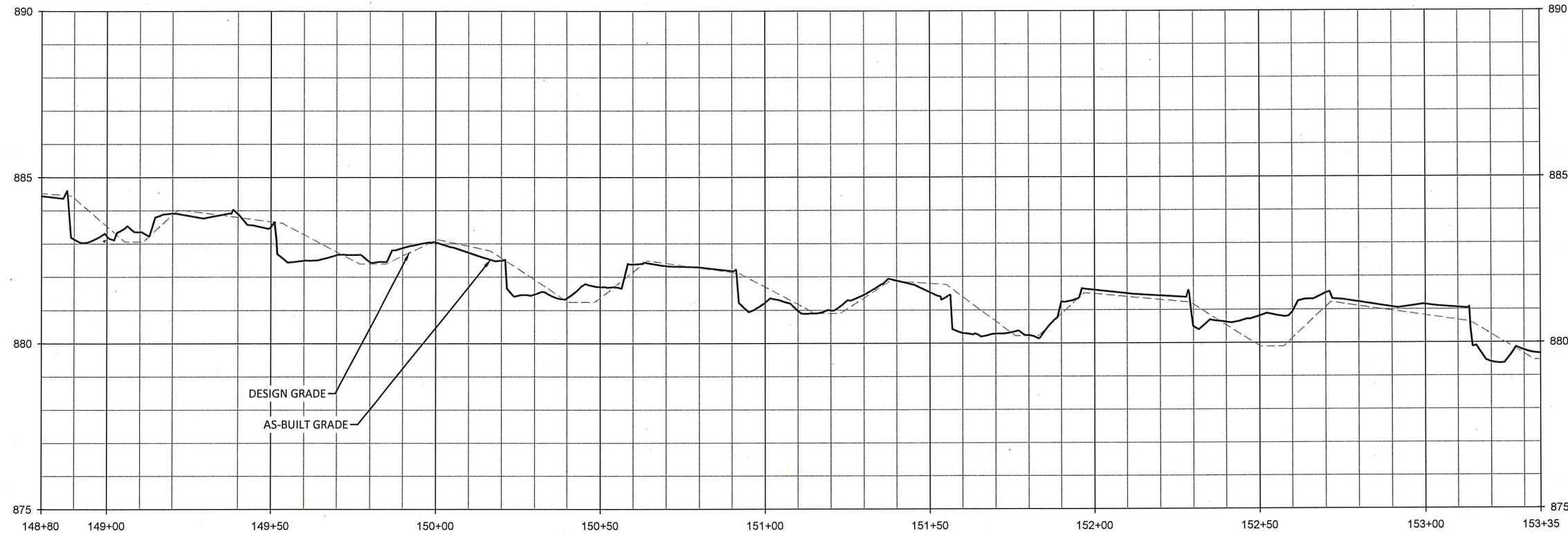
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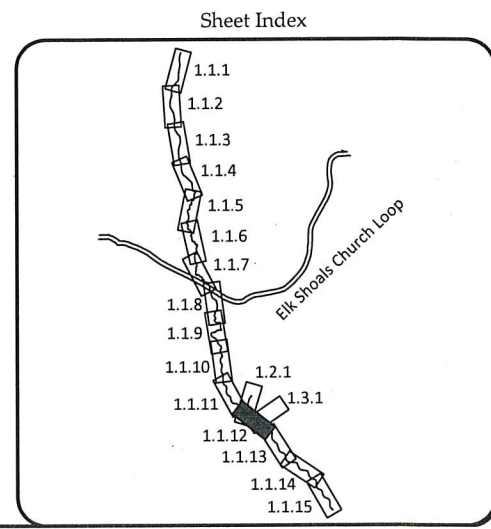
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Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	FICB
Checked By:	JCK
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Alexander Farm Mitigation Site - Baseline Monitoring Plans 07105 - A-B Profiles.dwg



\*Rock and Roll Riffles contain log sills as shown in profiles.



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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 4A & 4B  
 Stream Plan and Profile

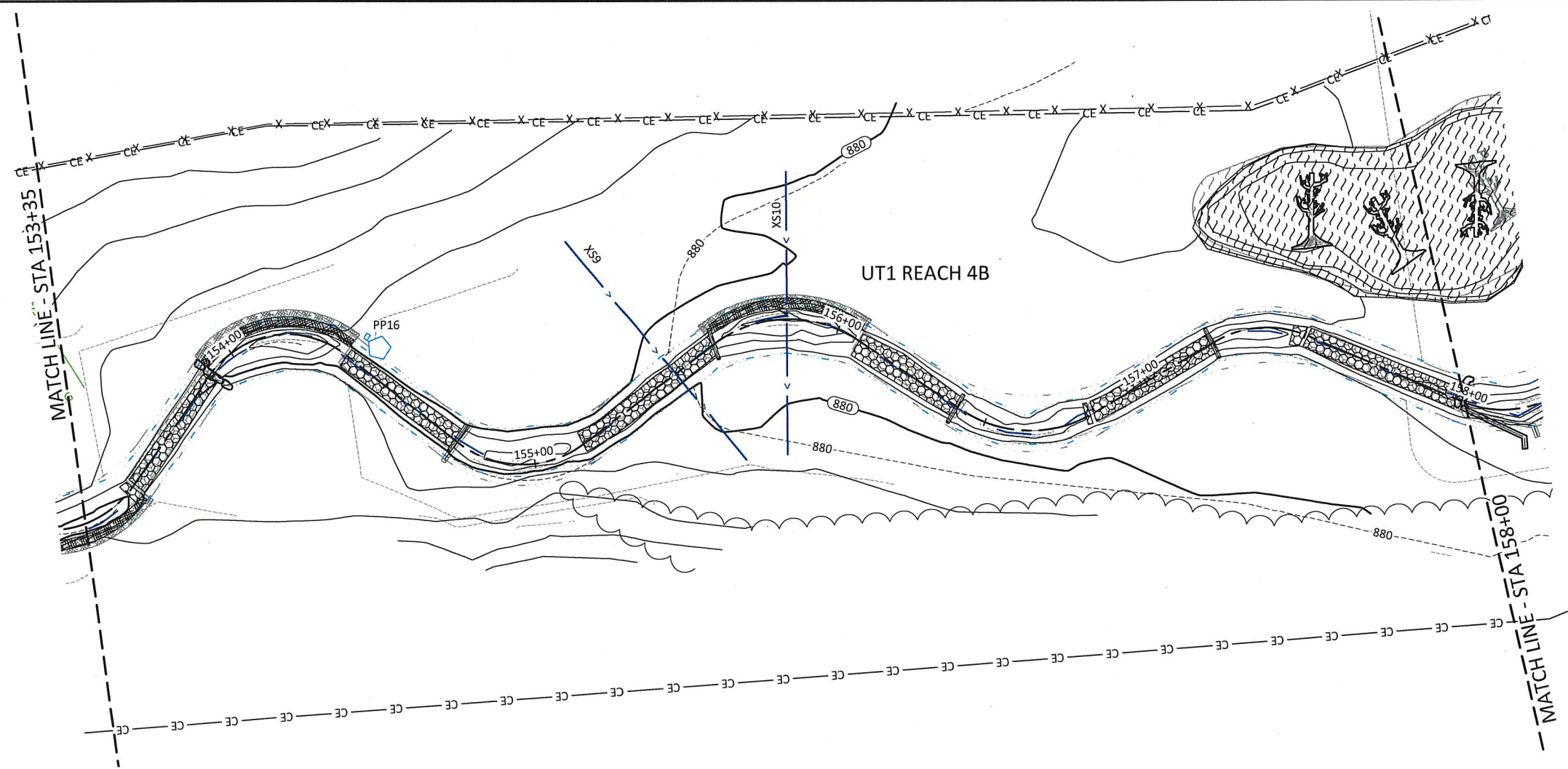
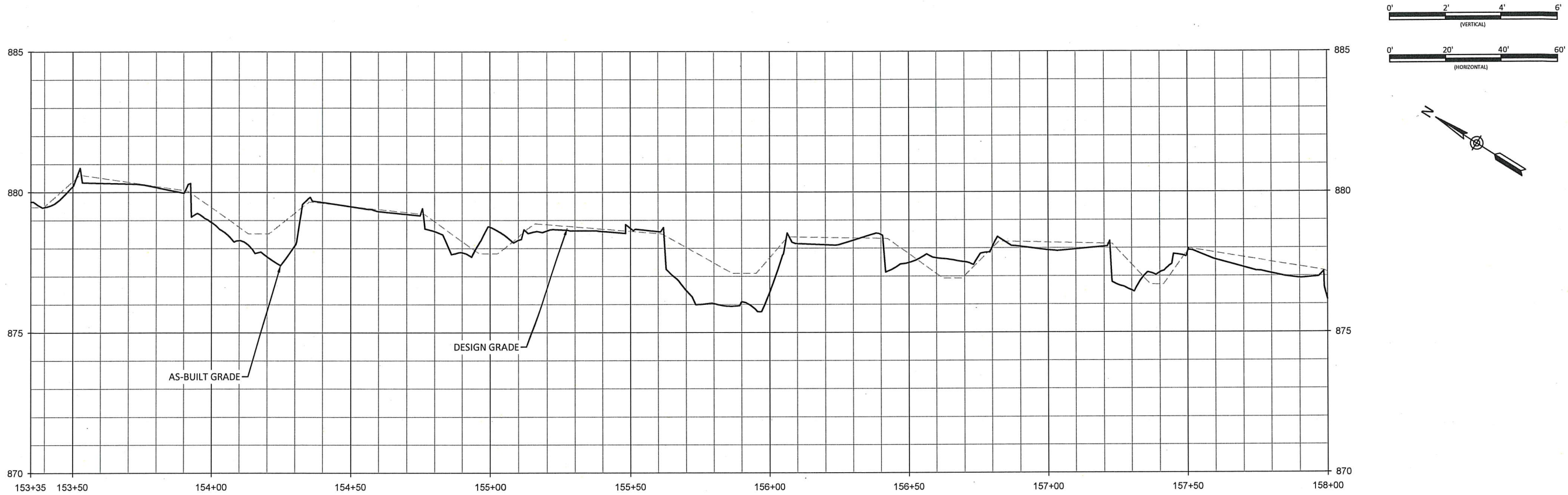
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Revisions:	

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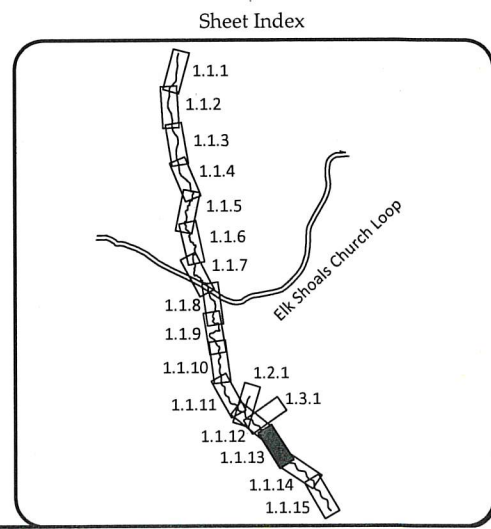
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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 4B  
 Stream Plan and Profile

Revisions:

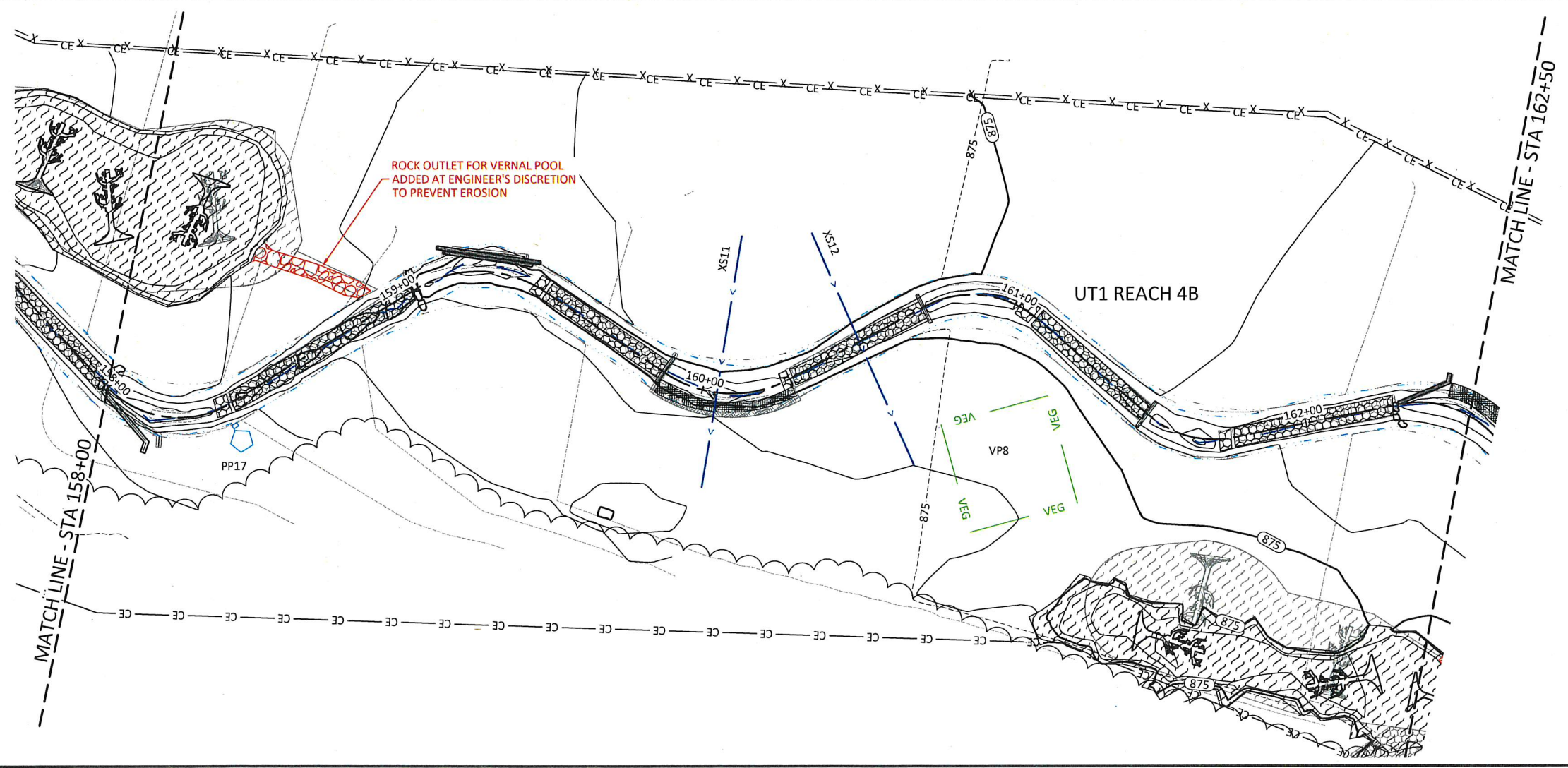
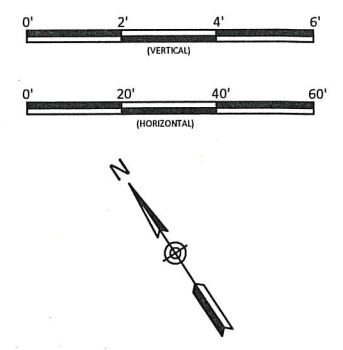
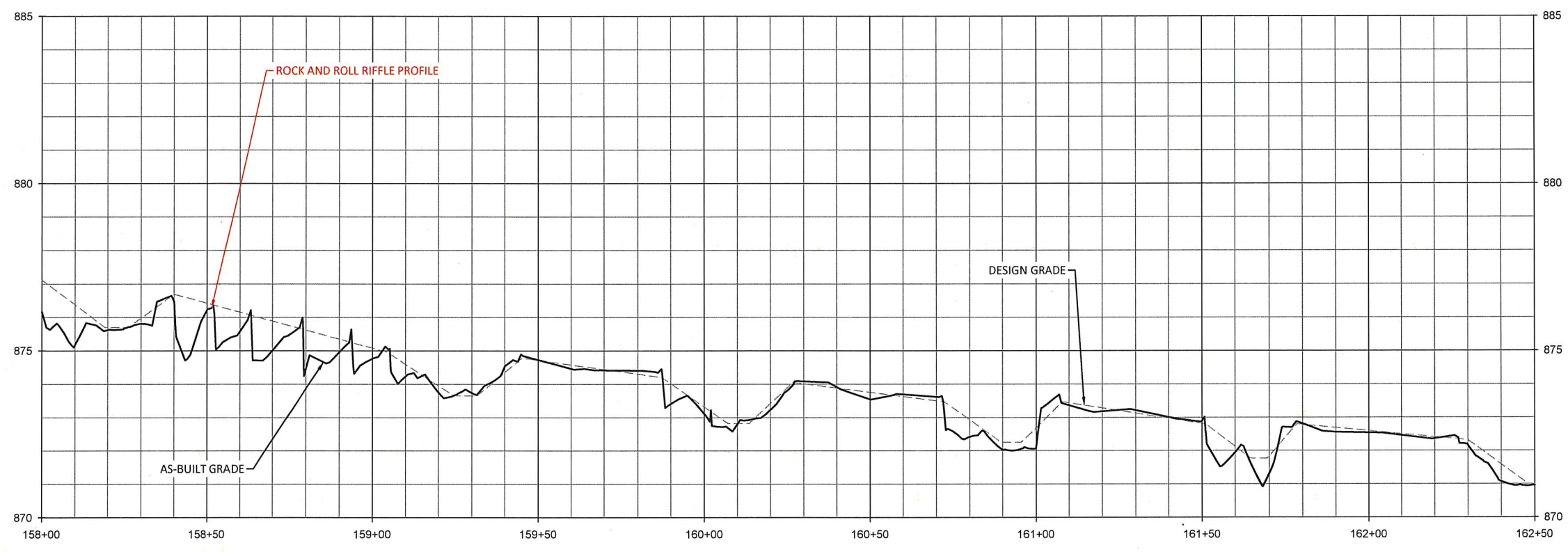

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 Project Engineer: ASE  
 Drawn By: HCB  
 Checked By: JCK

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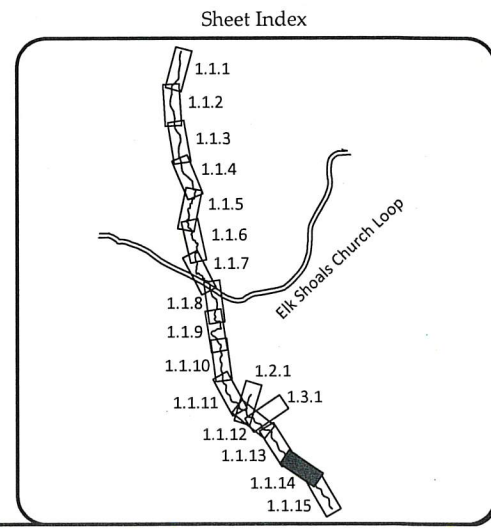
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August 30, 2020  
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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

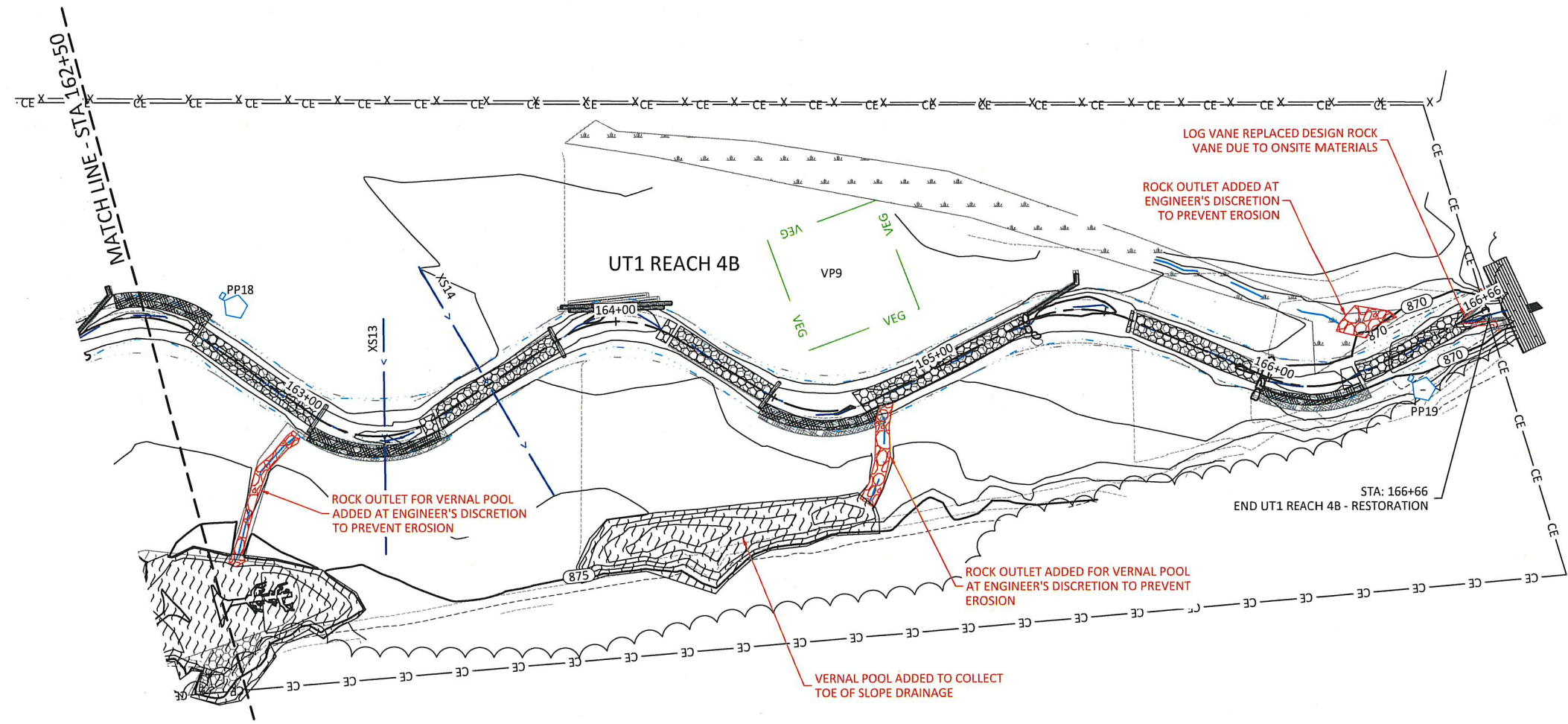
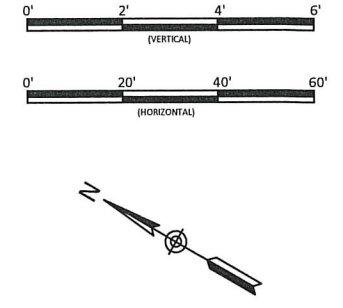
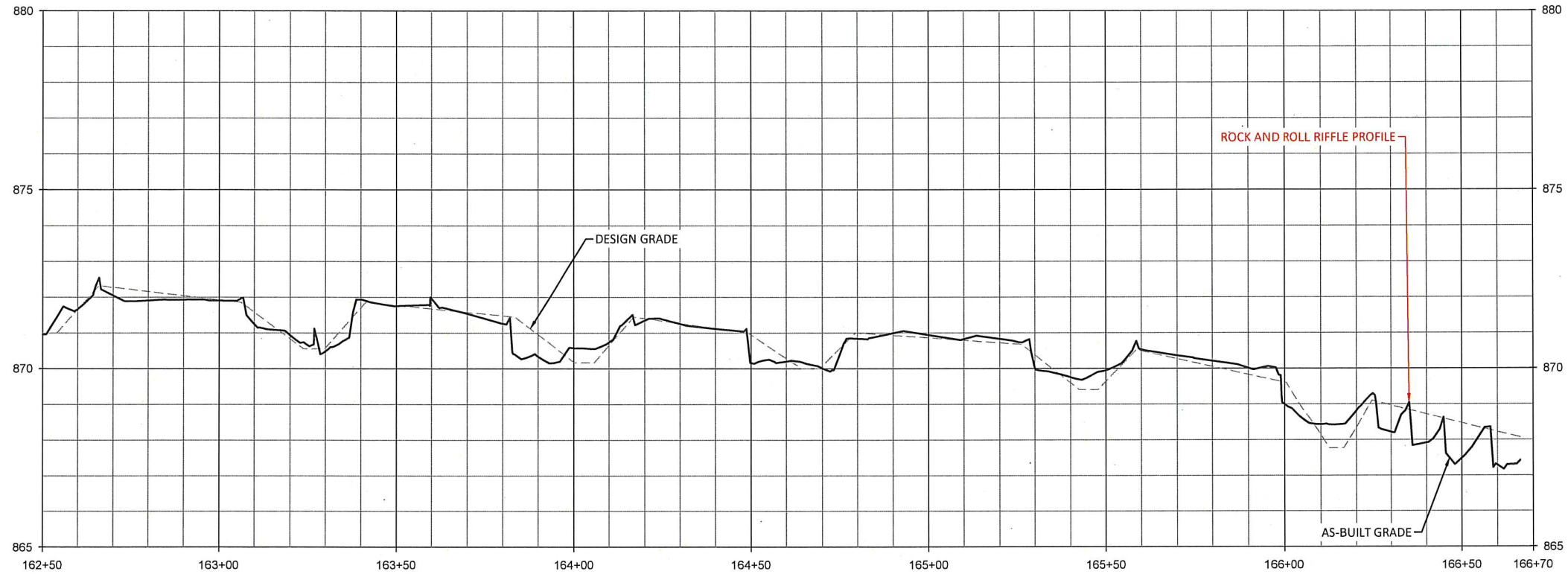
UT1 Reach 4B  
Stream Plan and Profile

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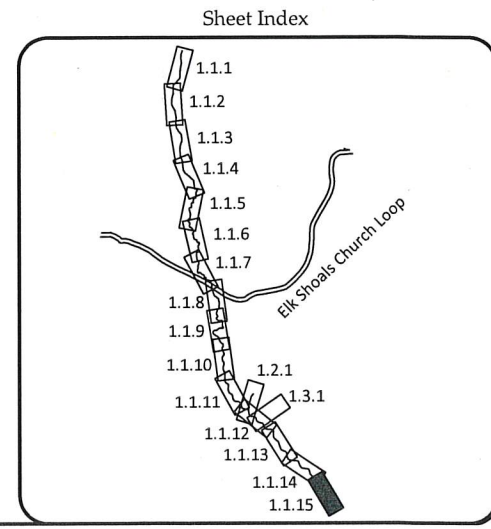
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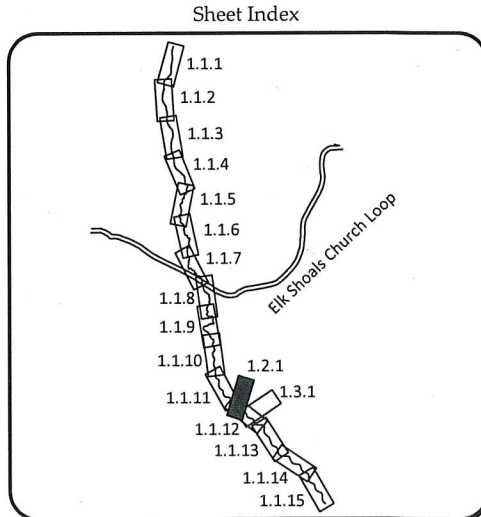
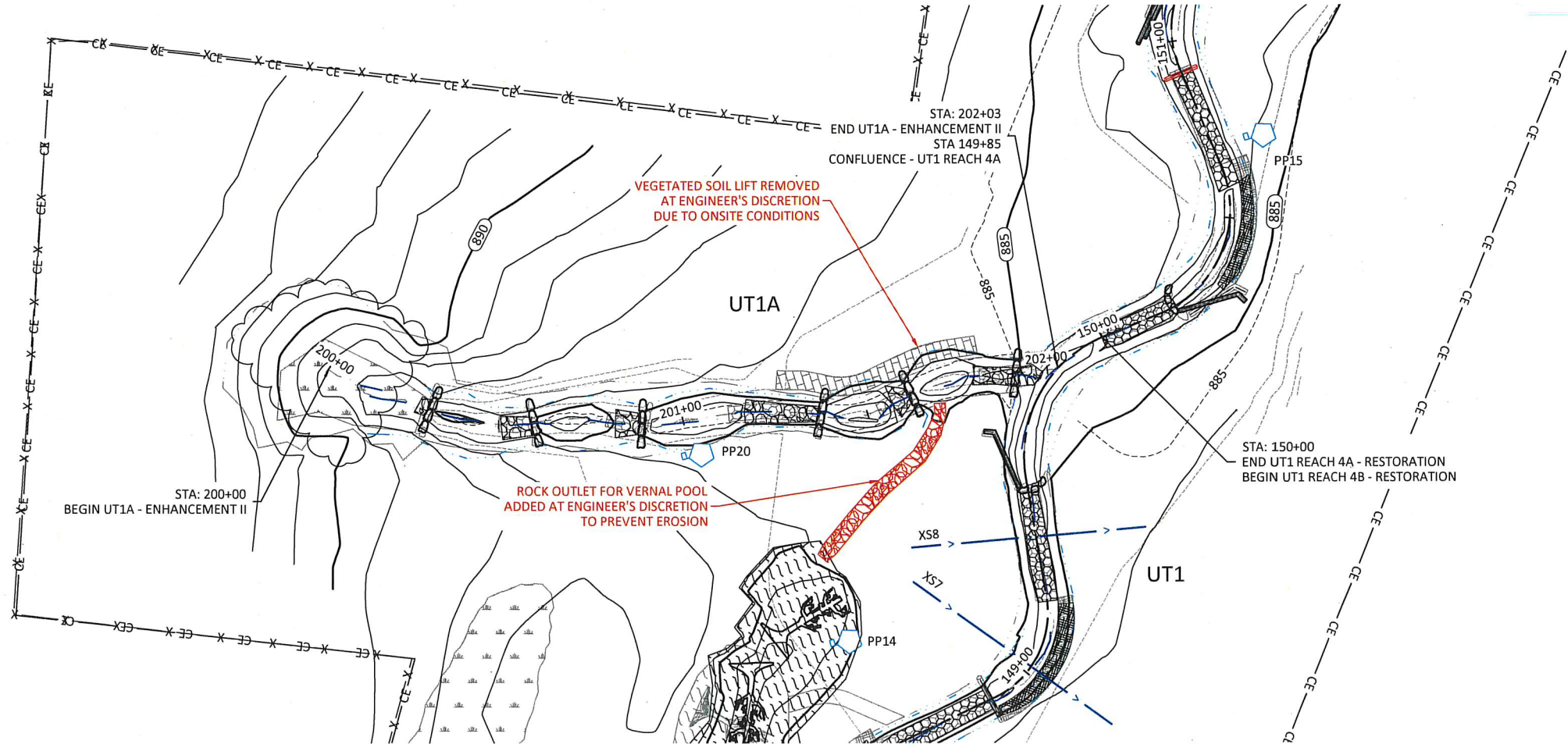
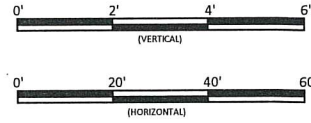
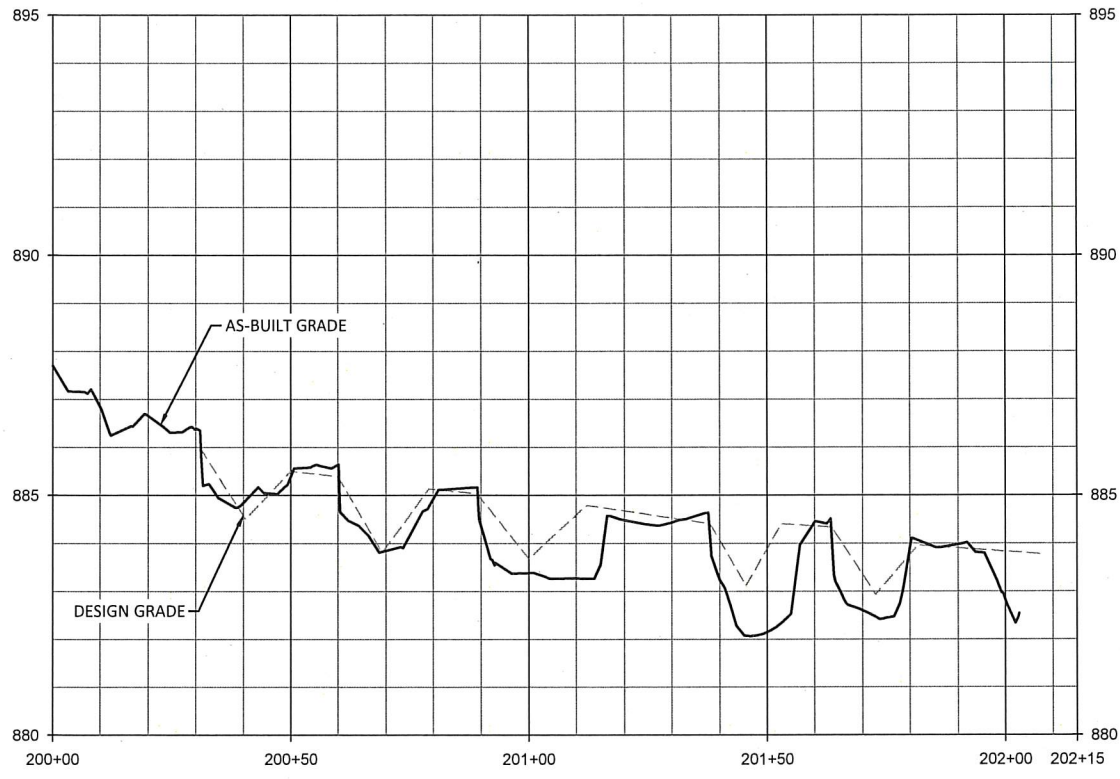


Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 4B  
 Stream Plan and Profile

Date:	08/13/2020
Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK
<b>1.1.15</b>	
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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

UT1A  
Stream Plan and Profile

Revisions:

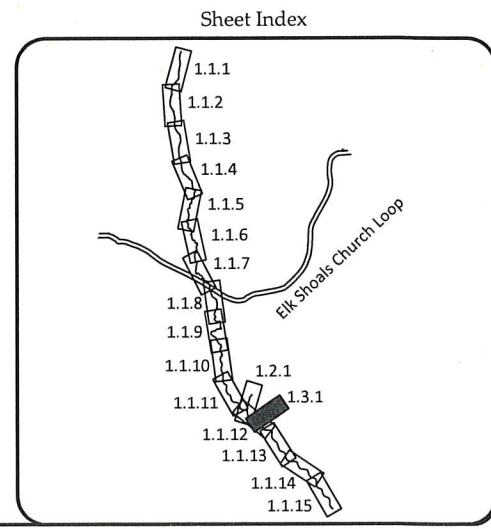
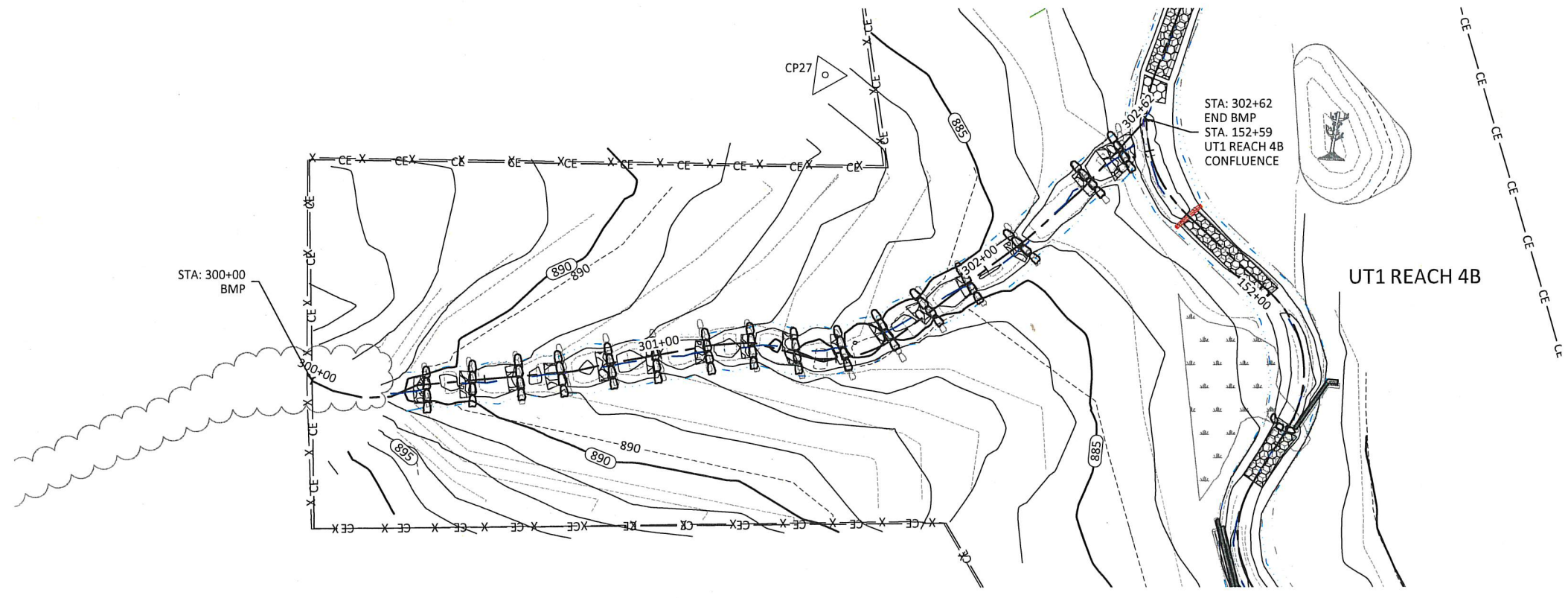
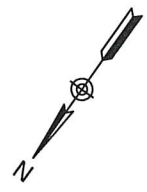
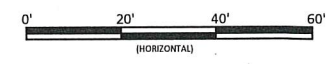
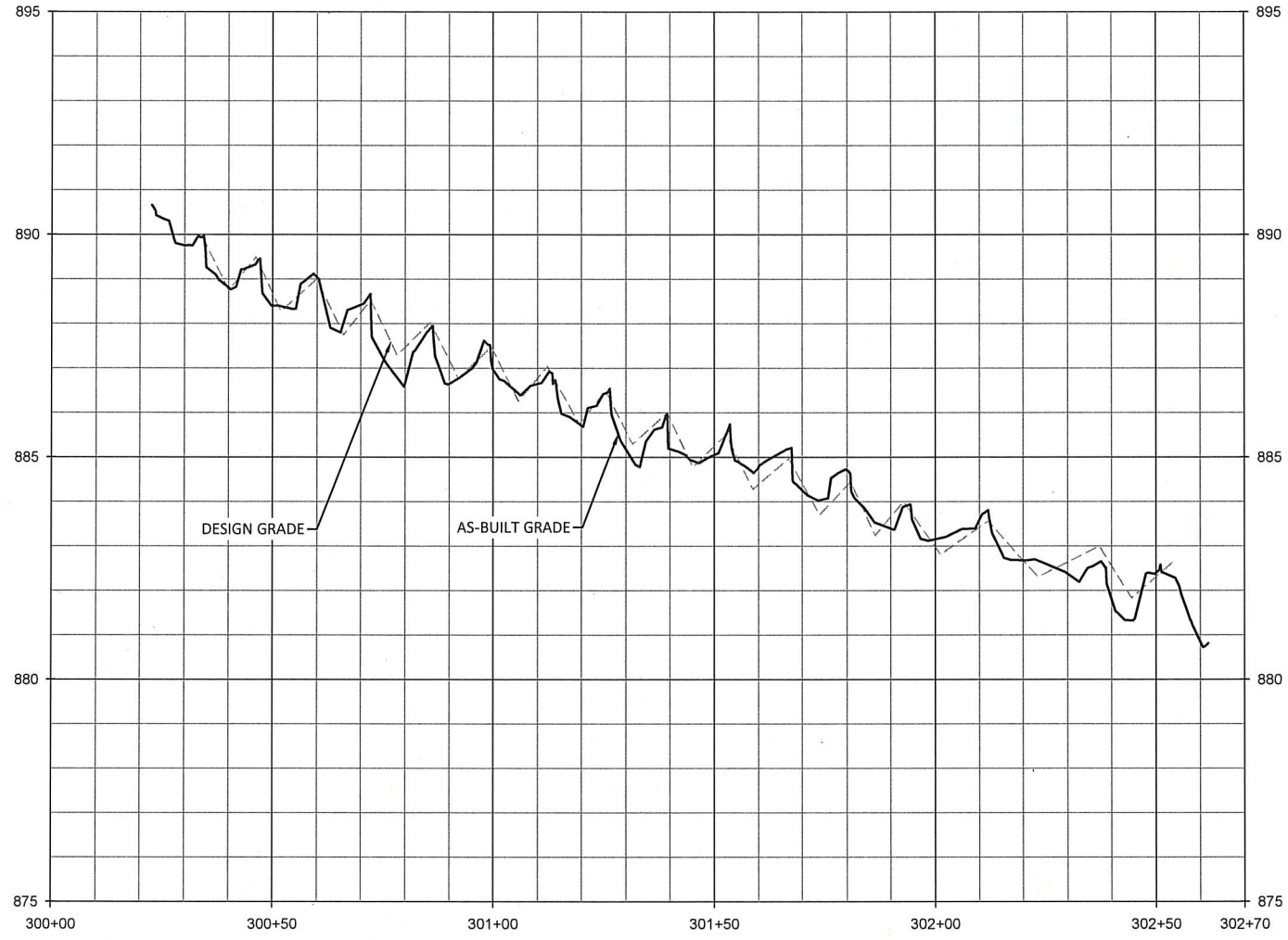

Date:	08/13/2020
Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

1.2.1

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Alexander Farm Mitigation Site - Record Drawings  
Alexander County, North Carolina

BMP  
Stream Plan and Profile

Revisions:


Date: 08/13/2020  
 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
 Checked By: JCK

1.3.1

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Streambank Planting Zone						
Live Stakes and Herbaceous Plugs						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Physocarpus opulifolius</i>	Ninebark	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	20%
<i>Cornus amomum</i>	Silky Dogwood	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	<del>40%</del> 36%
<i>Salix sericea</i>	Silky Willow	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	<del>40%</del> 44%
<i>Juncus effusus</i>	Common Rush	5 ft.	4-6 ft.	1.0"- 2.0" plug	Herb	N/A
<i>Carex alata</i>	Broadwing Sedge	5 ft.	4-6 ft.	1.0"- 2.0" plug	Herb	N/A
						100%

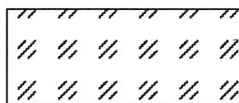
Open/Graded Buffer Planting Zone						
Bare Root						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Acer negundo</i>	Box Elder	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20%
<i>Quercus phellos</i>	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Platanus occidentalis</i>	Sycamore	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Betula nigra</i>	River Birch	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus pagoda</i>	Cherrybark Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	<del>12 ft.</del>	<del>6-12 ft.</del>	<del>0.25"-1.0"</del>	<del>Canopy</del>	<del>20%</del>
<i>Quercus alba</i>	White Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	13%
<i>Quercus rubra</i>	Northern Red Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	7%
						100%

Shaded Areas Bare Roots - Buffer Planting As Needed to Increase Density		
Species	Common name	# of stems
<i>Platanus occidentalis</i>	Sycamore	18%
<i>Fraxinus pennsylvanicum</i>	Green Ash	18%
<i>Betula nigra</i>	River Birch	10%
<i>Liriodendron tulipifera</i>	Tulip Poplar	10%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	<del>10%</del>
<i>Quercus alba</i>	White Oak	10%
<i>Carpinus caroliniana</i>	Ironwood	<del>5%</del> 6%
<i>Diospyros virginiana</i>	Persimmon	5%
<i>Quercus pagoda</i>	Cherrybark Oak	5%
<i>Acer saccharinum</i>	Silver Maple	5%
<i>Nyssa sylvatica</i>	Black Gum	<del>5%</del> 7%
<i>Callicarpa americana</i>	Beautyberry	5%
<i>Euonymus americanus</i>	American Strawberry Bush	1%
<i>Calycanthus floridus</i>	Sweetshrub	1%
<i>Magnolia virginiana</i>	Sweetbay Magnolia	<del>1%</del> 3%
<i>Hamamelis virginiana</i>	Witch-Hazel	<del>1%</del> 3%
		100%

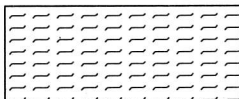
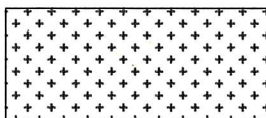
All streambank and buffer planting zones within easement.



All disturbed areas.



All disturbed pasture areas outside easement.



Permanent Riparian Seeding				
Pure Live Seed (20 lbs/ acre)				
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	2.0
All Year	<i>Agrostis Hyemalis</i>	Winter Bentgrass	Herb	2.0
All Year	<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	1.0
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	1.0
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	3.0
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	3.0
All Year	<i>Elymus virginicus</i>	Virginia Wildrye	Herb	3.0
All Year	<i>Bidens aristosa</i>	Bur-Marigold	Herb	1.2
All Year	<i>Helianthus angustifolius</i>	Swamp Sunflower	Herb	0.8
All Year	<i>Panicum virgatum</i>	Switchgrass	Herb	1.0
All Year	<i>Sorghastrum nutans</i>	Indiangrass	Herb	2.0

Temporary Seeding			
Scientific Name	Common Name	Application Dates	Application Rate
<i>Secale cereale</i>	Rye Grain	October 1 - March 31	120 lb/acre
<i>Panicum ramosum</i>	Browntop Millet	April 1 - June 30	45 lb/acre
<i>Pennisetum glaucum</i>	Pearl Headed Millet	July 1 - September 30	20 lb/acre

Pasture Seeding				
Approved Date	Species Name	Stratum	Common Name	Density (lbs/acre)
All Year	<i>Festuca arundinacea</i>	Herb	Tall Fescue	80
All Year	<i>Trifolium repens</i>	Herb	White Clover	8

Vernal Pool Planting Zone						
Herbaceous Plugs						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Calamagrostis canadensis</i>	<del>Bluejoint Grass</del>	<del>5 ft.</del>	<del>3-5 ft.</del>	<del>1.0"- 2.0" plug</del>	<del>Herb</del>	<del>30%</del>
<i>Carex alata</i>	<del>Broadwing Sedge</del>	<del>5 ft.</del>	<del>3-5 ft.</del>	<del>1.0"- 2.0" plug</del>	<del>Herb</del>	<del>35%</del>
<i>Juncus effusus</i>	Common Rush	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	35%
<i>Caryx crinata</i>	Fringed Sedge	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	35%
<i>Andropogon glomeratus</i>	Bushy Beardgrass	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	30%
						100%

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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

Plant List  
 Planting Tables

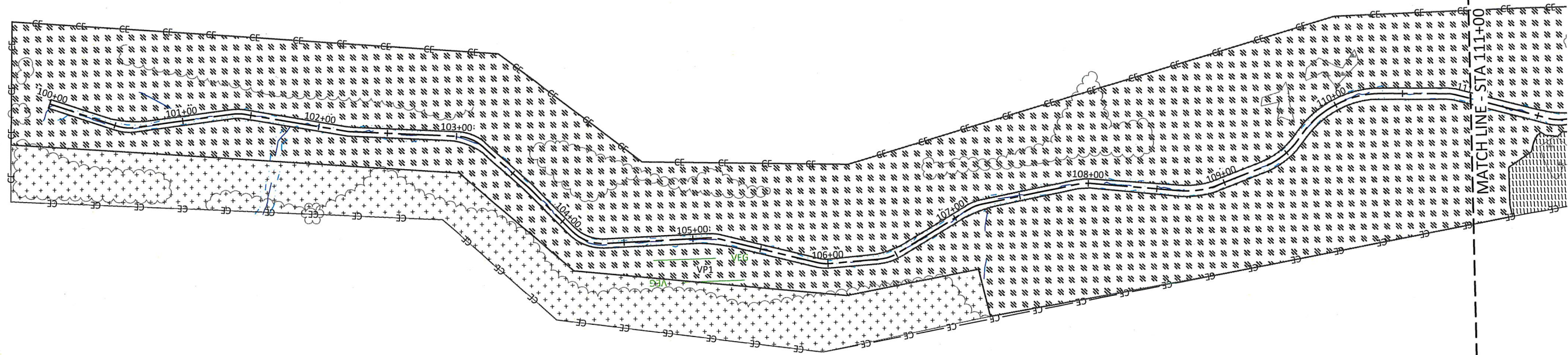
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Date: 08/13/2020  
 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
 Checked By: JCK

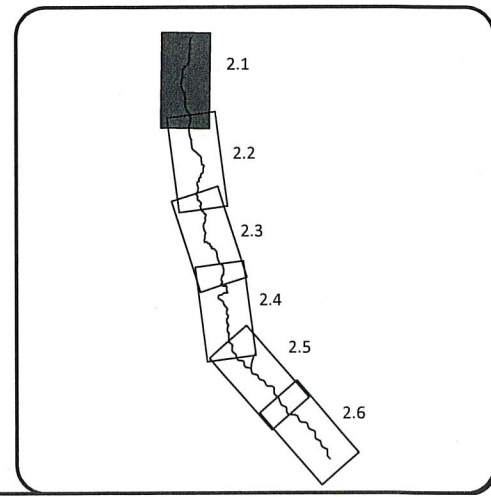
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Sheet Index



Date:	08/13/2020
Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

2.1

Sheet

Alexander Farm Mitigation Site - Record Drawings

Alexander County, North Carolina

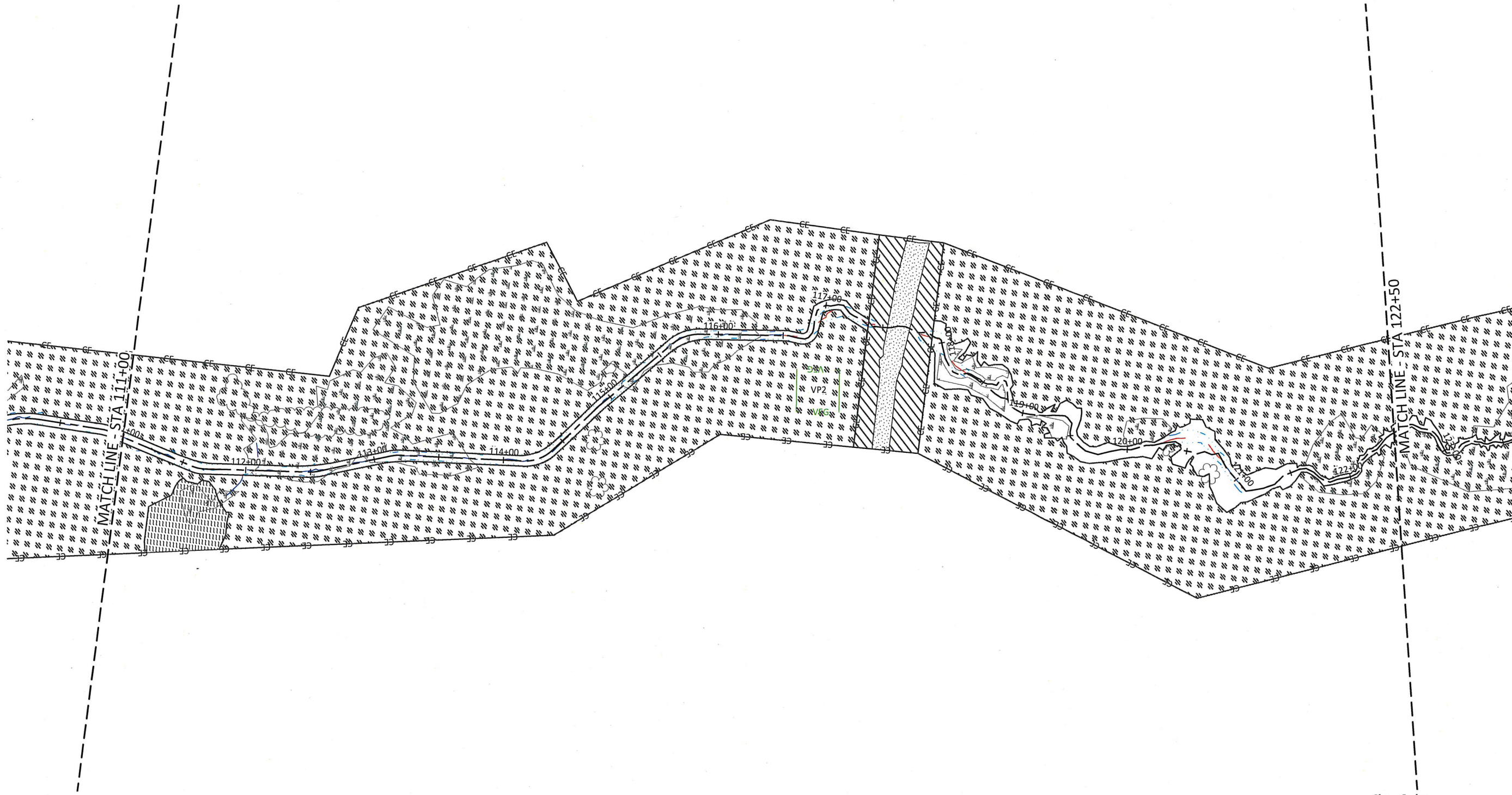
UT1 Reach 1A & 1B  
Planting Plan



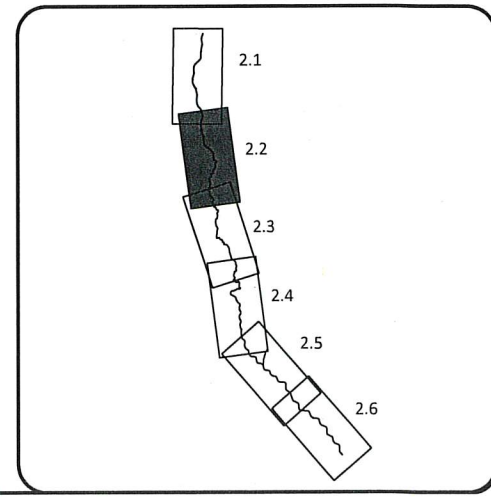
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Revisions:


Date: 08/13/2020  
 Job Number: 005-02169  
 Project Engineer: ASE  
 Drawn By: HCB  
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2.2

Sheet

Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 1B & 2  
 Planting Plan

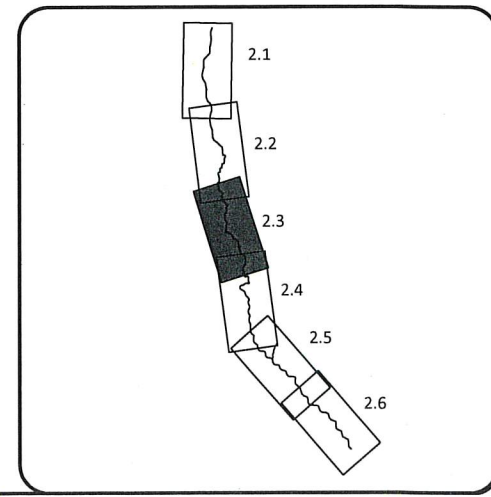
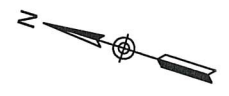
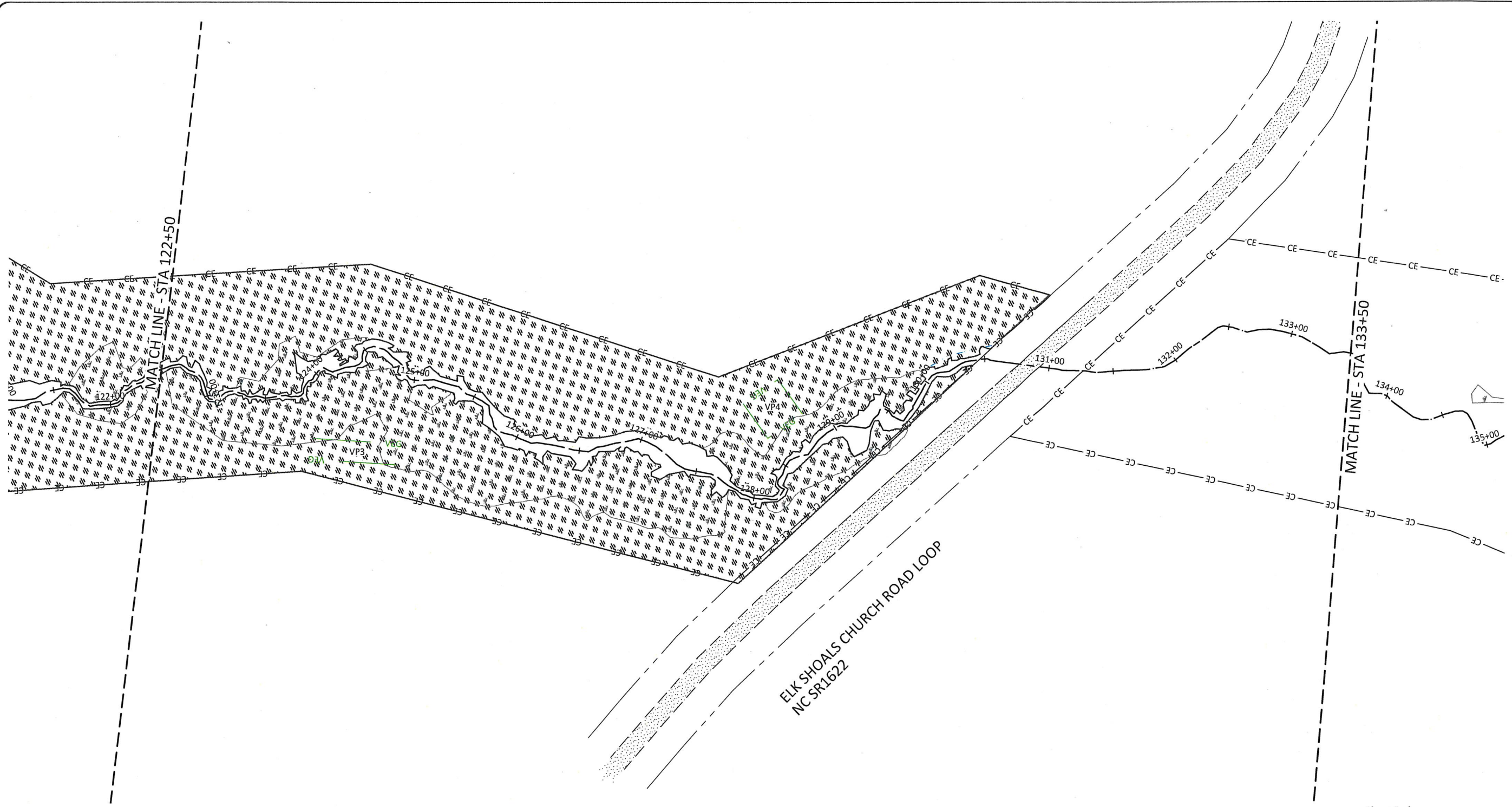


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August 20, 2020

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Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 2 & 3  
 Planting Plan

Revisions:


Date: 08/13/2020  
 Job Number: 005-02169  
 Project Engineer: ASE  
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 Checked By: JCK

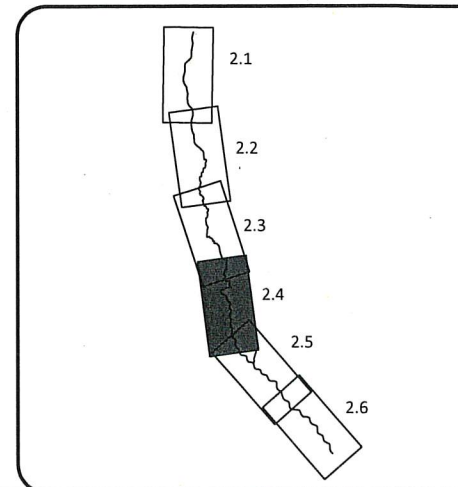
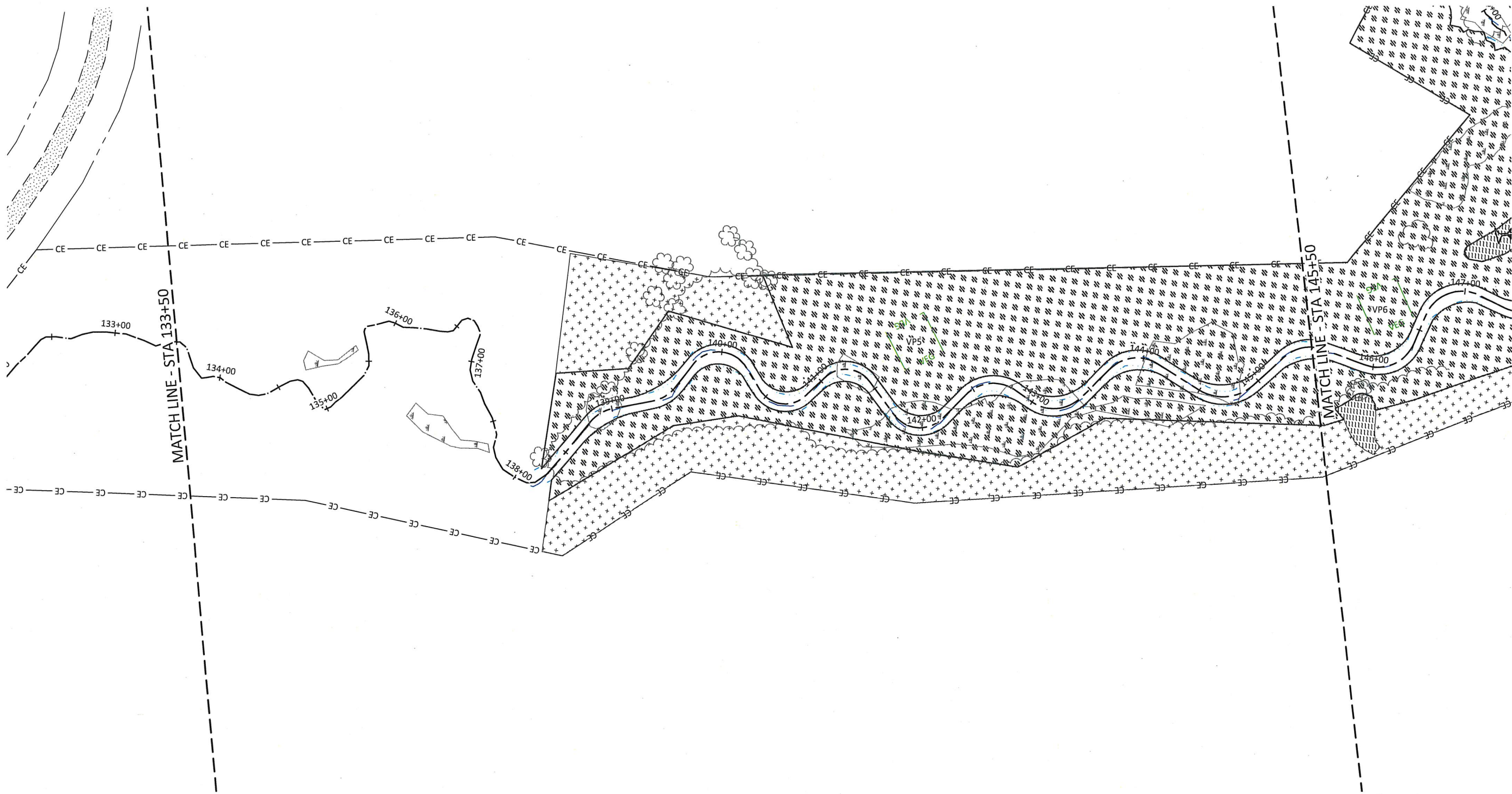
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Sheet Index

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Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

2.4

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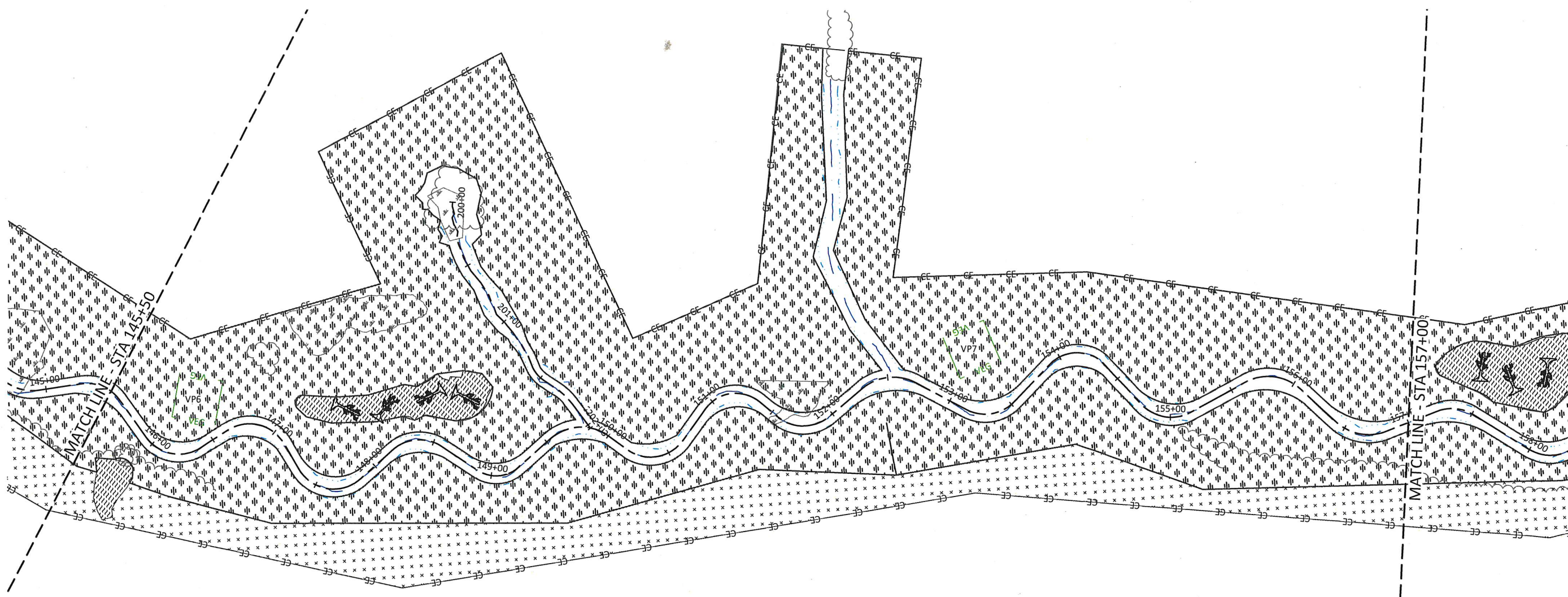
Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 3 & 4A  
 Planting Plan

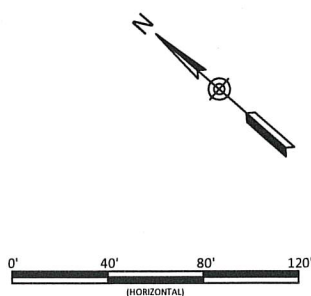
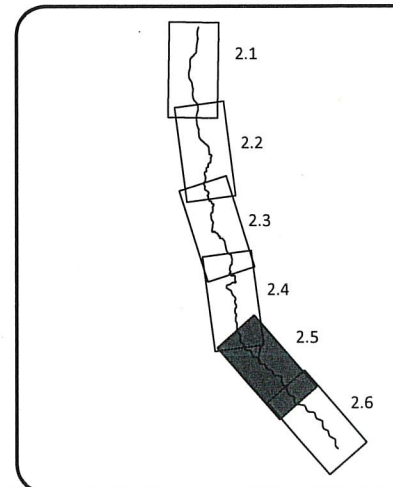


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Sheet Index



Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina  
 UT1 Reach 4A 4B & UT1A  
 Planting Plan

Date:	08/13/2020
Job Number:	005-02169
Project Engineer:	ASE
Drawn By:	HCB
Checked By:	JCK

2.5

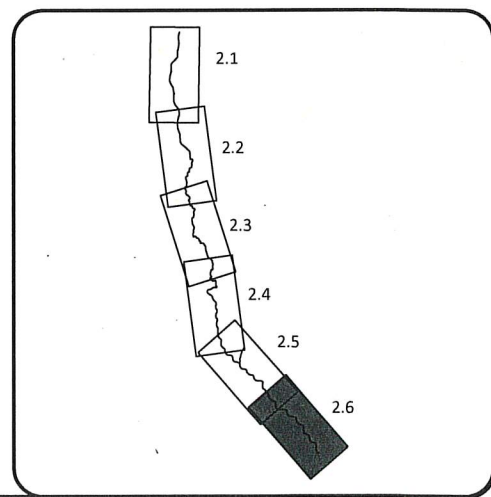
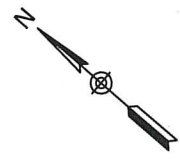
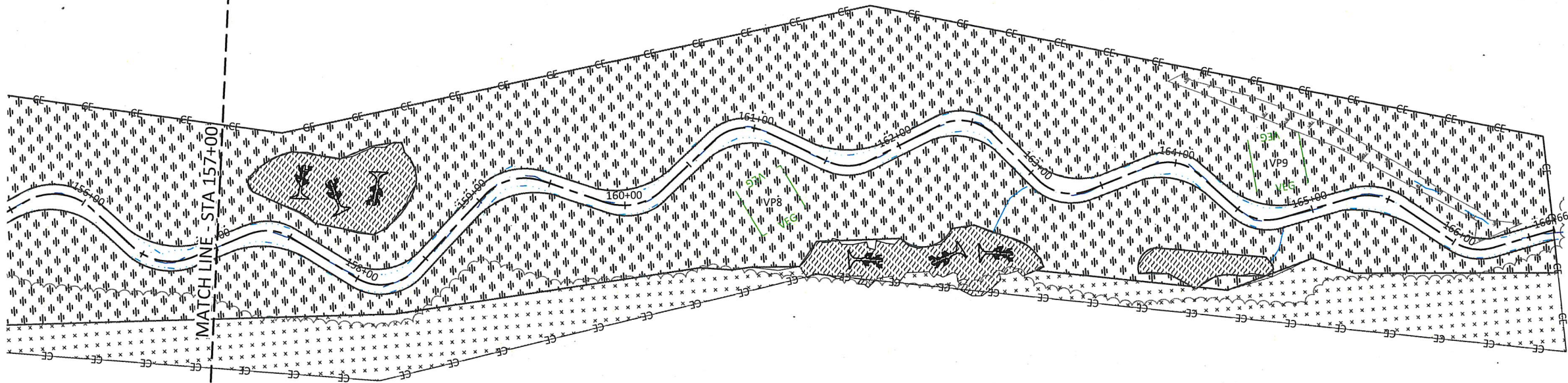
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Date: 08/13/2020

Job Number:	005-02109
Project Engineer:	ASE
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**2.6**

Sheet

Alexander Farm Mitigation Site - Record Drawings  
 Alexander County, North Carolina

UT1 Reach 4B  
 Planting Plan



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