

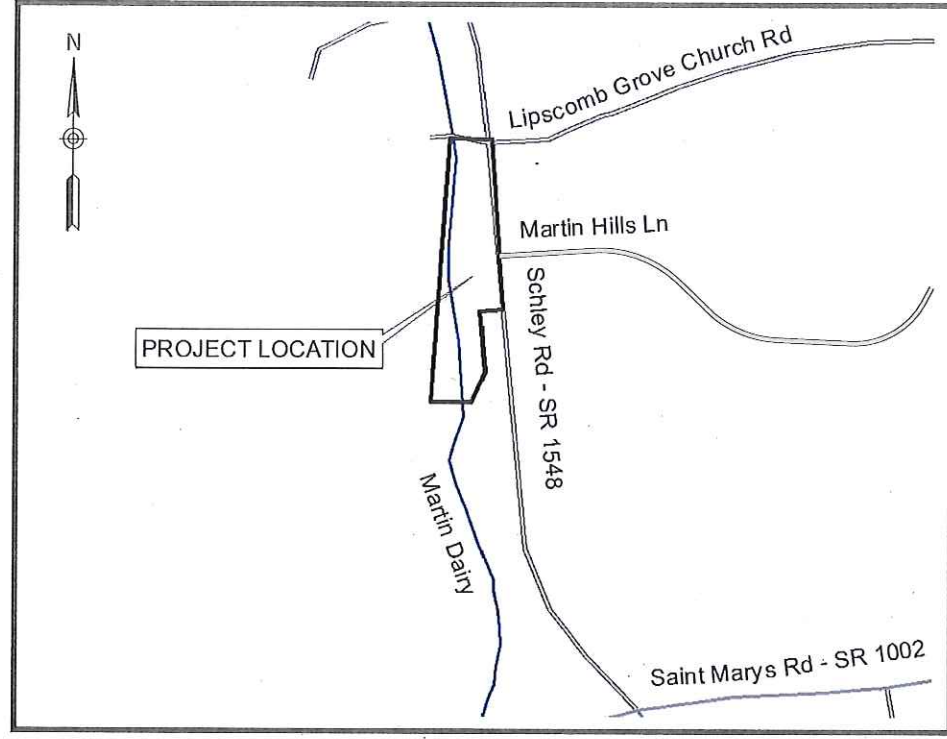
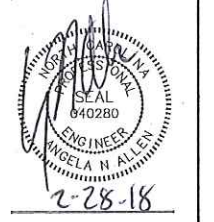
Martin Dairy Mitigation Site

Neuse River Basin 03020201

Orange County, North Carolina

for

NCDEQ Division of Mitigation Services



Vicinity Map
Not to Scale



Sheet Index	
Title Sheet	0.1
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Stream Overlay Plans	1.1-1.6
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Project Directory	
Engineering: Wildlands Engineering, Inc License No. F-0831 312 West Millbrook Rd, Suite 225 Raleigh, NC 27609 Angela N. Allen, PE 919-851-9986	Owner: NCDEQ Division of Mitigation Services 1652 Mail Service Center Raleigh, NC 27699-1652 Jeff Schaffer 919-707-8308
Surveying: Turner Land Surveying, PLLC P.O. Box 148 Swannanoa, NC 28778 919-827-0745	DEQ Contract No. 6831 DMS ID No. 97087

**CERTIFICATE OF SURVEY
AND
ACCURACY**

I, DAVID S. TURNER, CERTIFY THAT THE GROUND TOPOGRAPHIC SURVEY FOR 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 AND CONTOUR DATA PROVIDED BY TURNER LAND SURVEYING, PLLC, LICENSE #P-0702 AS SHOWN ON AN AS-BUILT SURVEY FOR "THE STATE OF NC, DIVISION OF MITIGATION SERVICES, DMS PROJECT #97087, SPO FILE#68-DE", DATED AUGUST 11, 2017; THAT THIS SURVEY WAS PERFORMED AT THE 95% CONFIDENCE LEVEL TO MEET THE FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS FOR A TOPOGRAPHIC SURVEY TO THE ACCURACY OF CLASS A HORIZONTAL AND CLASS A VERTICAL WHERE APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAIN BETWEEN THE DATES OF 08/09/17 - 08/11/17; THAT THE CONTOURS SHOWN AS BROKEN LINES MAY NOT MEET THE STATED STANDARD AND THAT ALL COORDINATES ARE BASED ON NAD 83 (NSRS 2011) AND ALL ELEVATIONS ARE BASED ON NAVD 88; THAT THIS MAP MEETS THE SPECIFICATIONS FOR TOPOGRAPHIC SURVEYS AS STATED IN TITLE 21, CHAPTER 56, SECTION .1606; THAT THIS MAP WAS NOT PREPARED IN ACCORDANCE WITH G.S. 47-30, AS AMENDED AND DOES NOT REPRESENT AN OFFICIAL BOUNDARY SURVEY. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 1st DAY OF MARCH, 2018

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



**FINAL AS-BUILT AND
RECORD DRAWINGS**
February 2018

Stream Origins		
Stream	Latitude	Longitude
Martin Dairy	N 36° 07' 31.65"	W 79° 00' 13.78"
UT1	N 36° 07' 26.69"	W 79° 00' 12.28"

Martin Dairy Mitigation Site
Orange County, North Carolina

Title Sheet

As-Built and Record Drawing

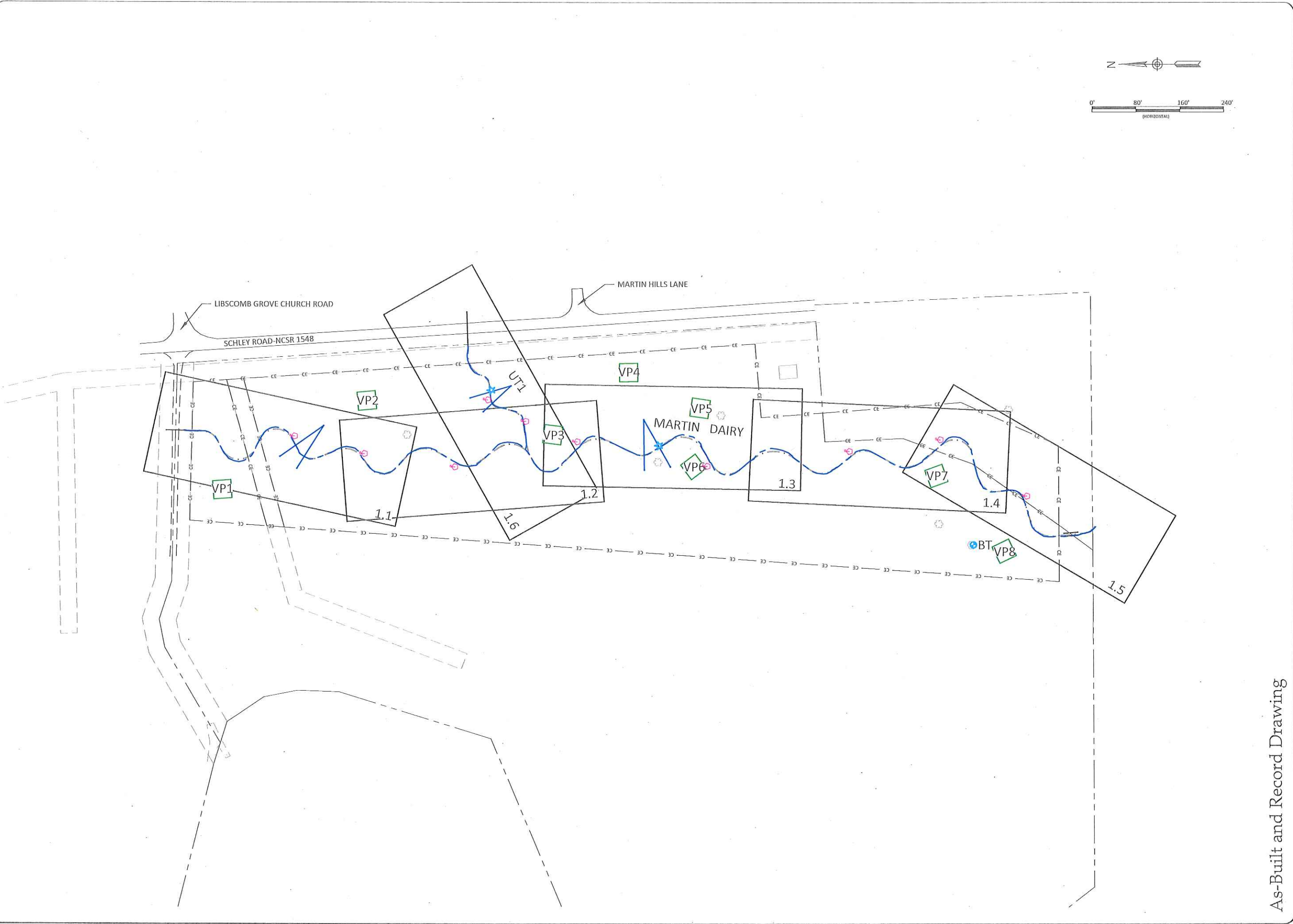
Revisions:

Date: 02-28-2018
Job Number: 005-02158
Project Engineer: ANA
Drawn By: CLM
Checked By: JWH

0.1

Sheet

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As-Built and Record Drawing

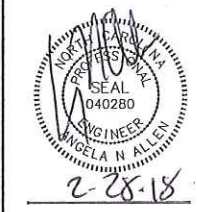
Martin Dairy Mitigation Site
Orange County, North Carolina

Stream Overlay Overview

Date:	02-28-2018
Job Number:	005-02188
Project Engineer:	ANA
Drawn By:	CLM
Checked By:	JWH

0.2

Sheet



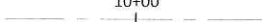








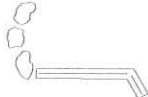




2-28-18

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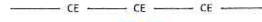
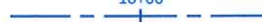



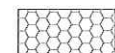


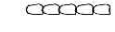

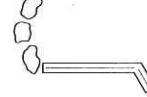









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Proposed Features

-  10+00 Proposed Stream Alignment
-  Proposed Bankfull
-  -520 Proposed 5' Major Contour
-  Proposed 1' Minor Contour
-  Property Boundary
-  Proposed Constructed Riffle
-  Proposed Lunker Log
-  Proposed Angled Log Drop
-  Proposed Boulder Sill
-  Proposed Log J-Hook
-  Proposed Transplanted Sod Mats
-  Proposed Brush Toe
-  Proposed Rock Outlet
-  Proposed Permanent Culvert Crossing

As-Built Features

-  CE Conservation Easement
-  10+00 As-Built Thalweg Alignment - Restoration
-  As-Built Bankfull
-  -520 As-Built 5' Major Contour
-  As-Built 1' Minor Contour
-  As-Built Constructed Riffle
-  As-Built Lunker Log
-  As-Built Angled Log Drop
-  As-Built Boulder Sill
-  As-Built Log Sill
-  As-Built Log J-Hook
-  As-Built Transplanted Sod Mats
-  As-Built Brush Toe
-  As-Built Rock Outlet
-  As-Built Permanent Culvert Crossing
-  XS1 Permanent Cross Section
-  CG1 Crest Gage
-  PP1 Photo Point
-  VP1 Vegetation Plot
-  BT Barotroll

NOTE: FEATURES IN RED INDICATE DEVIATION FROM FINAL CONSTRUCTION PLANS.



Martin Dairy Mitigation Site
 Orange County, North Carolina

Legend

As-Built and Record Drawing

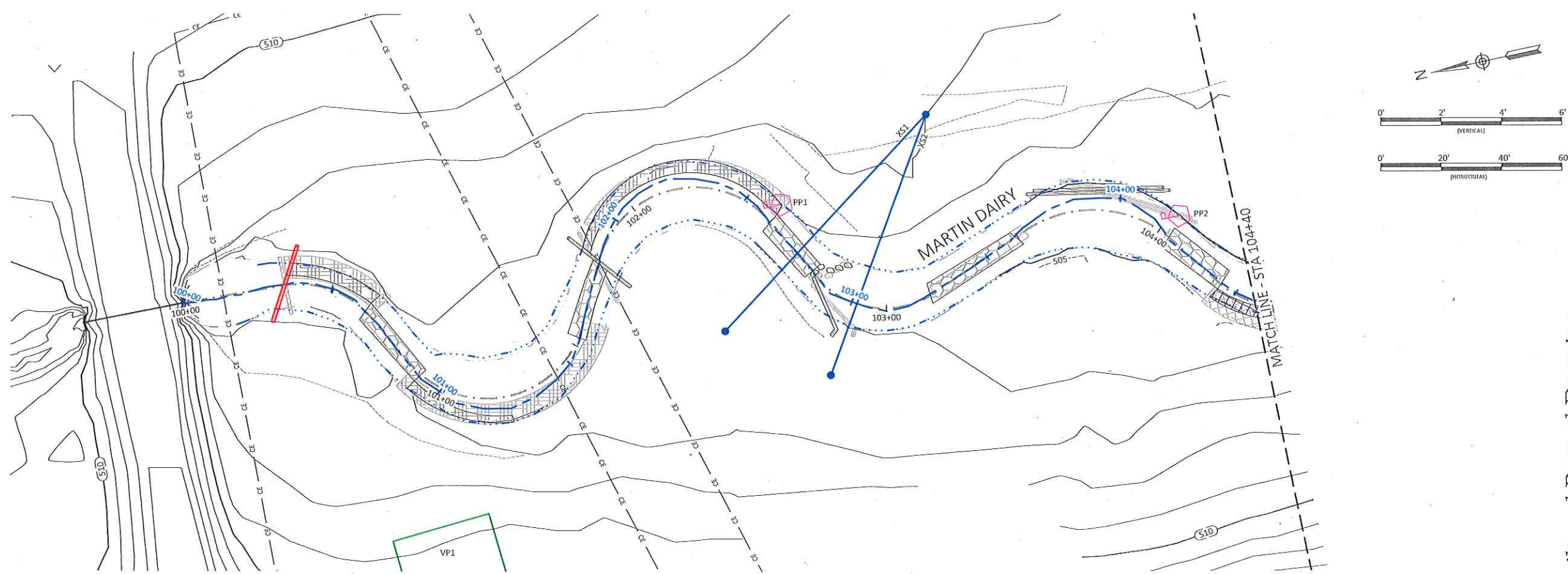
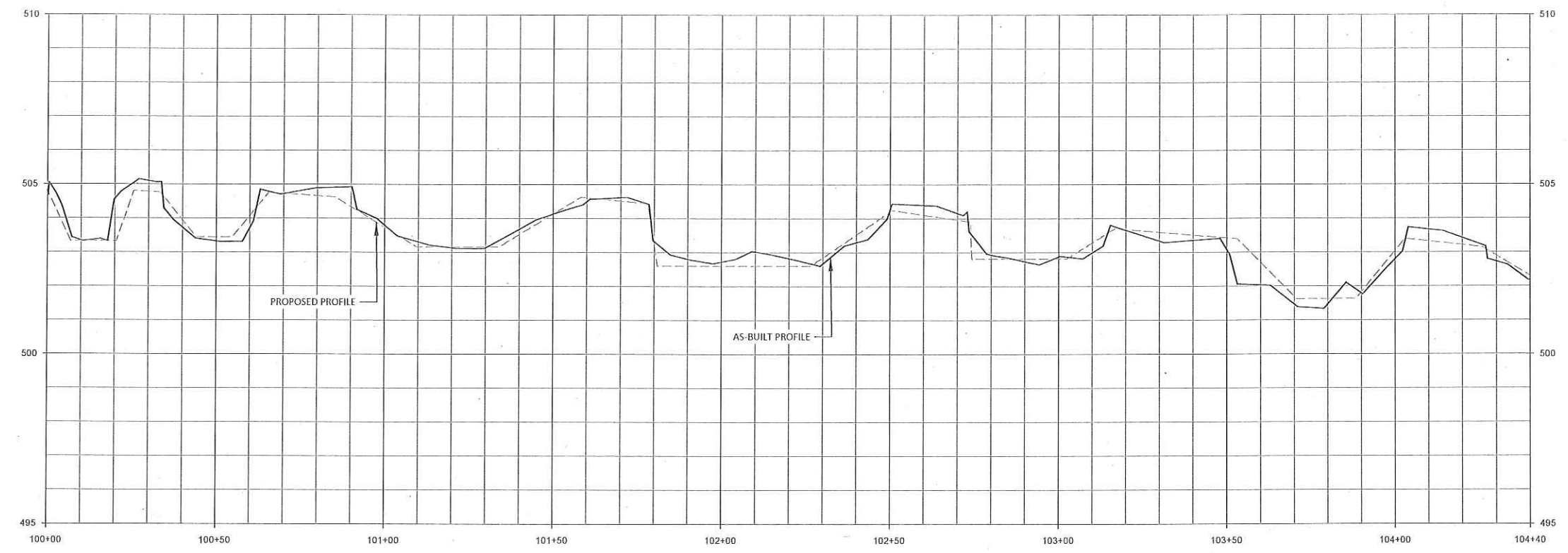
Revisions:	

Date: 02-28-2018
 Job Number: 005-02158
 Project Engineer: ANA
 Drawn By: CLM
 Checked By: JWH

0.3

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 February 28, 2018



NOTE: AT MARTIN DAIRY STA. 100+34, BOULDER SILL WAS REPLACED WITH LOG SILL DUE TO FIELD CONDITIONS AND AVAILABILITY OF ONSITE MATERIAL.

As-Built and Record Drawing

Date:	02/28/2018
Job Number:	005-0218S
Project Engineer:	ANA
Drawn By:	CLM
Checked By:	JWH

1.1

Sheet

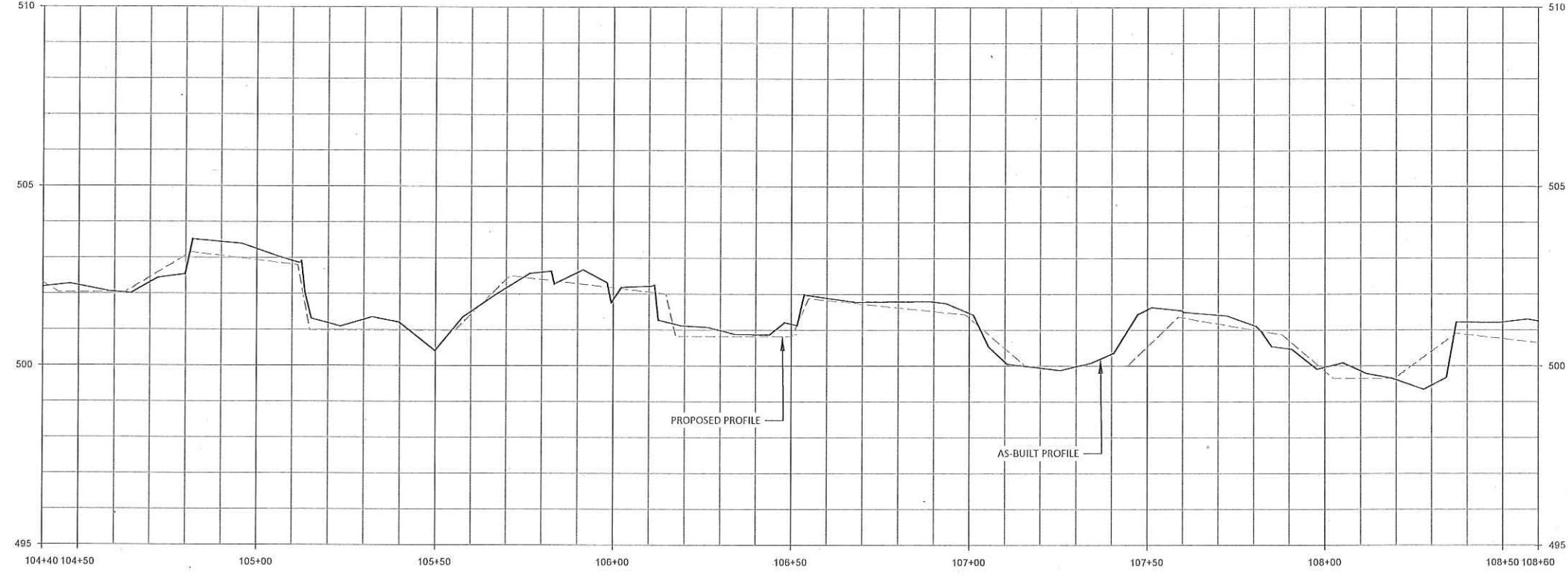
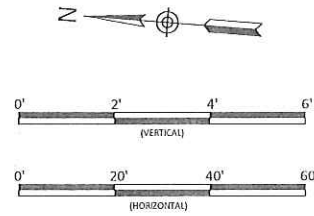
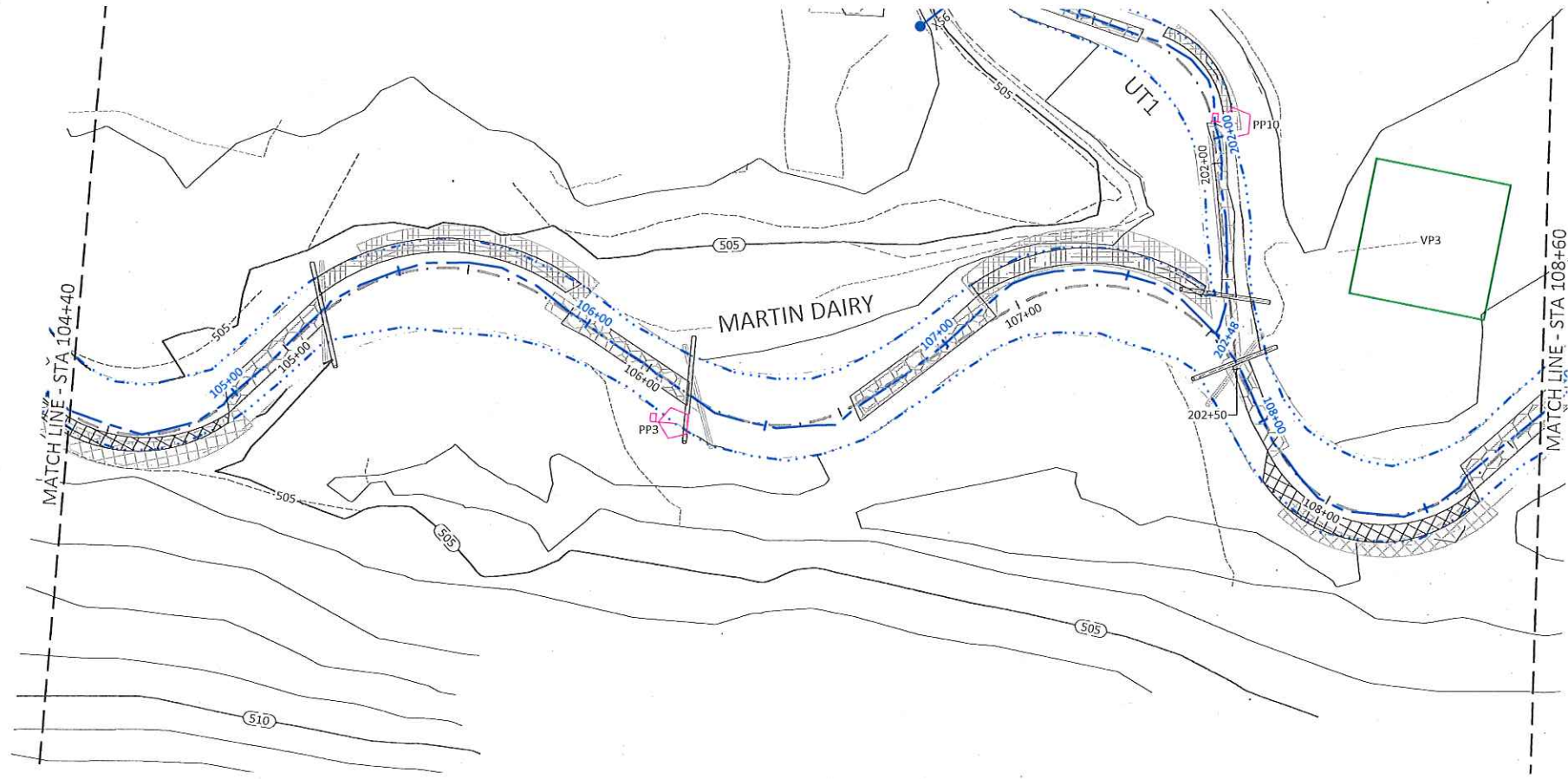
Martin Dairy Mitigation Site
 Orange County, North Carolina
 Martin Dairy Reach 1
 Stream Overlay Plans



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As-Built and Record Drawing

Date:	02/28/2018
Job Number:	005-02158
Project Engineer:	ANA
Drawn By:	CLM
Checked By:	JWH

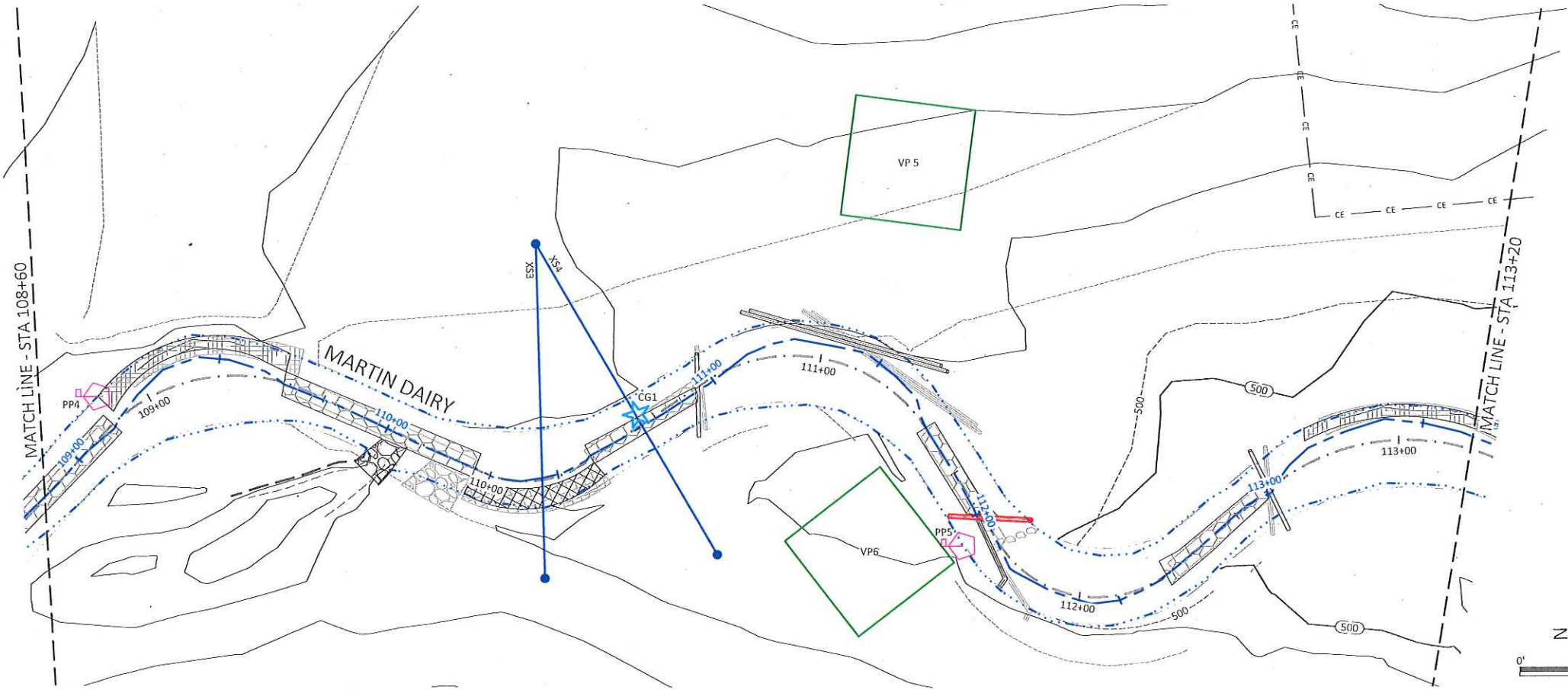
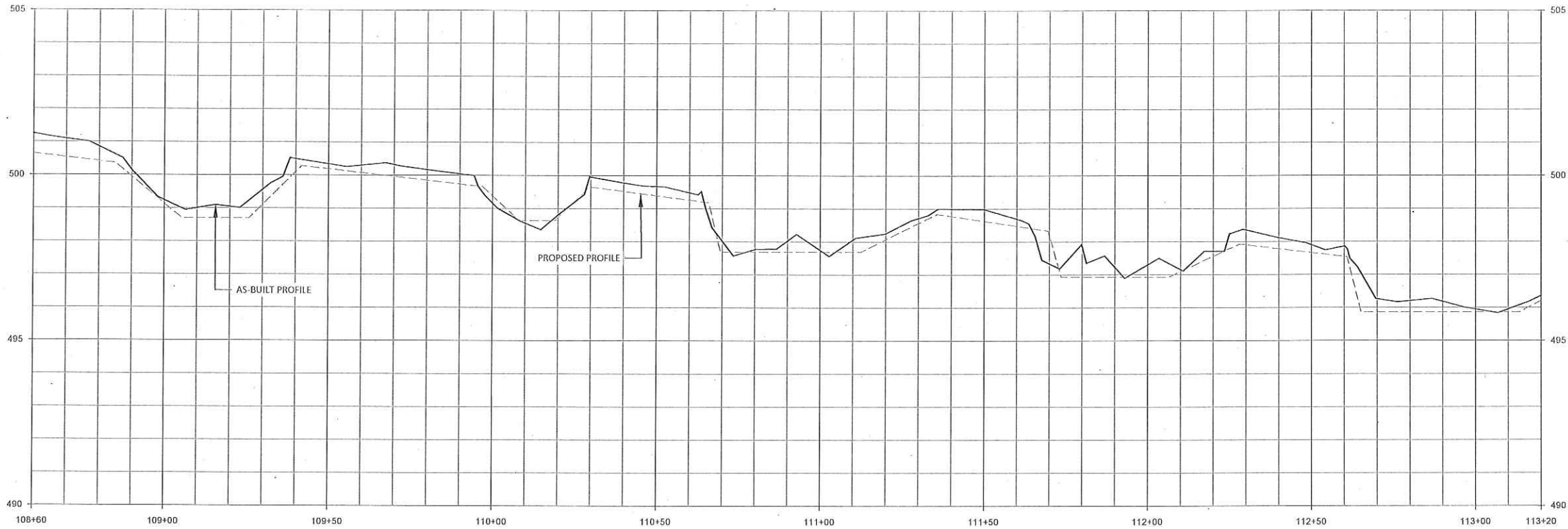
Martin Dairy Mitigation Site
 Orange County, North Carolina
 Martin Dairy Reaches 1 and 2
 Stream Overlay Plans



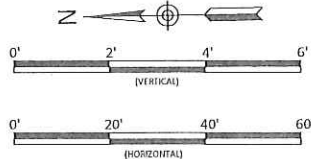
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NOTE: AT MARTIN DAIRY STA. 112+01, BOULDER SILL WAS REPLACED WITH LOG SILL DUE TO FIELD CONDITIONS AND AVAILABILITY OF ONSITE MATERIAL.



Martin Dairy Mitigation Site
Orange County, North Carolina
Martin Dairy Reach 2
Stream Overlay Plans

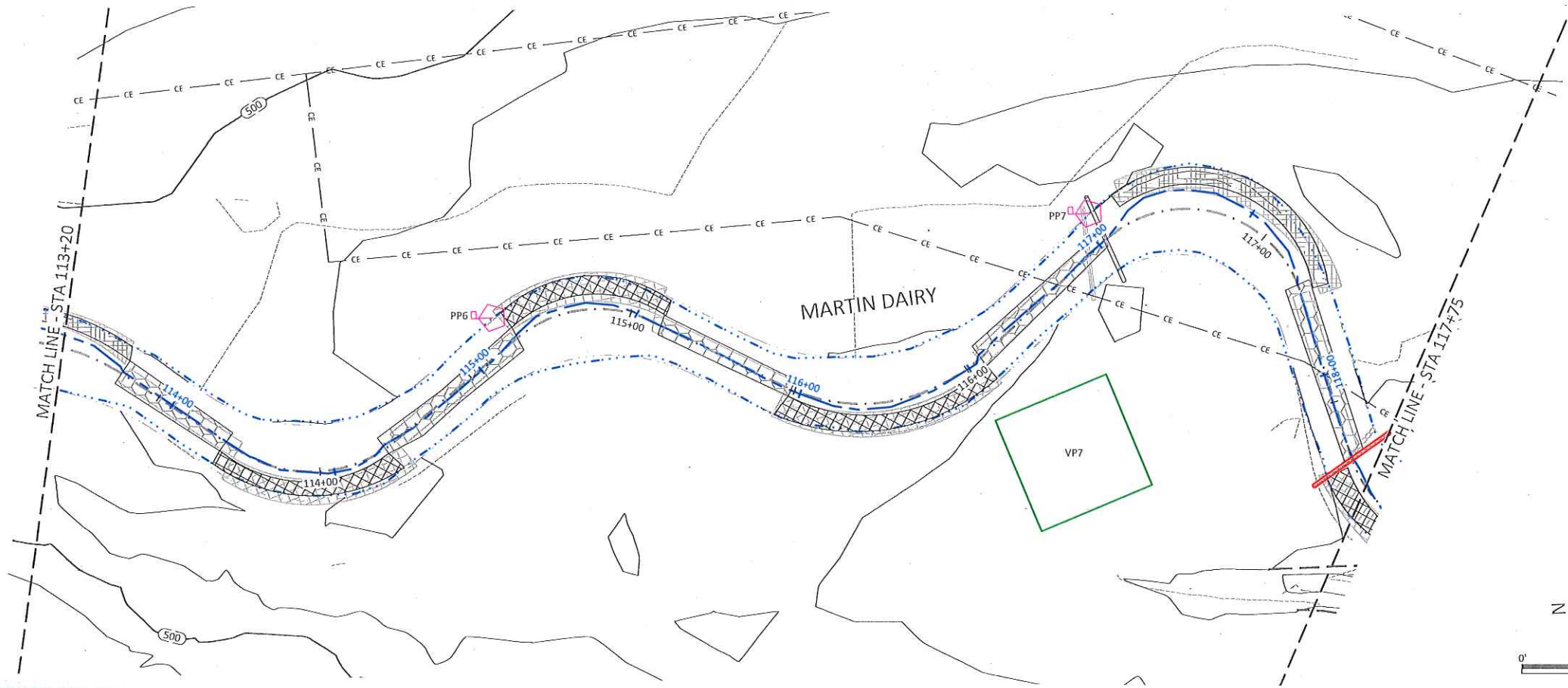
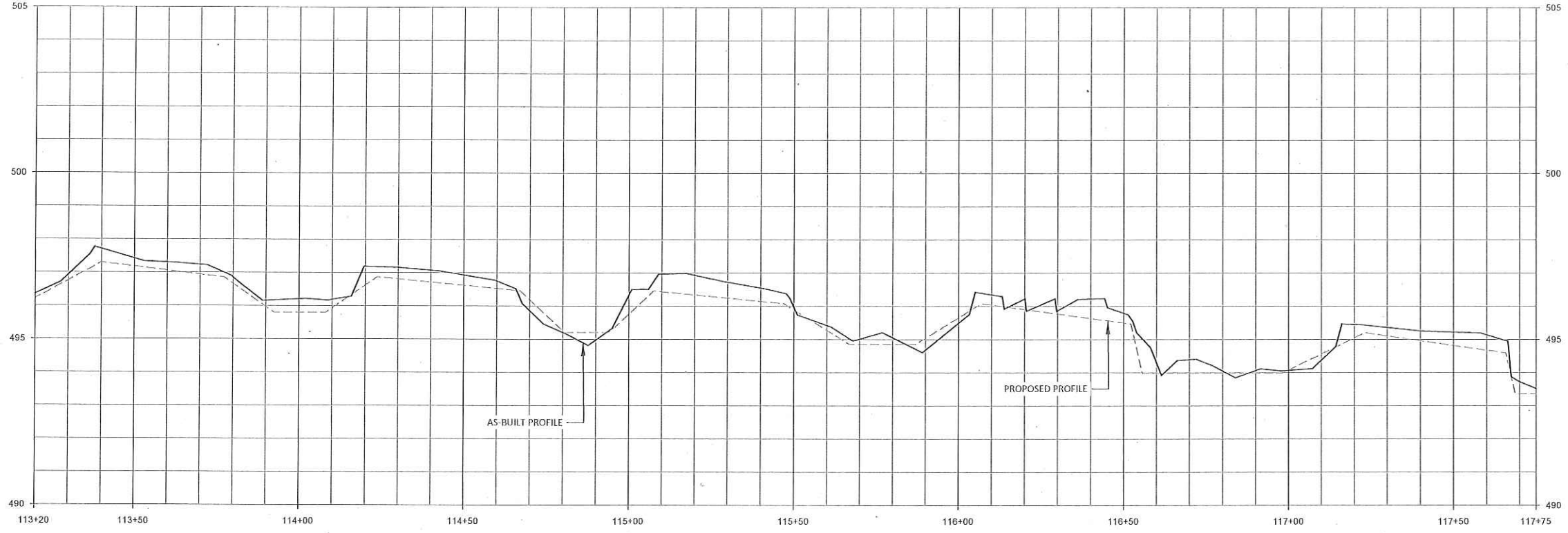
Revisions:

Date: 02-28-2018
Job Number: 005-02158
Project Engineer: ANA
Drawn By: CLM
Checked By: JWH

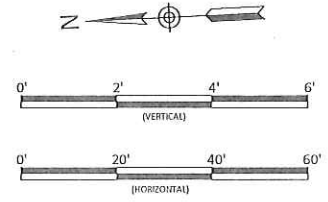
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As-Built and Record Drawing

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 February 28, 2018



NOTE: AT MARTIN DAIRY STA. 118+24, BOULDER SILL WAS REPLACED WITH LOG SILL DUE TO FIELD CONDITIONS AND AVAILABILITY OF ONSITE MATERIAL.



As-Built and Record Drawing

Date:	02/28/2018
Job Number:	005-02158
Project Engineer:	ANA
Drawn By:	CLM
Checked By:	JWH

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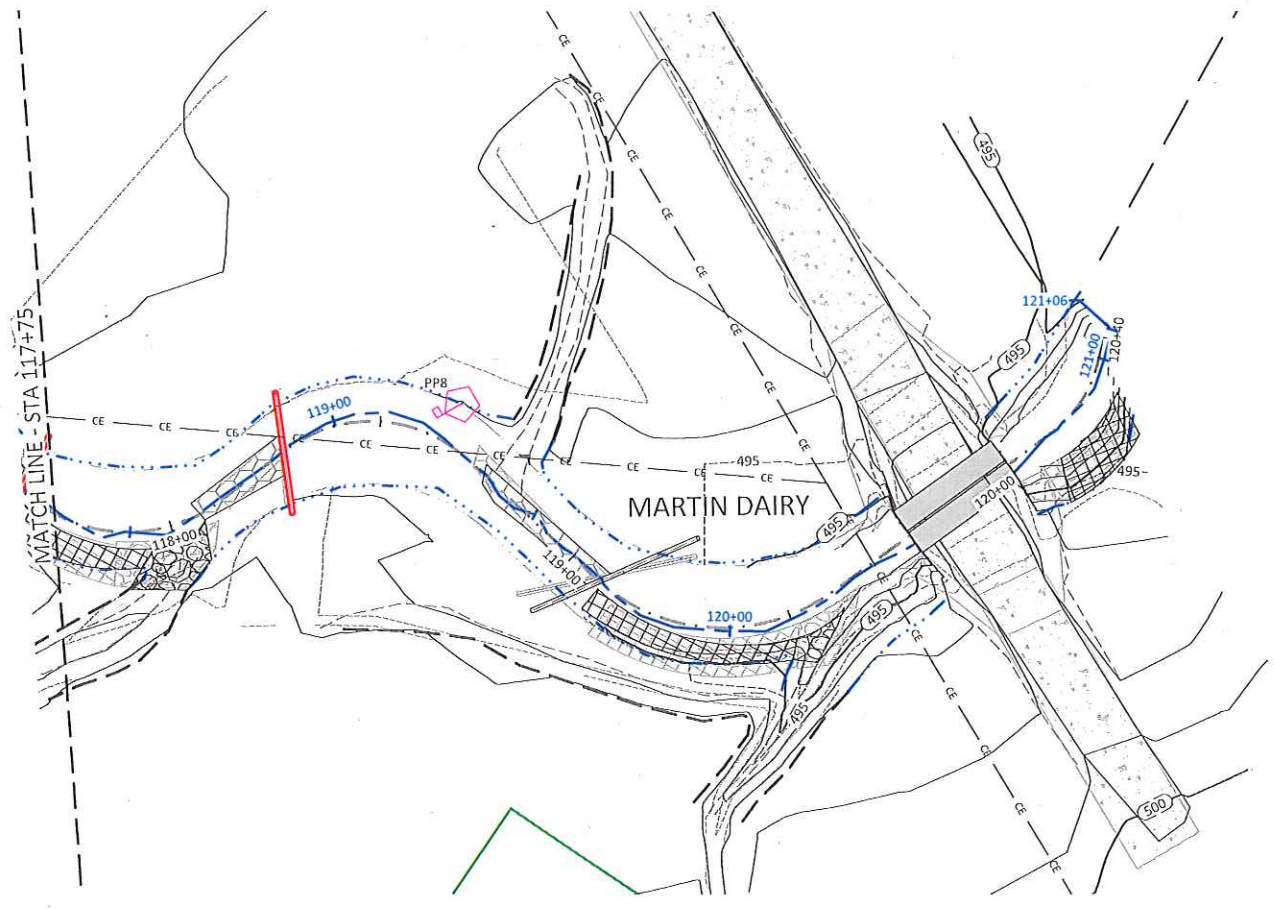
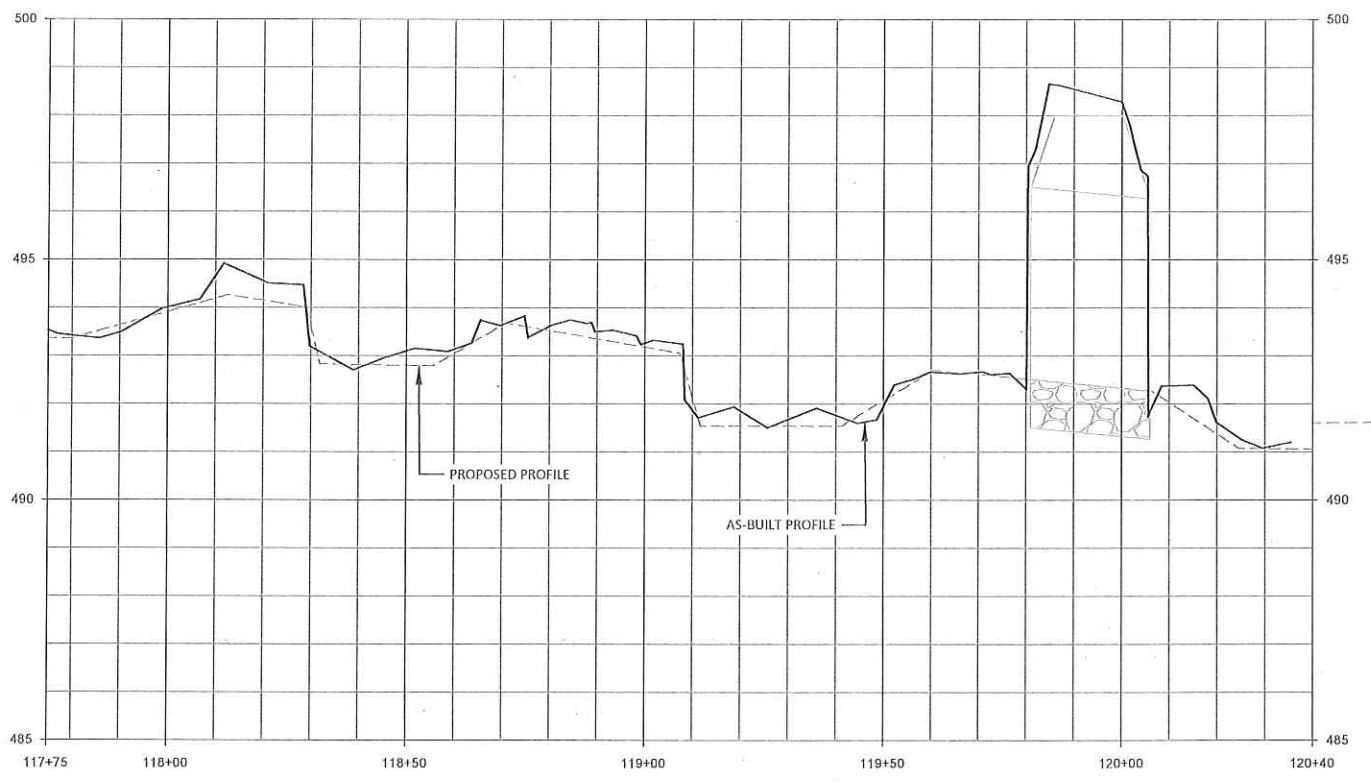
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Martin Dairy Mitigation Site
 Orange County, North Carolina
 Martin Dairy Reach 2
 Stream Overlay Plans

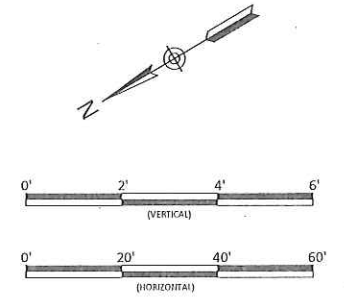


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NOTE: AT MARTIN DAIRY STA. 118+88, BOULDER SILL WAS REPLACED WITH LOG SILL DUE TO FIELD CONDITIONS AND AVAILABILITY OF ONSITE MATERIAL.



As-Built and Record Drawing

Date:	02-28-2018
Job Number:	005-0218S
Project Engineer:	ANA
Drawn By:	CLM
Checked By:	JWH

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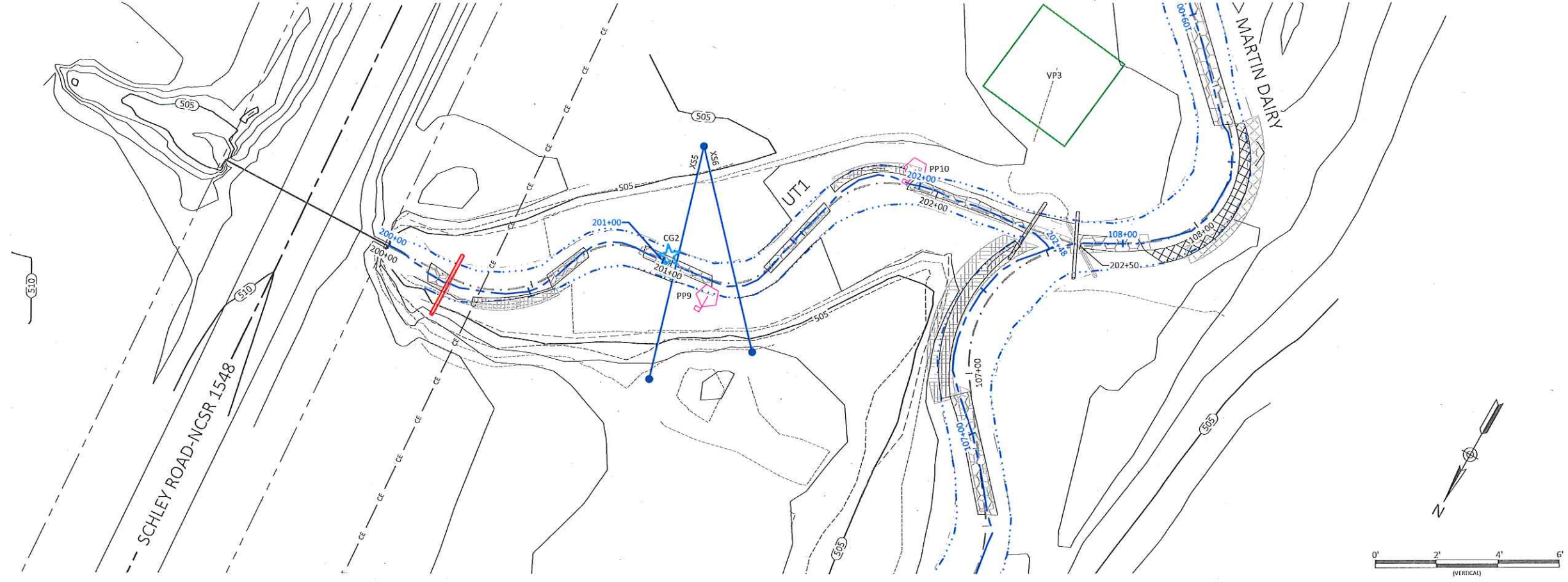
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Martin Dairy Mitigation Site
 Orange County, North Carolina
 Martin Dairy Reach 2
 Stream Overlay Plans

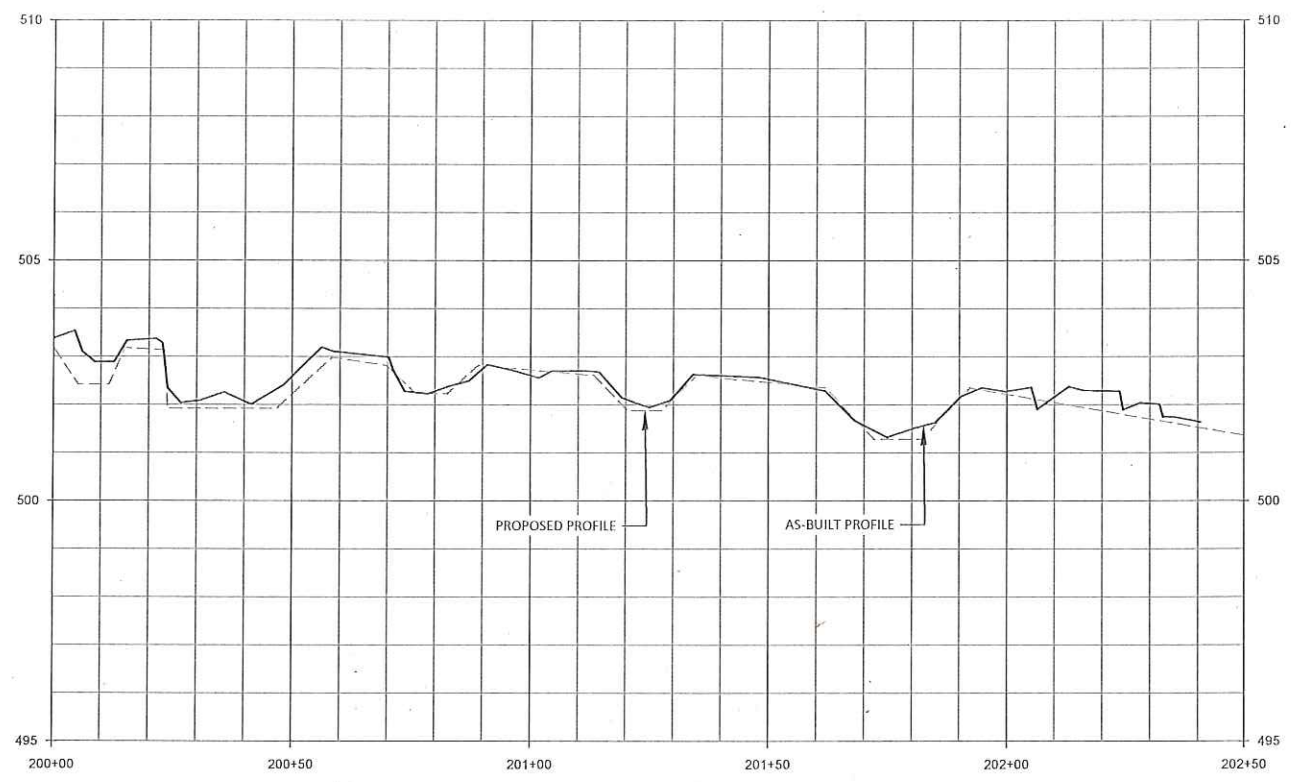


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NOTE: AT UT1 STA. 200+23, BOULDER SILL WAS REPLACED WITH LOG SILL DUE TO FIELD CONDITIONS AND AVAILABILITY OF ONSITE MATERIAL.



As-Built and Record Drawing

Martin Dairy Mitigation Site
Orange County, North Carolina

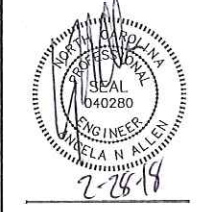
UT1
Stream Overlay Plans

Revisions:	

Date:	02/26/2018
Job Number:	005-02158
Project Engineer:	A.N.A.
Drawn By:	CLM
Checked By:	J.W.H.


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Sheet



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-  Streambank Planting Zone
-  Buffer Planting Zone & Permanent Riparian Seed Mix
-  Utility Easement Planting Zone (Permanent Riparian Seed Mix)

 Easement Perimeter Additional Planting 1 Gallon Stems

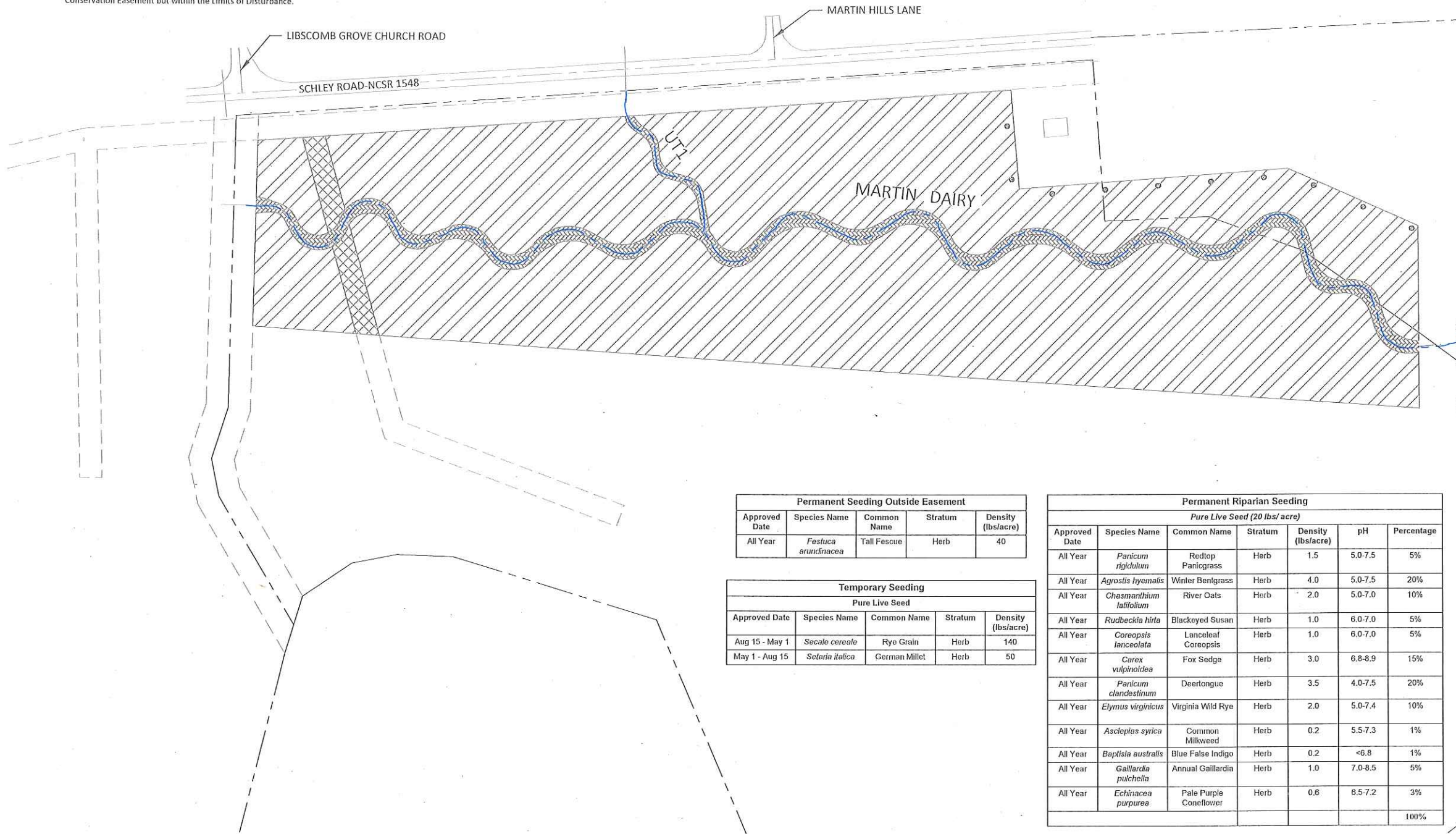
- Notes:
- Utility Easement Planting Zone seeded with permanent riparian seed mix. No trees planted in this zone.
 - 10 1-gallon stems of Eastern Redbud and Flowering Dogwood spread out along the Easement Perimeter Planting zone. This area interspersed with species from the Buffer Planting Zone to get the appropriate planting density for the Buffer Planting Zone of 6-12 ft. spacing on center.
 - Permanent Seeding Outside Easement used in areas outside of the Conservation Easement but within the limits of Disturbance.

Easement Perimeter Additional Planting						
Containerized						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Cercis canadensis</i>	Eastern Redbud	24 ft.	12-24 ft.	3 gallon	Canopy	5
<i>Comus florida</i>	Flowering Dogwood	24 ft.	12-24 ft.	3 gallon	Canopy	5

Streambank Planting Zone						
Live Stakes						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	% of Stems
<i>Salix nigra</i>	Black Willow	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	15%
<i>Cornus amomum</i>	Silky Dogwood	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	35%
<i>Salix sericea</i>	Silky Willow	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	35%
<i>Plyocarpus opulifolius</i>	Ninebark	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	15%
100%						
Herbaceous Plugs						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	% of Stems
<i>Juncus effusus</i>	Common Rush	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	40%
<i>Carex alata</i>	Broadwing Sedge	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	40%
<i>Panicum virgatum</i>	Switchgrass	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	20%
100%						

Buffer Planting Zone						
Bare Root						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Quercus phellos</i>	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	12%
<i>Platanus occidentalis</i>	Sycamore	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	22%
<i>Betula nigra</i>	River Birch	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	16%
<i>Liriodendron tulipifera</i>	Tulip Poplar	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	16%
<i>Quercus palustris</i>	Pin Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	14%
<i>Fraxinus pennsylvanica</i>	Green Ash	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	18%
* <i>Cercis canadensis</i>	Eastern Redbud	24 ft.	12-24 ft.	0.25"-1.0"	Canopy	1%
* <i>Comus florida</i>	Flowering Dogwood	24 ft.	12-24 ft.	0.25"-1.0"	Canopy	1%
100%						

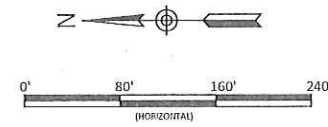
*Note: These species to be planted along easement perimeter only. Space evenly throughout perimeter, mixing with other above species.



Permanent Seeding Outside Easement				
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)
All Year	<i>Festuca arundinacea</i>	Tall Fescue	Herb	40

Temporary Seeding				
Pure Live Seed				
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)
Aug 15 - May 1	<i>Secale cereale</i>	Rye Grain	Herb	140
May 1 - Aug 15	<i>Setaria italica</i>	German Millet	Herb	50

Permanent Riparian Seeding						
Pure Live Seed (20 lbs/ acre)						
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)	pH	Percentage
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	1.5	5.0-7.5	5%
All Year	<i>Agrostis hyemalis</i>	Winter Benigrass	Herb	4.0	5.0-7.5	20%
All Year	<i>Chasmanthium latifolium</i>	River Oats	Herb	2.0	5.0-7.0	10%
All Year	<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	1.0	6.0-7.0	5%
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	1.0	6.0-7.0	5%
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	3.0	6.8-8.9	15%
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	3.5	4.0-7.5	20%
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	2.0	5.0-7.4	10%
All Year	<i>Asclepias syriaca</i>	Common Milkweed	Herb	0.2	5.5-7.3	1%
All Year	<i>Baptisia australis</i>	Blue False Indigo	Herb	0.2	<6.8	1%
All Year	<i>Gaillardia pultchella</i>	Annual Gaillardia	Herb	1.0	7.0-8.5	5%
All Year	<i>Echinacea purpurea</i>	Pale Purple Coneflower	Herb	0.6	6.5-7.2	3%
100%						



Martin Dairy Mitigation Site
Orange County, North Carolina

Planting

As-Built and Record Drawing

Date:	02-28-2018
Job Number:	005-02198
Project Engineer:	ANA
Drawn By:	CLM
Checked By:	JWH

2.0