

Bug Headwaters Mitigation Site

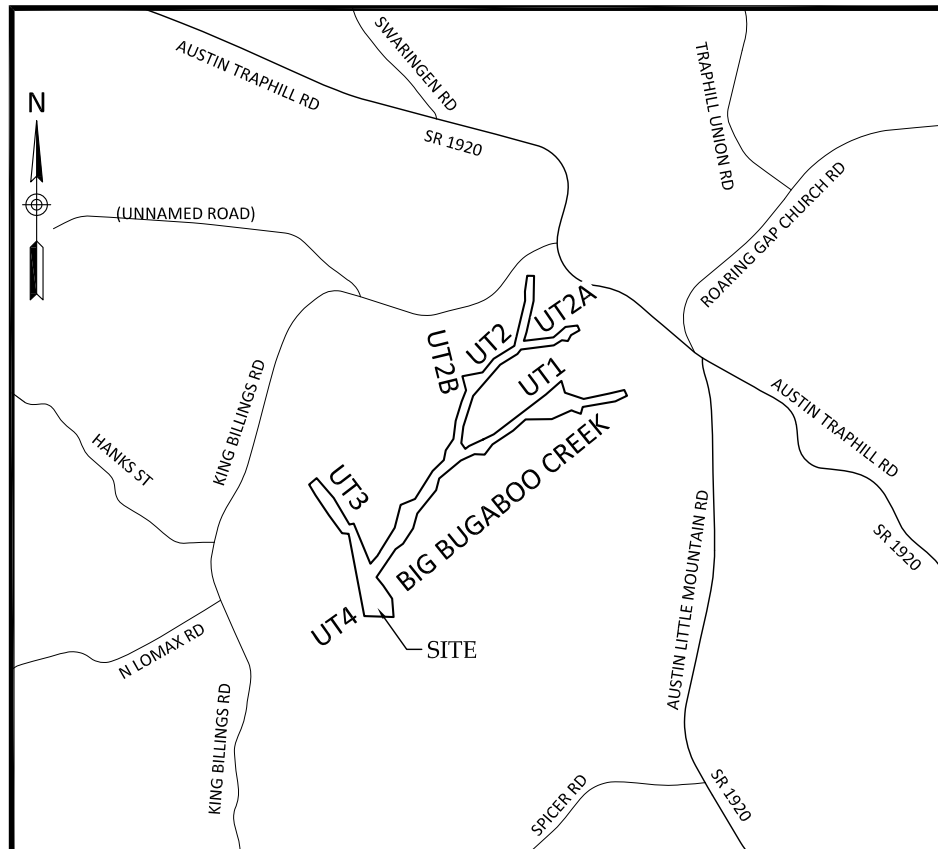
Record Drawings

Wilkes County, North Carolina

for

NCDEQ

Division of Mitigation Services



Vicinity Map
Not to Scale

**CERTIFICATE OF SURVEY
AND
ACCURACY**

I, PHILLIP B. KEE, 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 KEE MAPPING AND SURVEYING, PA AS SHOWN ON AN AS-BUILT SURVEY FOR "BUG HEADWATERS MITIGATION SITE", JOB # 2104041-AB, DATED 08/25/21; 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 04/29/21 - 07/06/21; 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; 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, LICENSE NUMBER, AND SEAL THIS 15TH DAY OF SEPTEMBER, 2021, A.D.

DocuSigned by:

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647

D965004A7692407...



**AS-BUILT &
RECORD DRAWINGS**
SEPTEMBER 15, 2021

Sheet Index

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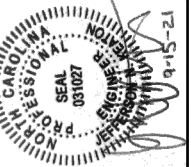
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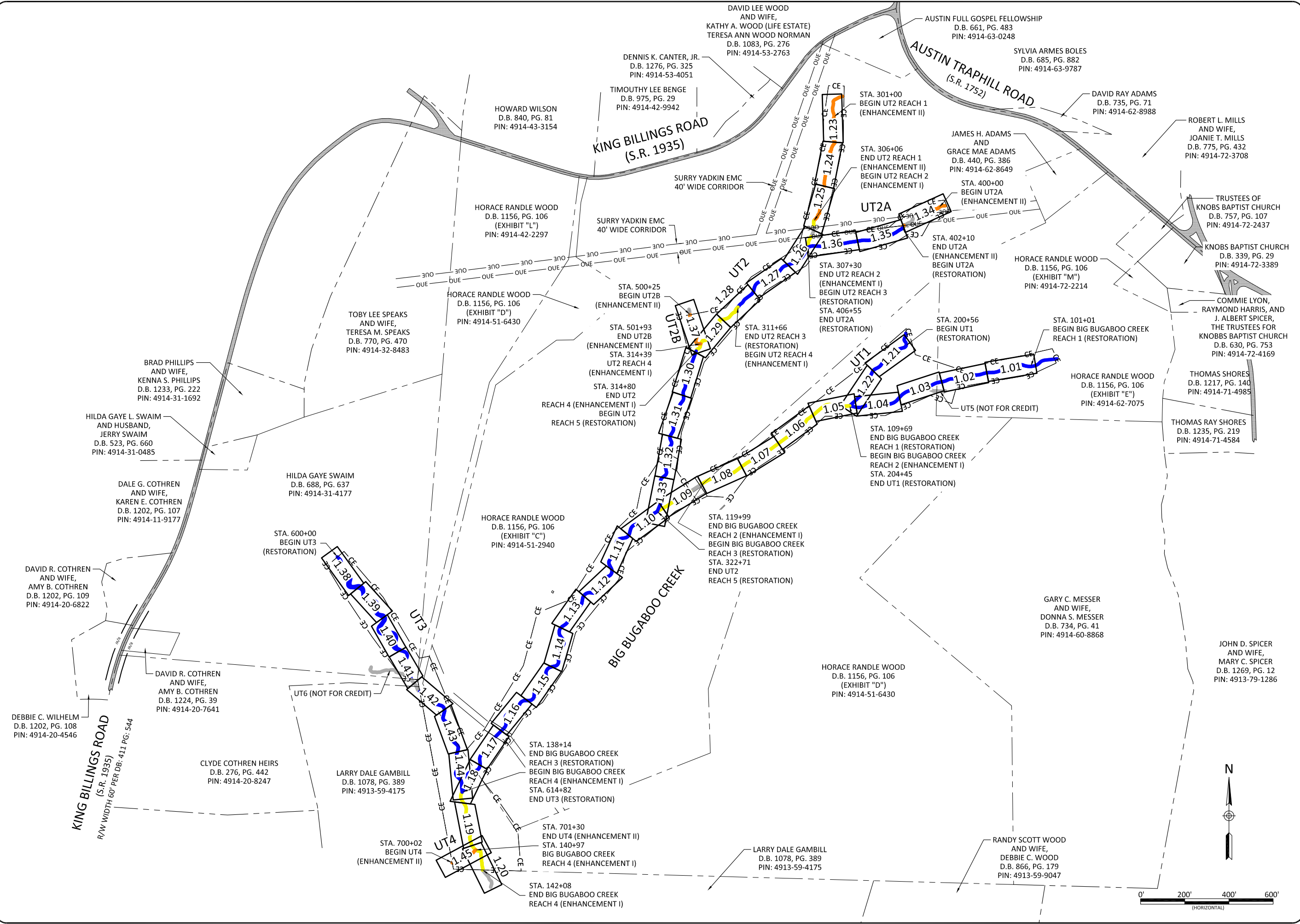
Engineering:
Wildlands Engineering, Inc
License No. F-0831
312 W. Millbrook Rd, Suite 225
Raleigh, NC 27609
Jeff Keaton, PE, Project Manager
Nicole Millns, PE, Project Engineer
919-851-9986

Surveying:
Kee Mapping and Surveying, PA
88 Central Avenue
Asheville, NC 28801
Phillip B. Kee, PLS
828-575-9021

Owner:
DEQ NCDMS
1652 Mail Service Center
Raleigh, NC 27699-1652
Attention: Matthew Reid
919-707-8976

NCDEQ Contract No. 7617
DMS ID No. 100084
Yadkin River Basin
HUC 03040101
USACE Action ID No.
SAW-2018-01788
NCDWR No. 18-1273





WILDLANDS ENGINEERING
 312 W. Millbrook Rd. Suite 205
 Raleigh, NC 27609
 Tel: 919.851.9986
 License No. F-0831

PROFESSIONAL SEAL
 081027
 9-15-21

Bug Headwaters Record Drawings
 Wilkes County, North Carolina

General Overview

Revisions:

Date: 09.15.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

0.2

Sheet

Preconstruction Features

	EXISTING SPRING
	UTILITY POLE
	EXISTING GUY WIRE
	EXISTING WELL
	EXISTING TOP OF BANK
	EXISTING FENCE
	EXISTING STORM PIPE
	EXISTING PROPERTY LINE
	OVERHEAD ELECTRIC
	OVERHEAD UTILITY EASEMENT
	CONSERVATION EASEMENT
	CONSERVATION EASEMENT INTERNAL CROSSING
	EXISTING BEDROCK
	EXISTING FARM PATH
	EXISTING WETLAND

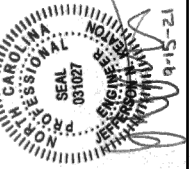
As-Designed Features

	10+00	NOT FOR CREDIT
	10+00	DESIGN PRESERVATION REACH
	10+00	DESIGN ENHANCEMENT I REACH
	10+00	DESIGN ENHANCEMENT II REACH
	10+00	DESIGN RESTORATION REACH
		DESIGNED BANKFULL
		DESIGNED LOG VANE
		DESIGNED LOG SILL
		DESIGNED ROCK SILL
		DESIGNED COVER LOG
		DESIGNED ROCK STEP POOLS
		DESIGNED CULVERT
		DESIGNED CASCADE
		DESIGNED FARM PATH
		DESIGNED RIFFLE
		DESIGNED STREAM BANK GRADING AREA
		DESIGNED ROCK OUTLET
		DESIGNED BRUSH TOE
		DESIGNED TRANSPLANTED SOD MAT
		DESIGNED VEGETATED SOIL LIFT
		DESIGNED BOULDER TOE
		DESIGNED WOVEN WIRE FENCE
		DESIGNED 5 WIRE FENCE
		DESIGNED DOUBLE 2" TUBE STEEL GATE
		DESIGNED SINGLE 2" TUBE STEEL GATE

As-Built Features

	AS-BUILT THALWEG	
	AS-BUILT BANKFULL	
	LIMITS OF DISTURBANCE	
	AS-BUILT 5' MAJOR CONTOUR	
	AS-BUILT 1' MINOR CONTOUR	
	CROSS SECTION	
	PP ##	PHOTO POINT
	CG FG BAROTROLL	GAUGES
	VEG	VEGETATION PLOT
		AS-BUILT LOG SILL
		AS-BUILT BOULDER SILL
		AS-BUILT COVER LOG
		AS-BUILT CULVERT
		AS-BUILT RIFFLE
		AS-BUILT ROCK OUTLET
		AS-BUILT BRUSH TOE
		AS-BUILT BOULDER TOE
		AS-BUILT FENCE
		AS-BUILT DOUBLE 2" TUBE STEEL GATE
		AS-BUILT SINGLE 2" TUBE STEEL GATE

- NOTES:**
- DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 - NATIVE BOULDER MATERIAL WAS NOT FOUND ON SITE, SO BOULDERS WERE TRANSPORTED FROM A QUARRY. SINCE LOGS WERE ABUNDANT ON THE SITE, SOME BOULDER SILLS WERE REPLACED WITH LOG SILLS TO REDUCE THE AMOUNT OF OFF-SITE MATERIAL NEEDED. THE QUARRY BOULDERS WERE MAINLY USED IN STRUCTURES AT THE HEADWATERS OF THE STREAM CHANNELS THAT ARE LIKELY TO BE INTERMITTENTLY DRY DURING THE SUMMER. THIS WAS DONE TO HELP PREVENT THE LOGS FROM ROTTING DURING THE DRY TIMES OF THE YEAR.

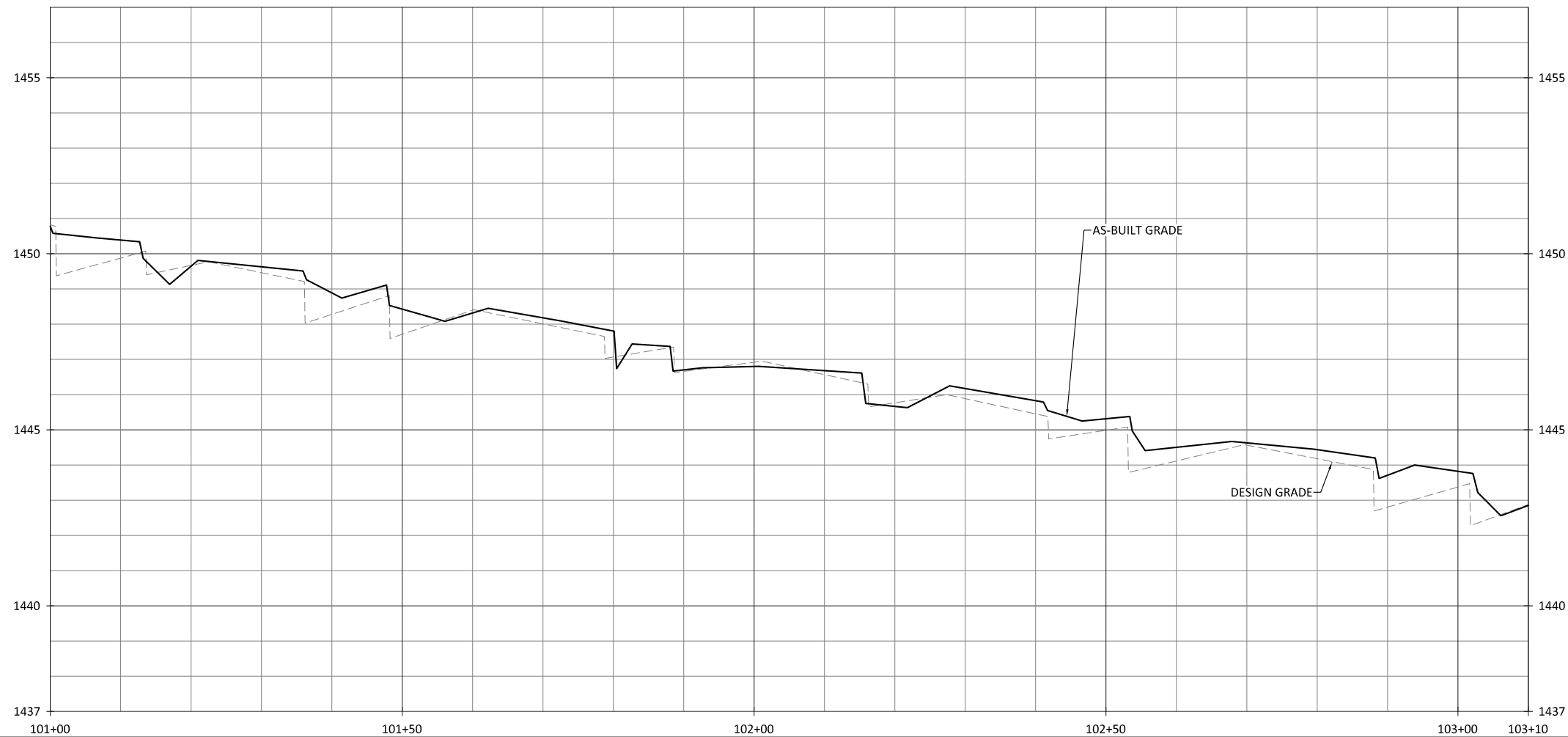


Bug Headwaters Record Drawings Wilkes County, North Carolina

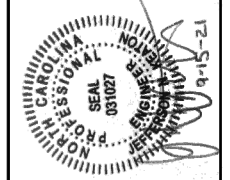
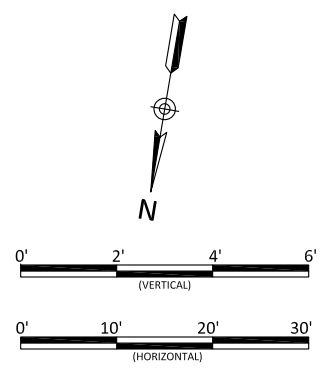
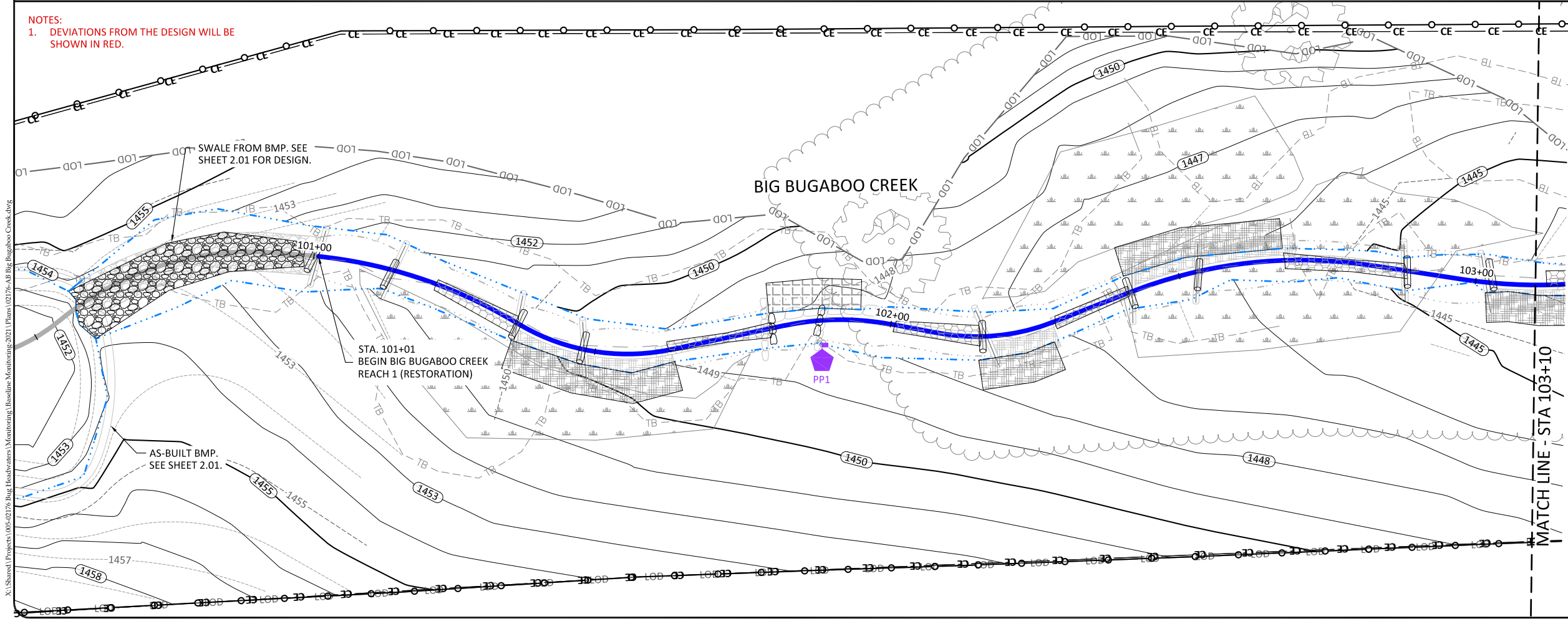
General Notes and Symbols

Revisions:	

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA



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

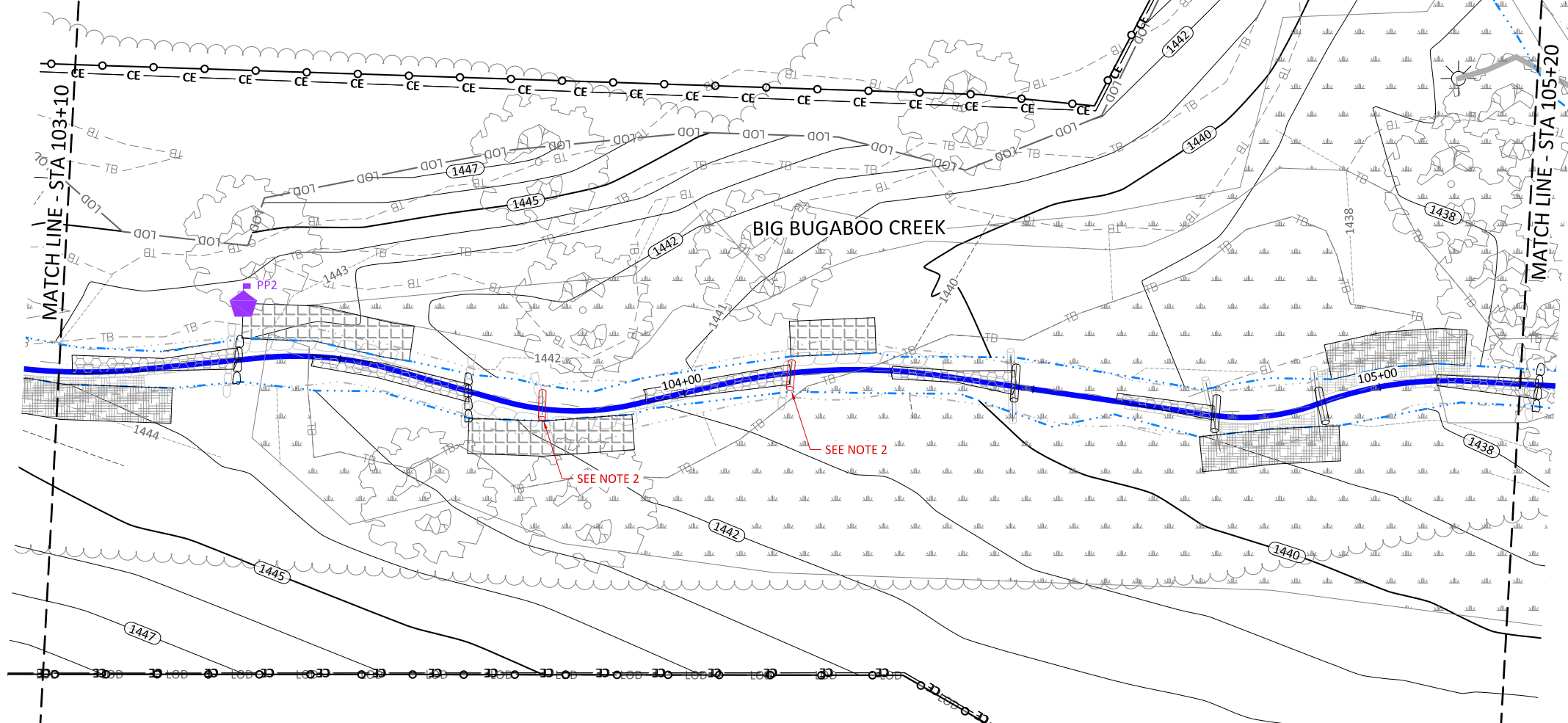
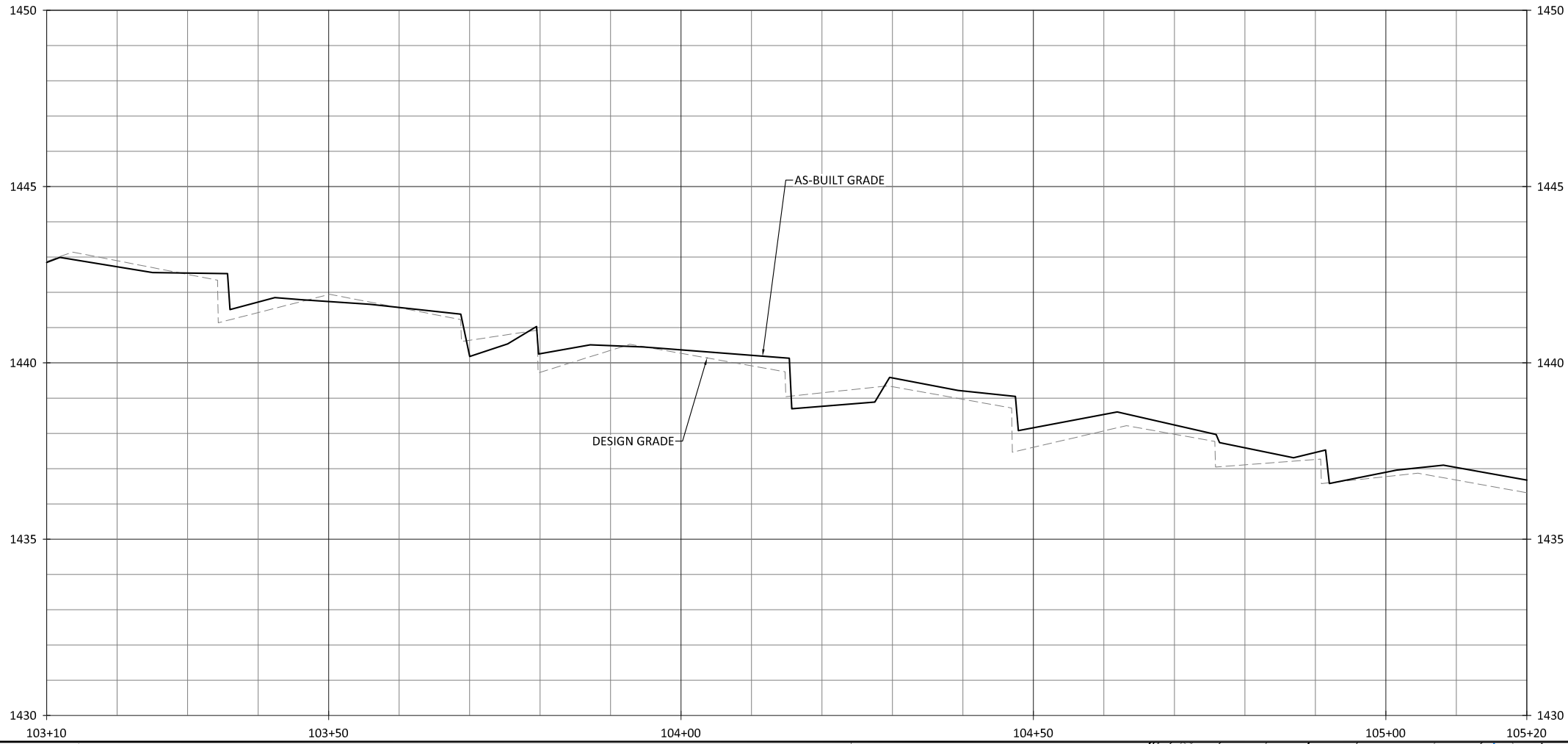


Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

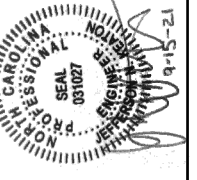
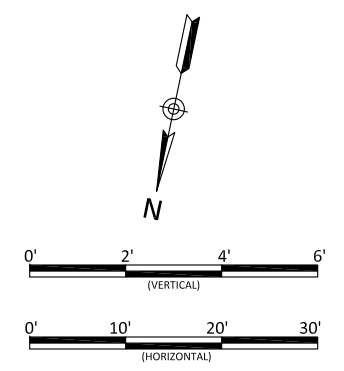
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Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: ANA

1.01



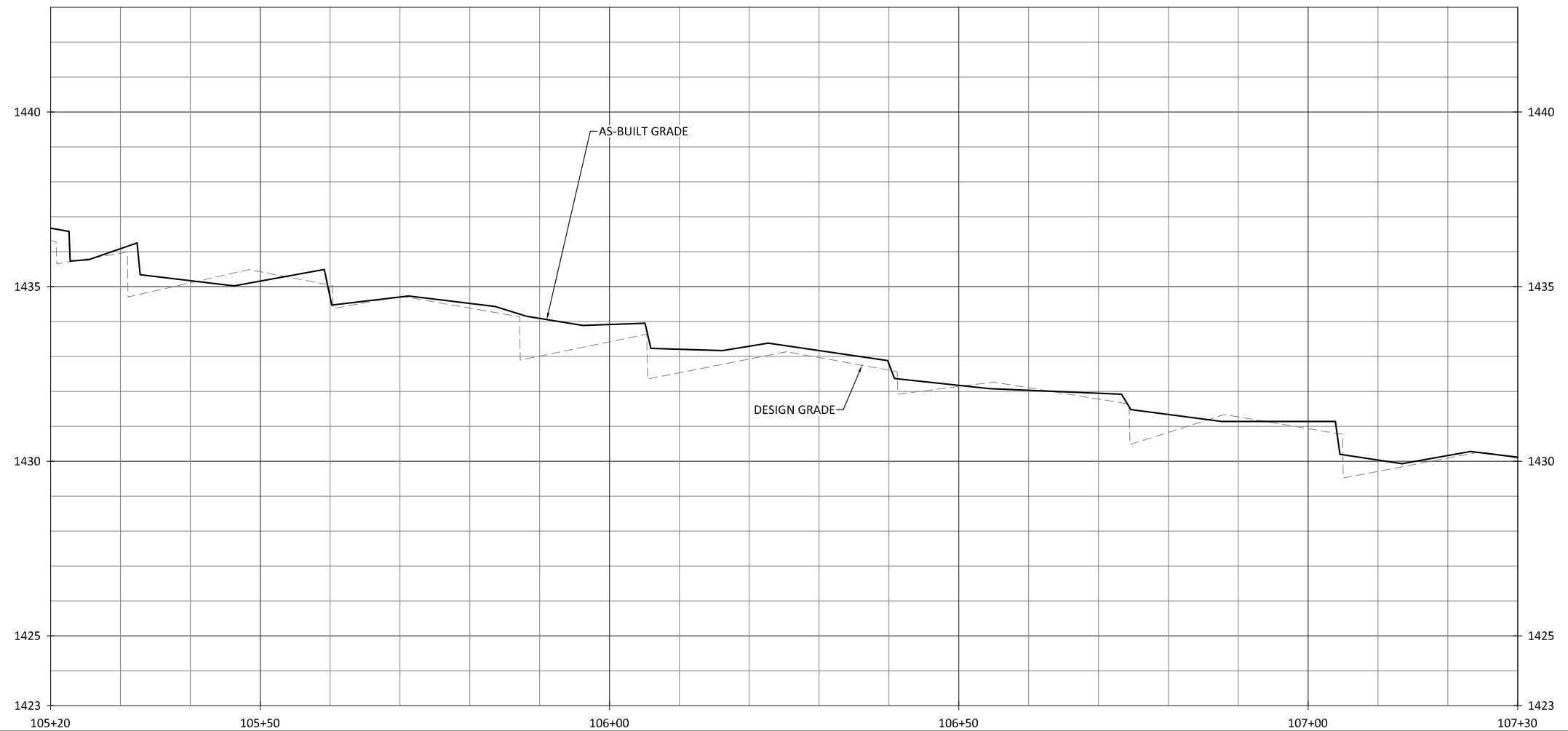
- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 103+80 & STA 104+15 BOULDER SILL REPLACED WITH LOG SILL DUE TO NO NATIVE BOULDERS ON SITE



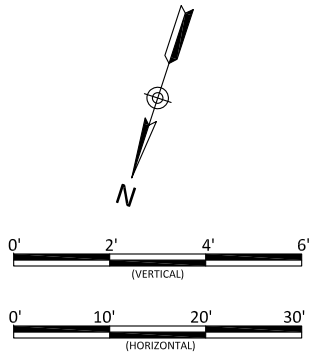
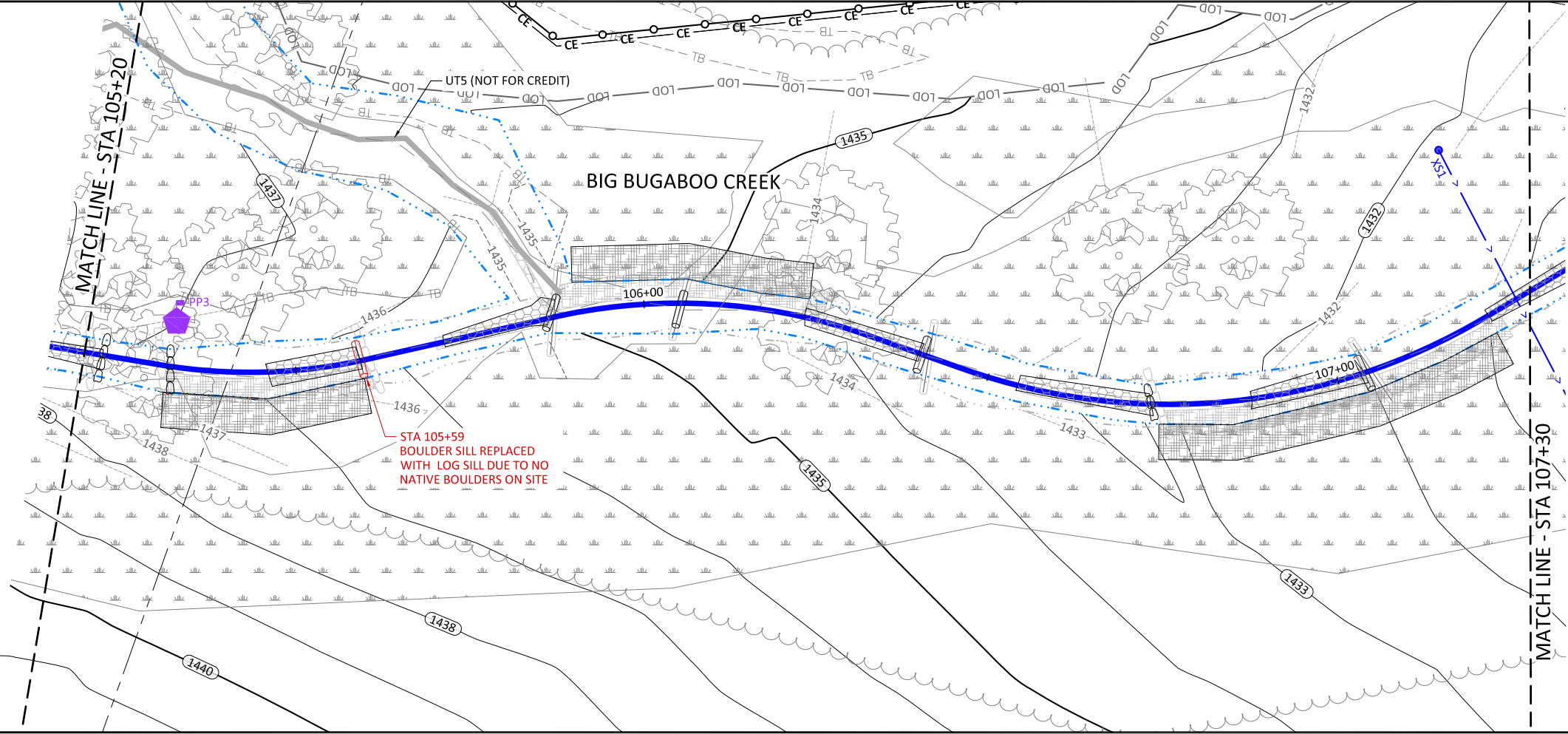
Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
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Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
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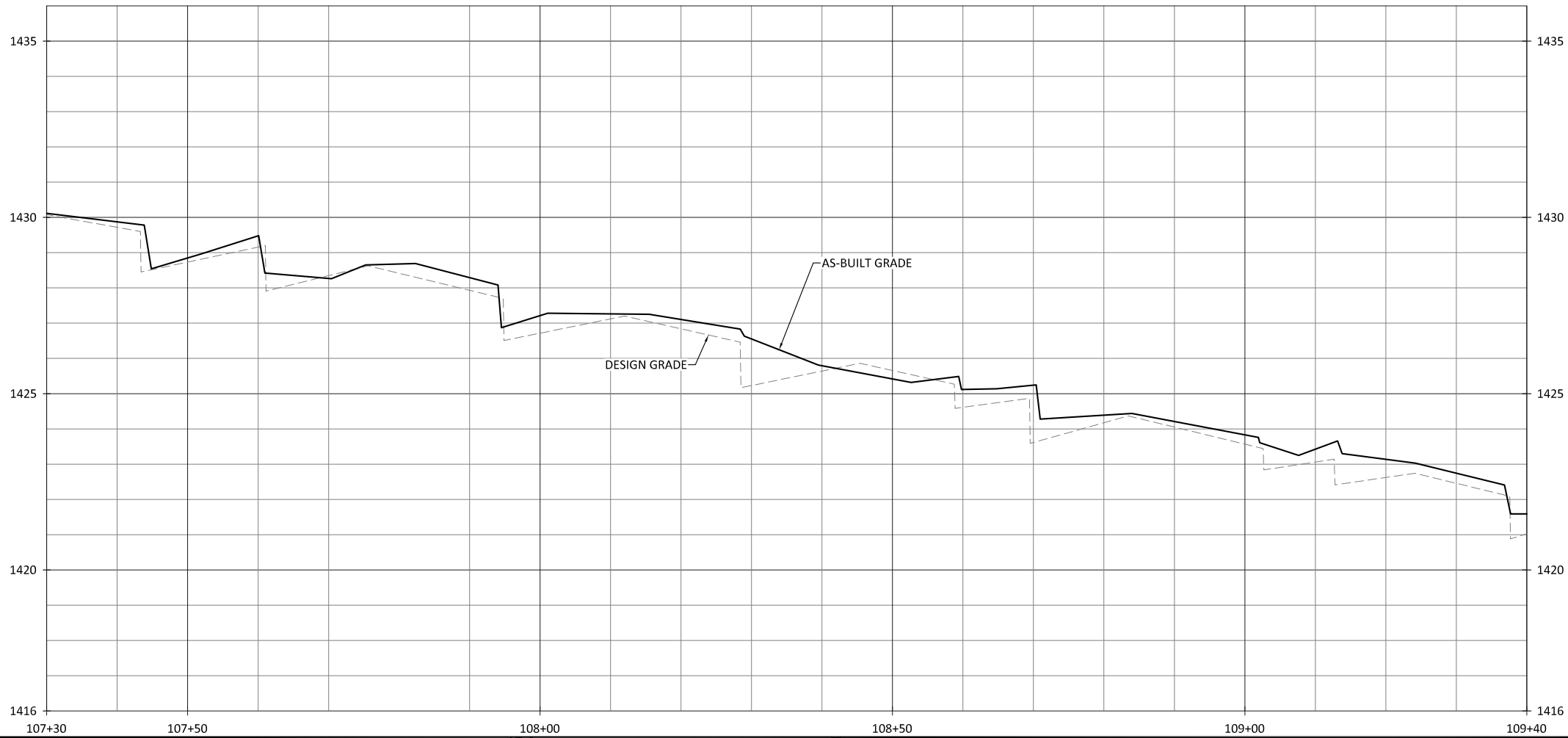
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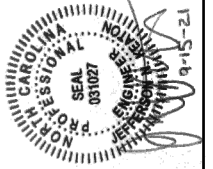
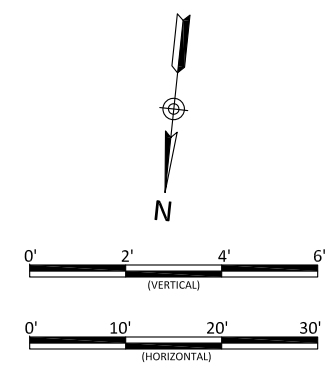
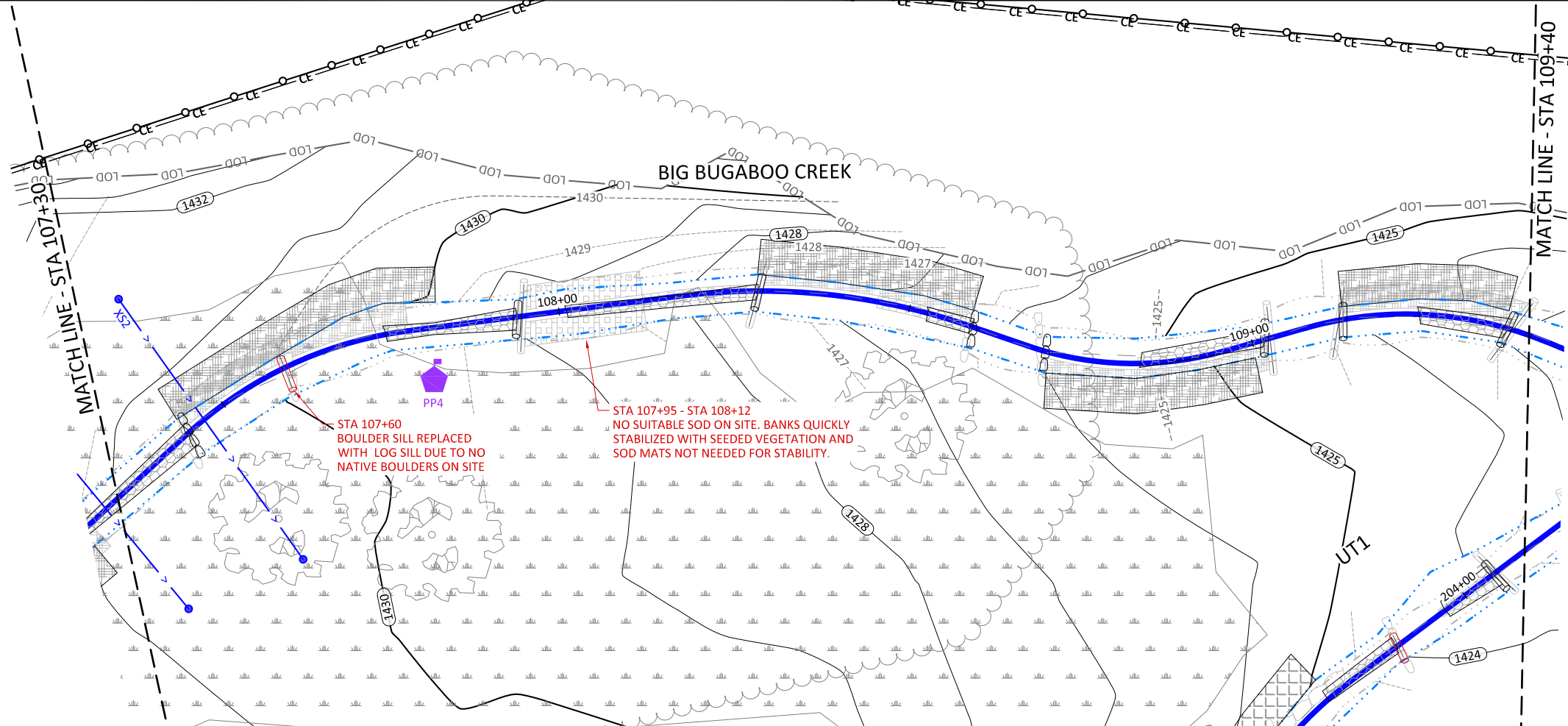
Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT1 IS ADDRESSED ON SHEET 1.21 AND 1.22.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

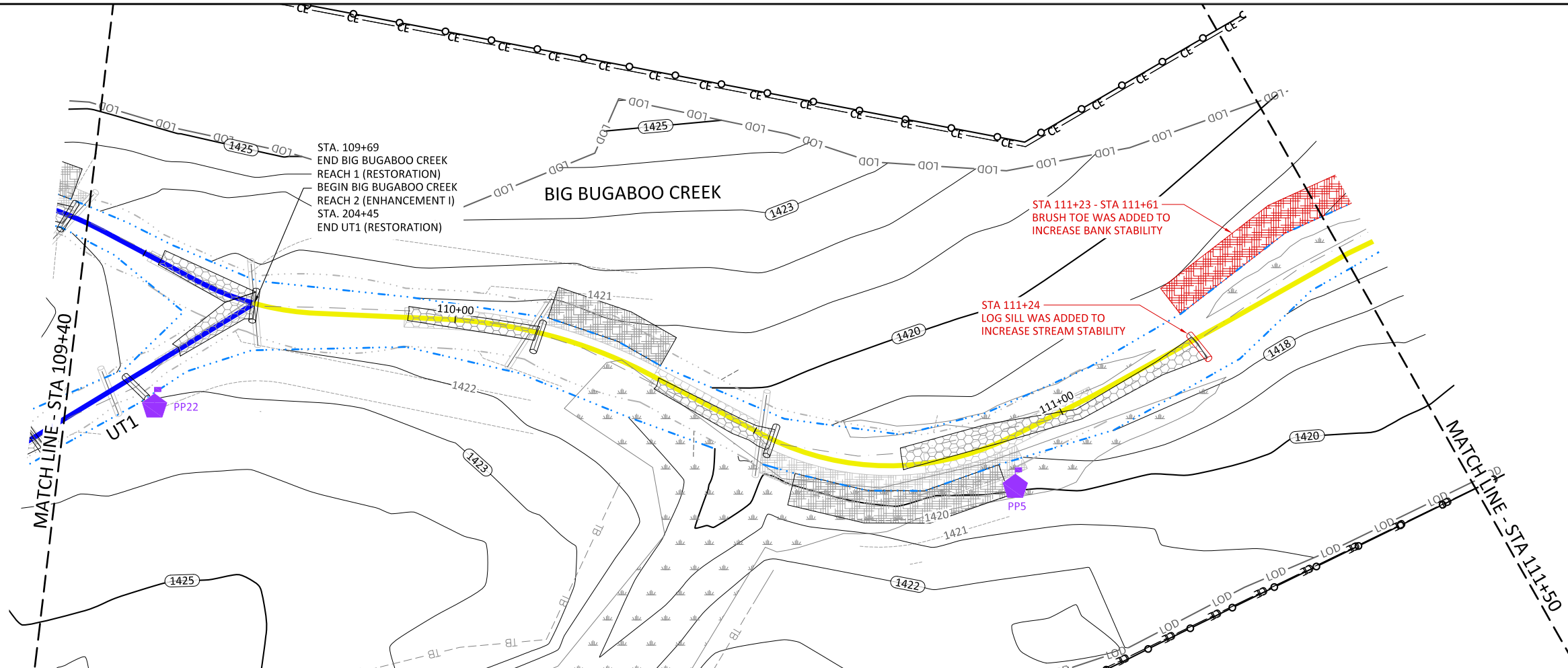
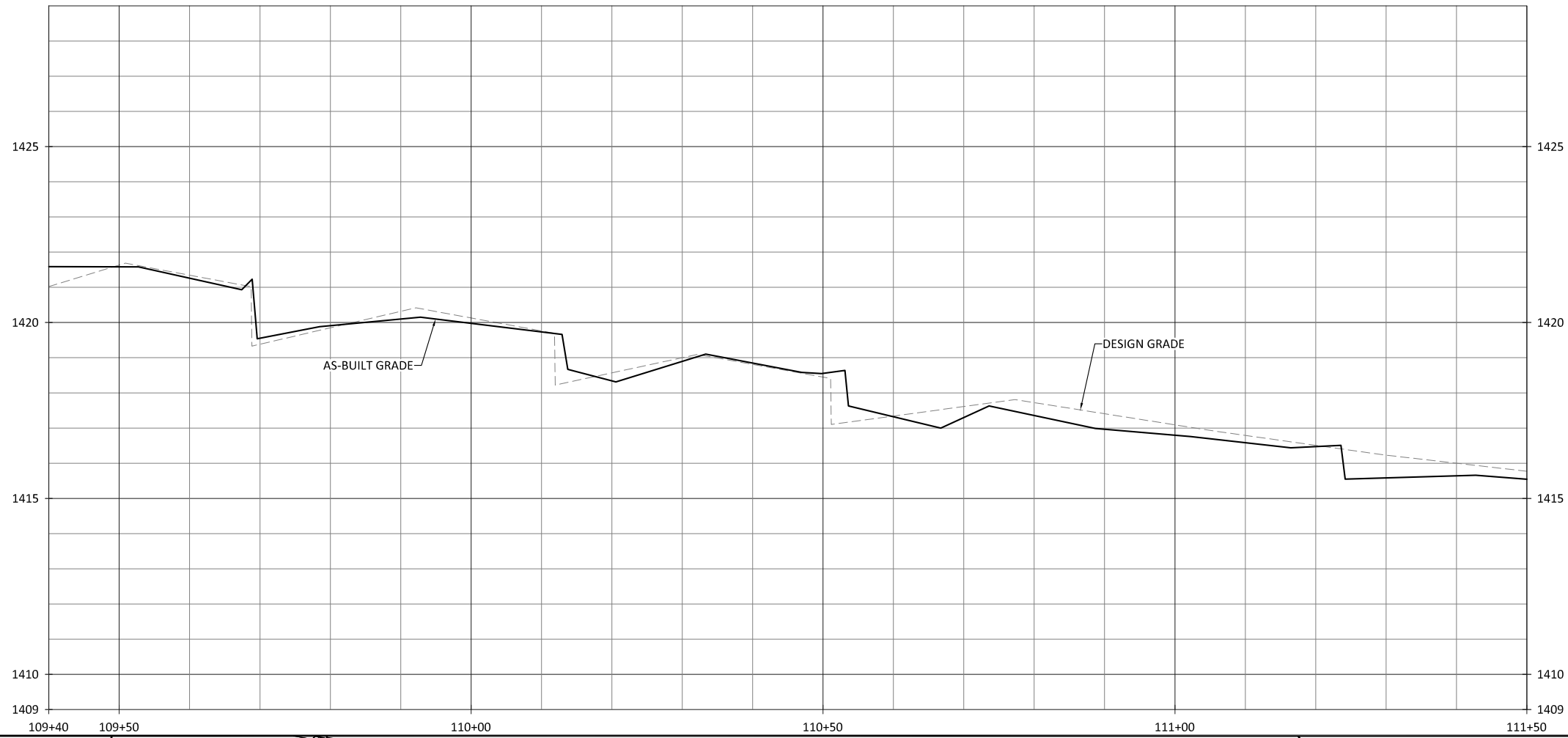
Big Bugaboo Creek
Stream Plan and Profile

Revisions:

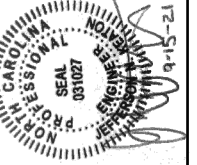
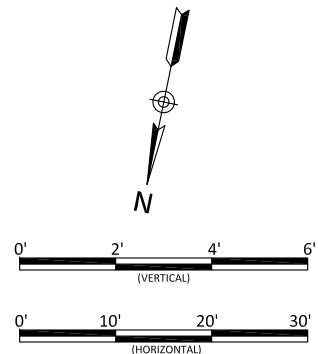
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Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.04

Sheet



- NOTES:
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 2. AS-BUILT INFORMATION FOR UT1 IS ADDRESSED ON SHEET 1.21 AND 1.22.

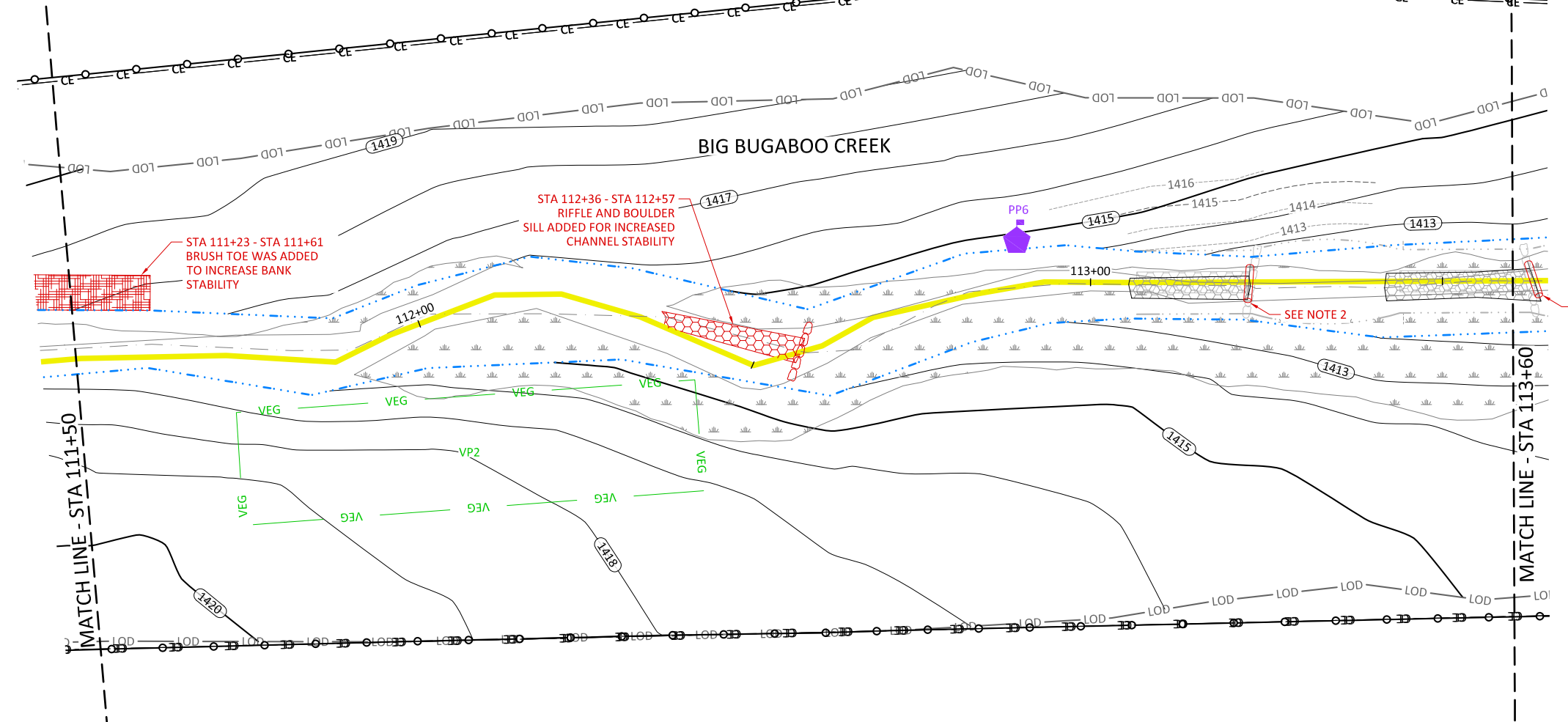
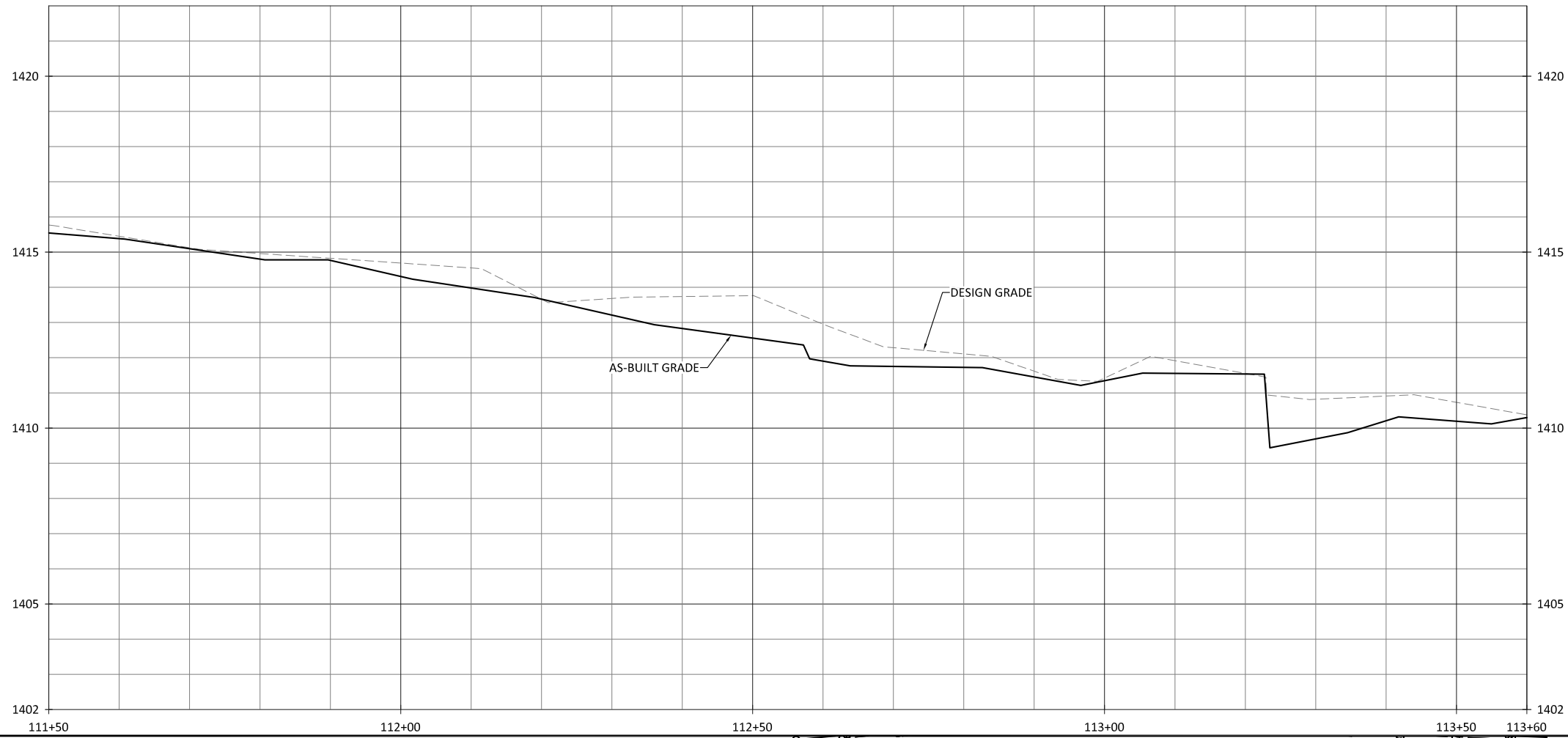


Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
Stream Plan and Profile

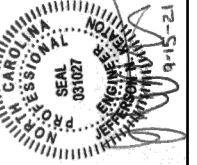
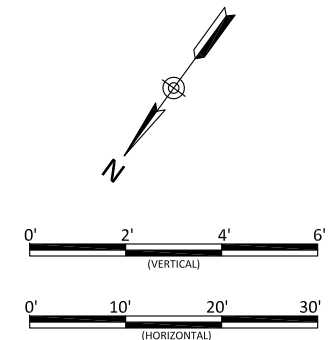
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

1.05
Sheet



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED
 2. 113+23 & STA 113+63 BOULDER SILL REPLACED WITH LOG SILL DUE TO NO NATIVE BOULDERS ON SITE



Bug Headwaters Record Drawings
Wilkes County, North Carolina

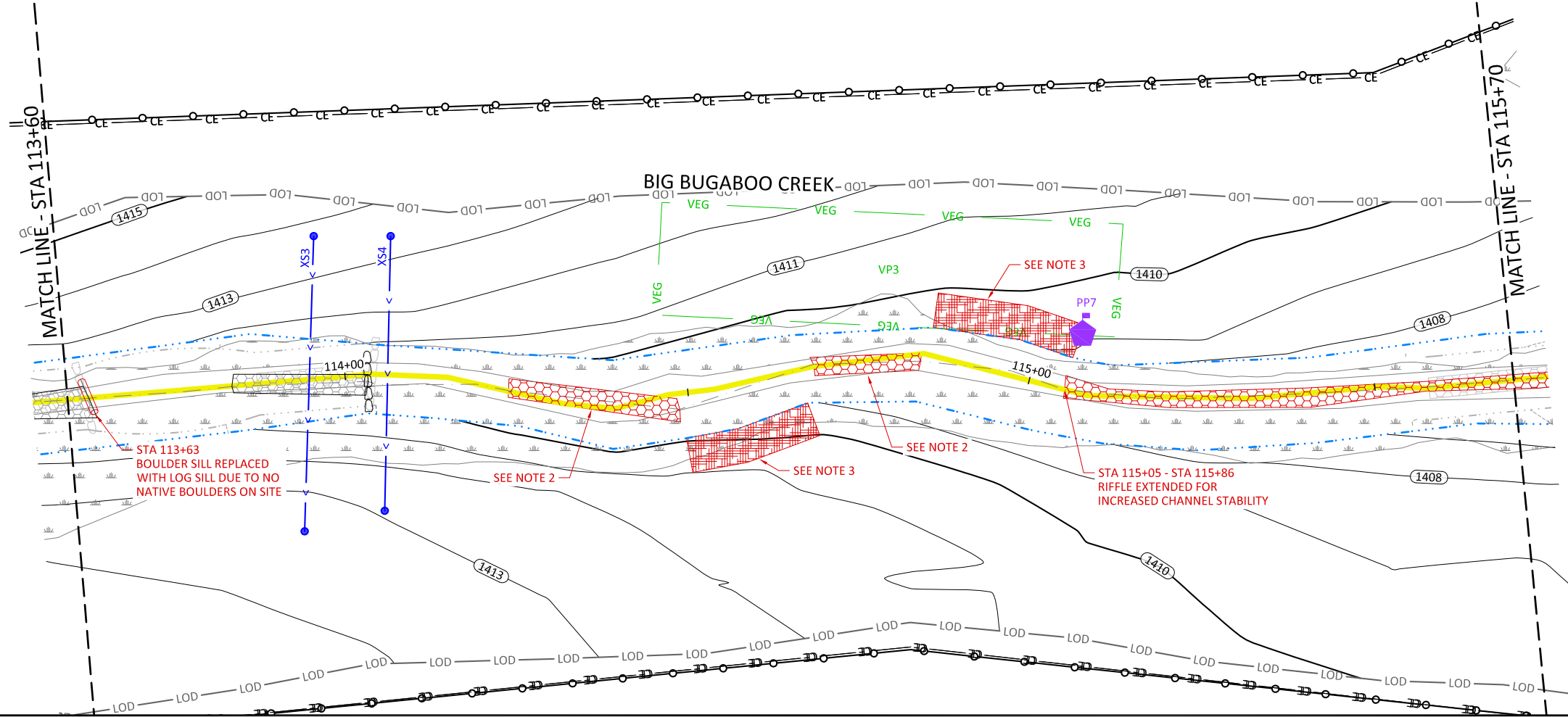
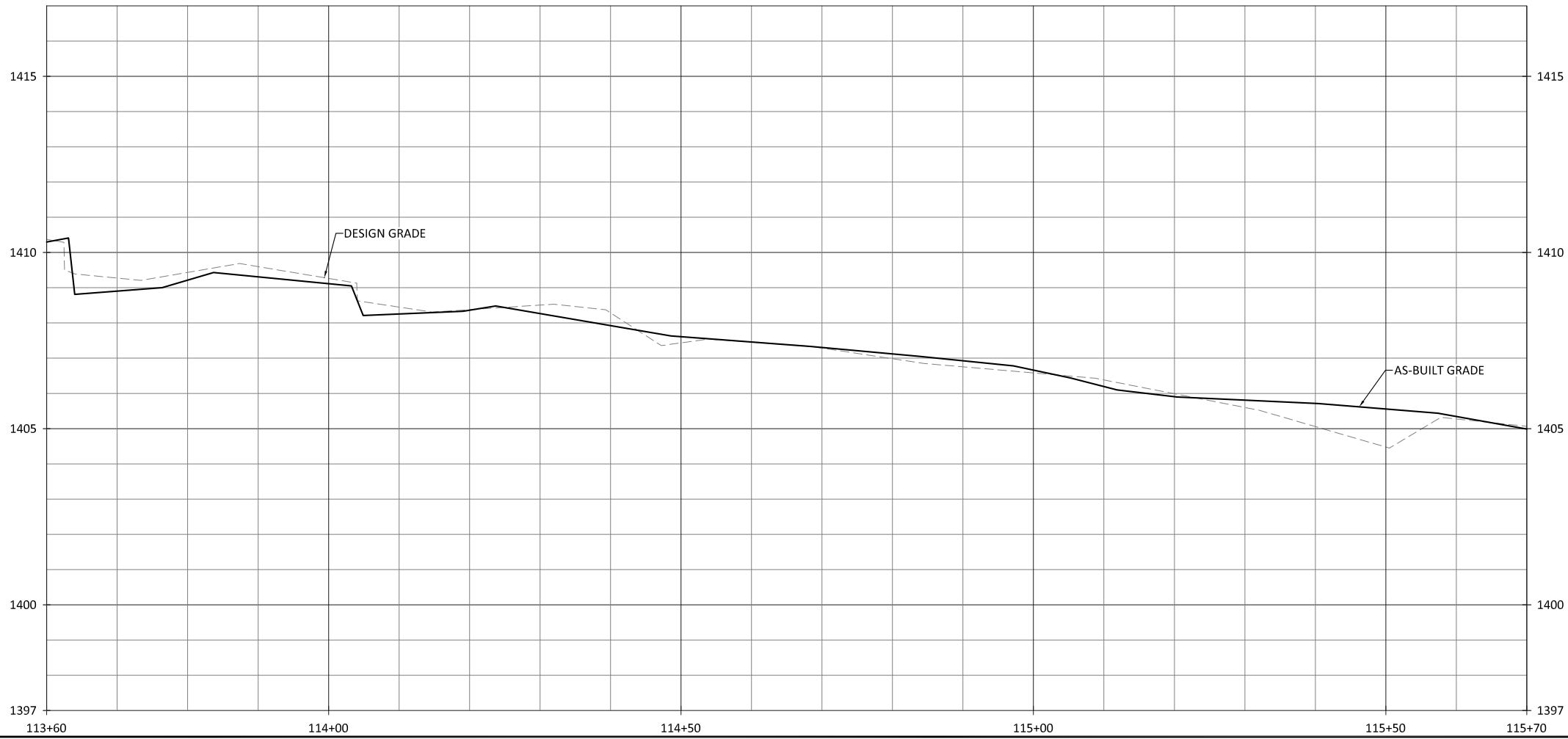
Big Bugaboo Creek
Stream Plan and Profile

Revisions:

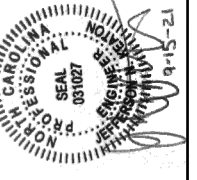
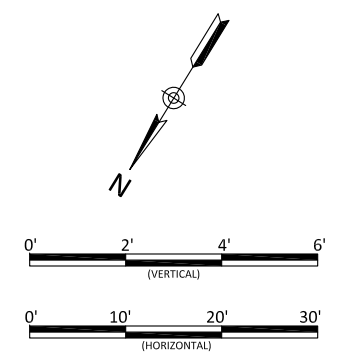
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.06

Sheet



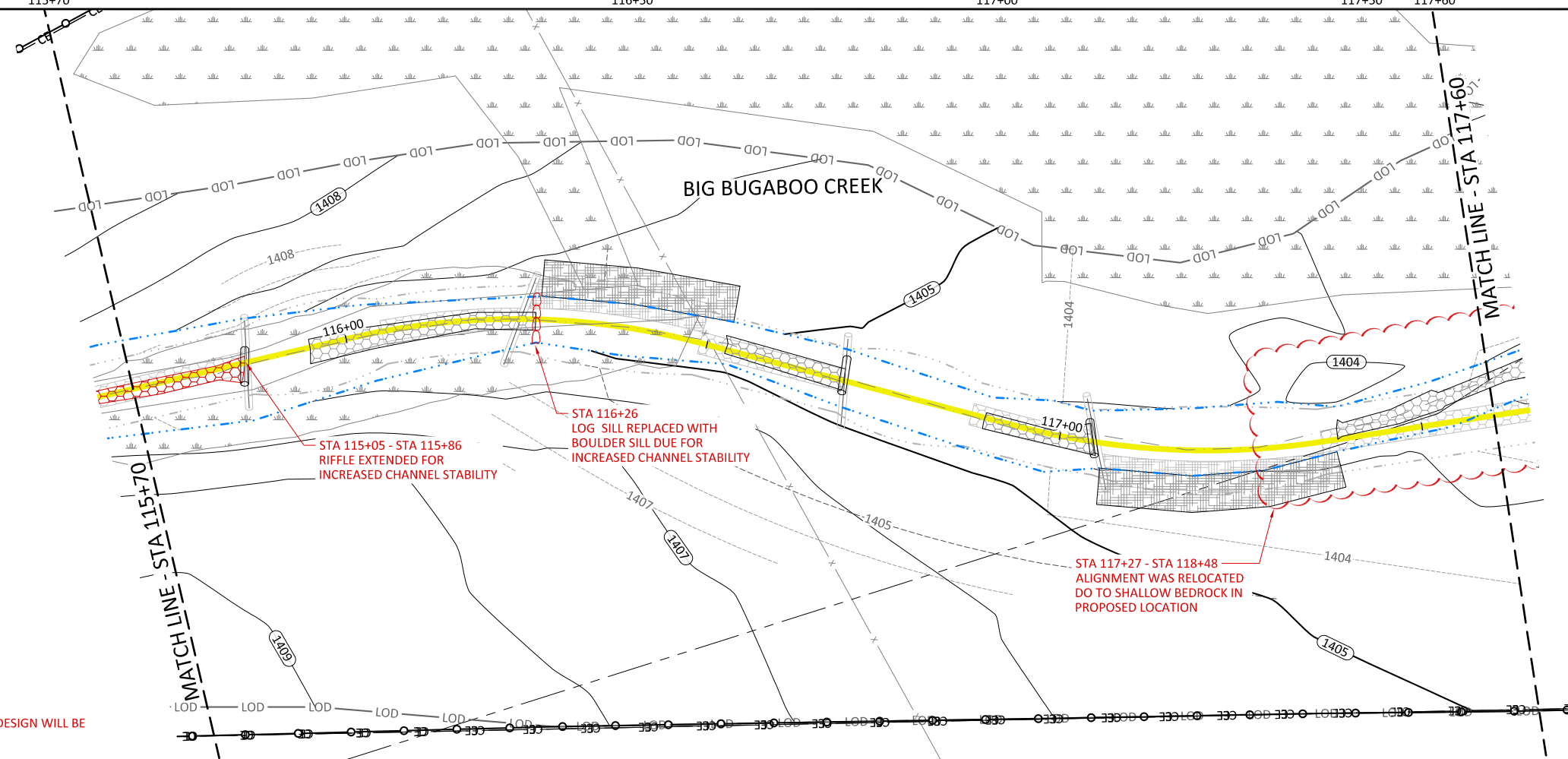
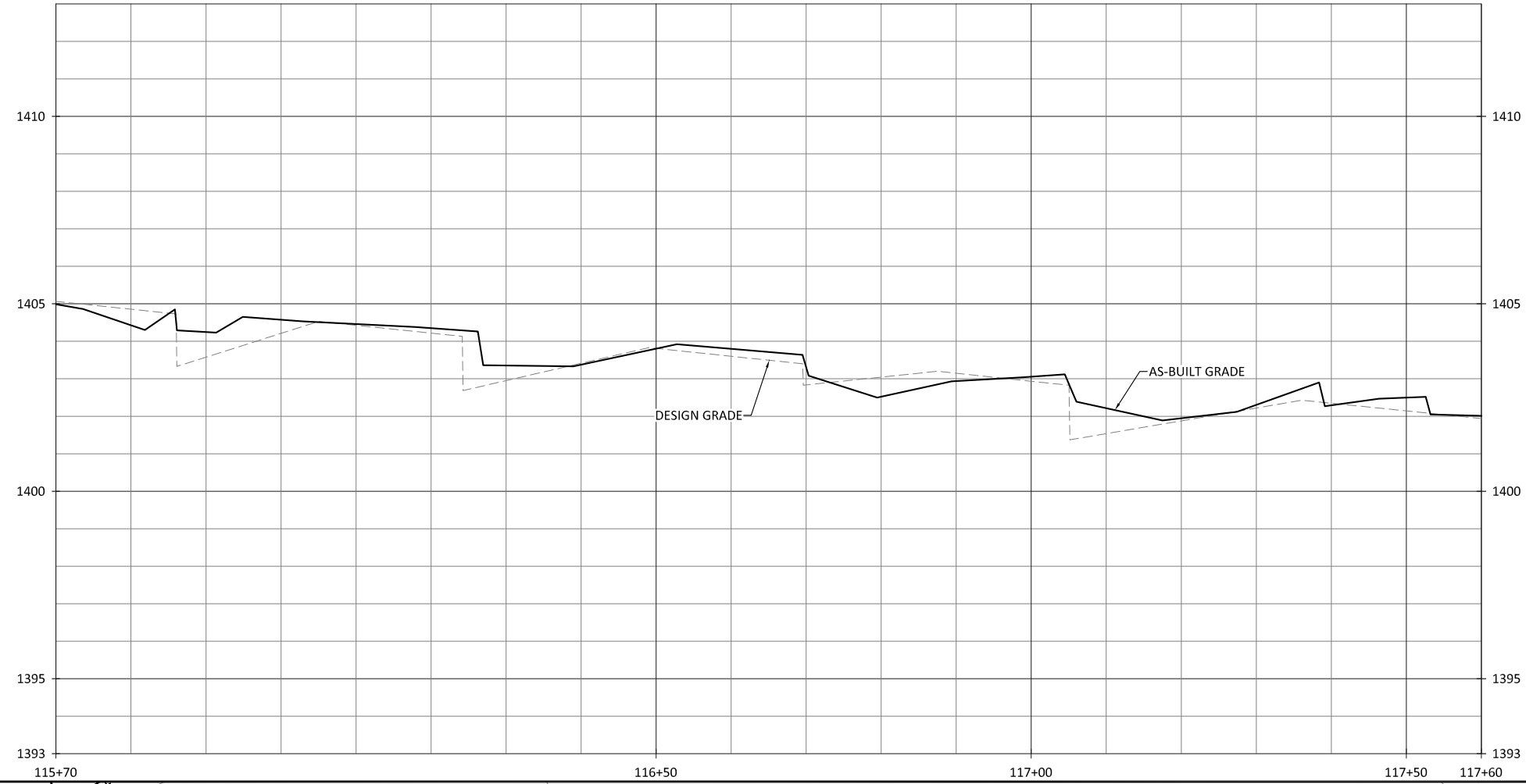
- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 114+24 - STA 114+49 & STA 114+68 - STA 114+84 RIFFLE ADDED FOR INCREASED CHANNEL STABILITY
 3. STA 114+49 - STA 114+66 & STA 114+85 - STA 115+05 BRUSH TOE ADDED FOR INCREASED CHANNEL STABILITY



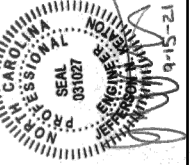
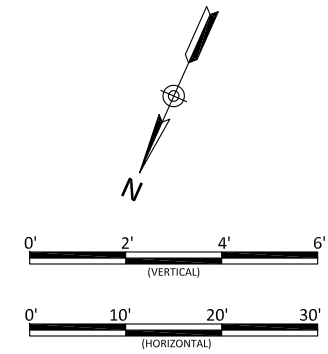
Bug Headwaters Record Drawings
Wilkes County, North Carolina

Big Bugaboo Creek
Stream Plan and Profile

Revisions:



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



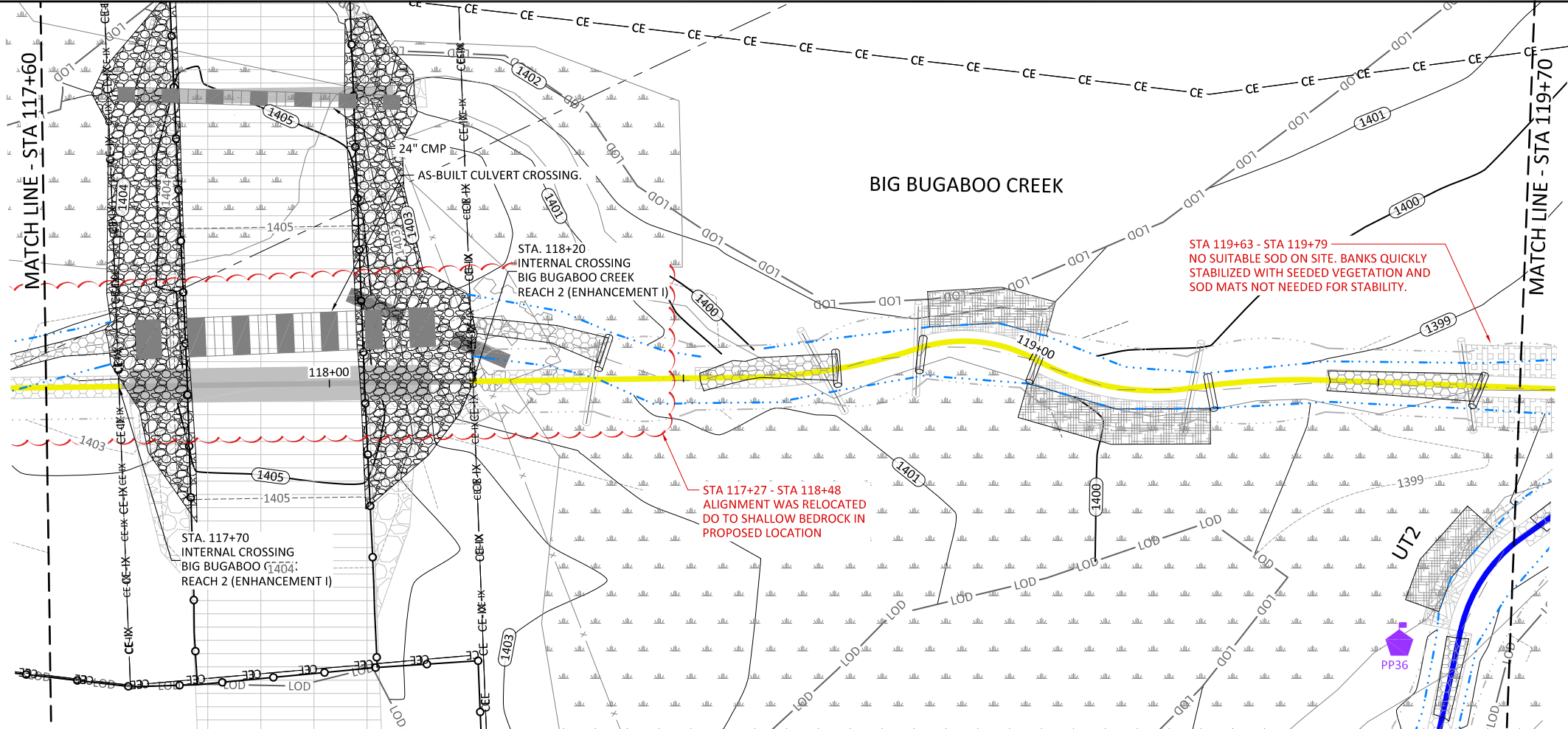
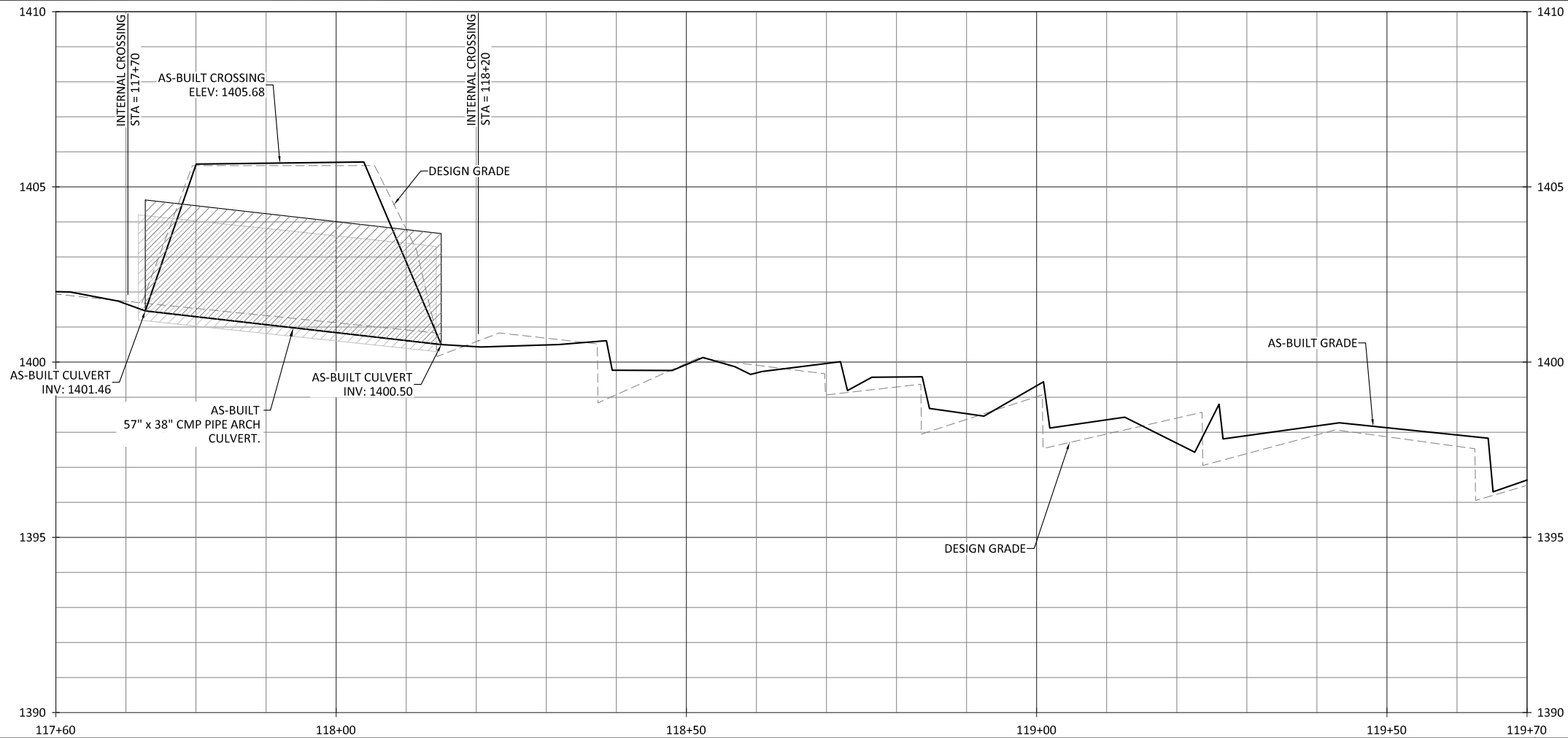
Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

Revisions:

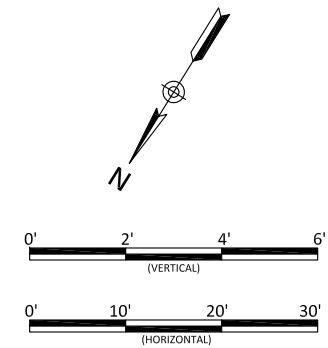
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.08

Sheet



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2 IS ADDRESSED ON SHEETS 1.23 THROUGH 1.33.

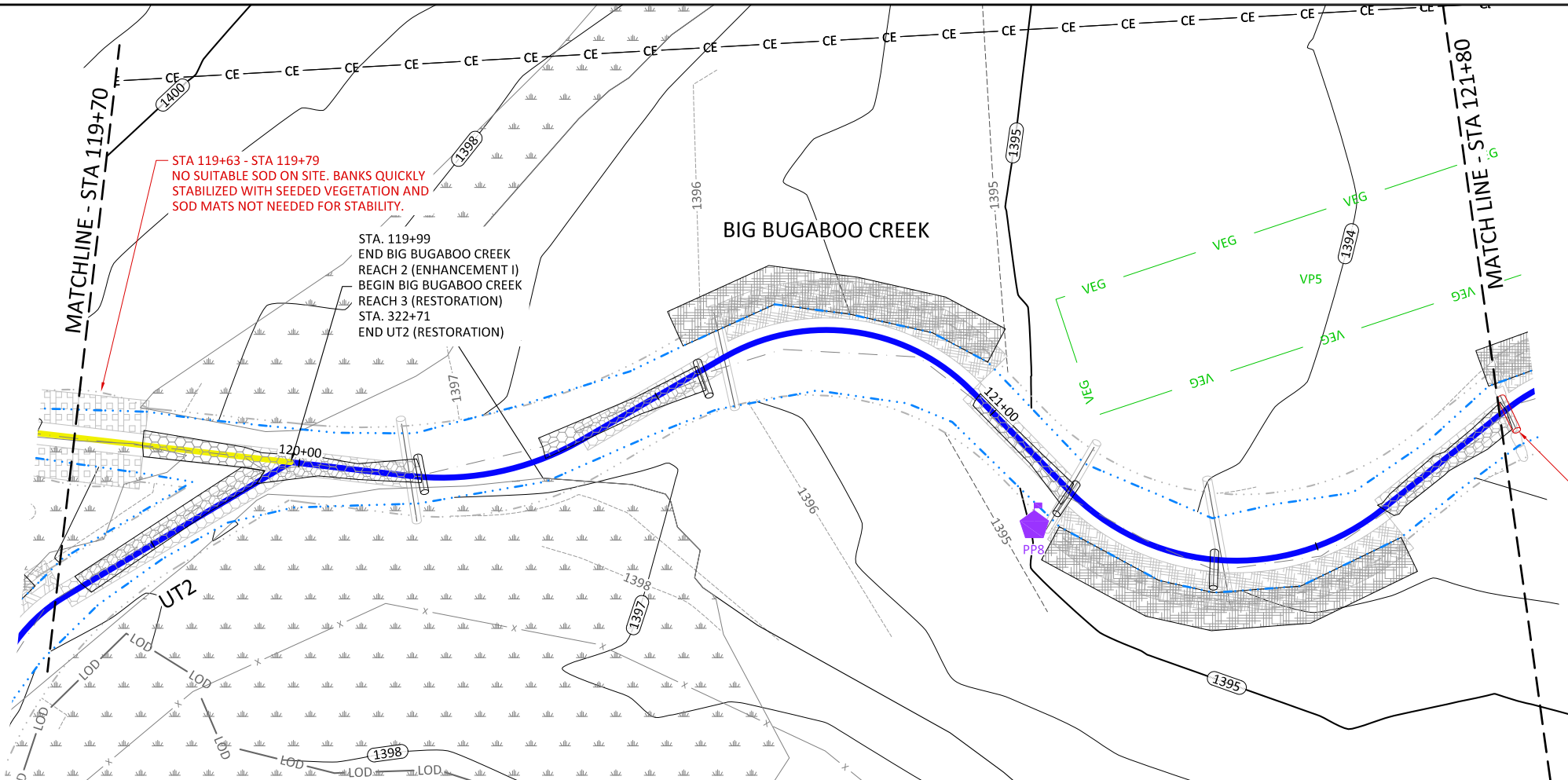
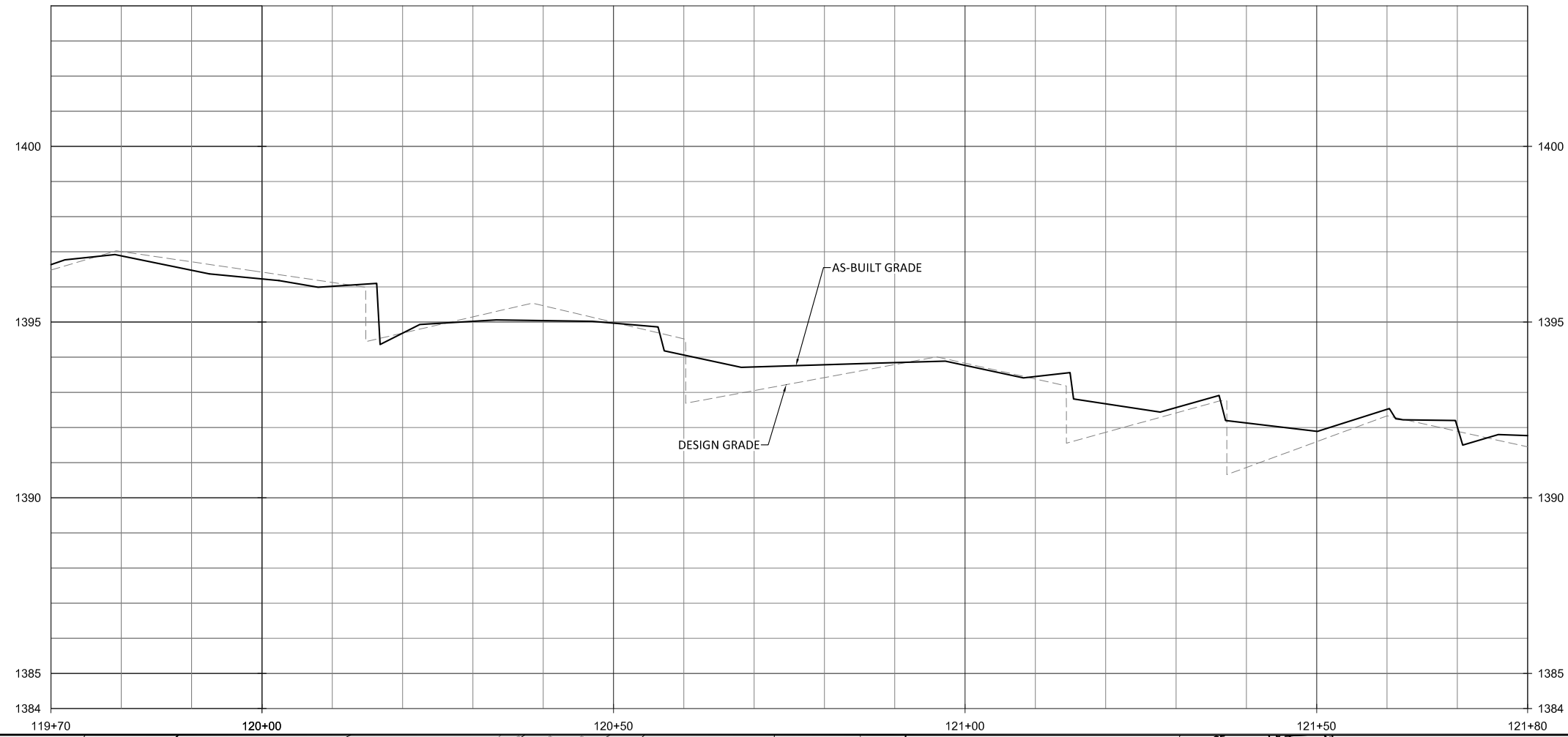


Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

Revisions:

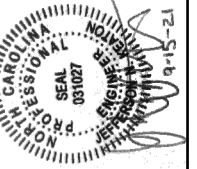
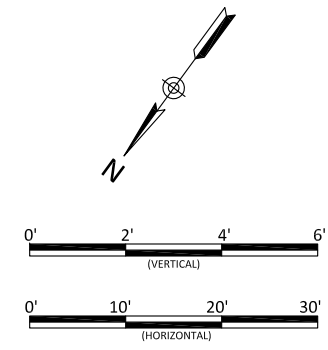
Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: ANA

1.09



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2 IS ADDRESSED ON SHEETS 1.23 THROUGH 1.33.

STA 121+81
BOULDER SILL REPLACED
WITH LOG SILL DUE TO NO
NATIVE BOULDERS ON SITE

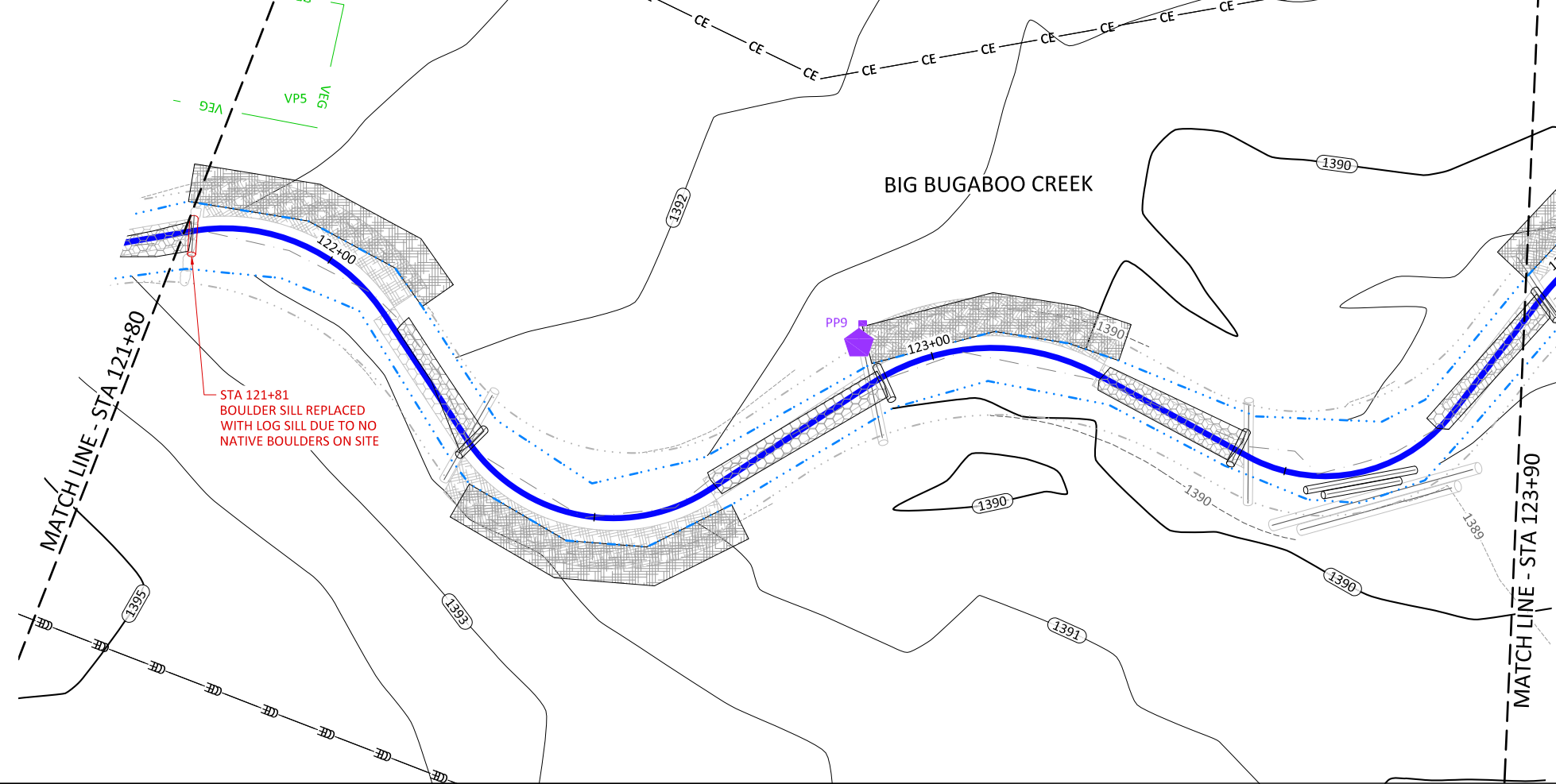
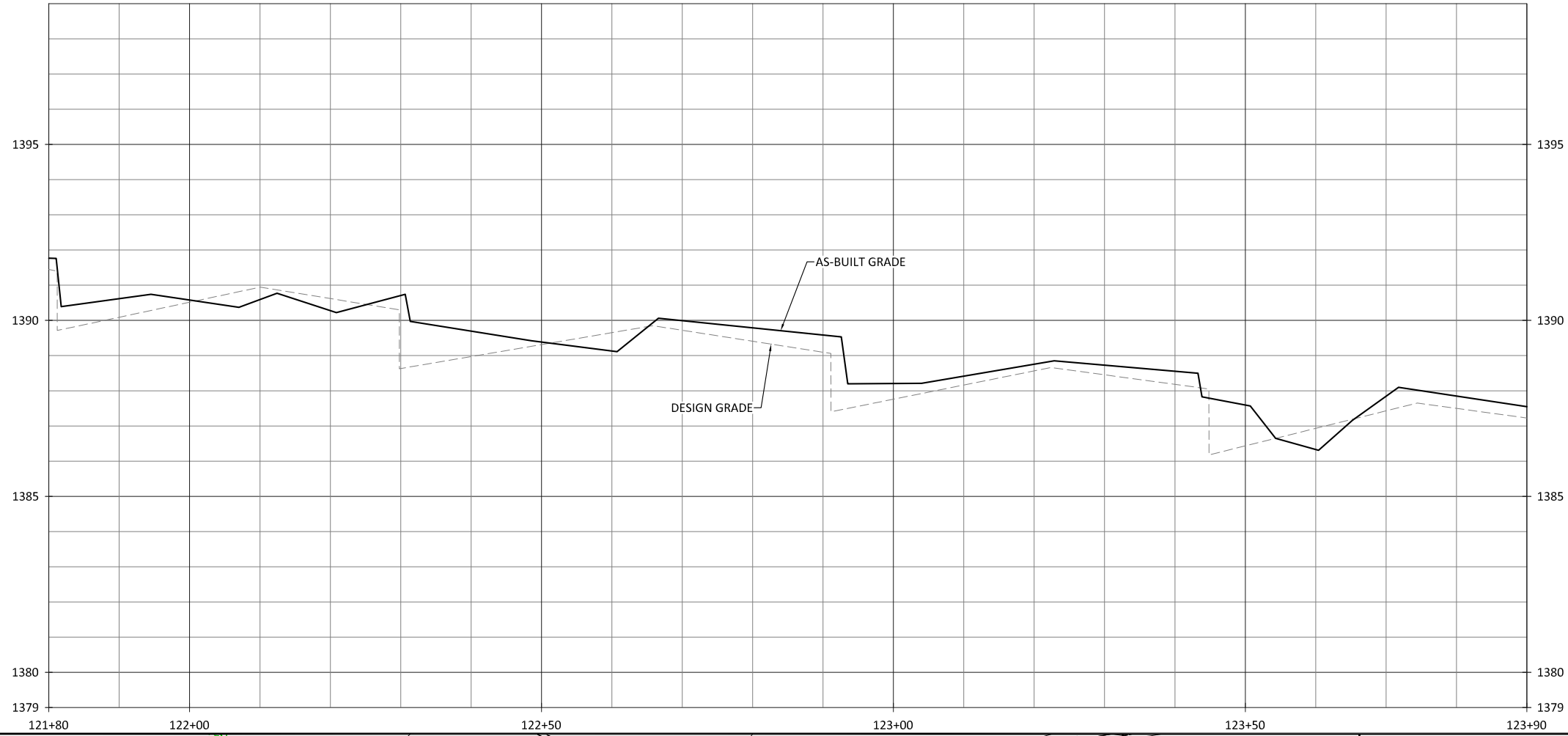


Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
Stream Plan and Profile

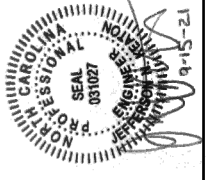
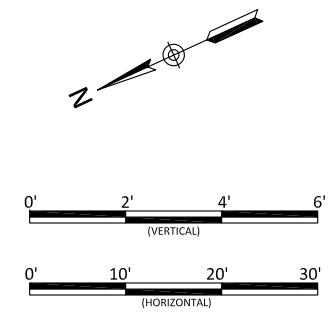
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.10



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



Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

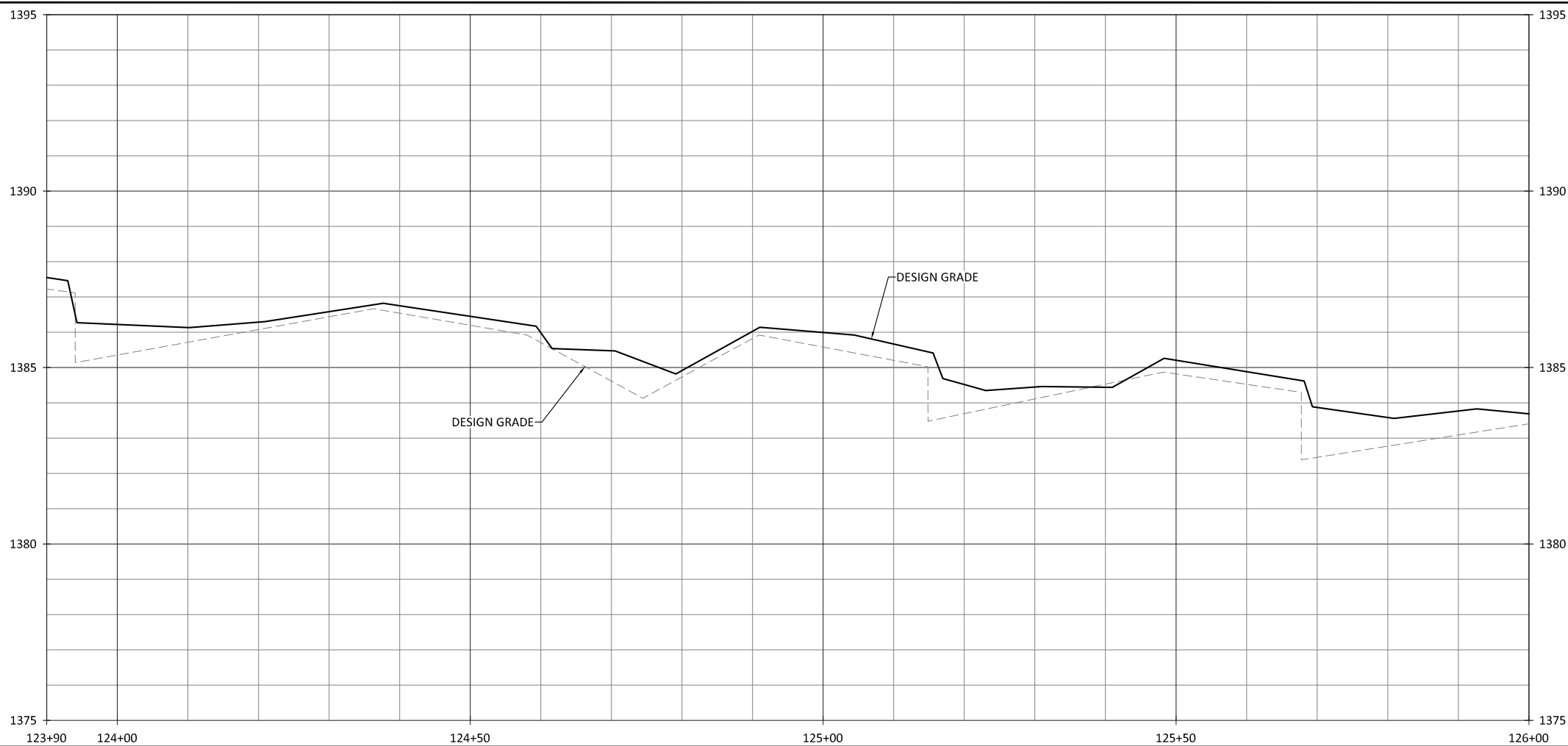
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Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

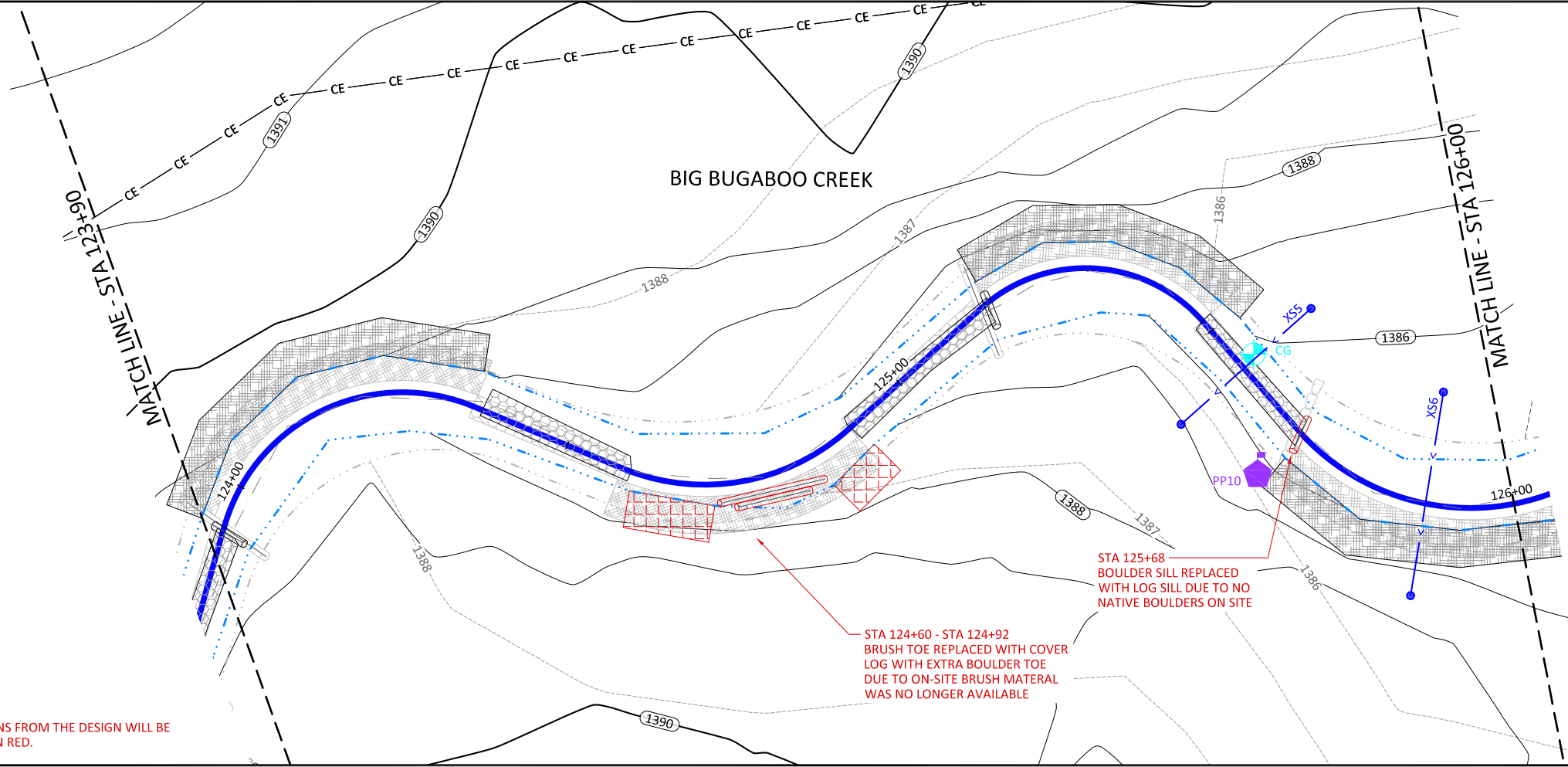
1.11

Sheet

October 12, 2021



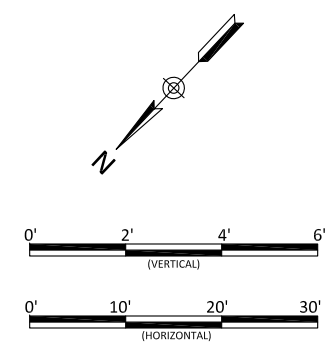
X:\Shared Projects\005-02176 Bug Headwaters Monitoring\2021 Plans\02176-AB Big Bugaboo Creek.dwg



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

STA 124+60 - STA 124+92
 BRUSH TOE REPLACED WITH COVER LOG WITH EXTRA BOULDER TOE DUE TO ON-SITE BRUSH MATERIAL WAS NO LONGER AVAILABLE

STA 125+68
 BOULDER SILL REPLACED WITH LOG SILL DUE TO NO NATIVE BOULDERS ON SITE



Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

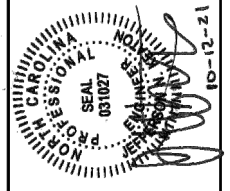
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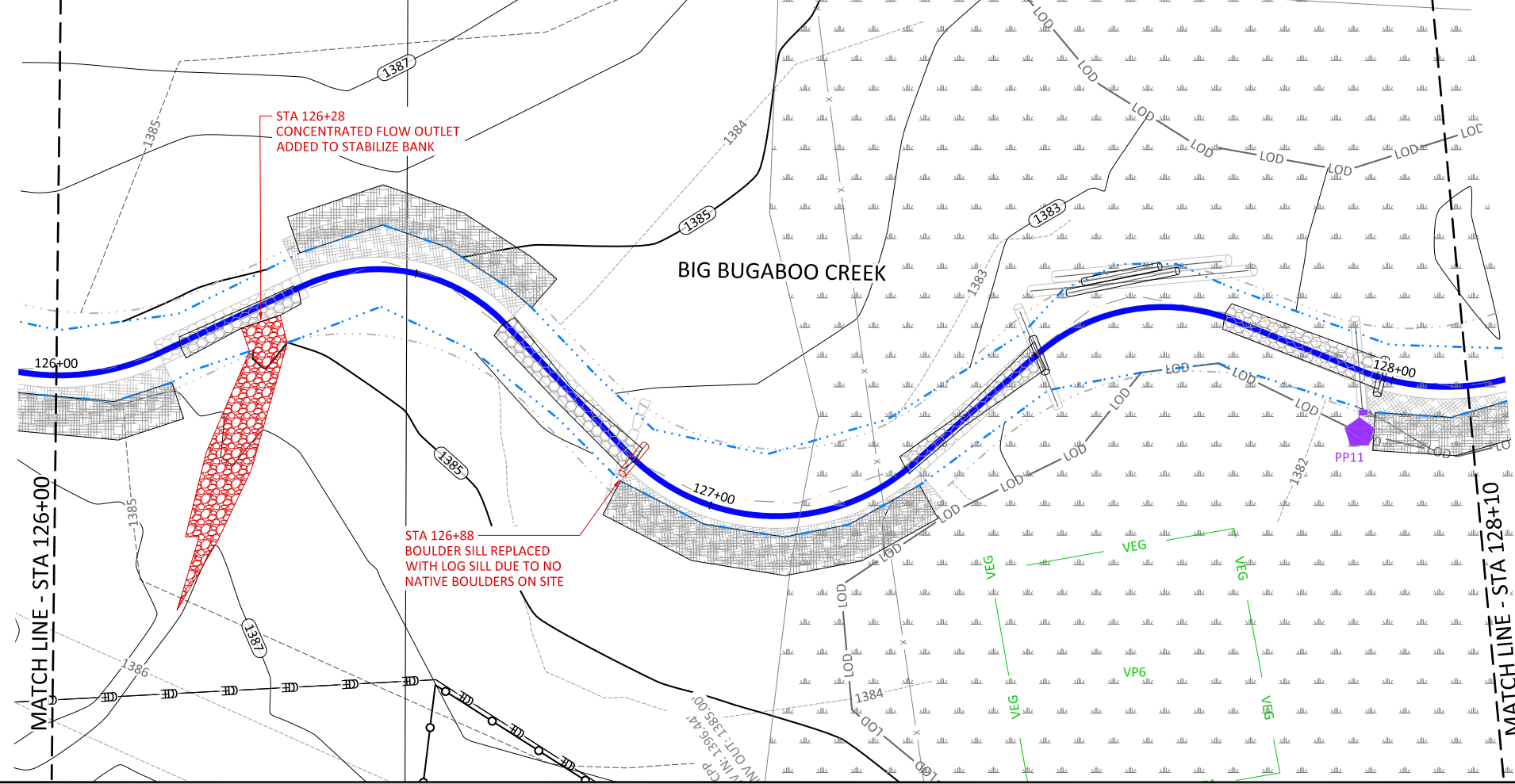
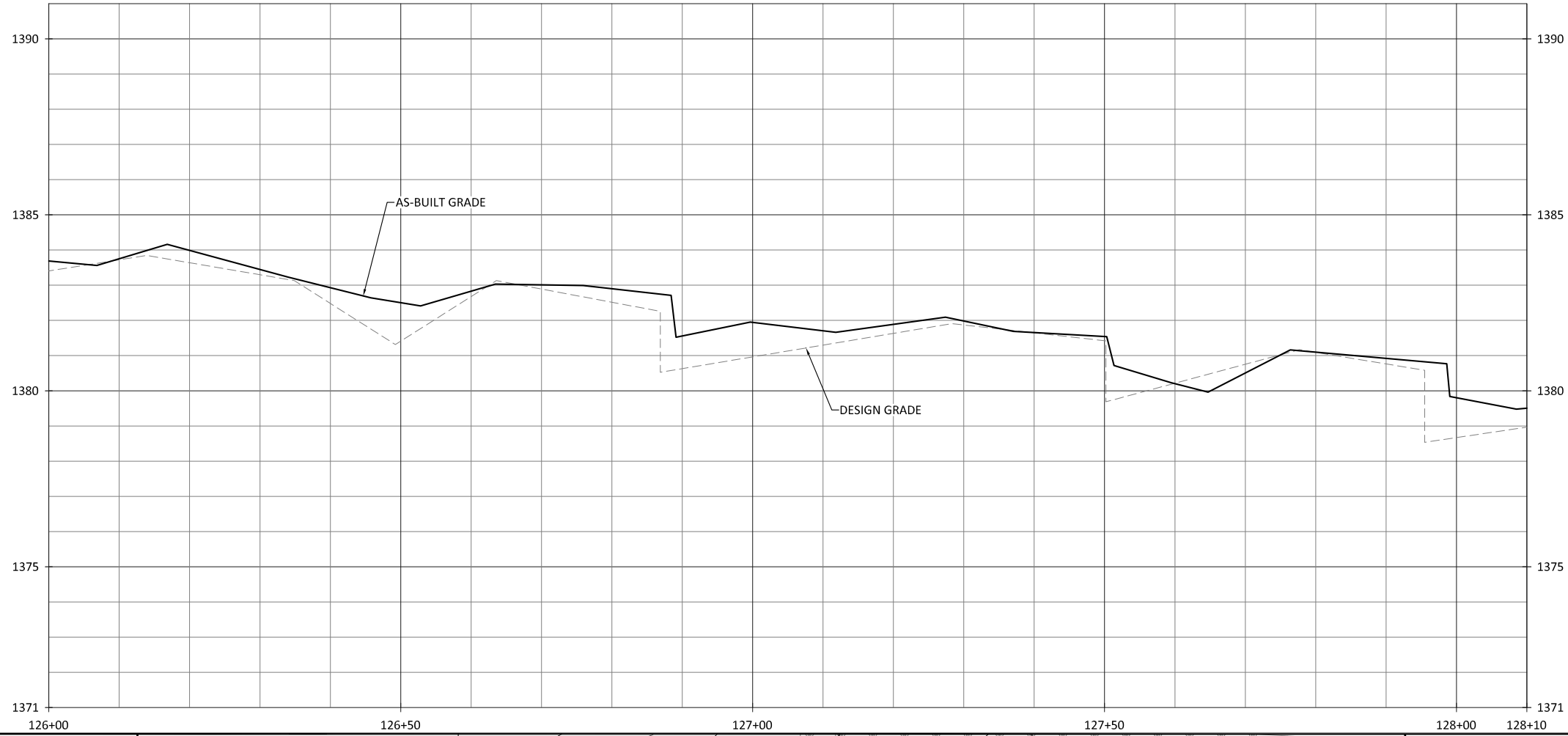
Revisions:
 10/2021 - Updated Notes

1.12

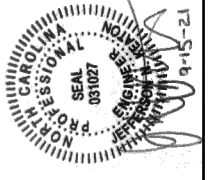
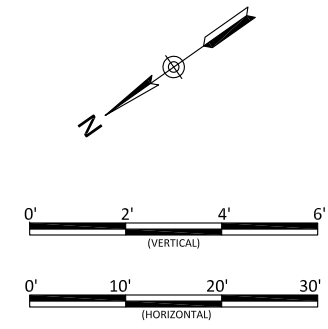
Sheet

WILDLANDS
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 312 W. Millbrook Rd. Suite 225
 Raleigh, NC 27609
 Tel: 919.851.9886
 License No. F-0831





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

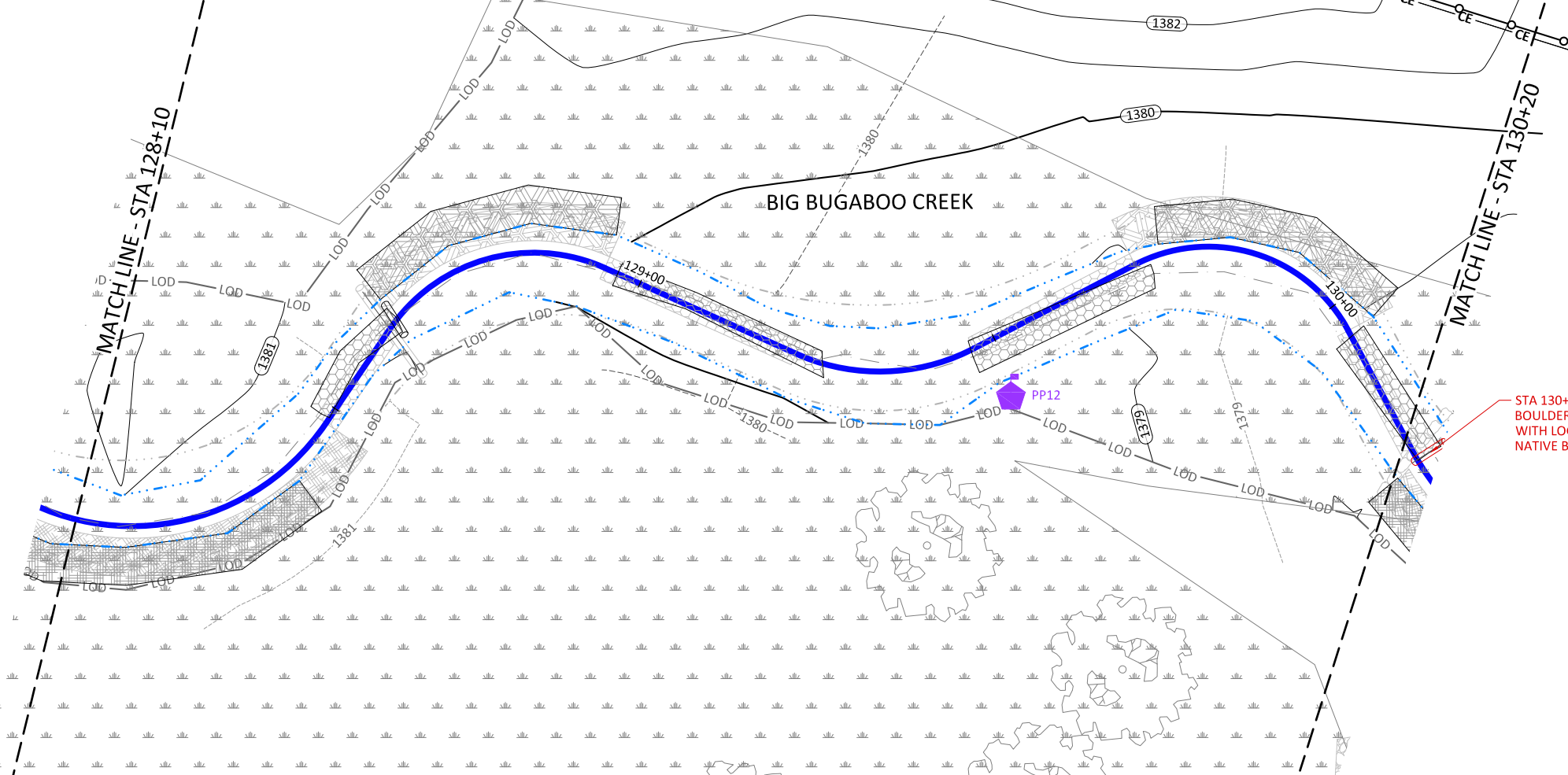
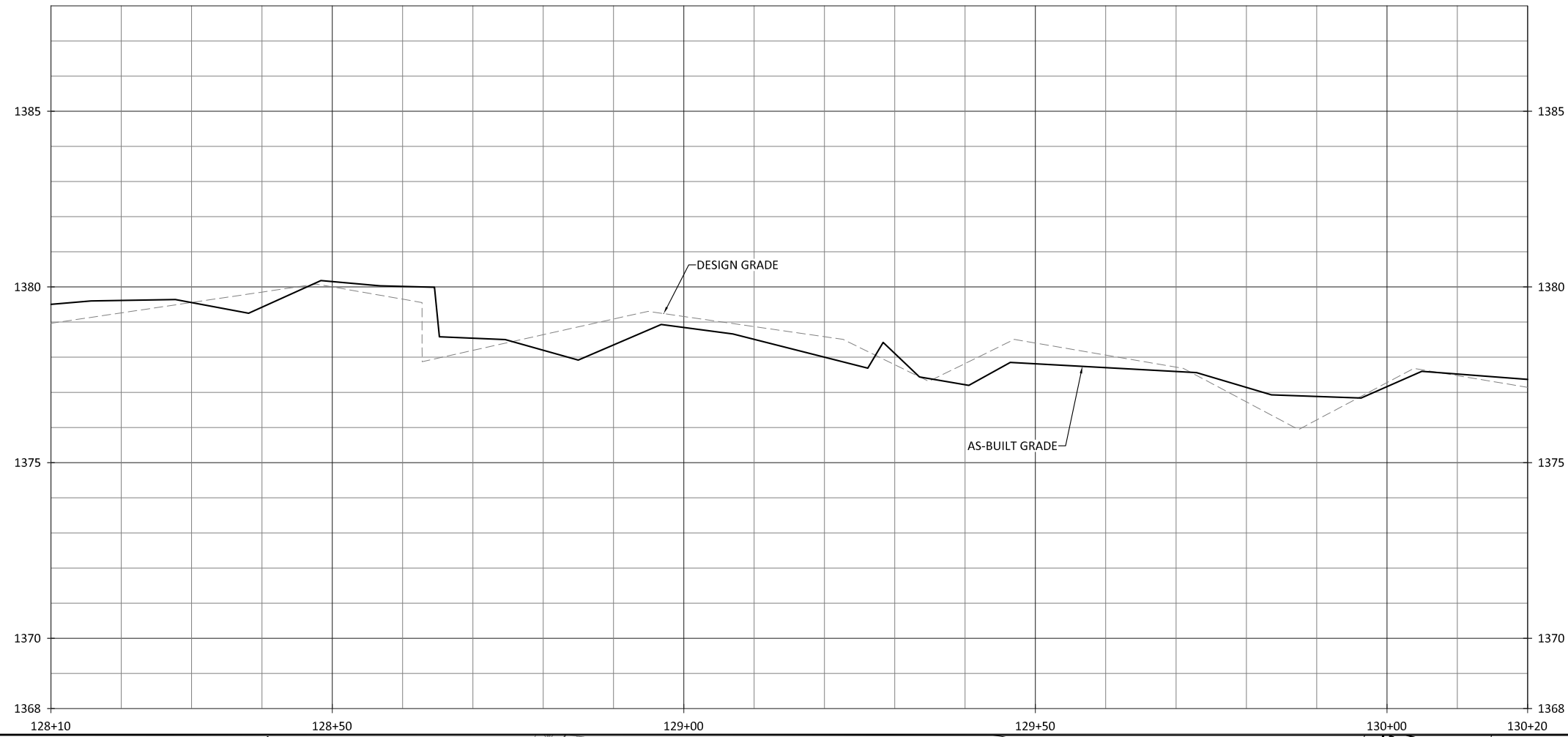


Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
Stream Plan and Profile

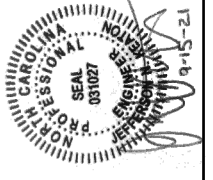
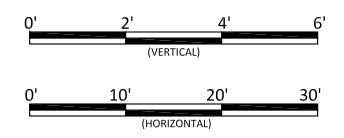
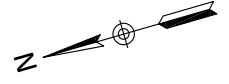
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAW
Checked By: ANA

1.13

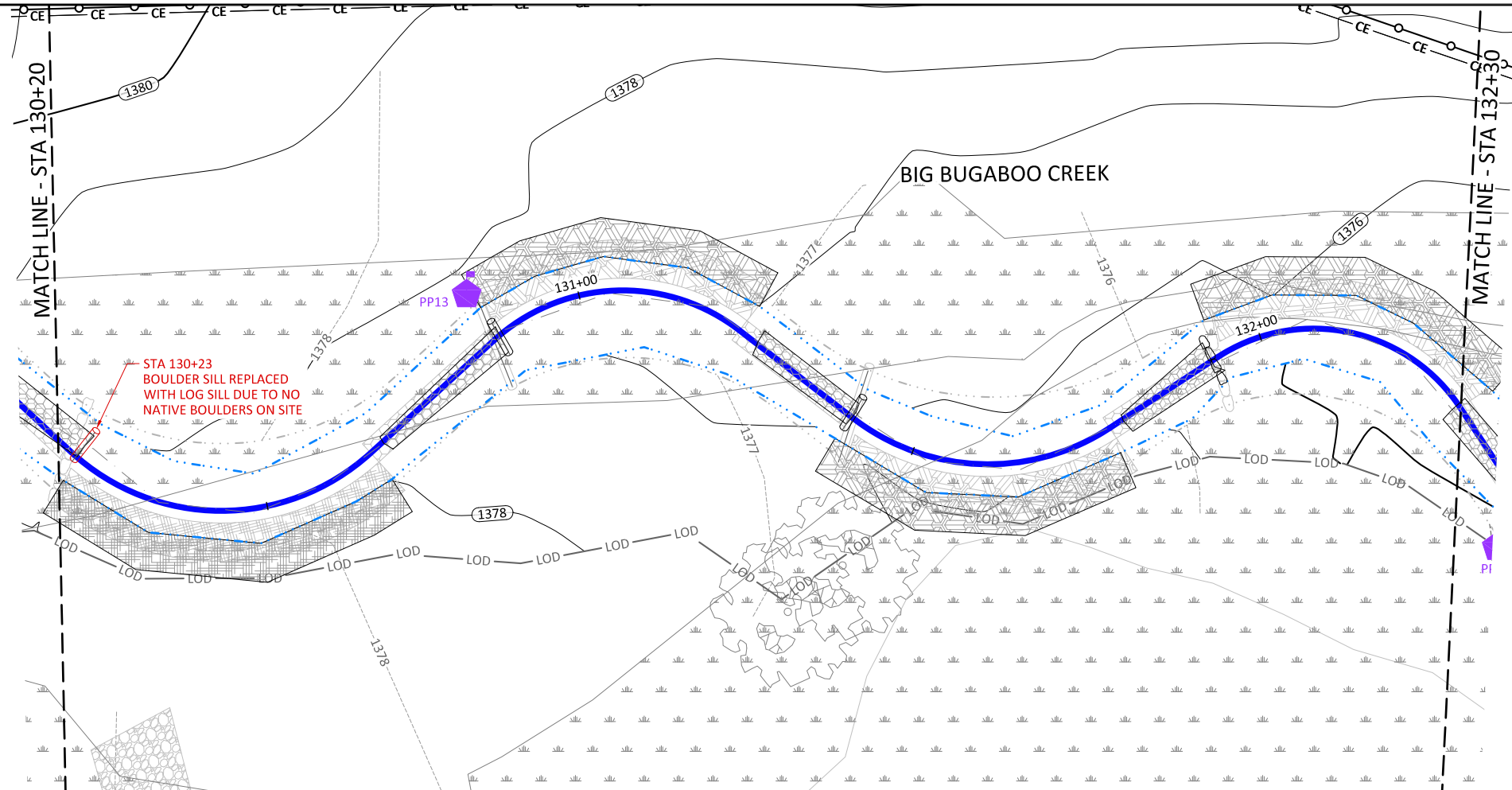
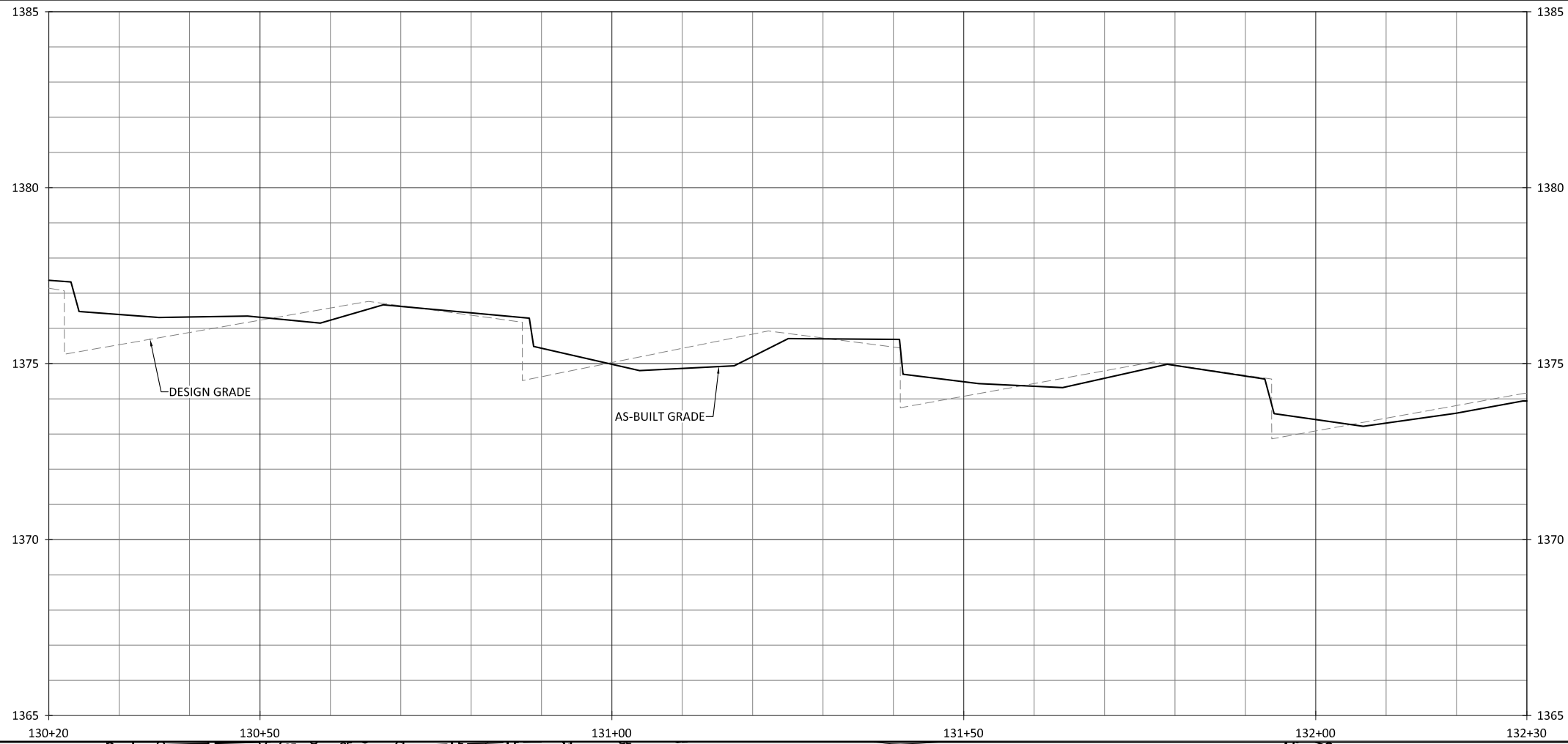


NOTES:
 1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.

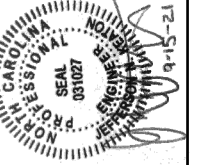
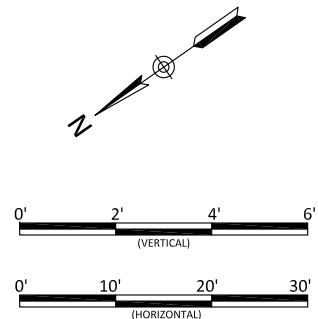


Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

Revisions:



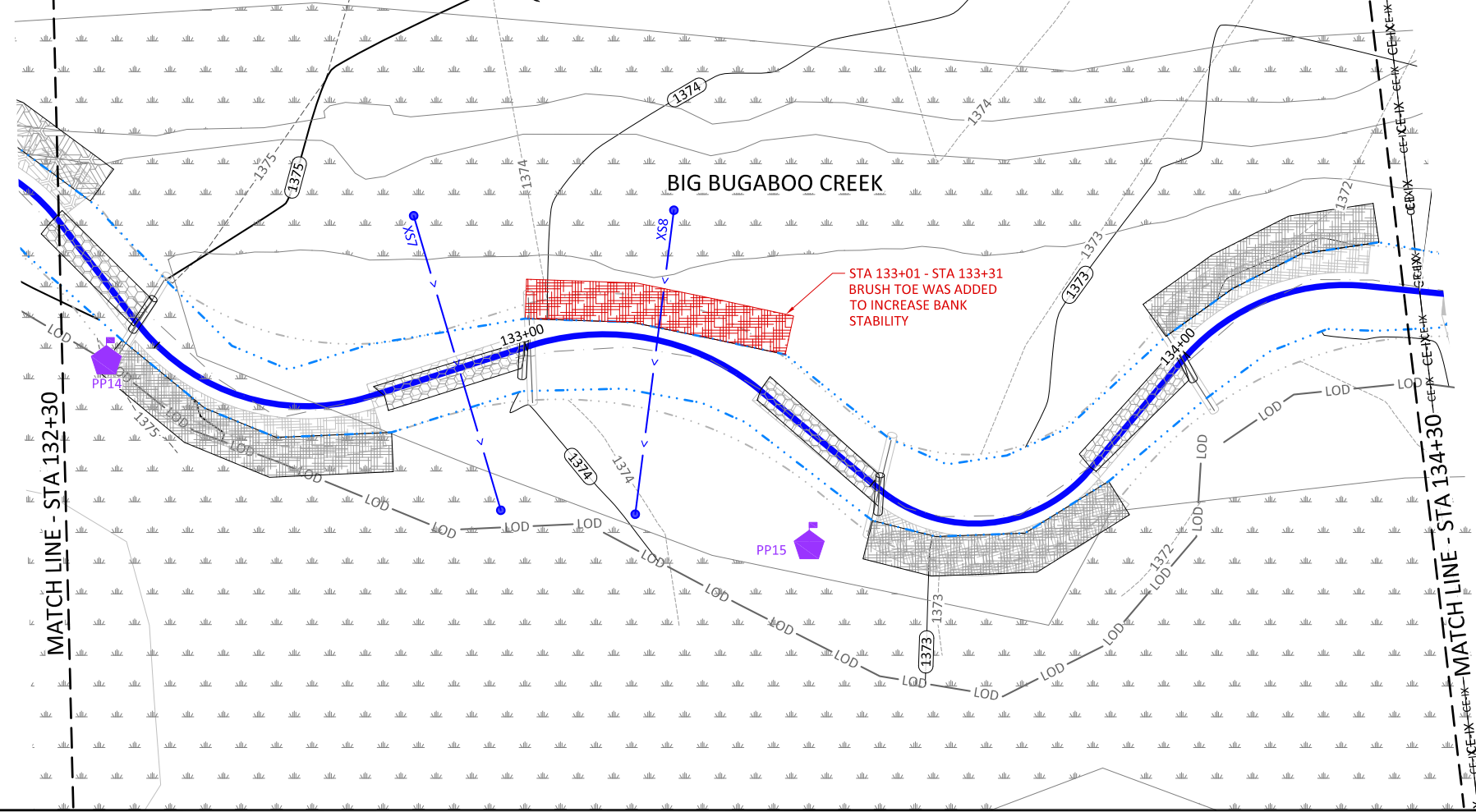
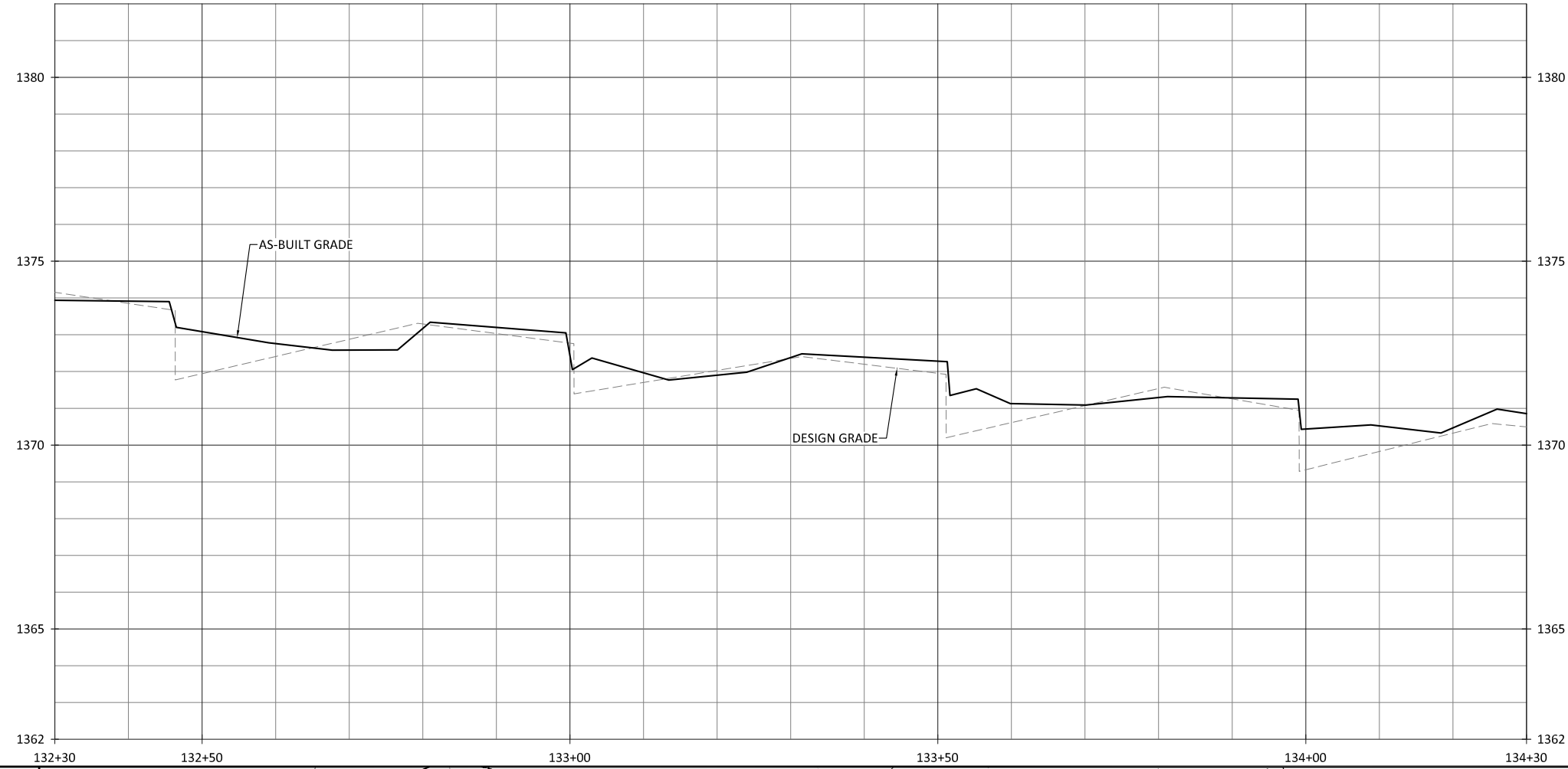
NOTES:
 1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.



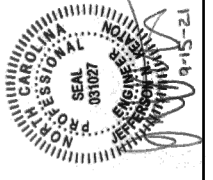
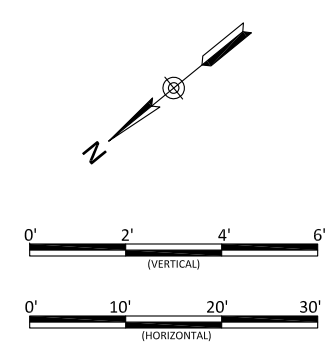
Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA



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

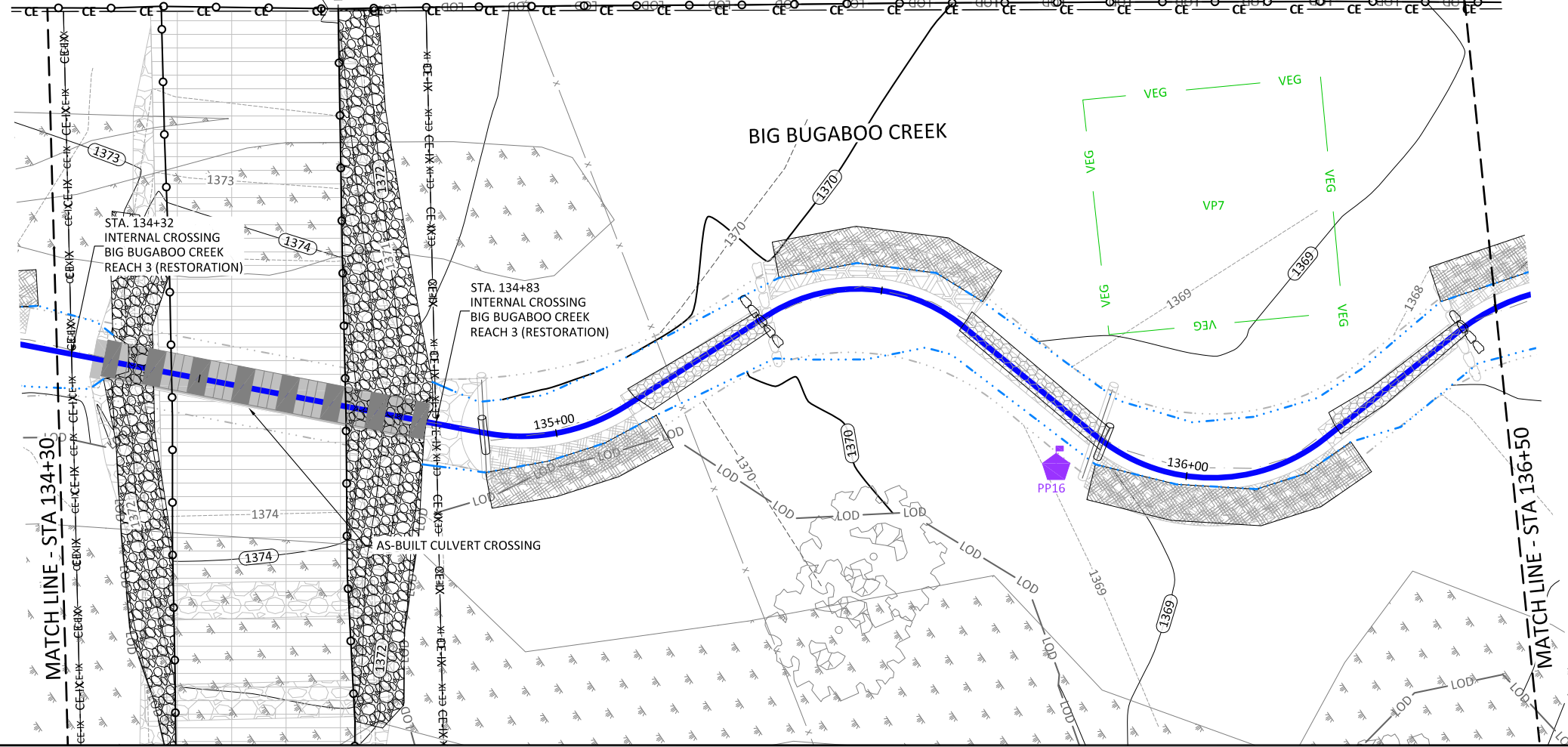
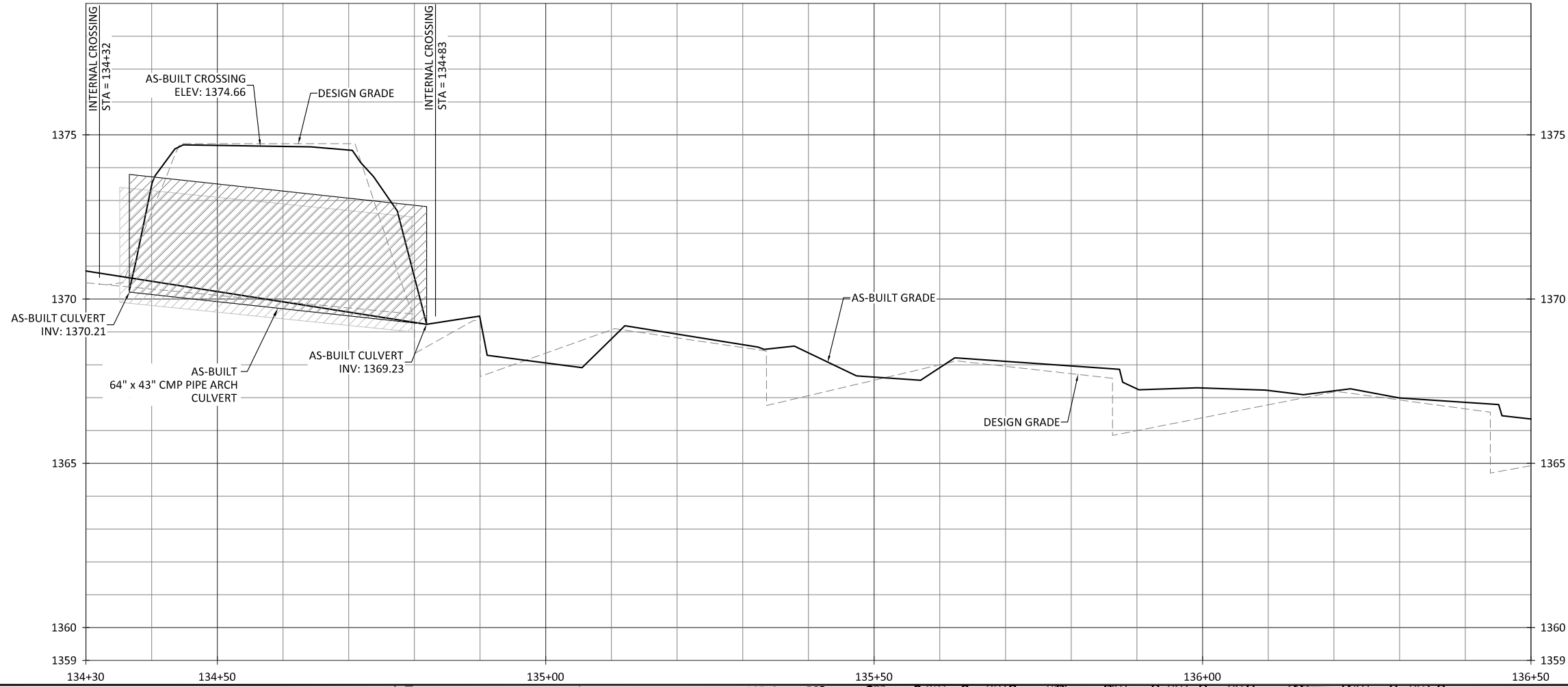


Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
Stream Plan and Profile

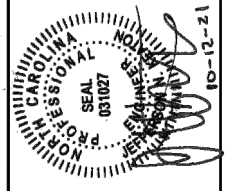
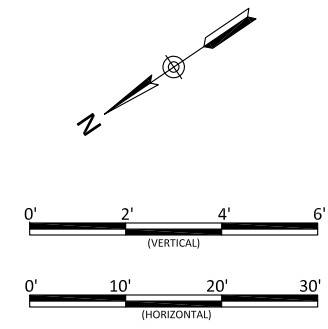
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

1.16



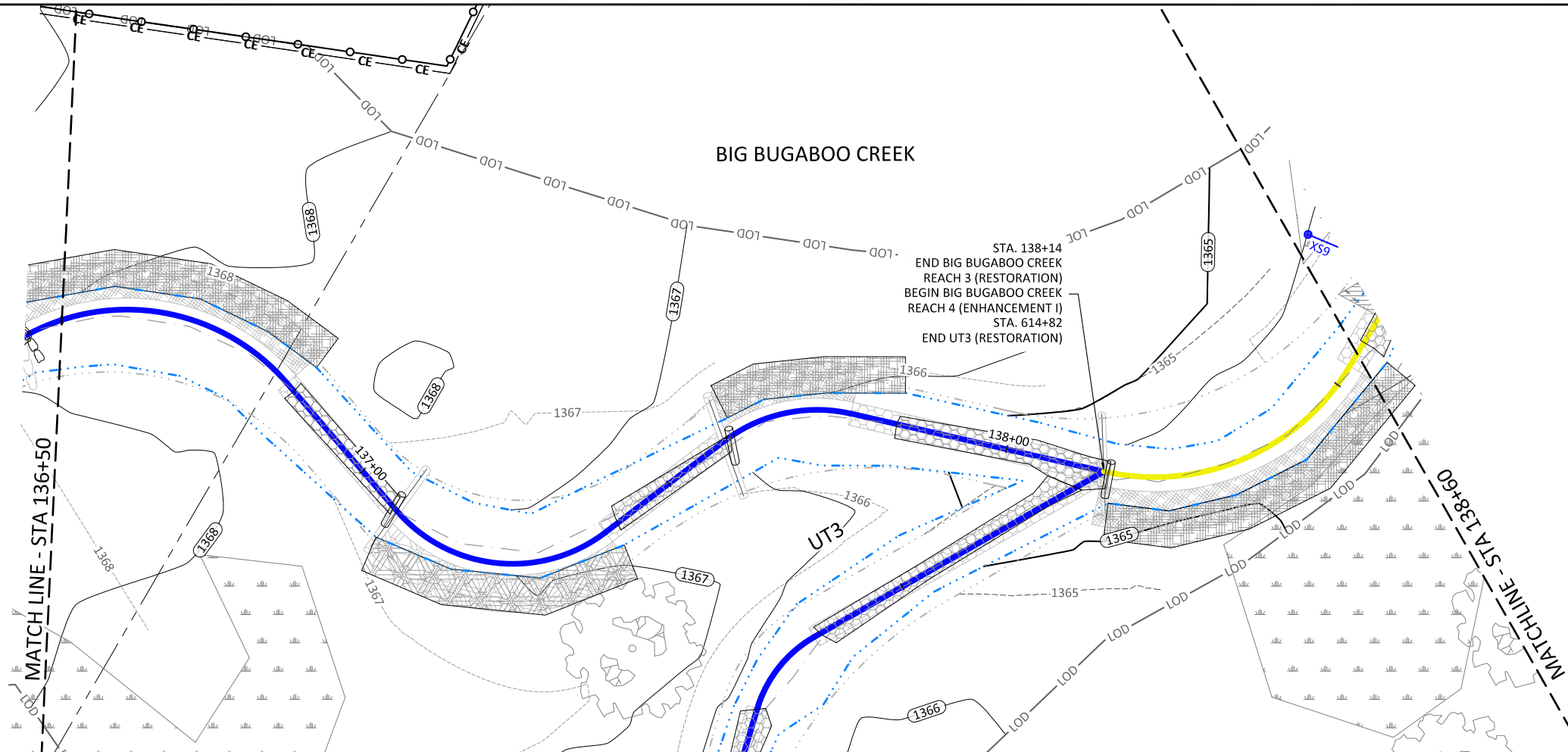
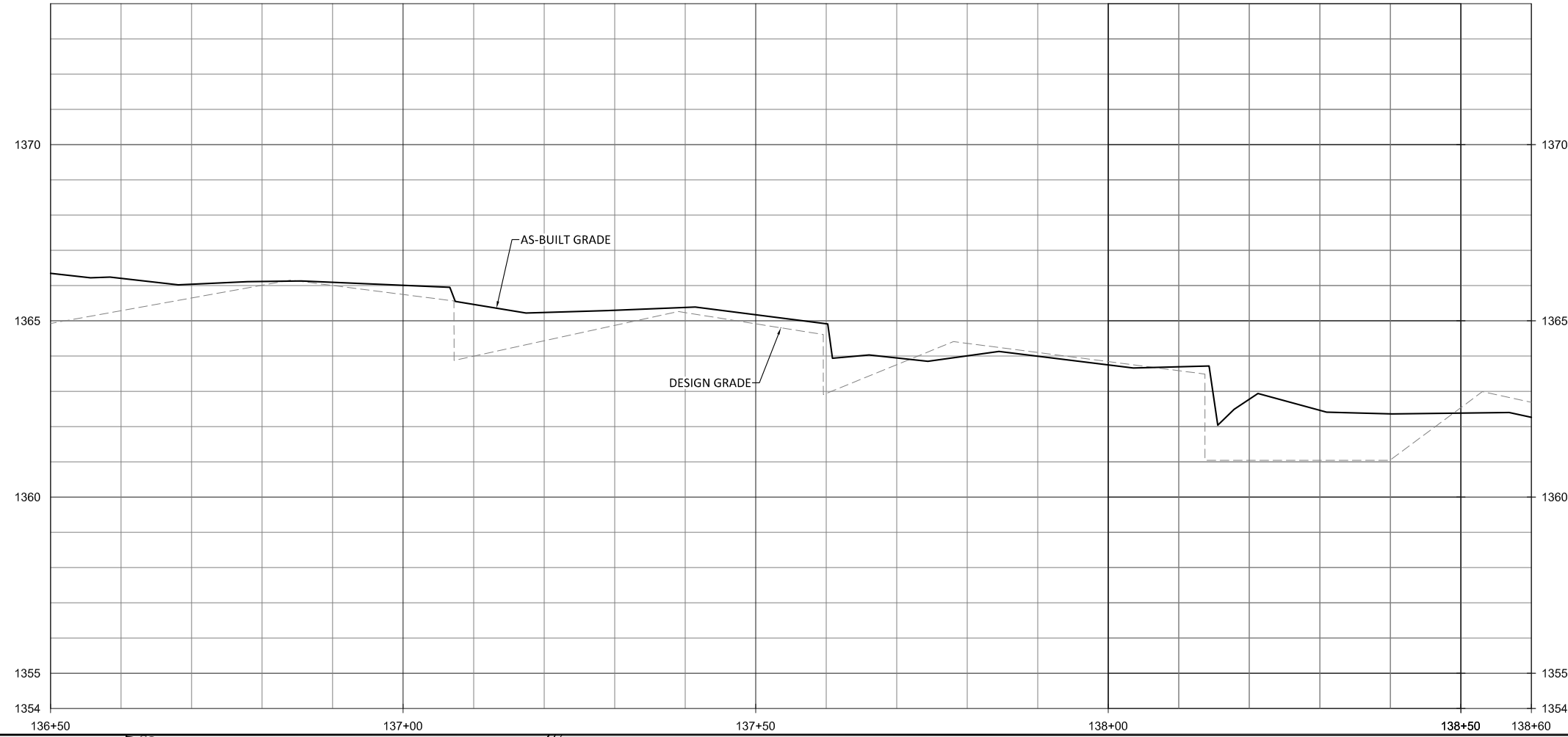
NOTES:
 1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.



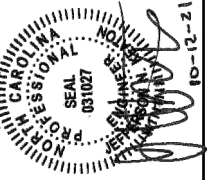
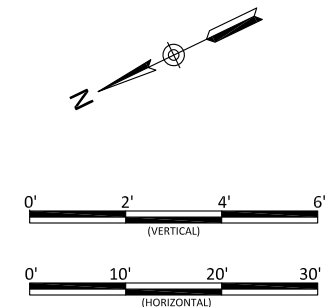
Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 Big Bugaboo Creek
 Stream Plan and Profile

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA
Revisions:	10.2021 - Removed Demo Items

1.17



- NOTES:**
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT3 IS ADDRESSED ON SHEETS 1.38 THROUGH 1.44.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

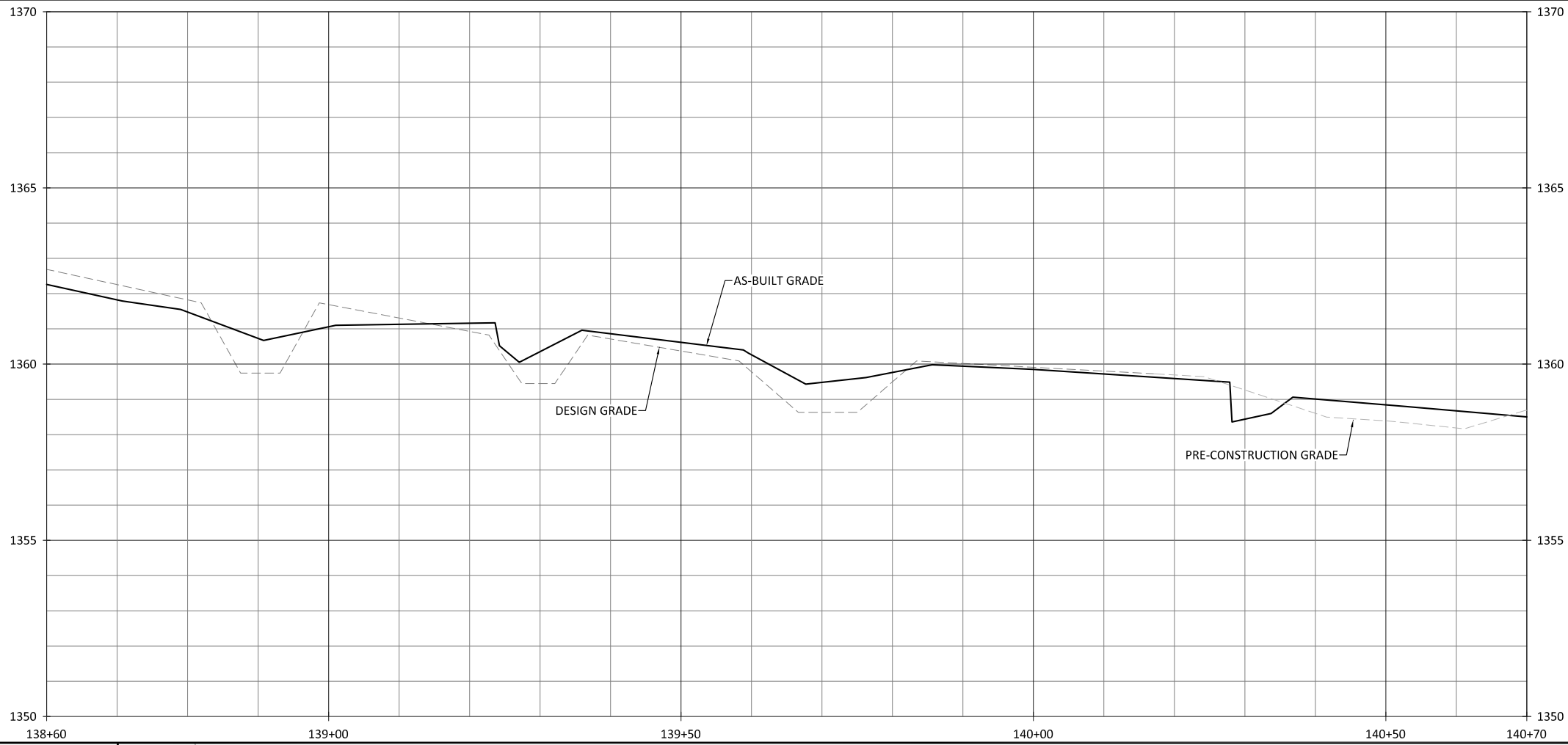
Big Bugaboo Creek
Stream Plan and Profile

Revisions:

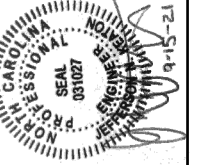
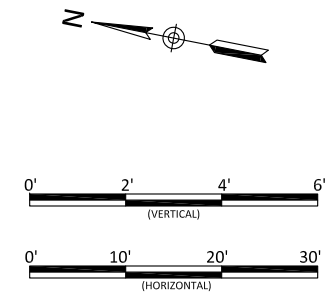
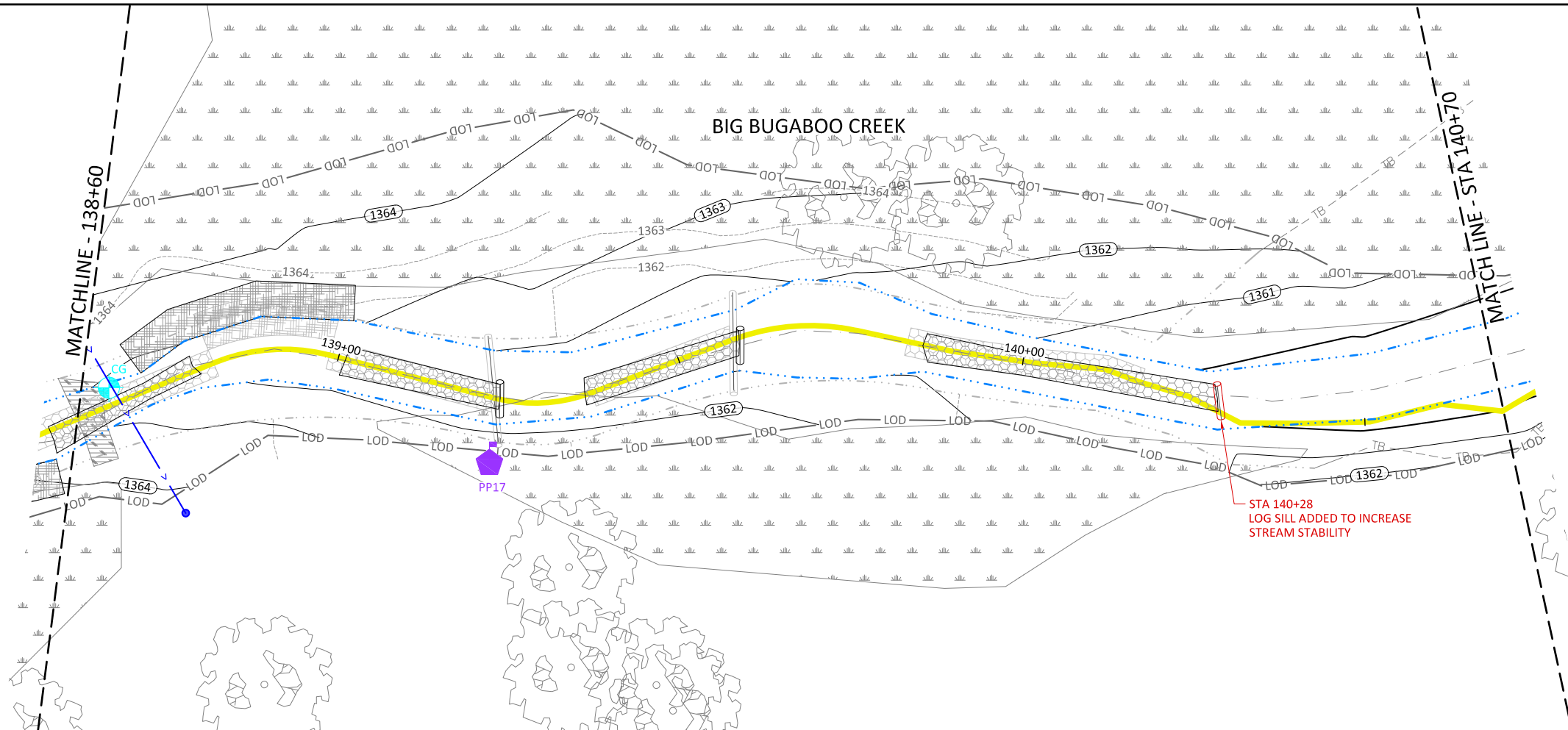
10.2021 - Removed Demo Items

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.18



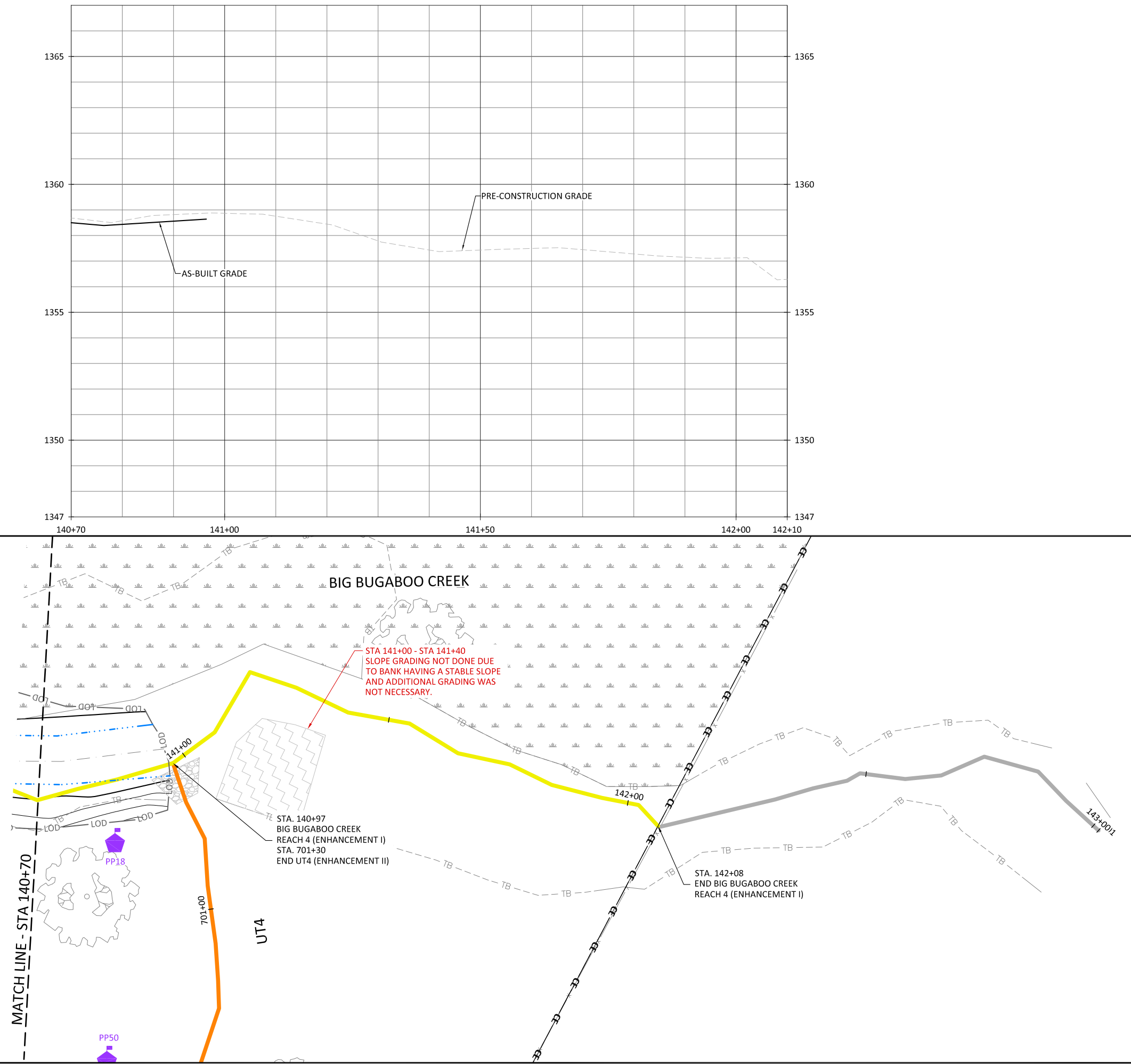
NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.



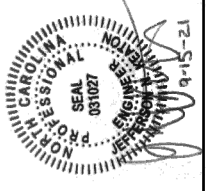
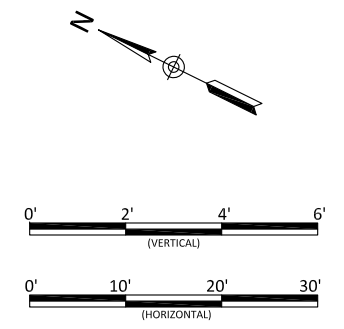
Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
Stream Plan and Profile

Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAW
Checked By: ANA



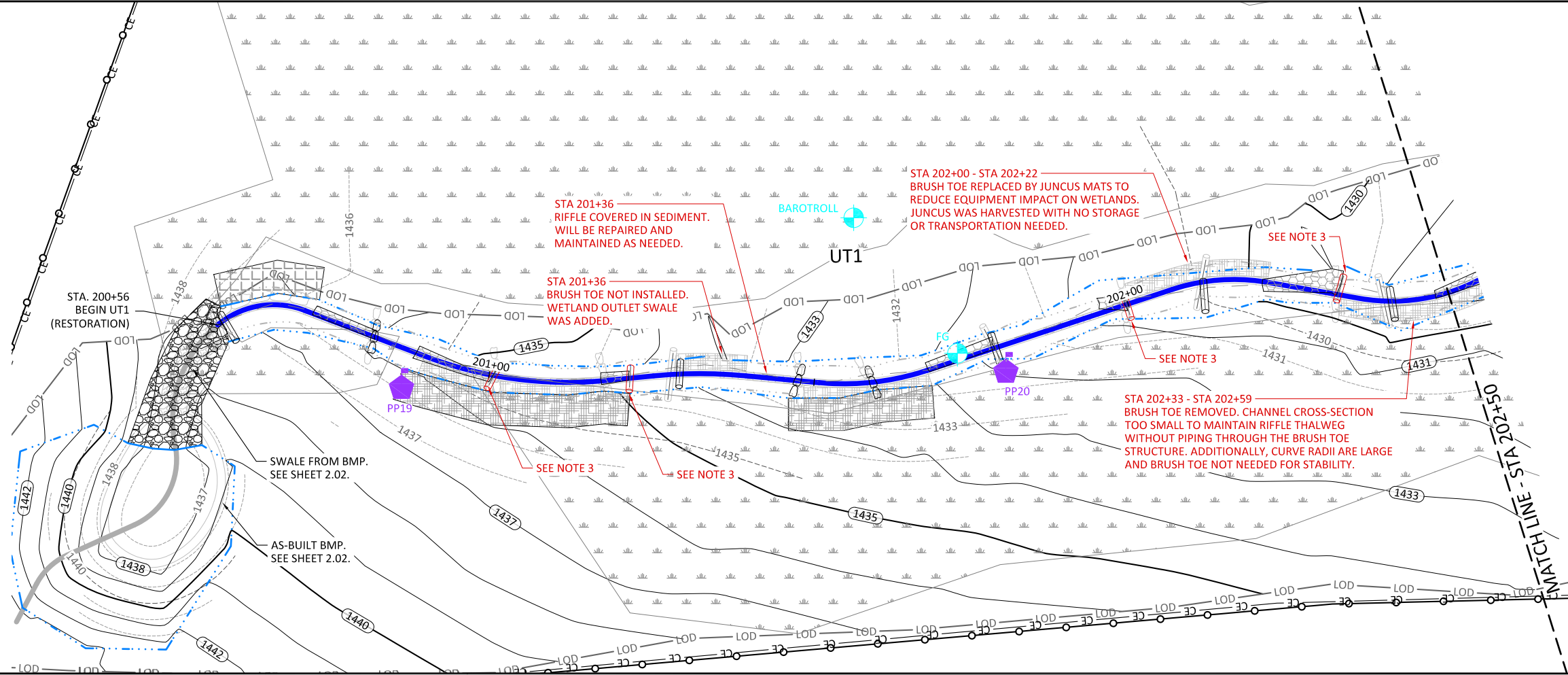
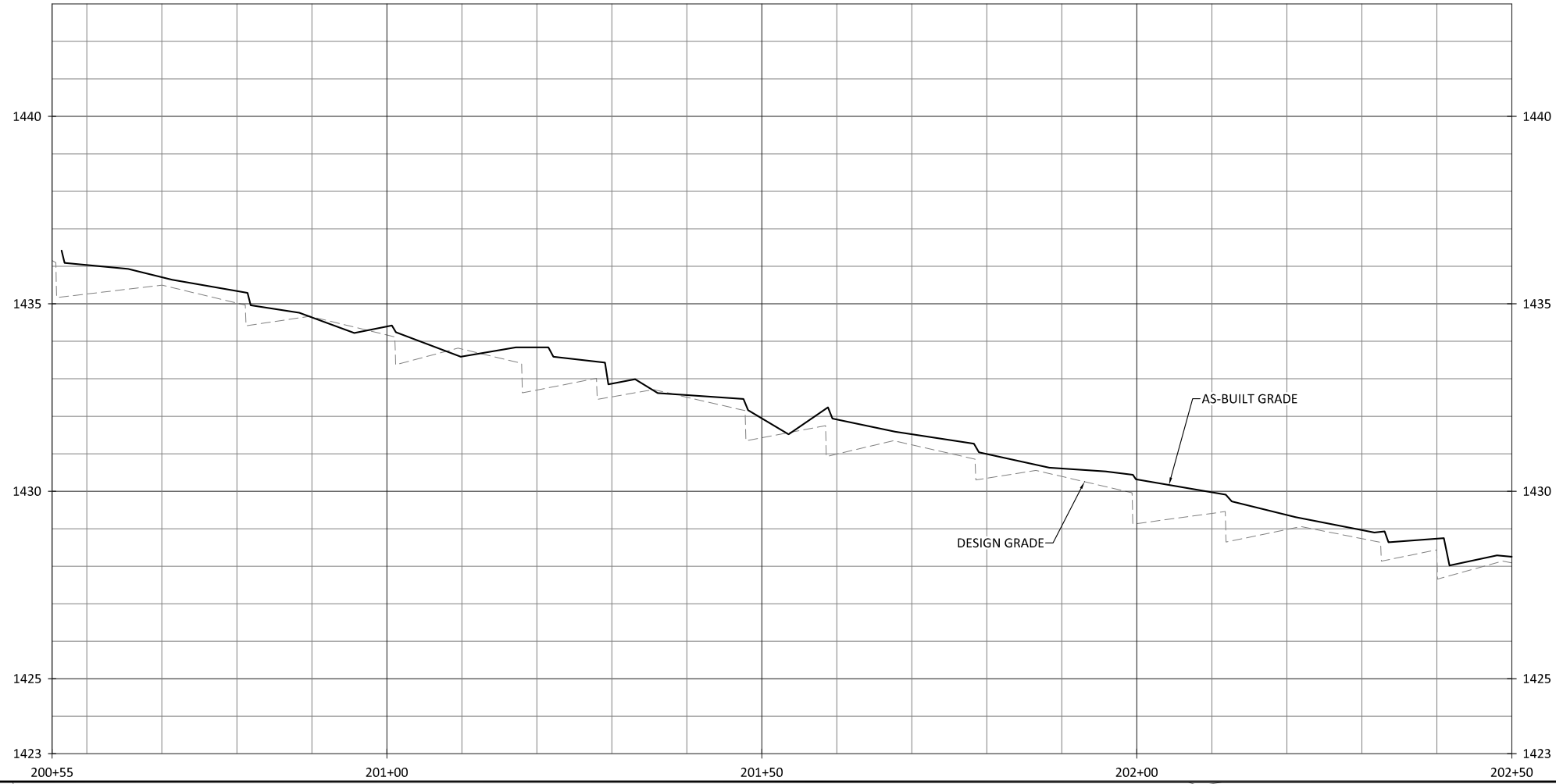
- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT4 IS ADDRESSED ON SHEET 1.45.



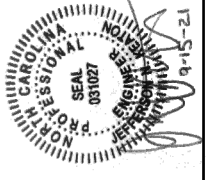
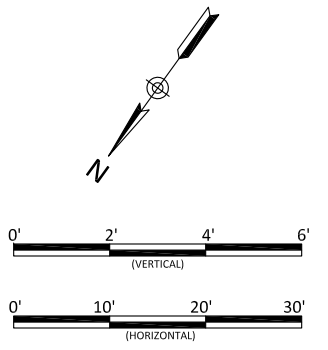
Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek
Stream Plan and Profile

Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA



- NOTES:**
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR BMP IS ADDRESSED ON SHEET 2.02.
 3. STA 201+01, 201+37, STA 202+00 & STA 202+33: BOULDER SILL REPLACED WITH LOG SILL DUE TO NO NATIVE BOULDERS ON SITE.



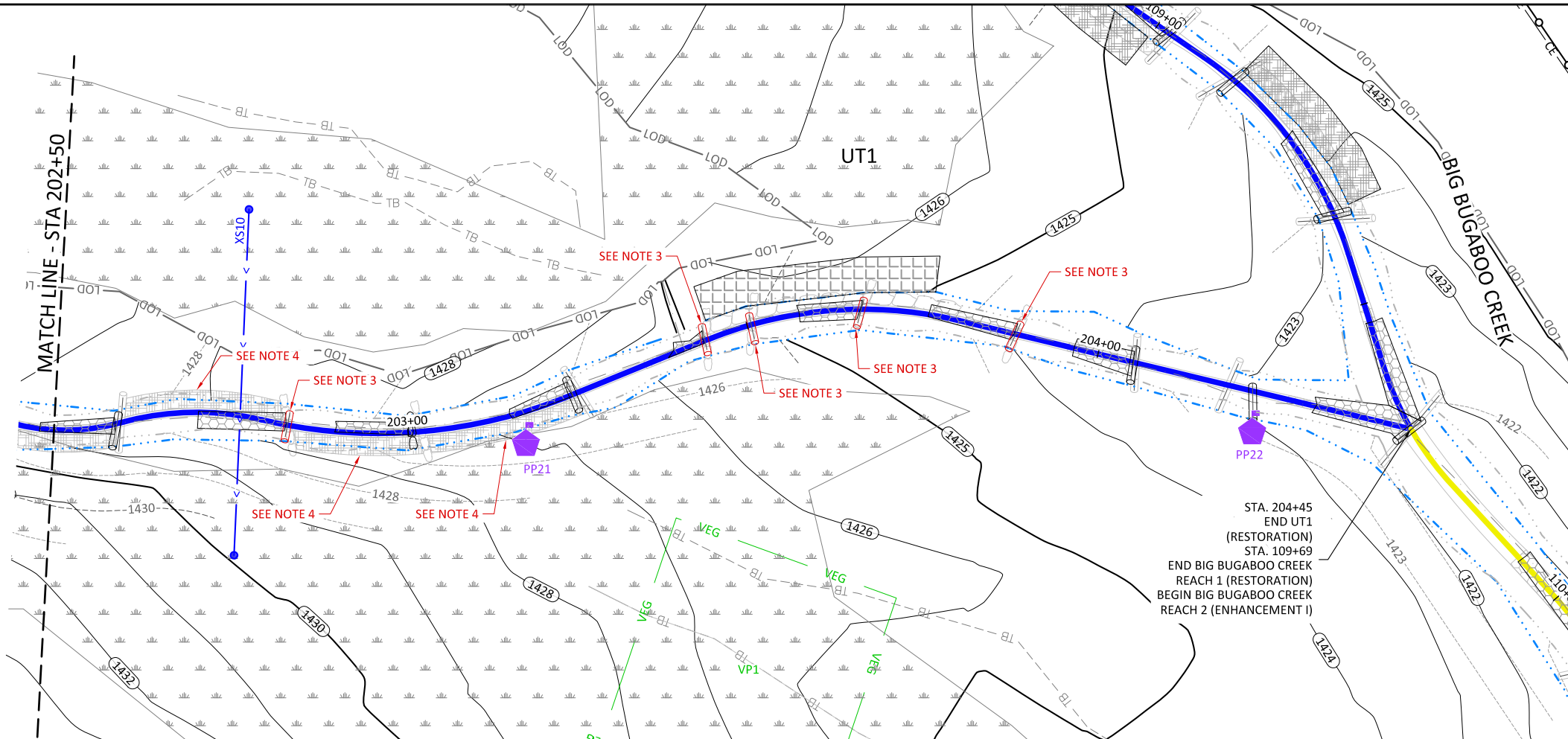
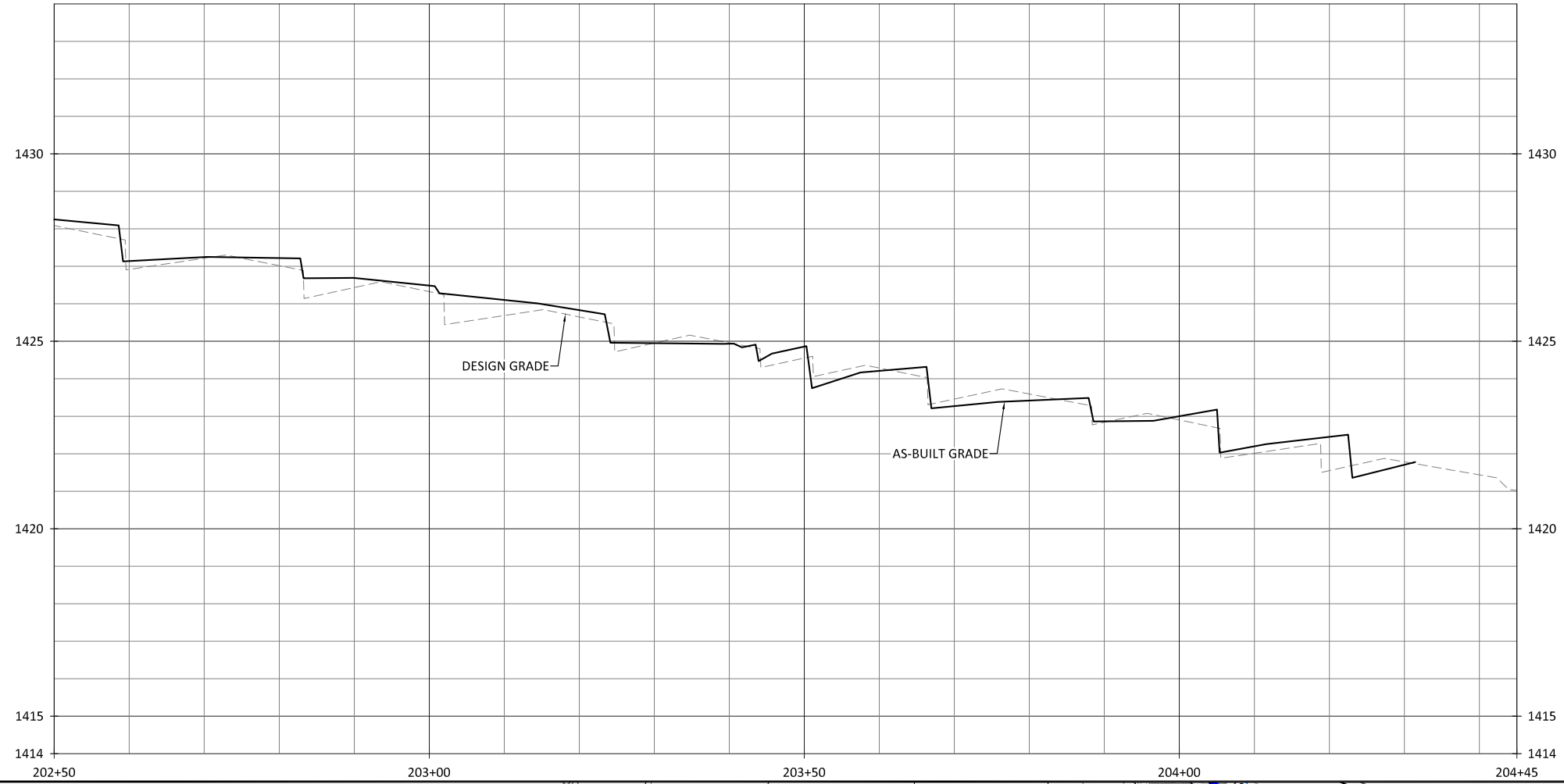
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT1
Stream Plan and Profile

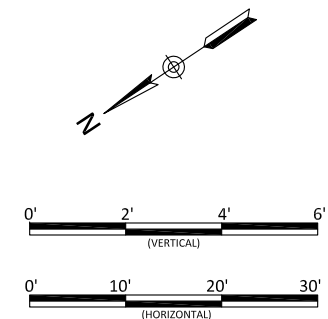
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

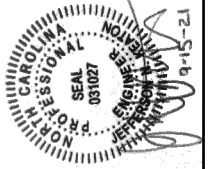
1.21



- NOTES:**
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR BIG BUGABOO CREEK IS ADDRESSED ON SHEETS 1.01 THROUGH 1.20.
 3. STA 202+83, STA 203+44, STA 203+50, STA 203+66 & STA 203+88 BOULDER SILL REPLACED WITH LOG SILL DUE TO NO NATIVE BOULDERS ON SITE.
 4. STA 202+33 - STA 202+59, STA 202+60 - STA 202+83 & STA 202+83 - STA 203+24 BRUSH TOE REMOVED. CHANNEL CROSS-SECTION TOO SMALL TO MAINTAIN RIFFLE THALWEG WITHOUT PIPING THROUGH THE BRUSH TOE STRUCTURE. ADDITIONALLY, CURVE RADII ARE LARGE AND BRUSH TOE NOT NEEDED FOR STABILITY.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

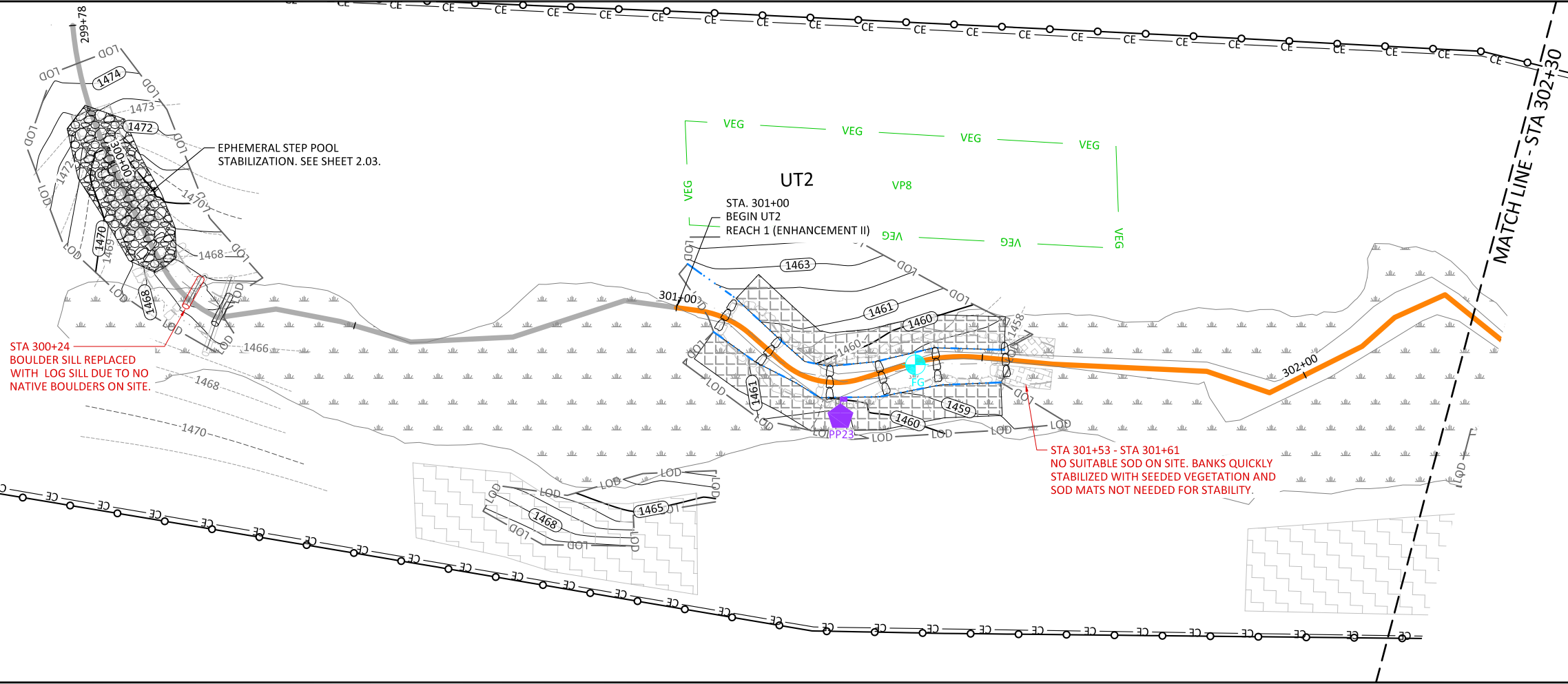
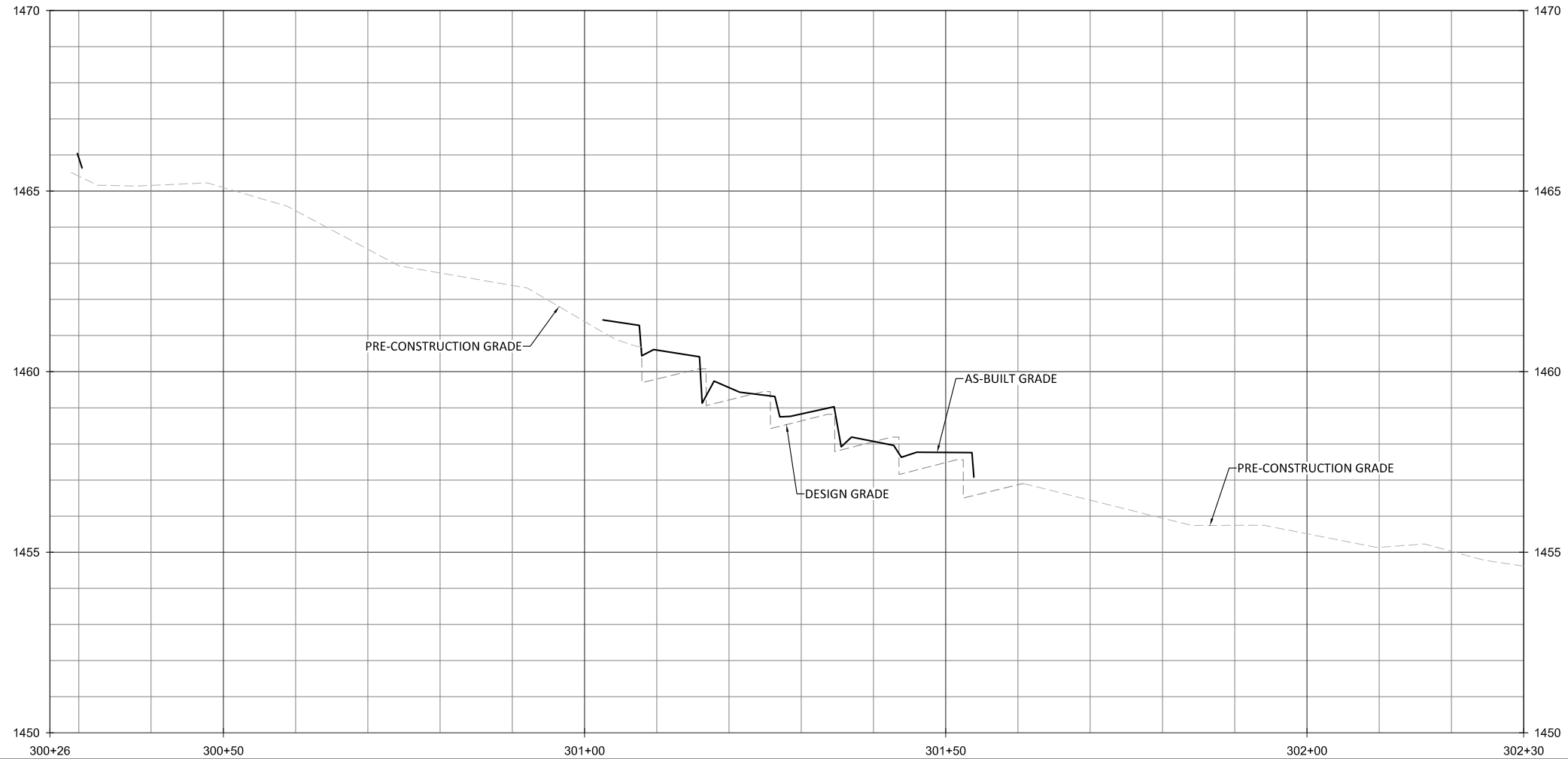


UT1
 Stream Plan and Profile

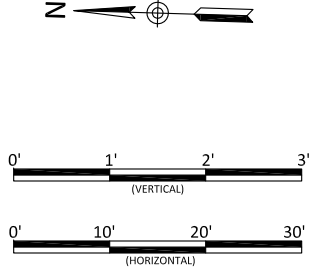
Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

1.22



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



Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT2
 Stream Plan and Profile

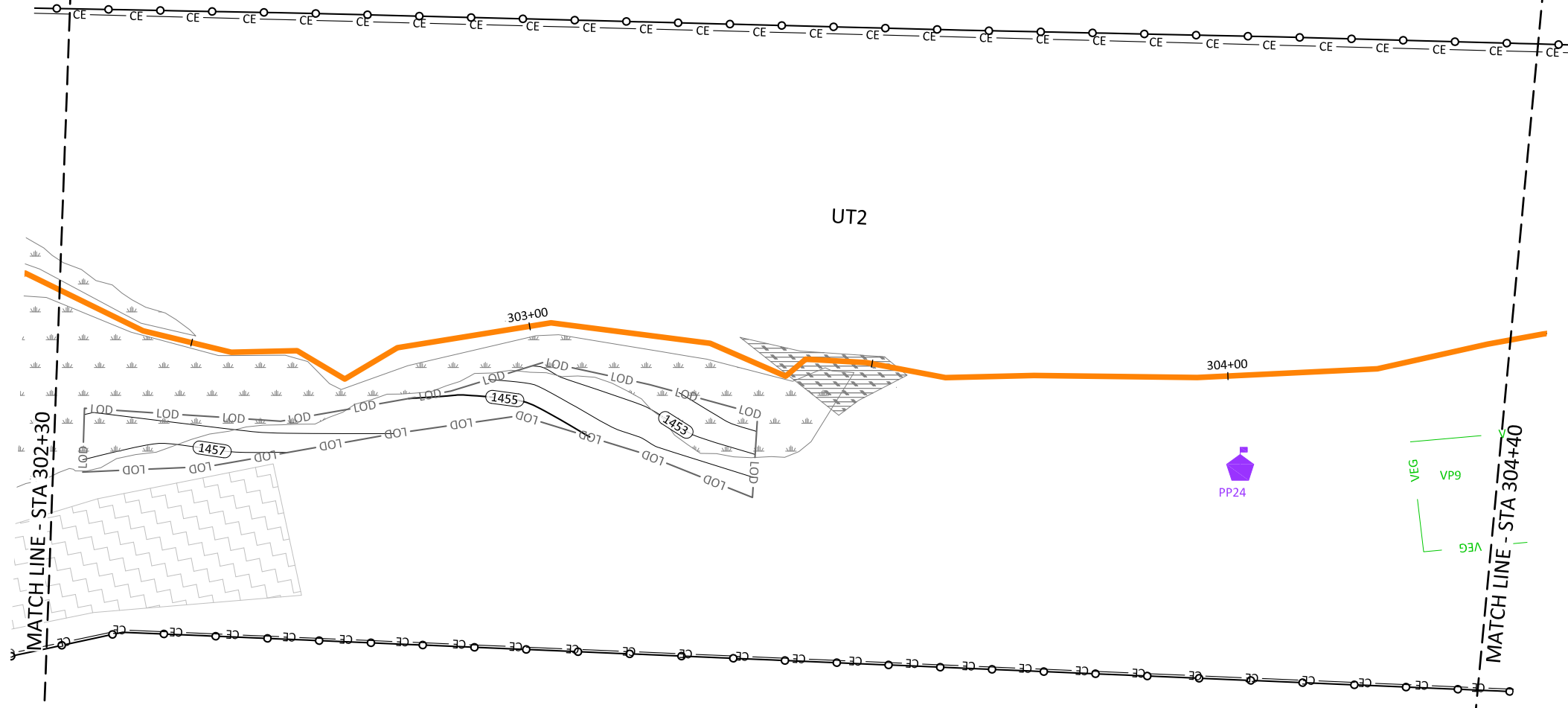
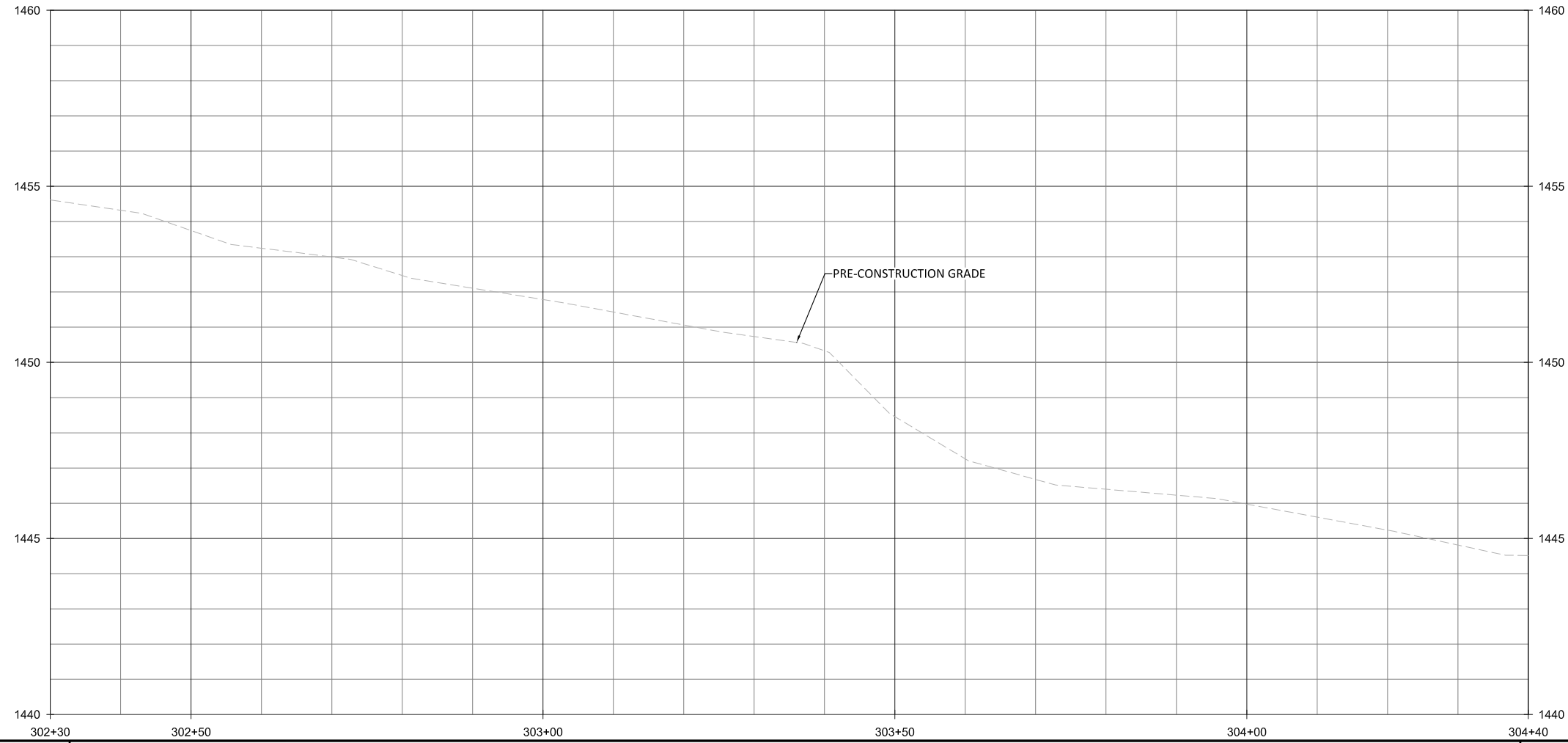
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

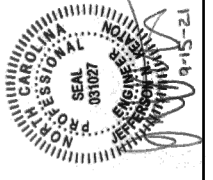
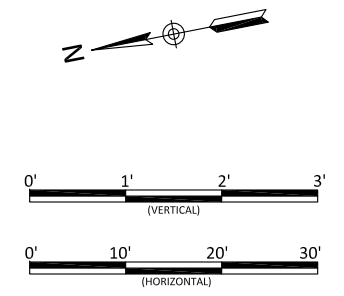
1.23

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



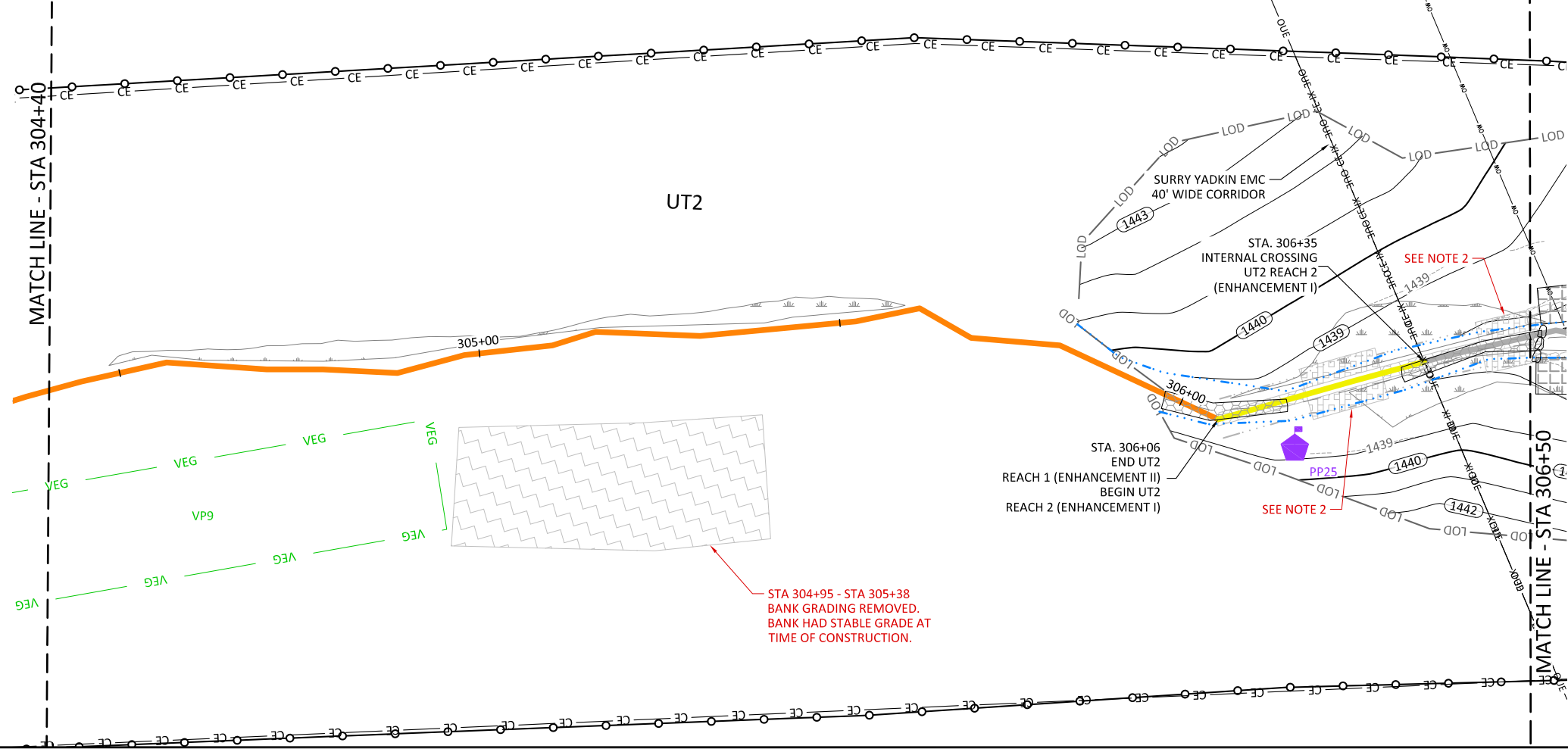
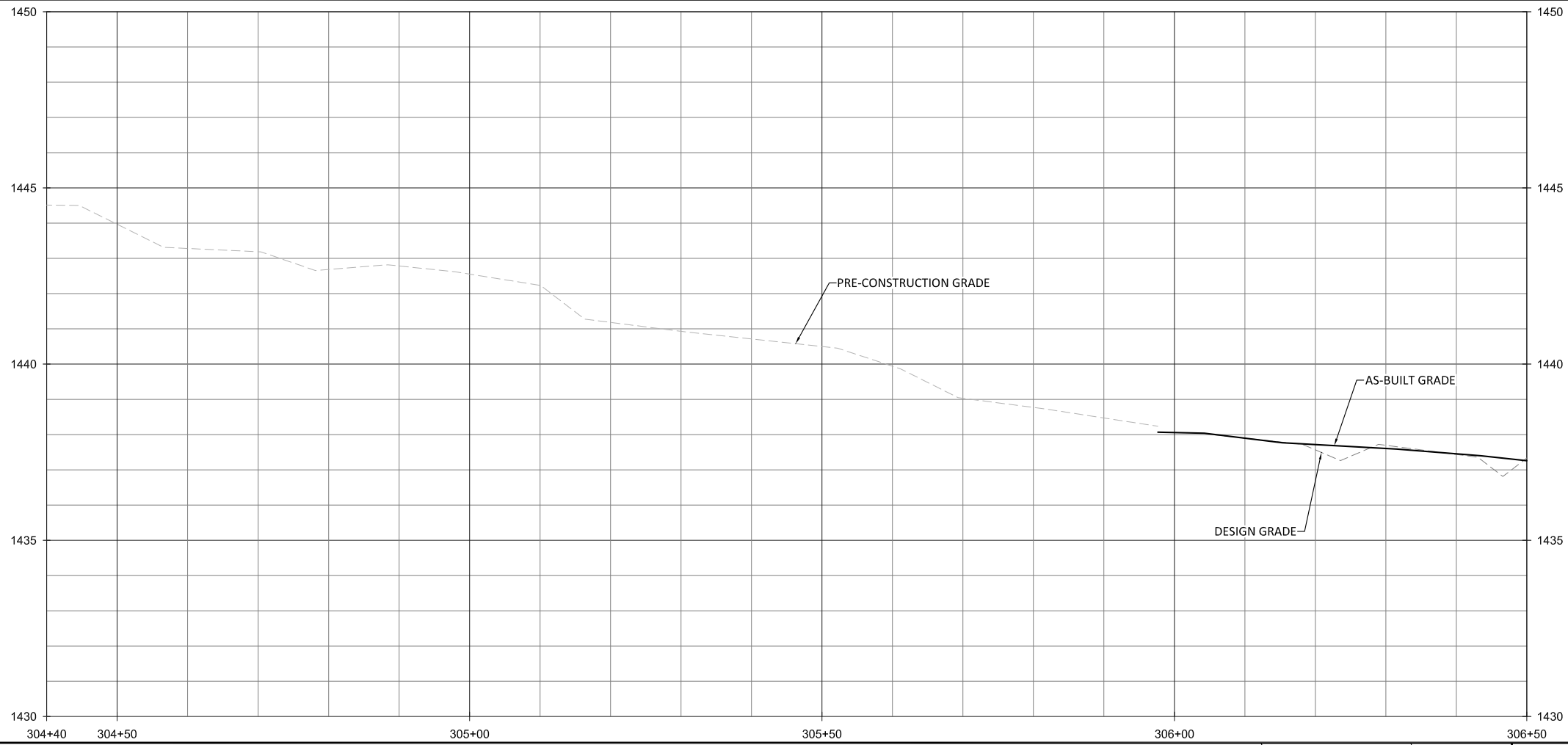
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT2
 Stream Plan and Profile

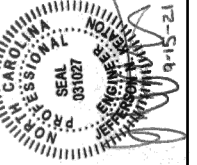
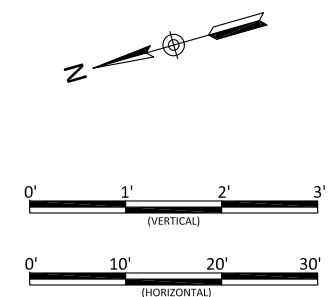
Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: ANA

1.24



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 306+18 - STA 306+29 & STA 306+43 - STA 306+50 NO SUITABLE SOD ON SITE. BANKS QUICKLY STABILIZED WITH SEEDING VEGETATION AND SOD MATS NOT NEEDED FOR STABILITY.



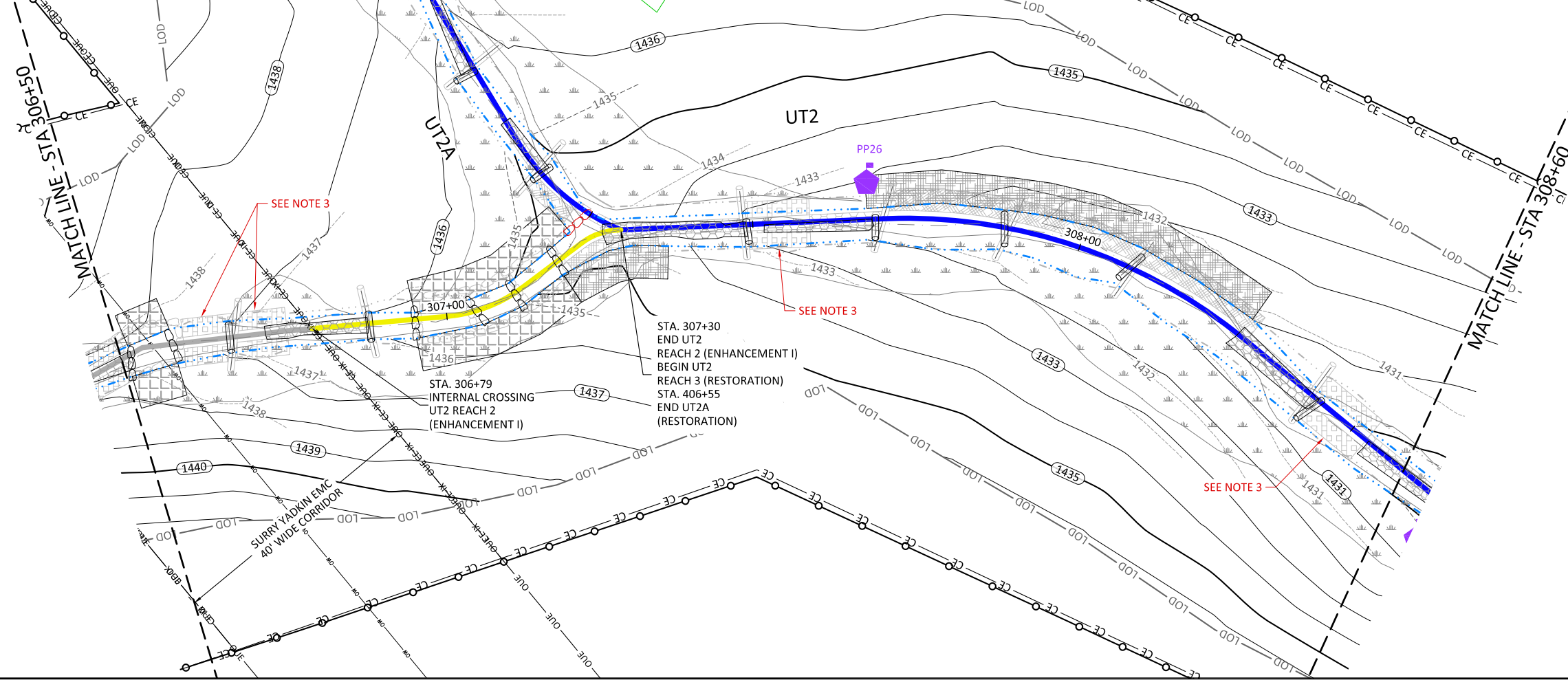
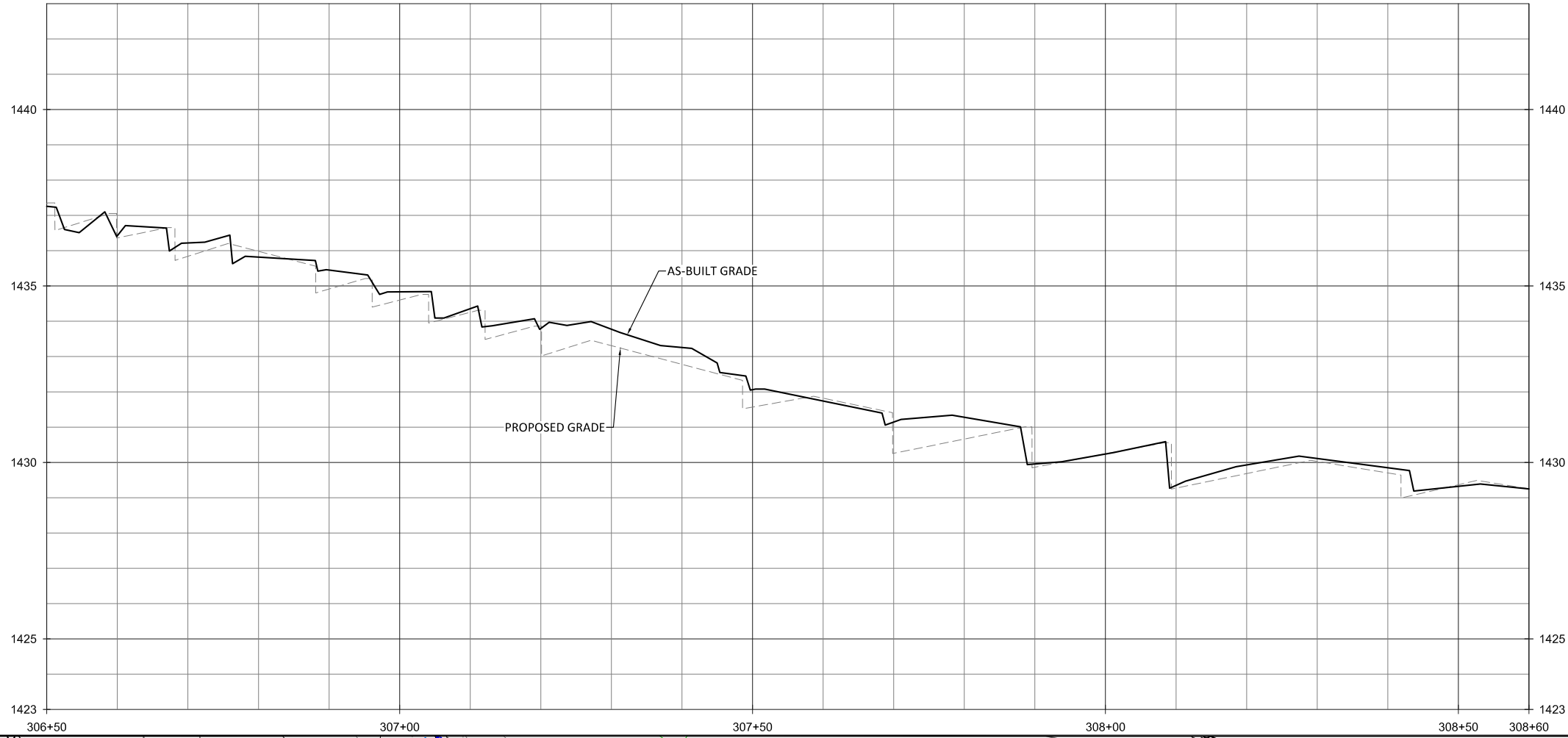
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2
Stream Plan and Profile

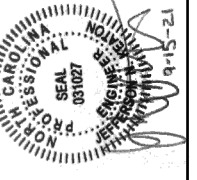
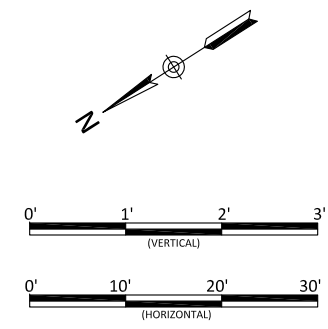
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAW
Checked By: ANA

1.25



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2A IS ADDRESSED ON SHEETS 1.34 THROUGH 1.36.
 3. STA 306+60 - STA 306+68, STA 306+68 - STA 306+76, STA 307+49 - STA 307+59 & STA 308+42 - STA 308+53 NO SUITABLE SOD ON SITE. BANKS QUICKLY STABILIZED WITH SEEDS VEGETATION AND SOD MATS NOT NEEDED FOR STABILITY.



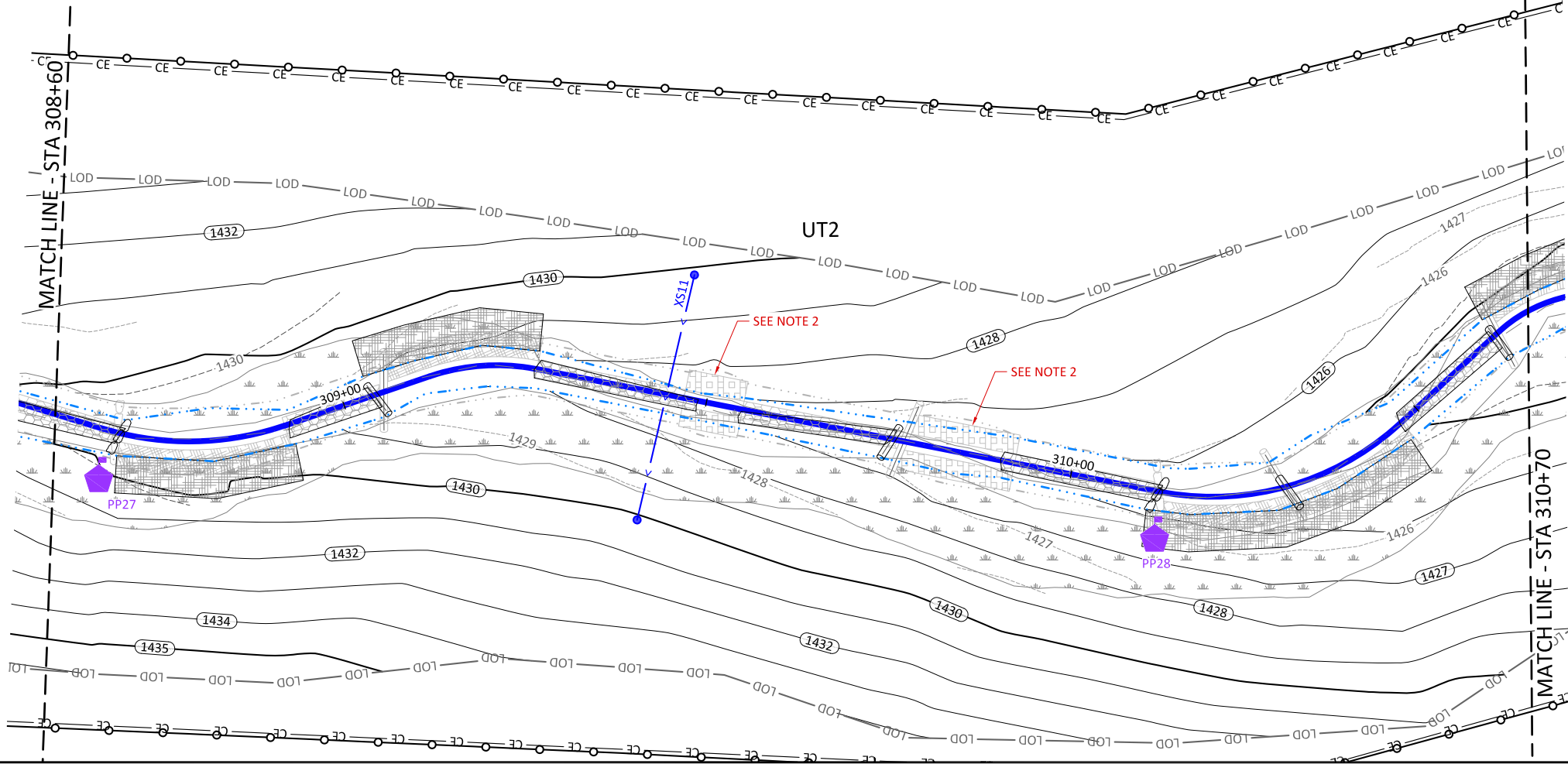
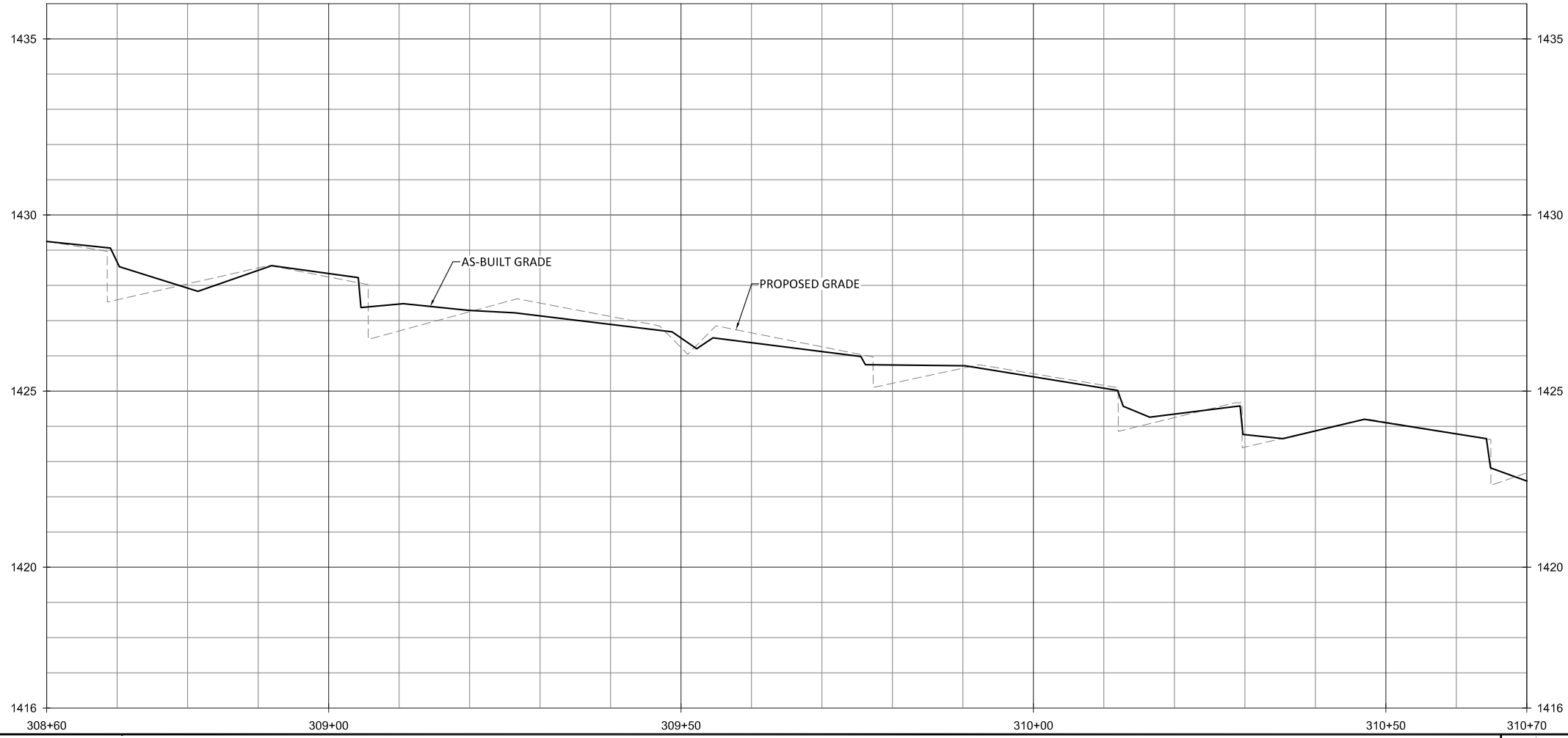
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2
Stream Plan and Profile

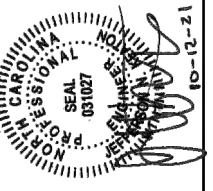
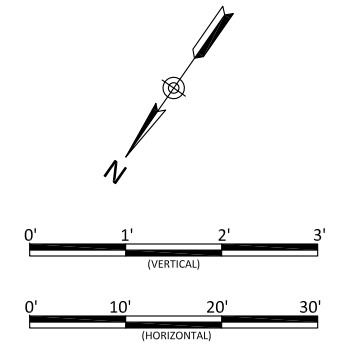
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAW
Checked By: ANA

1.26



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 309+47 - STA 309+55 & STA 309+77 - STA 309+92
NO SUITABLE SOD ON SITE. BANKS QUICKLY STABILIZED WITH SEEDING VEGETATION AND SOD MATS NOT NEEDED FOR STABILITY.



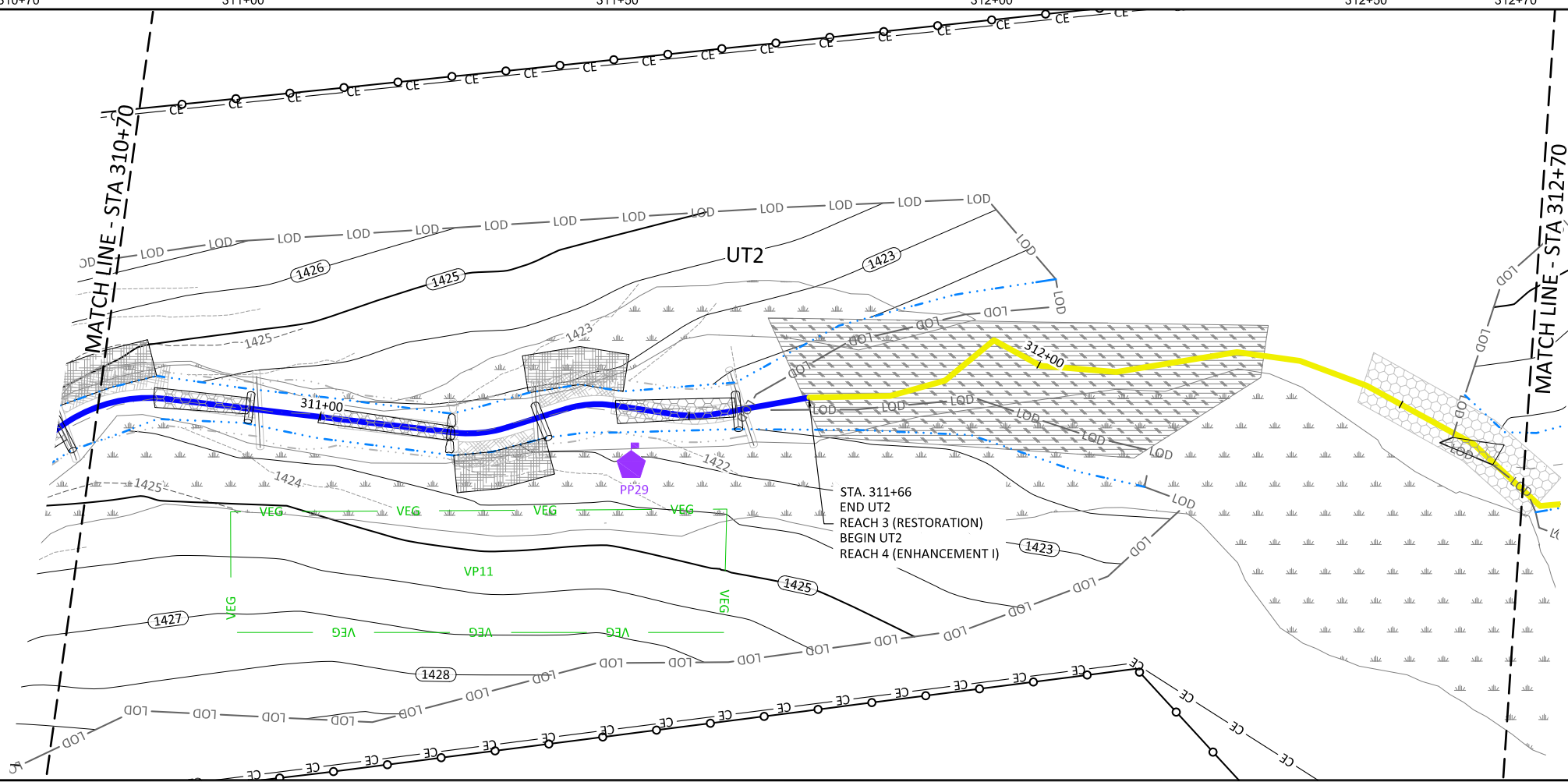
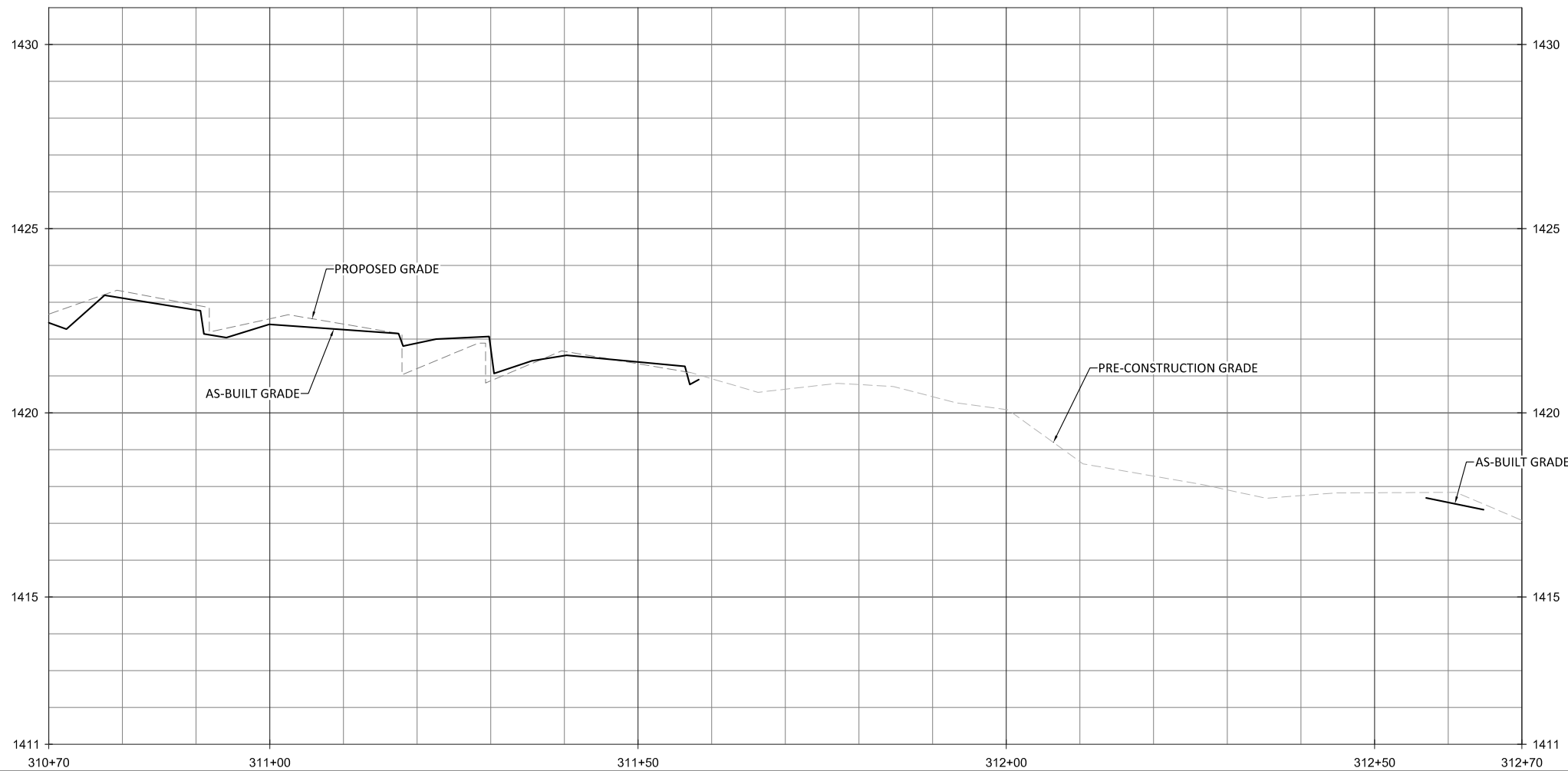
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT2
 Stream Plan and Profile

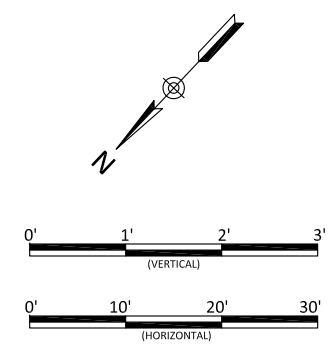
Revisions:
 10.2021 - Corrected a Label

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

1.27



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



Bug Headwaters Record Drawings
 Wilkes County, North Carolina

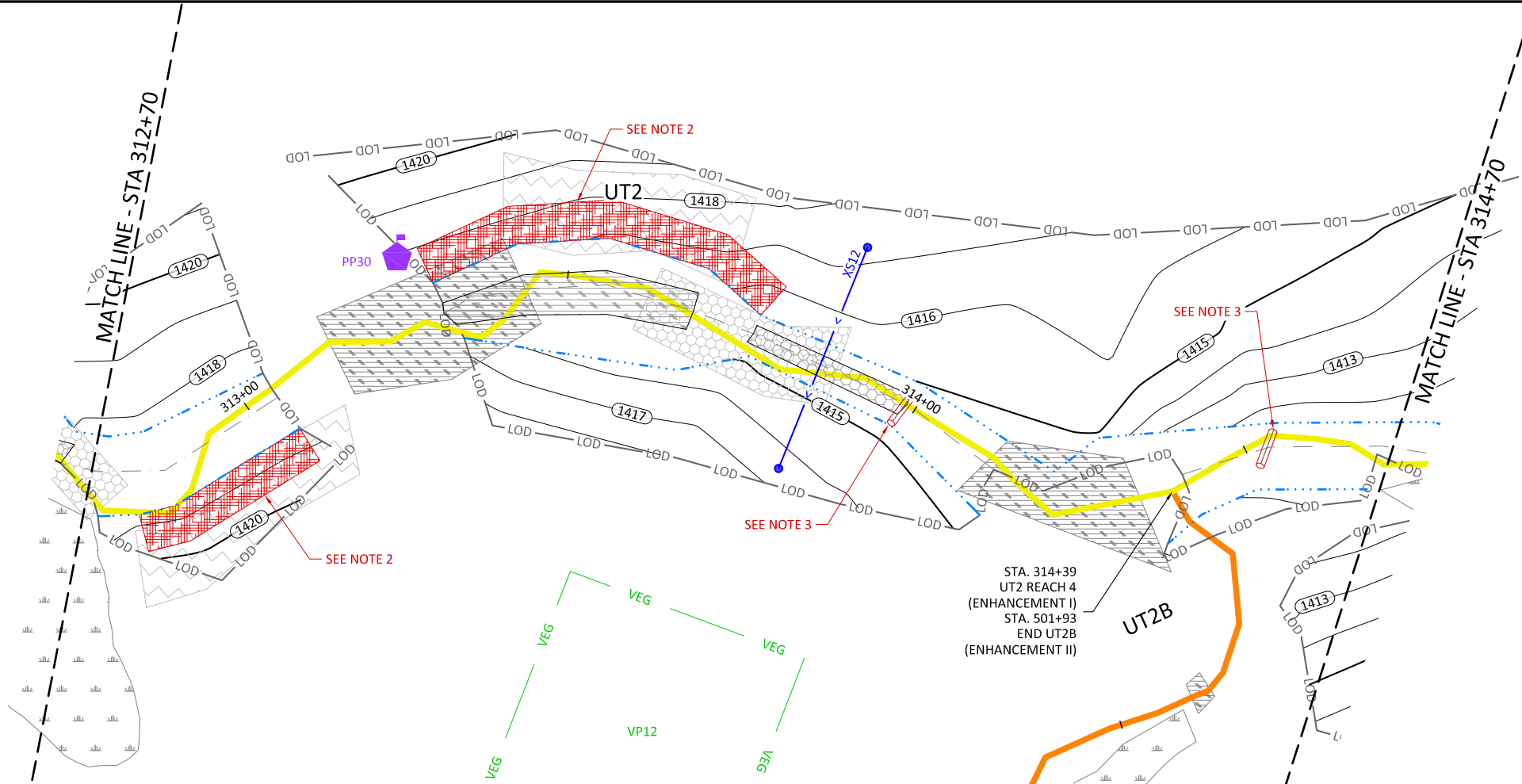
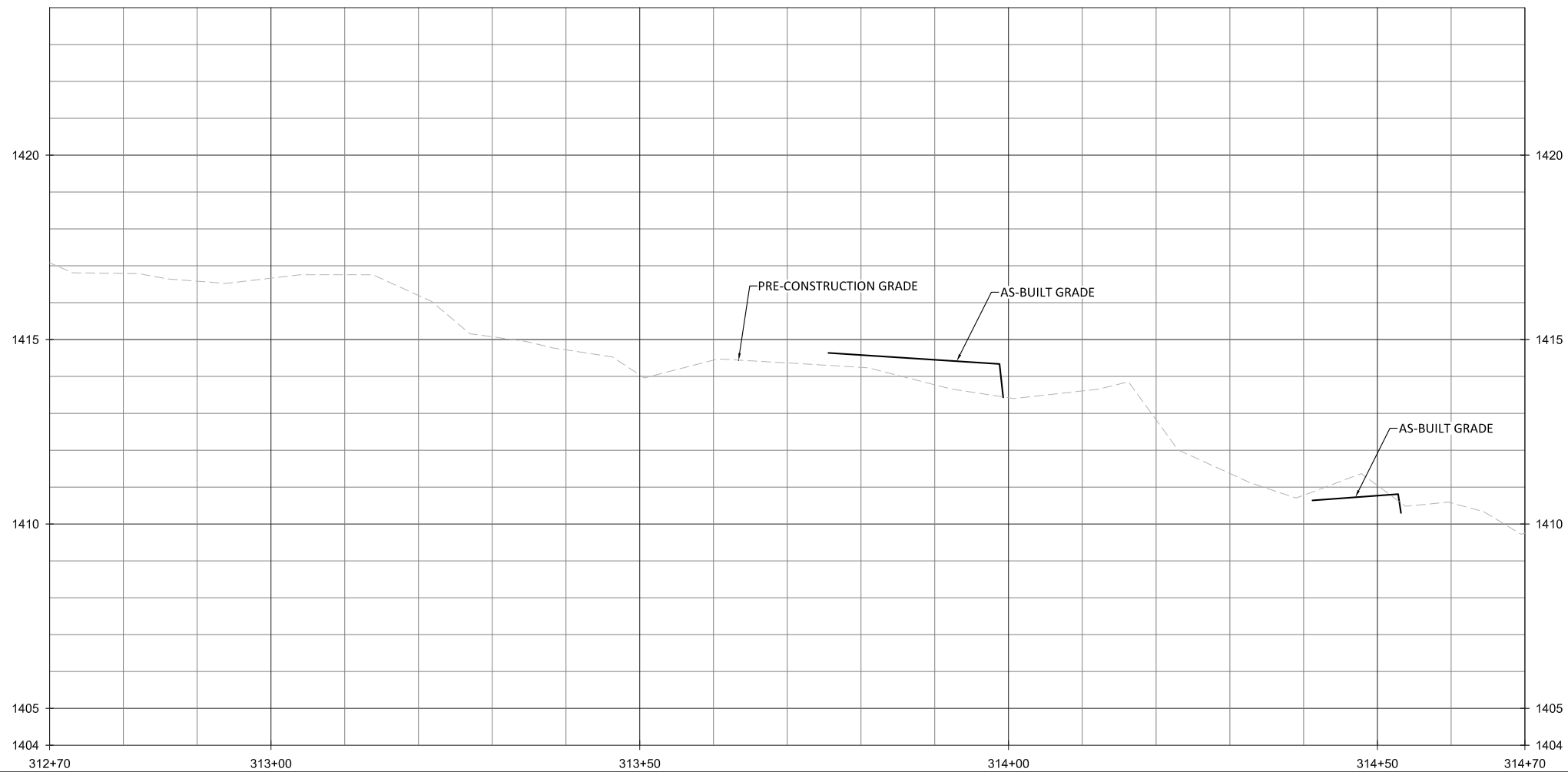
UT2
 Stream Plan and Profile

Revisions:

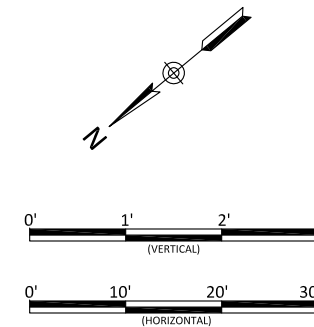
Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: ANA

1.28





- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 312+78 - STA 313+04 & STA 313+29 - STA 313+75 BRUSH TOE ADDED TO STABILIZE STREAMBANK.
 3. STA 313+99 & STA 314+54 LOG SILL ADDED FOR ADDITIONAL GRADE STABILITY.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2
Stream Plan and Profile

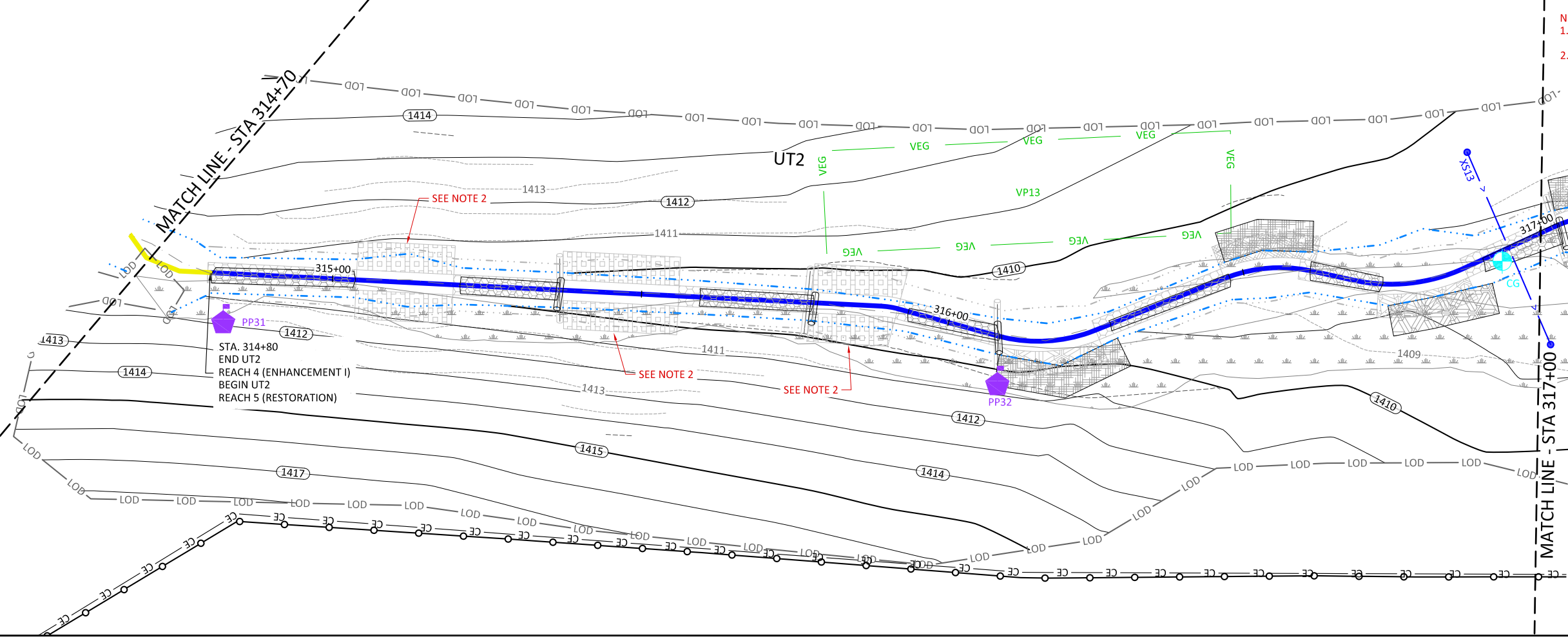
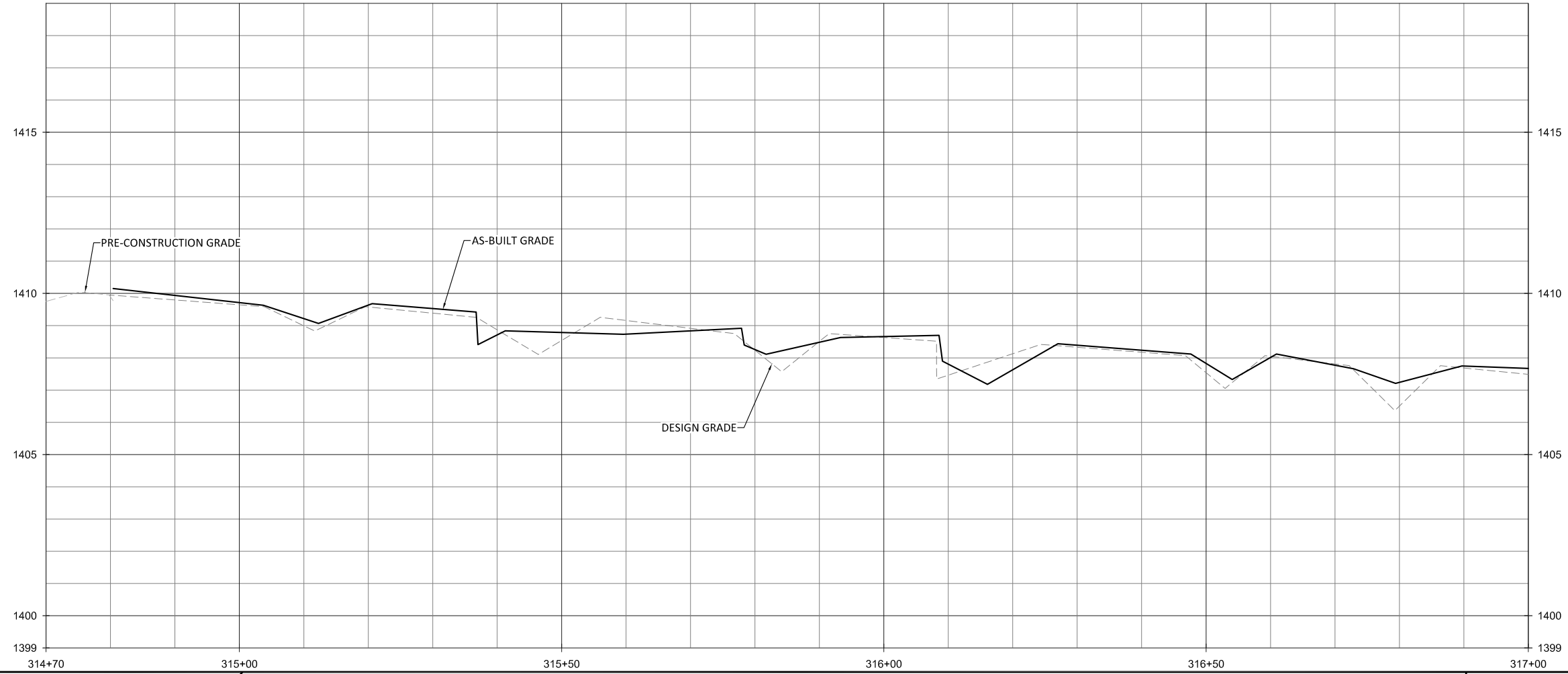
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

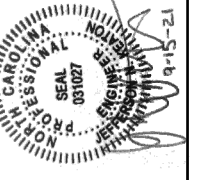
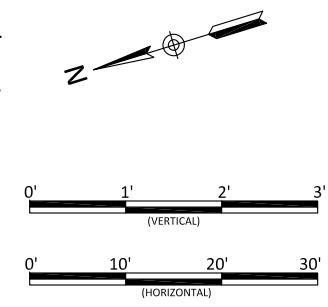
1.29

Sheet





- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 315+04 - STA 315+20, STA 315+37 - STA 315+56 & STA 315+77 - STA 315+92 NO SUITABLE SOD ON SITE. BANKS QUICKLY STABILIZED WITH SEEDED VEGETATION AND SOD MATS NOT NEEDED FOR STABILITY.



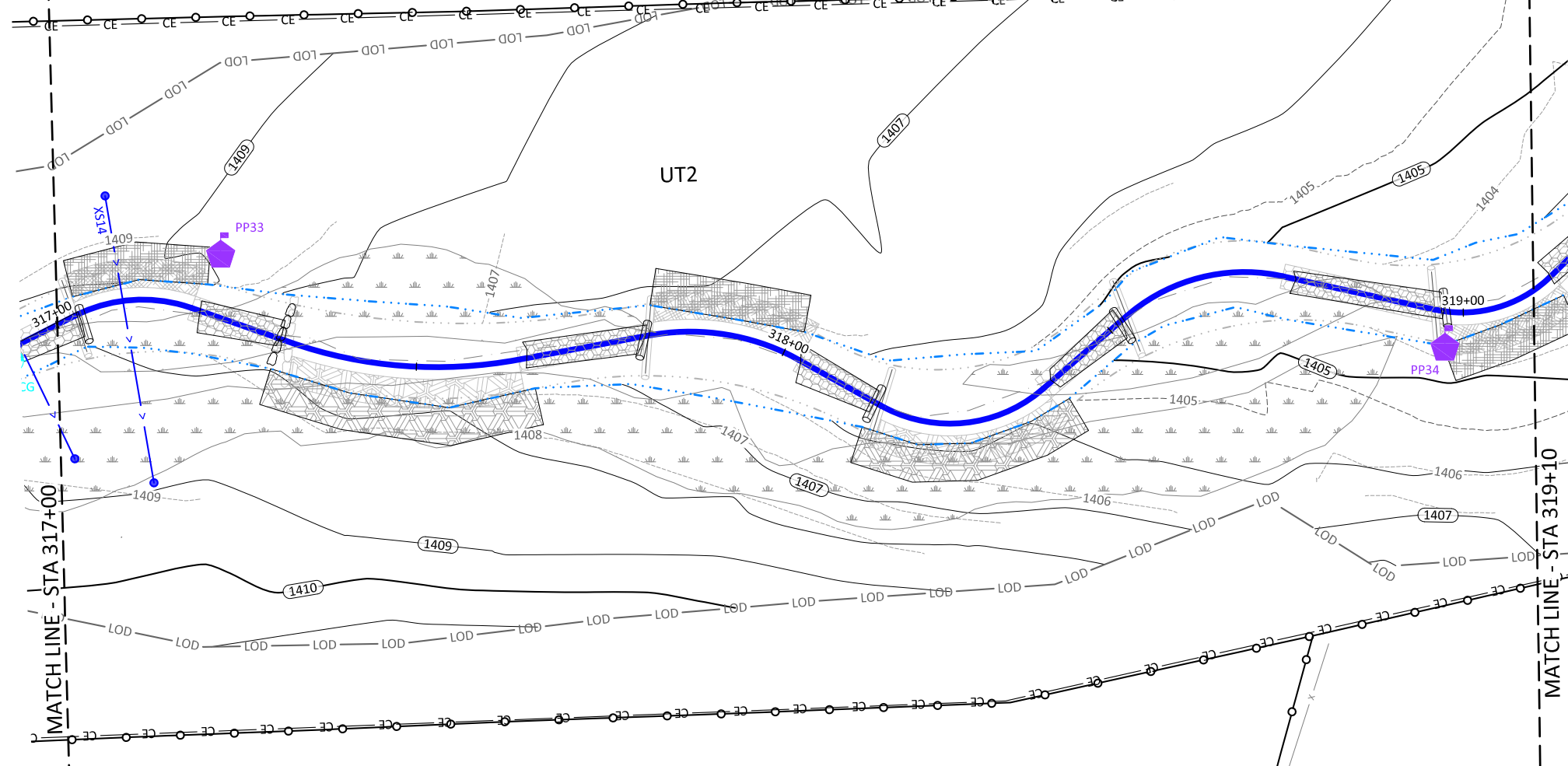
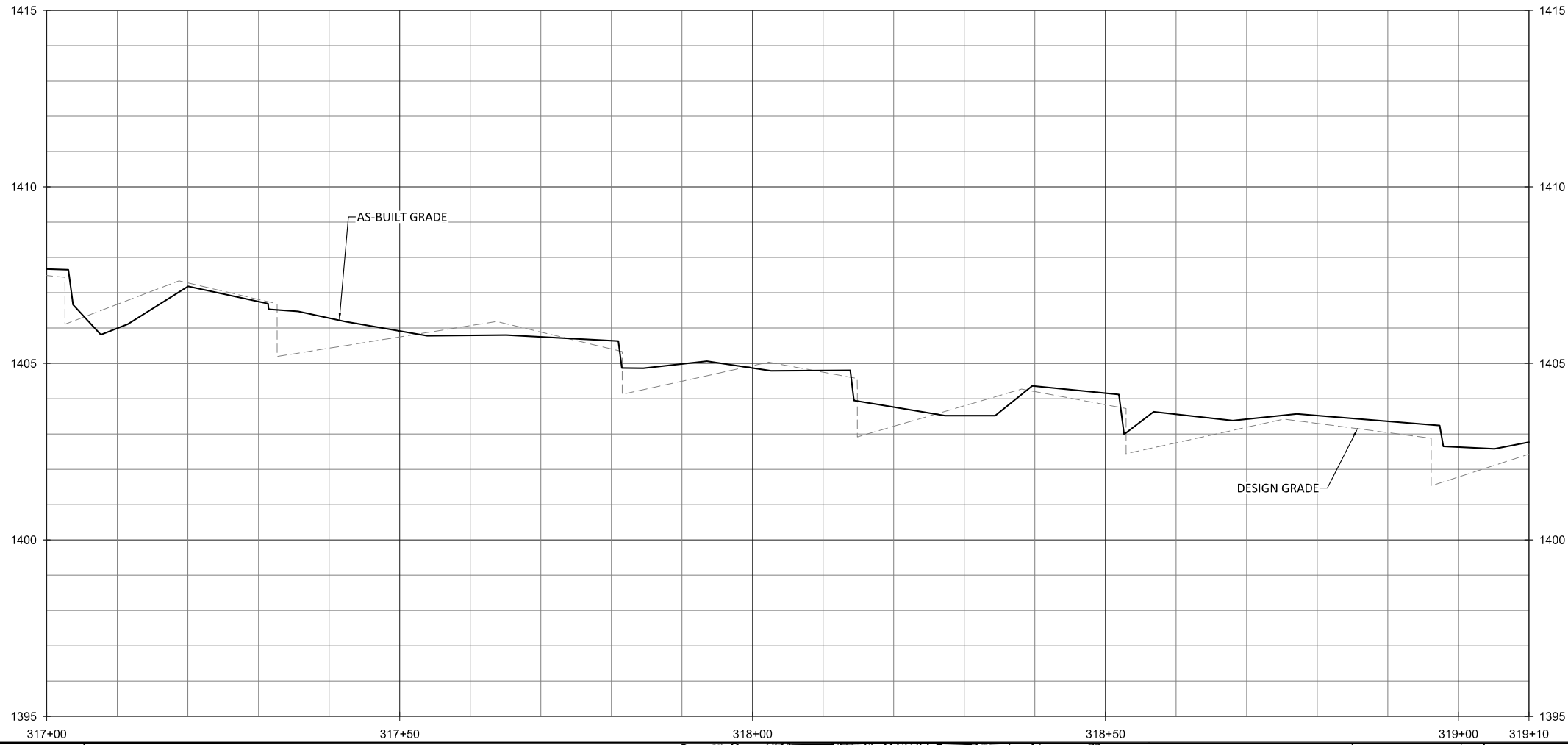
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2
Stream Plan and Profile

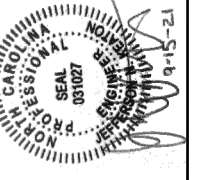
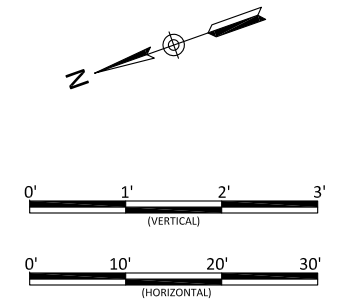
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

1.30



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



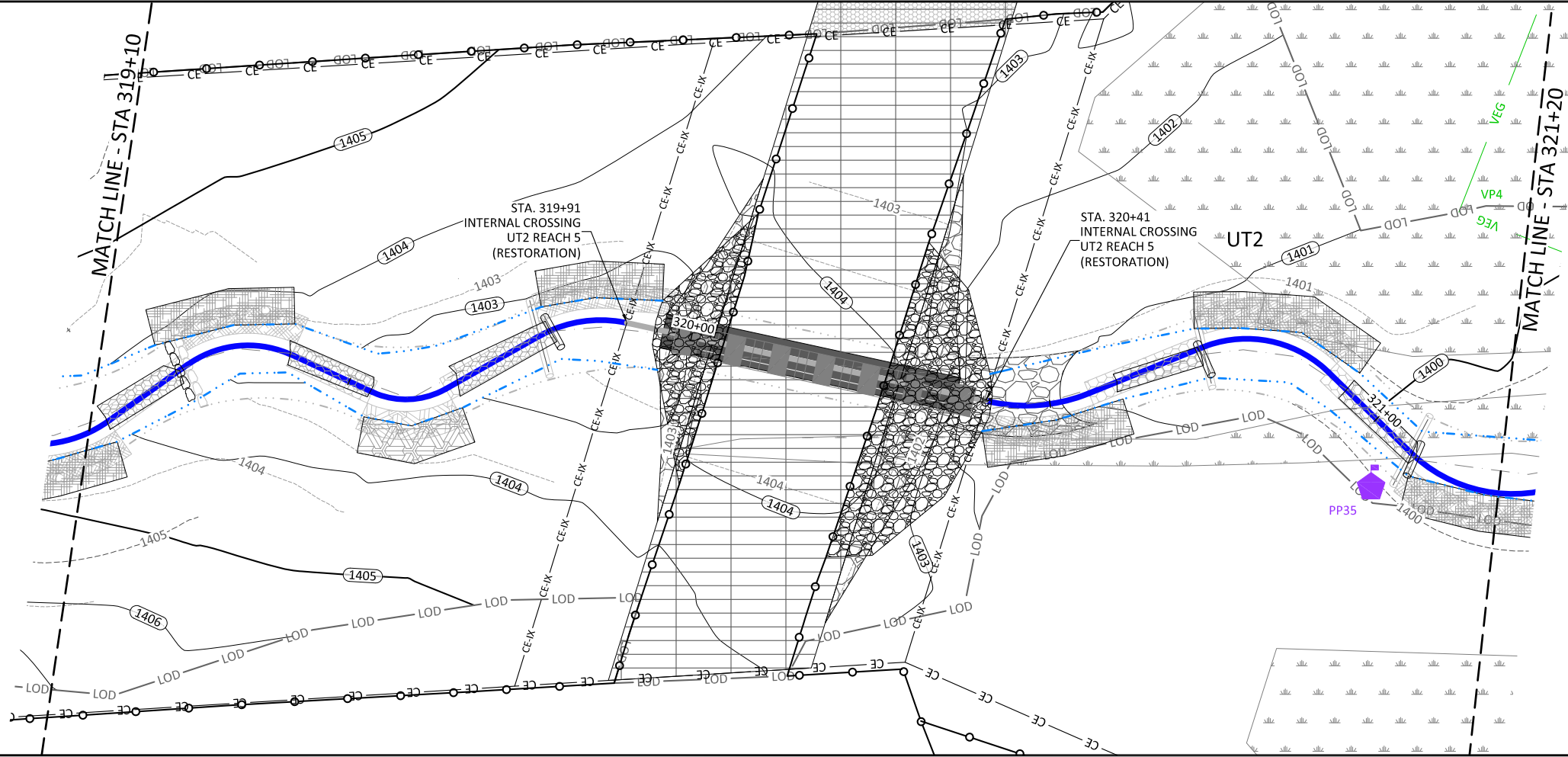
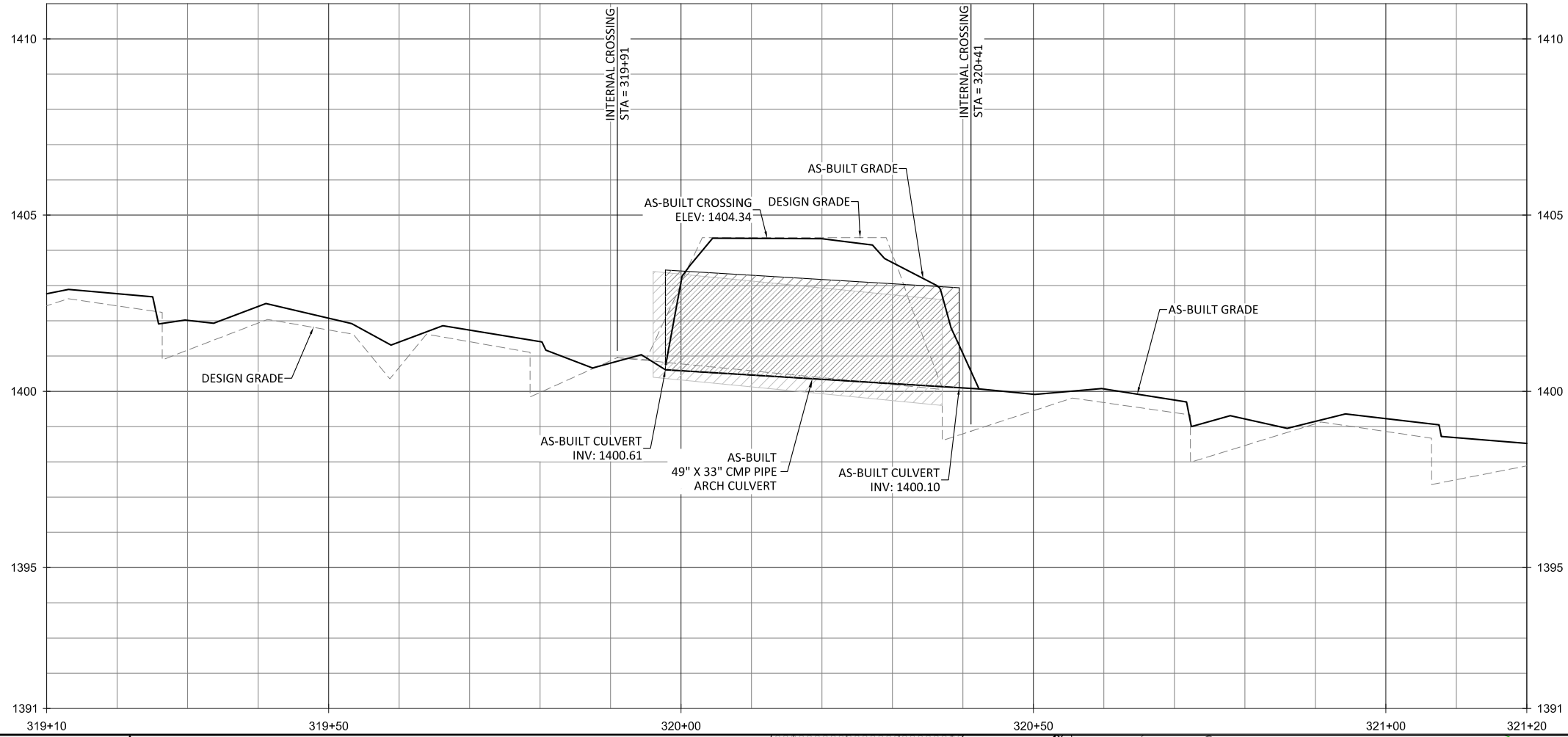
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT2
 Stream Plan and Profile

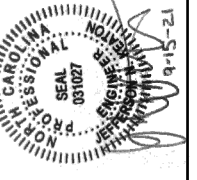
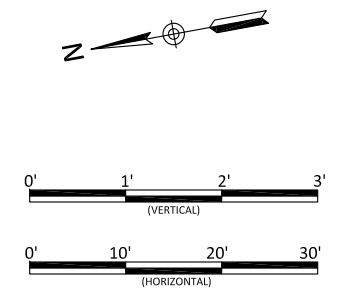
Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: ANA

1.31



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



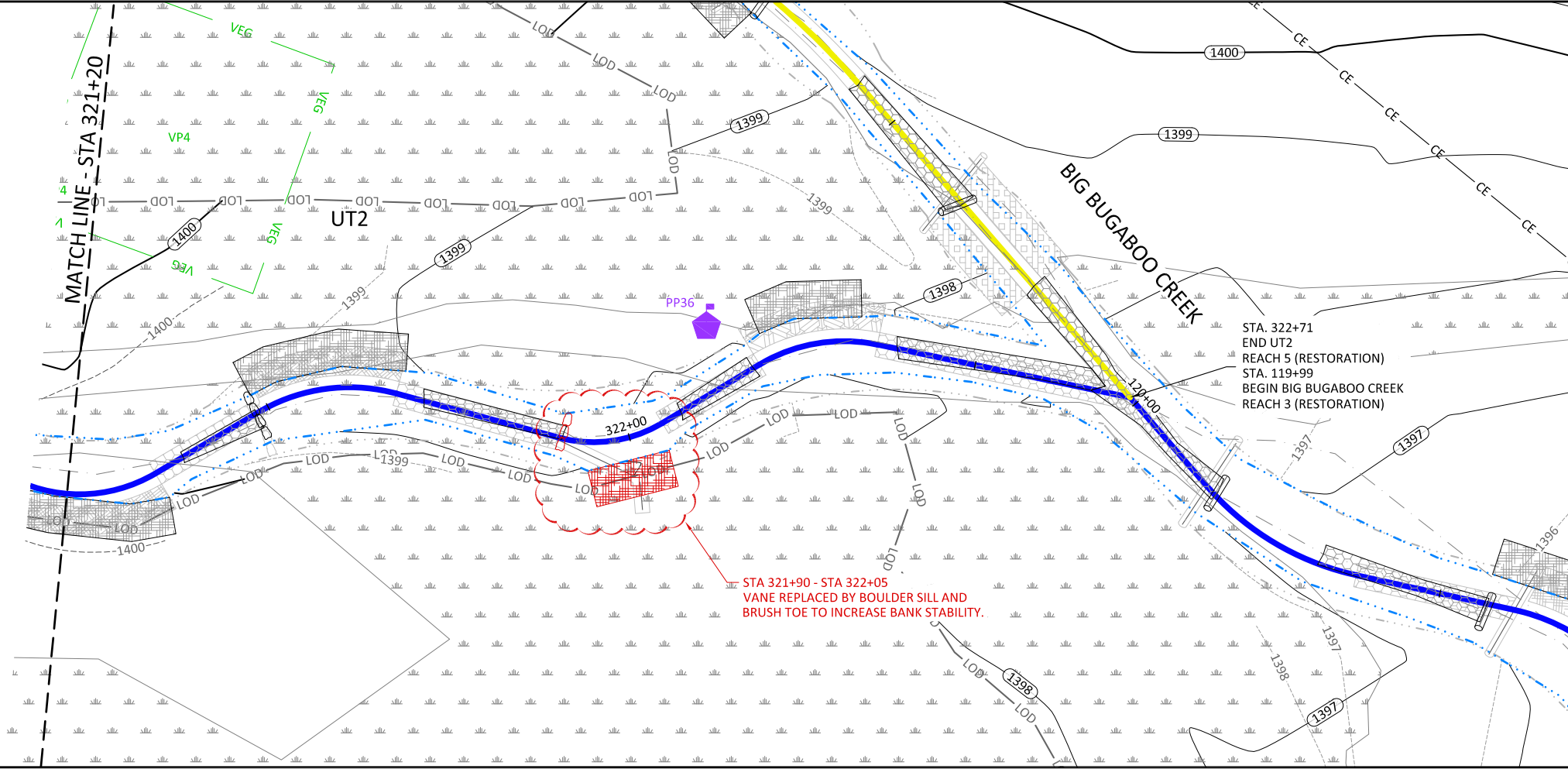
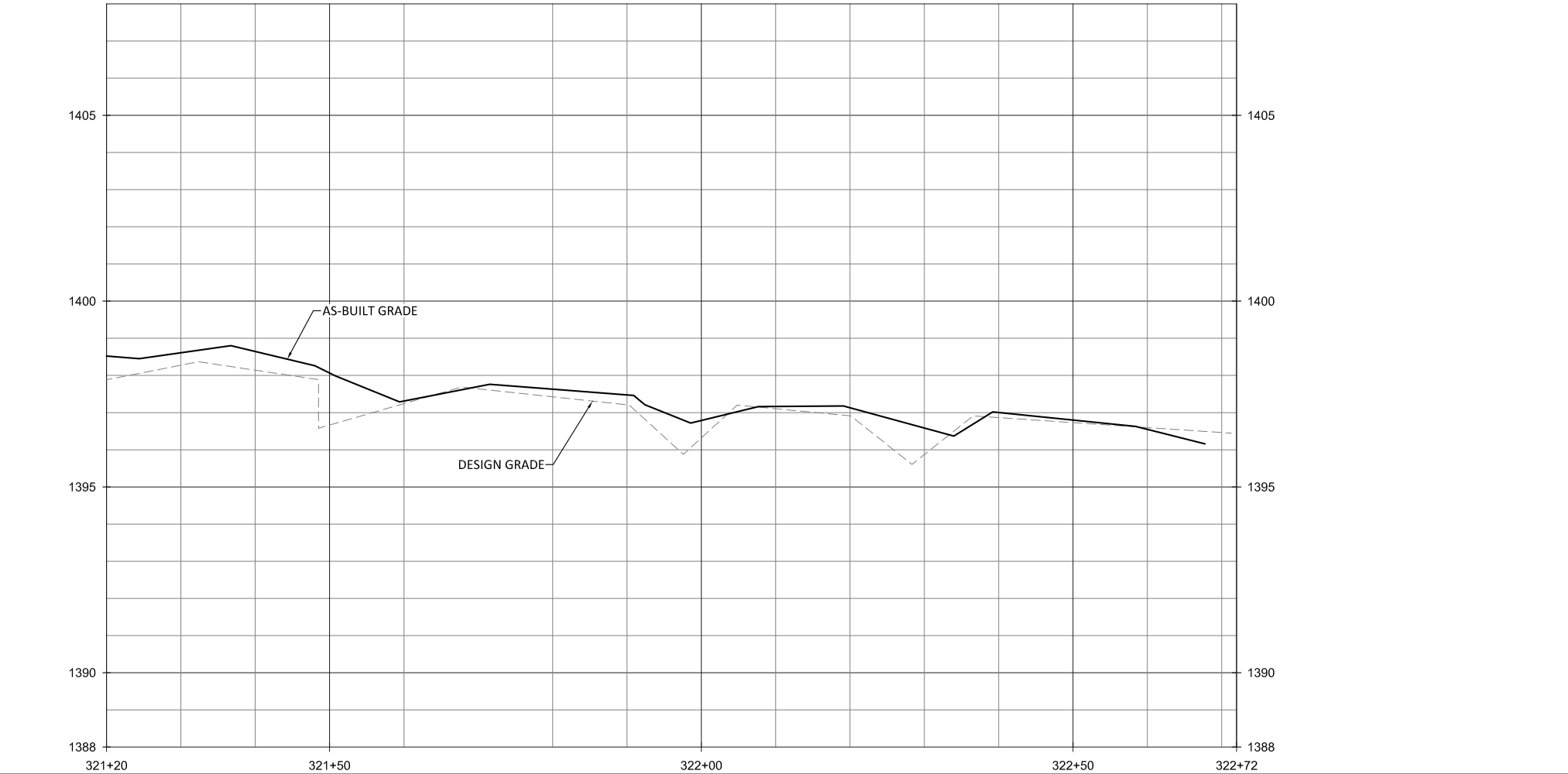
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT2
 Stream Plan and Profile

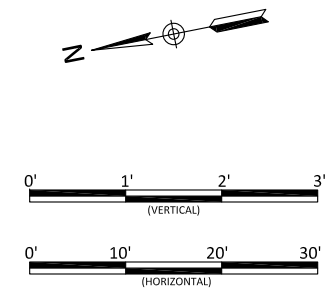
Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

1.32



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR BIG BUGABOO CREEK IS ADDRESSED ON SHEETS 1.01 THROUGH 1.20.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2
Stream Plan and Profile

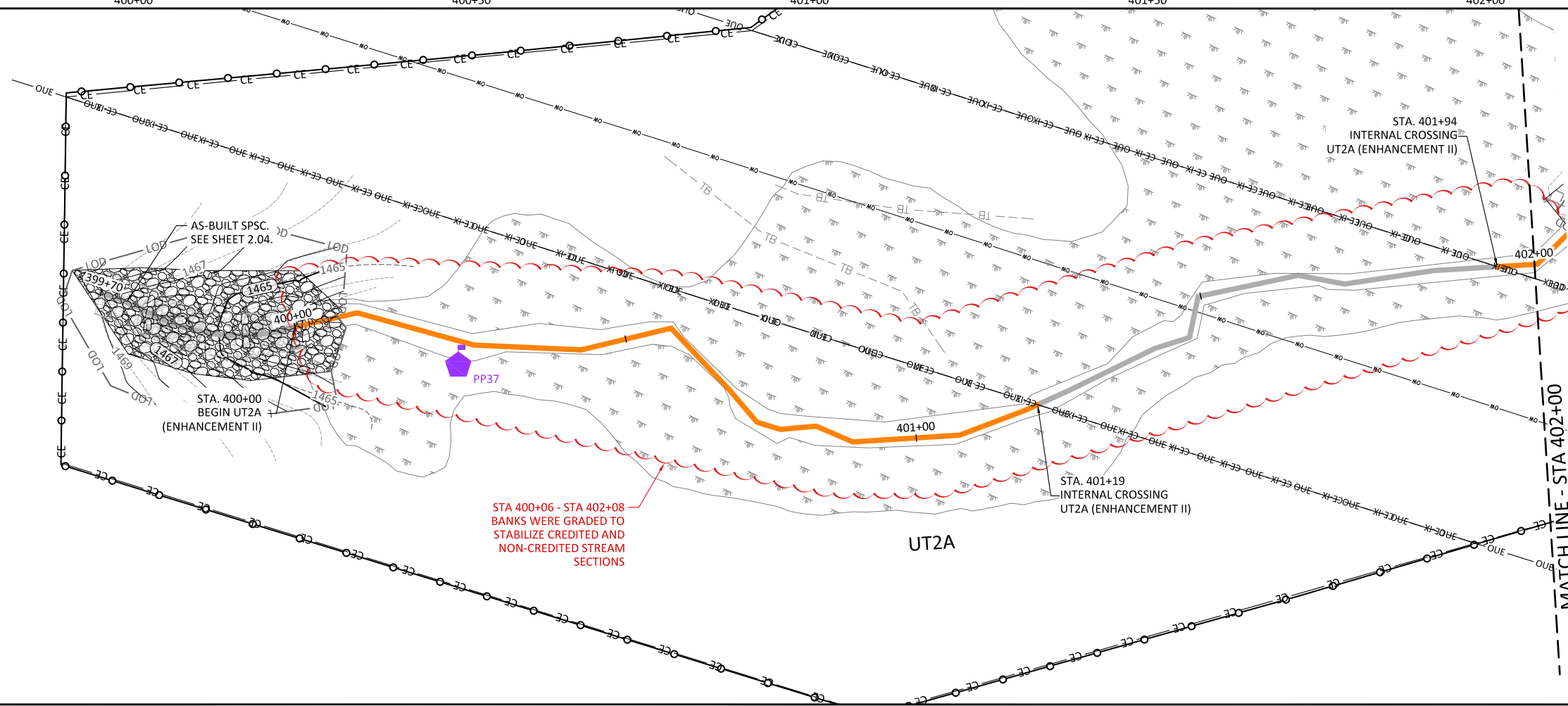
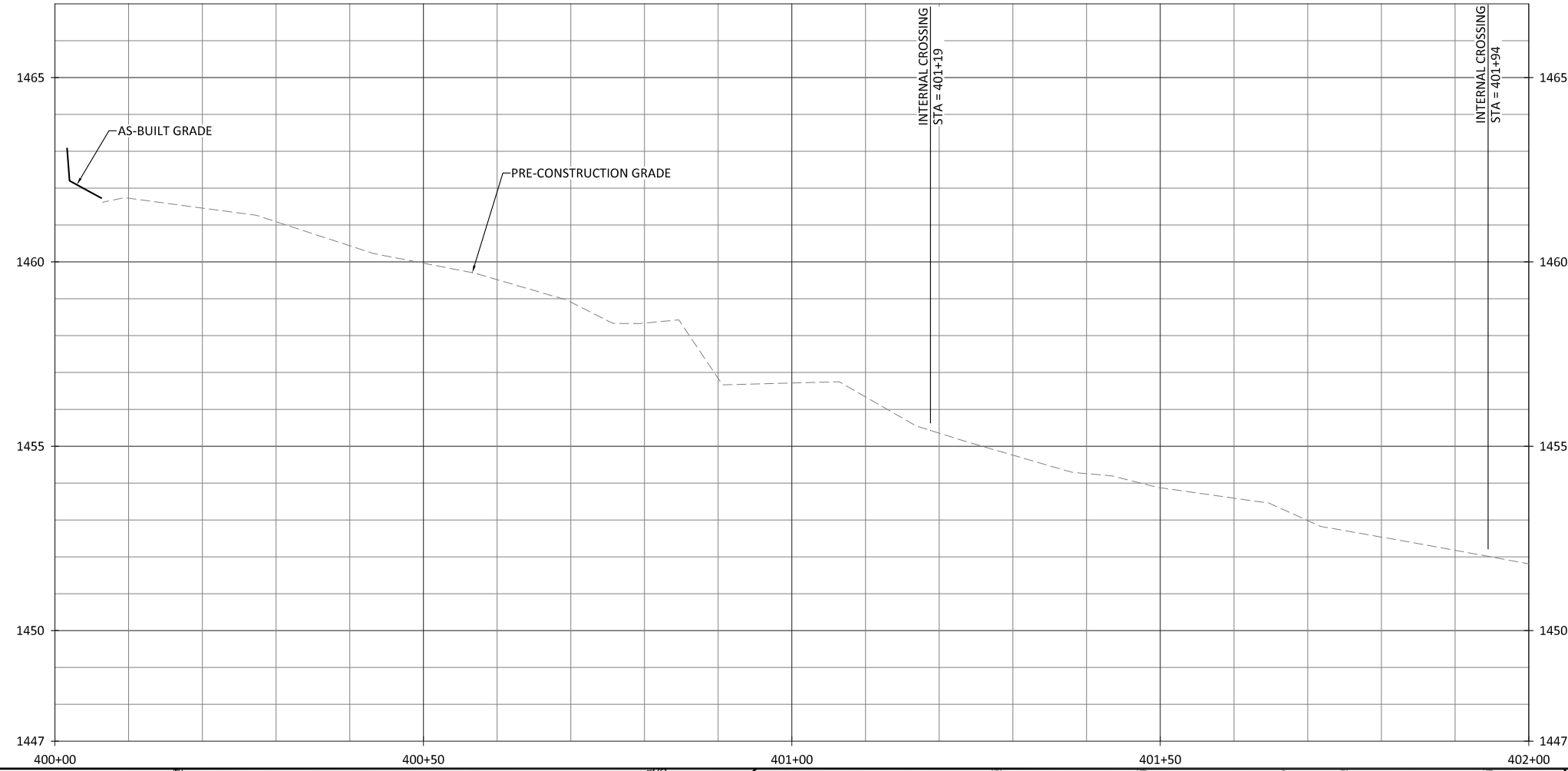
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

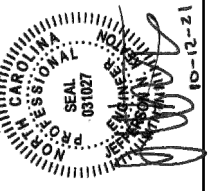
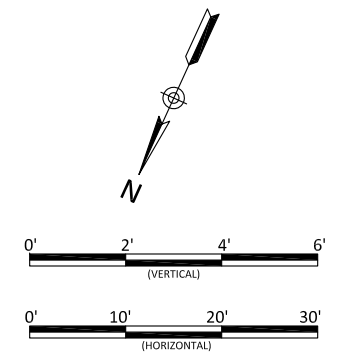
1.33

Sheet





- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR SPSC IS ADDRESSED ON SHEET 2.04.



Bug Headwaters Record Drawings
 Wilkes County, North Carolina

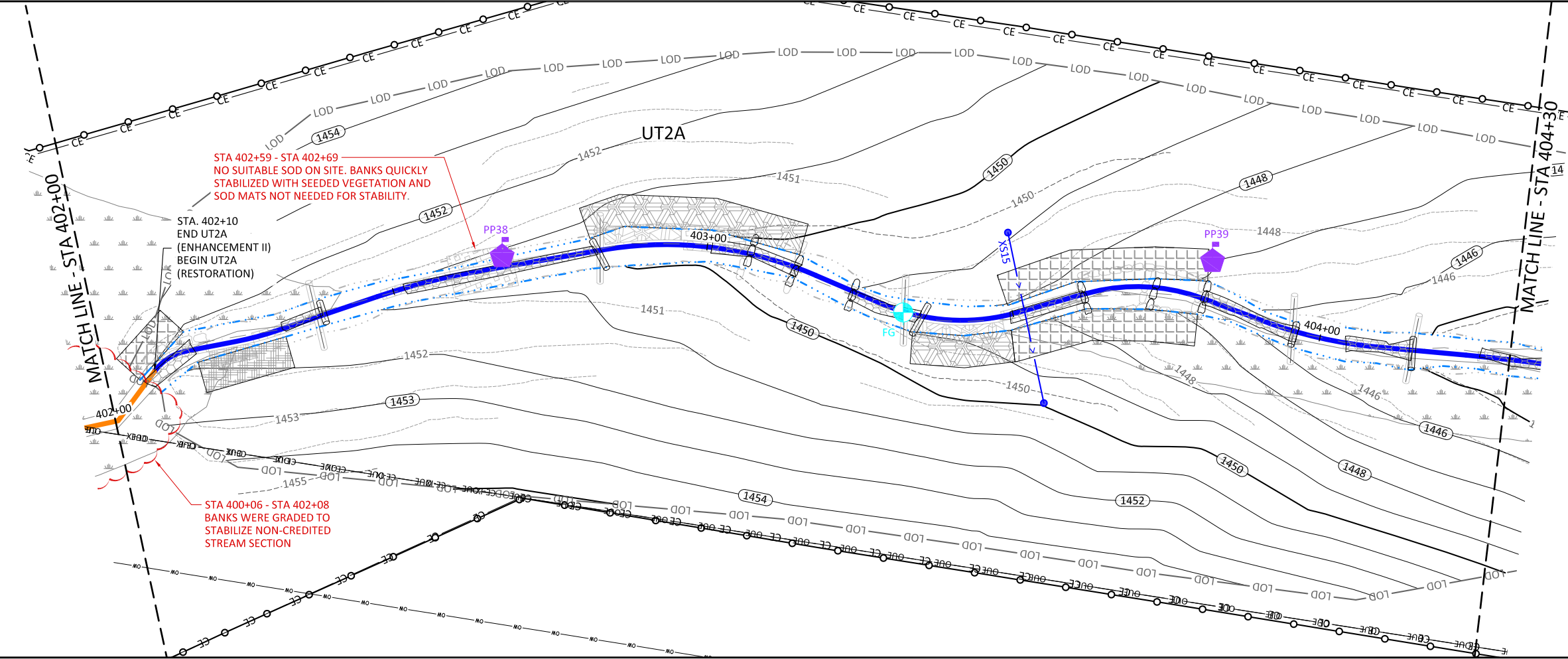
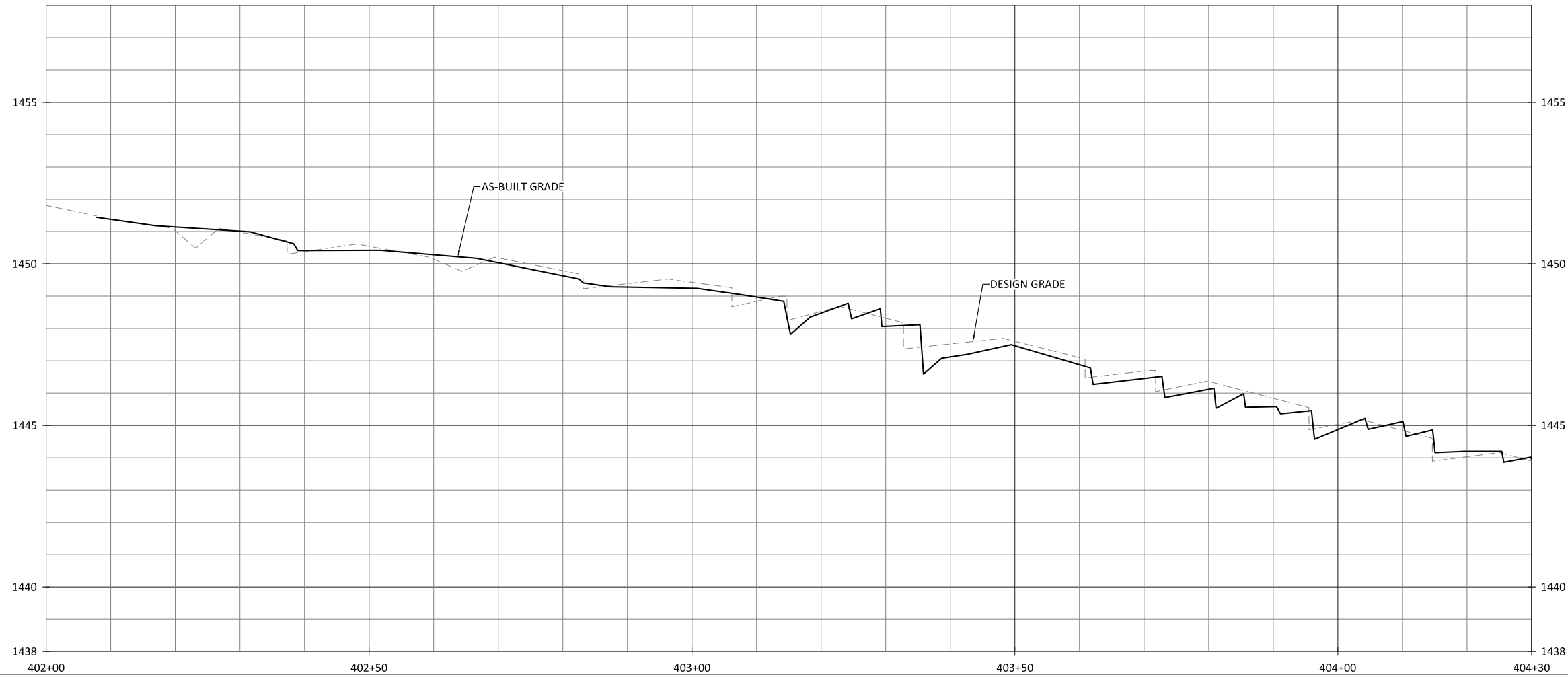
UT2A
 Stream Plan and Profile

Revisions:

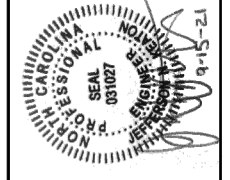
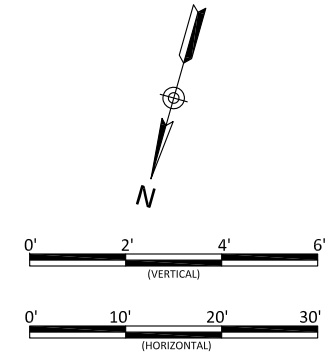
10/2021 - Corrected a Label

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.34



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

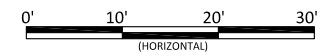
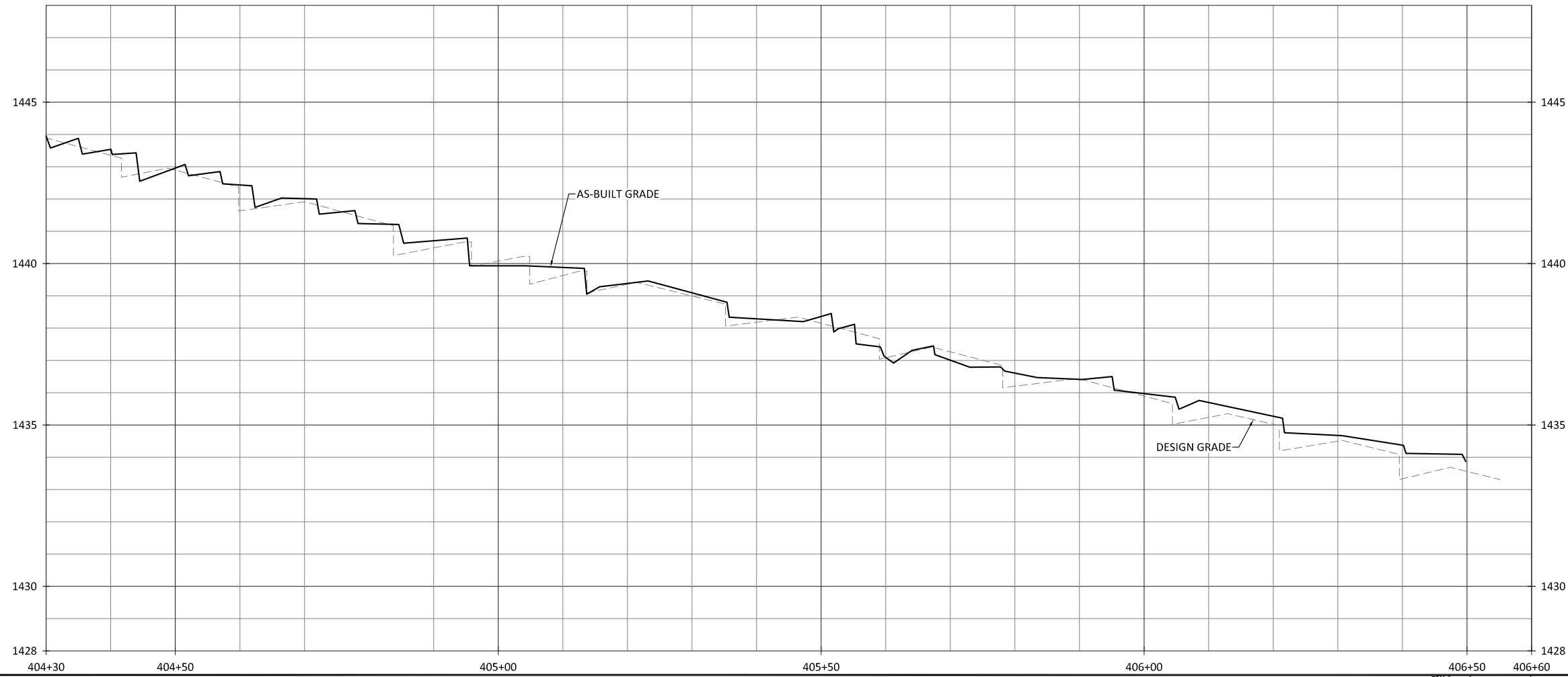


Bug Headwaters Record Drawings
Wilkes County, North Carolina
UT2A
Stream Plan and Profile

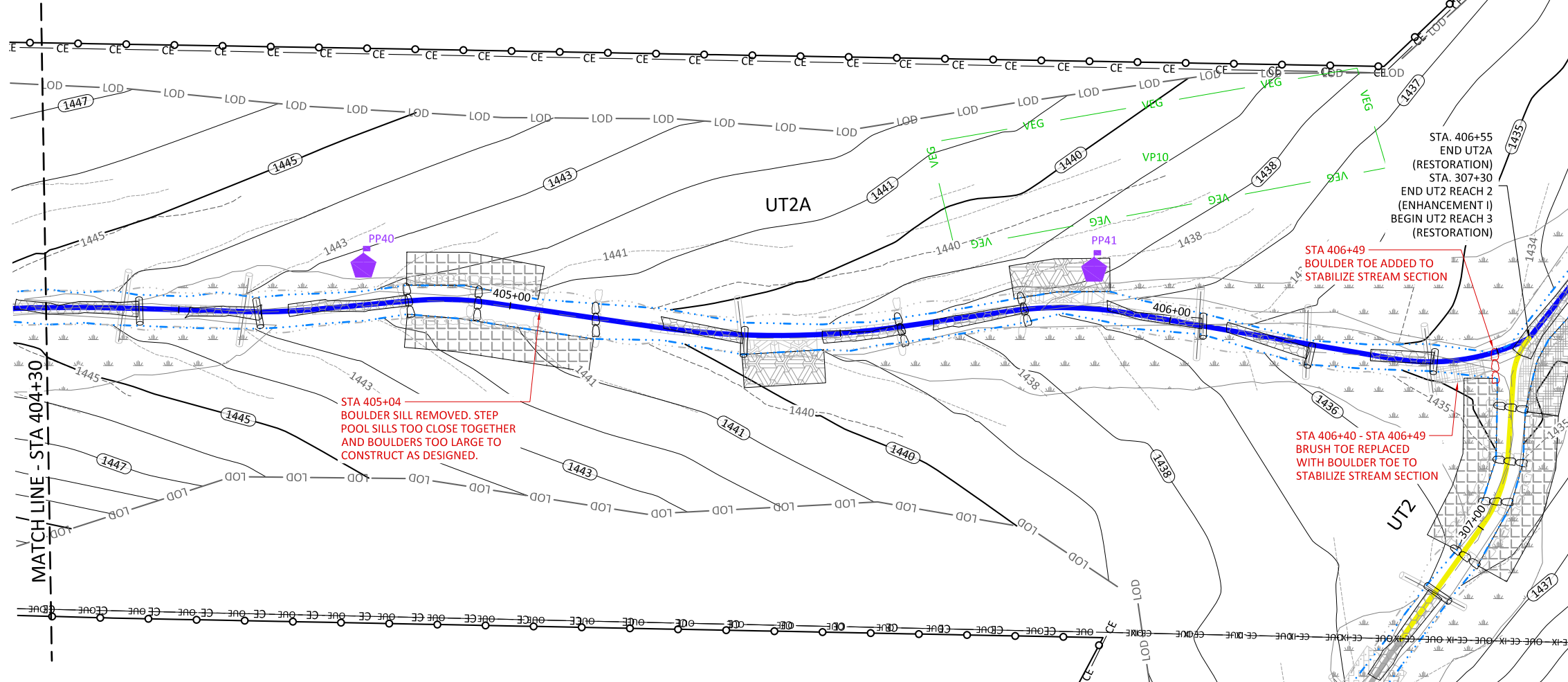
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAW
Checked By: ANA

1.35

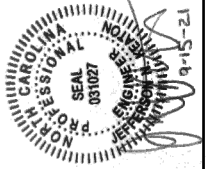


- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2 IS ADDRESSED ON SHEETS 1.23 THROUGH 1.33.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

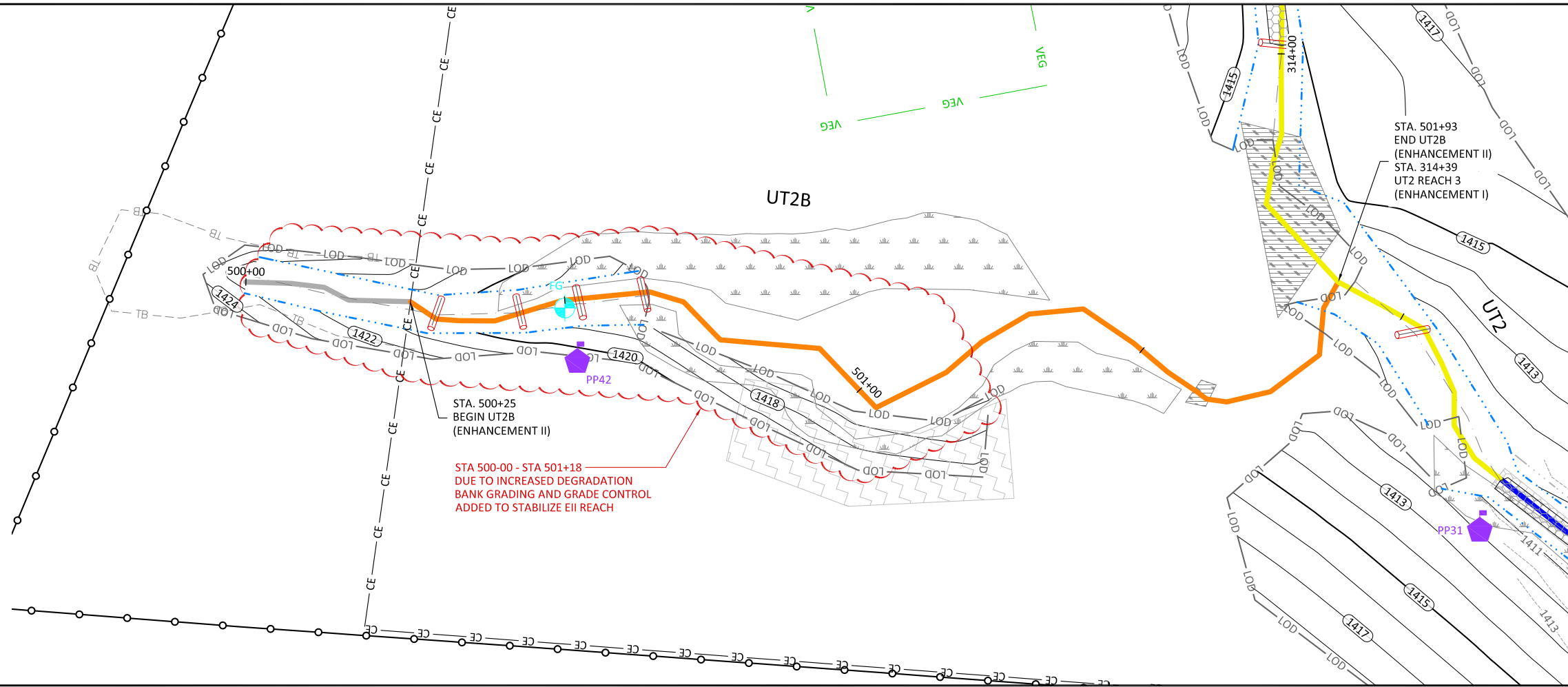
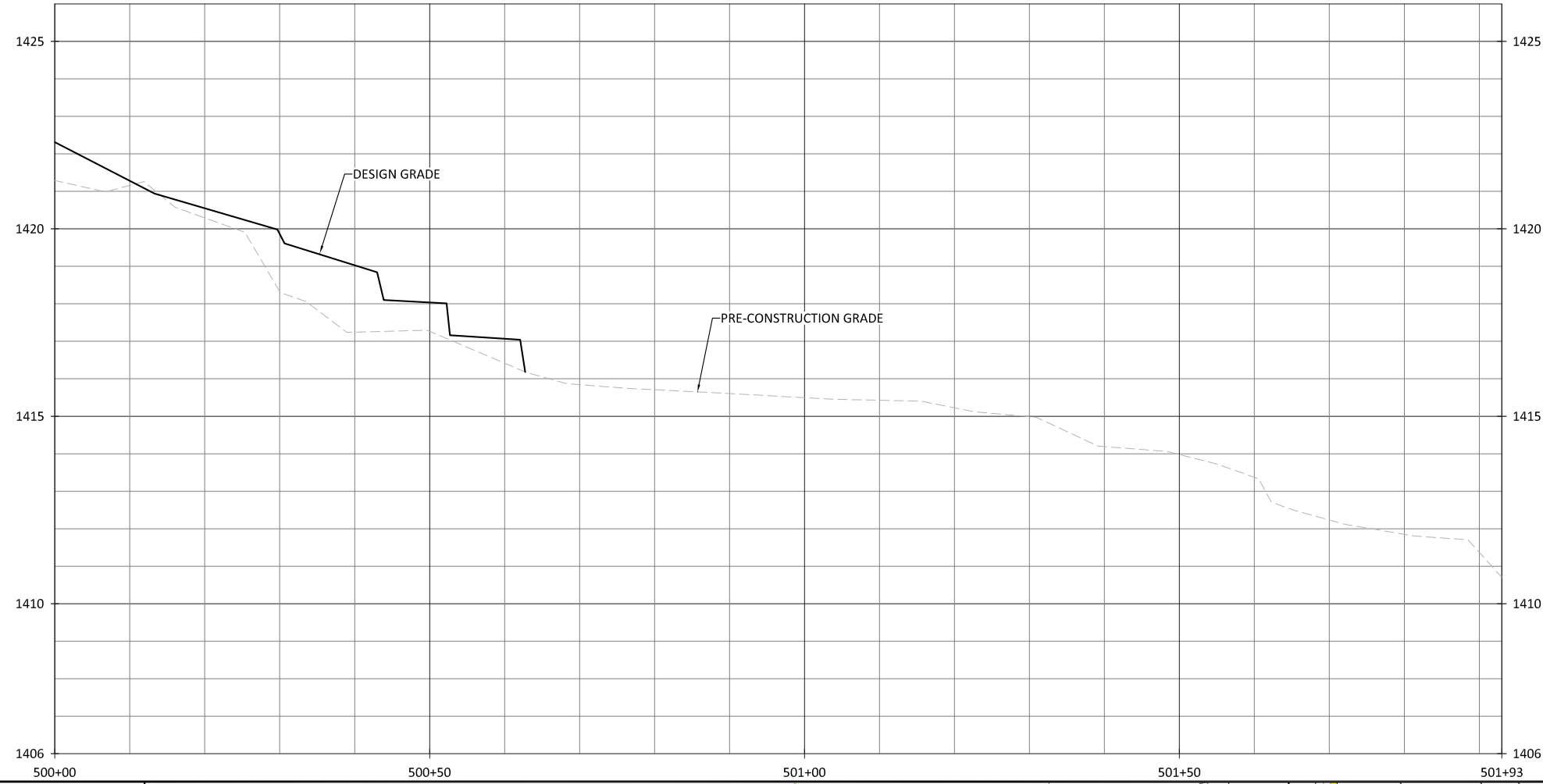
UT2A
Stream Plan and Profile



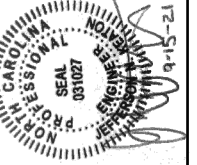
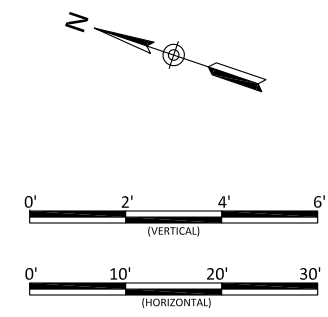
Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: ANA

1.36



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2 IS ADDRESSED ON SHEETS 1.23 THROUGH 1.33.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2B
Stream Plan and Profile

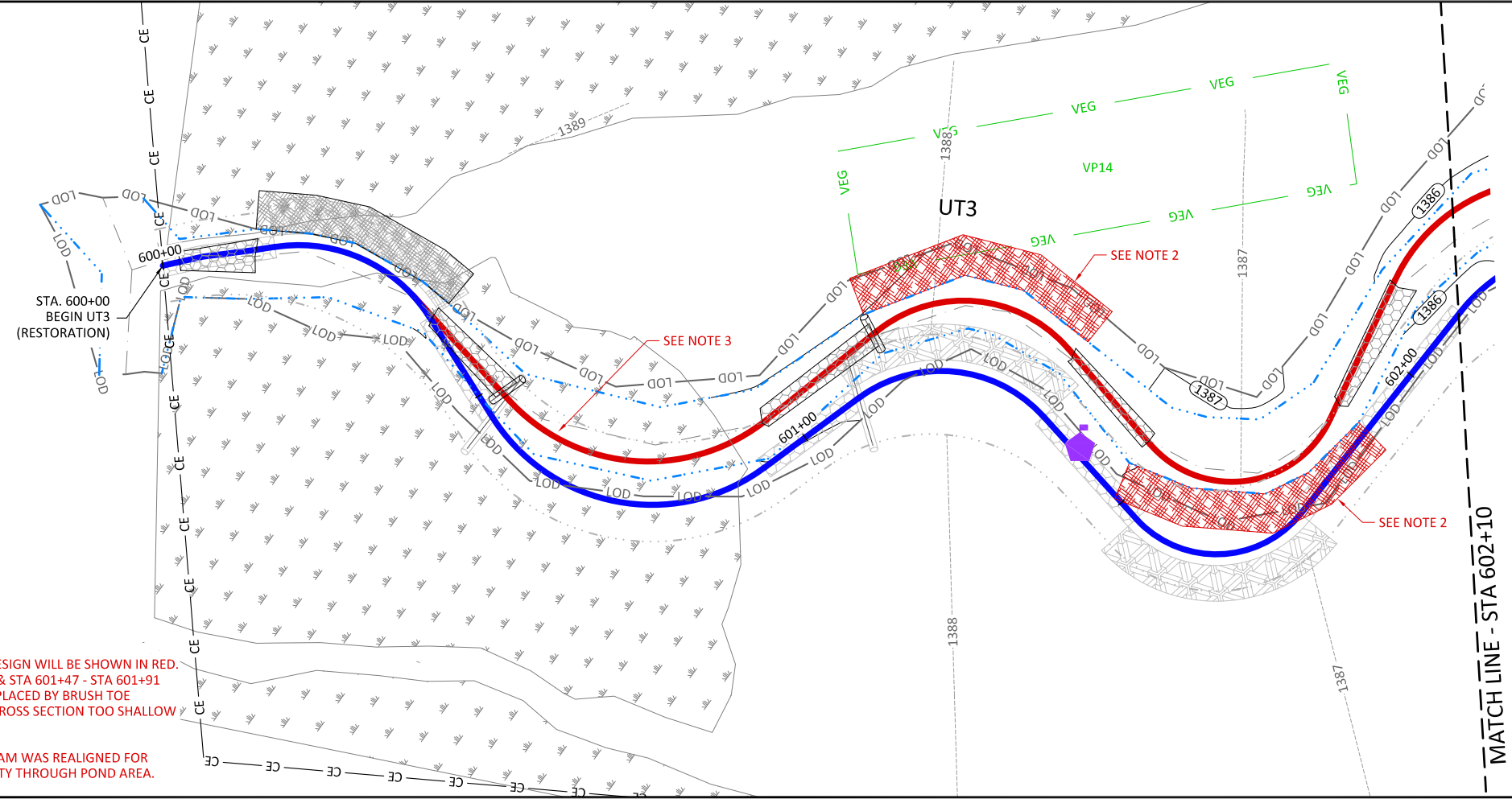
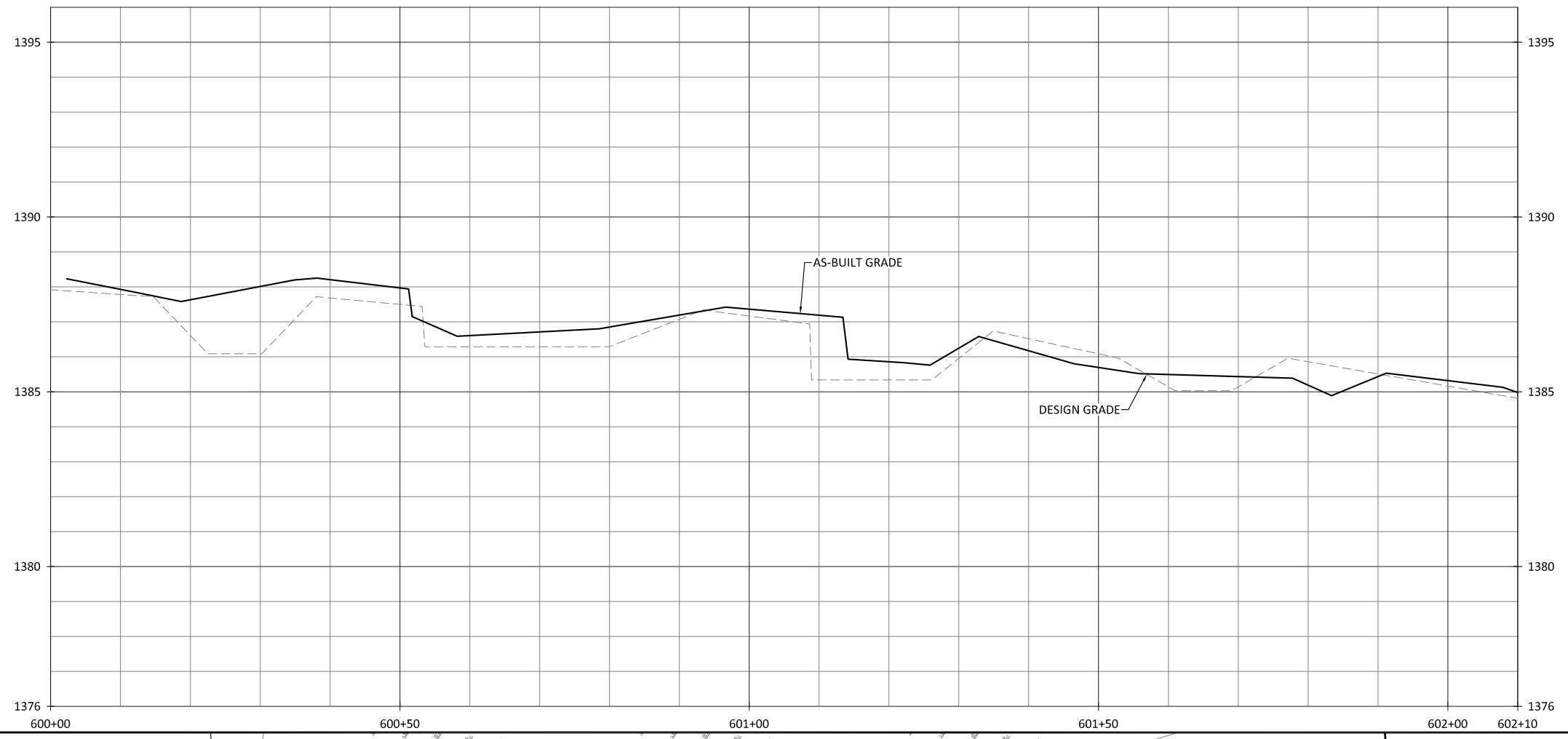
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

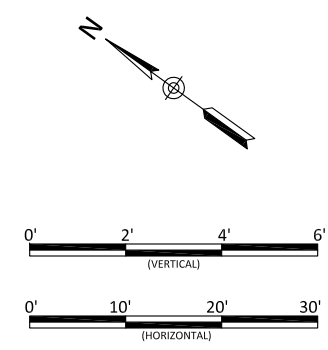
1.37

Sheet

September 14, 2021
X:\Shared\Projects\005-02176 Bug Headwaters\Monitoring\Baseline-Monitoring-2021\Plans\02176-AE UT1 UT2A UT2B UT3 UT4.dwg



- NOTES:**
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 601+13 - STA 601+33 & STA 601+47 - STA 601+91 VEGETATED SOIL LIFTS REPLACED BY BRUSH TOE REVETMENT. PROPOSED CROSS SECTION TOO SHALLOW FOR MULTIPLE SOIL LIFTS.
 3. STA 600+34 - STA 602+60
231 LINEAR FEET OF STREAM WAS REALIGNED FOR BETTER CONSTRUCTABILITY THROUGH POND AREA.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

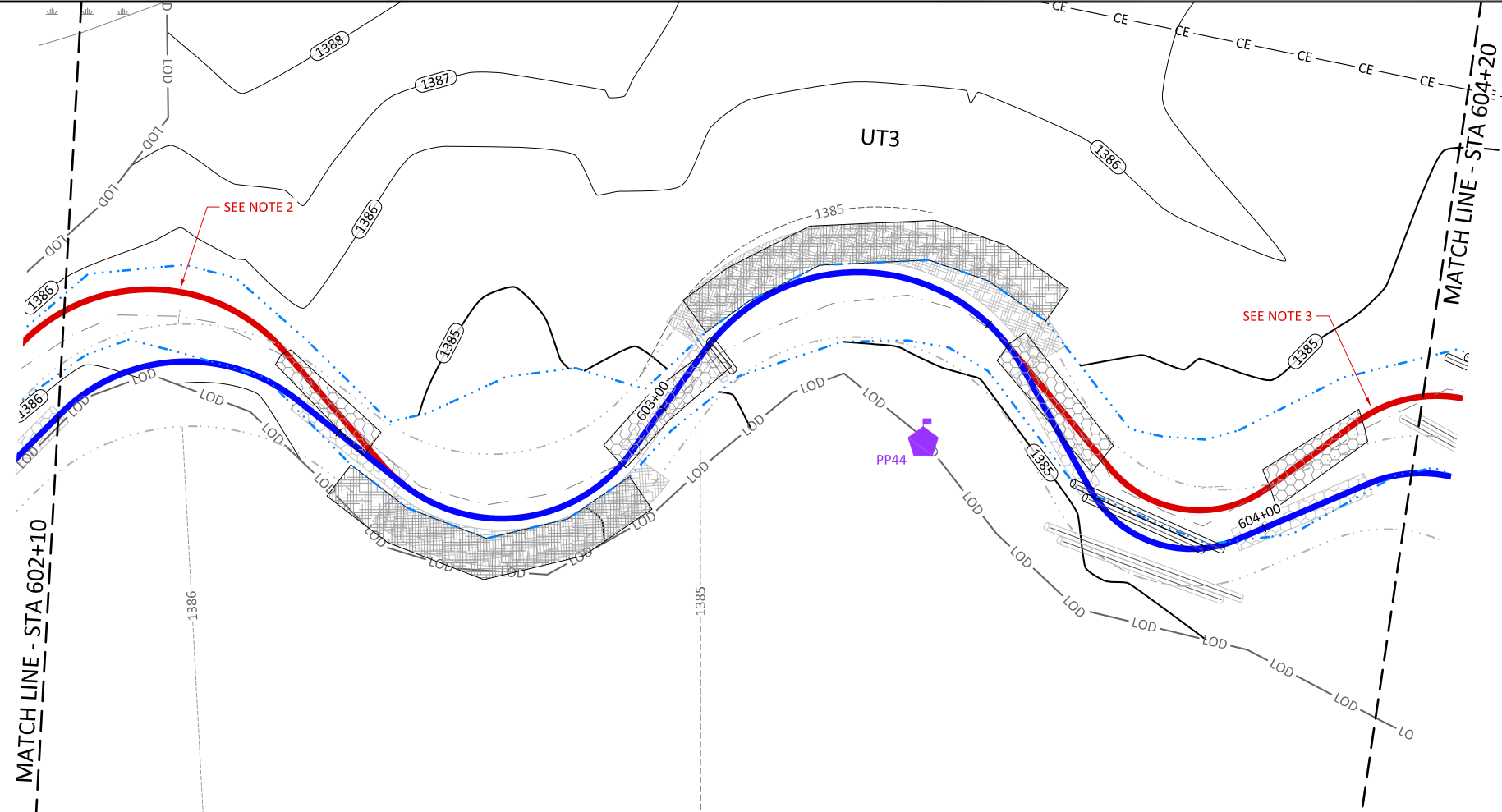
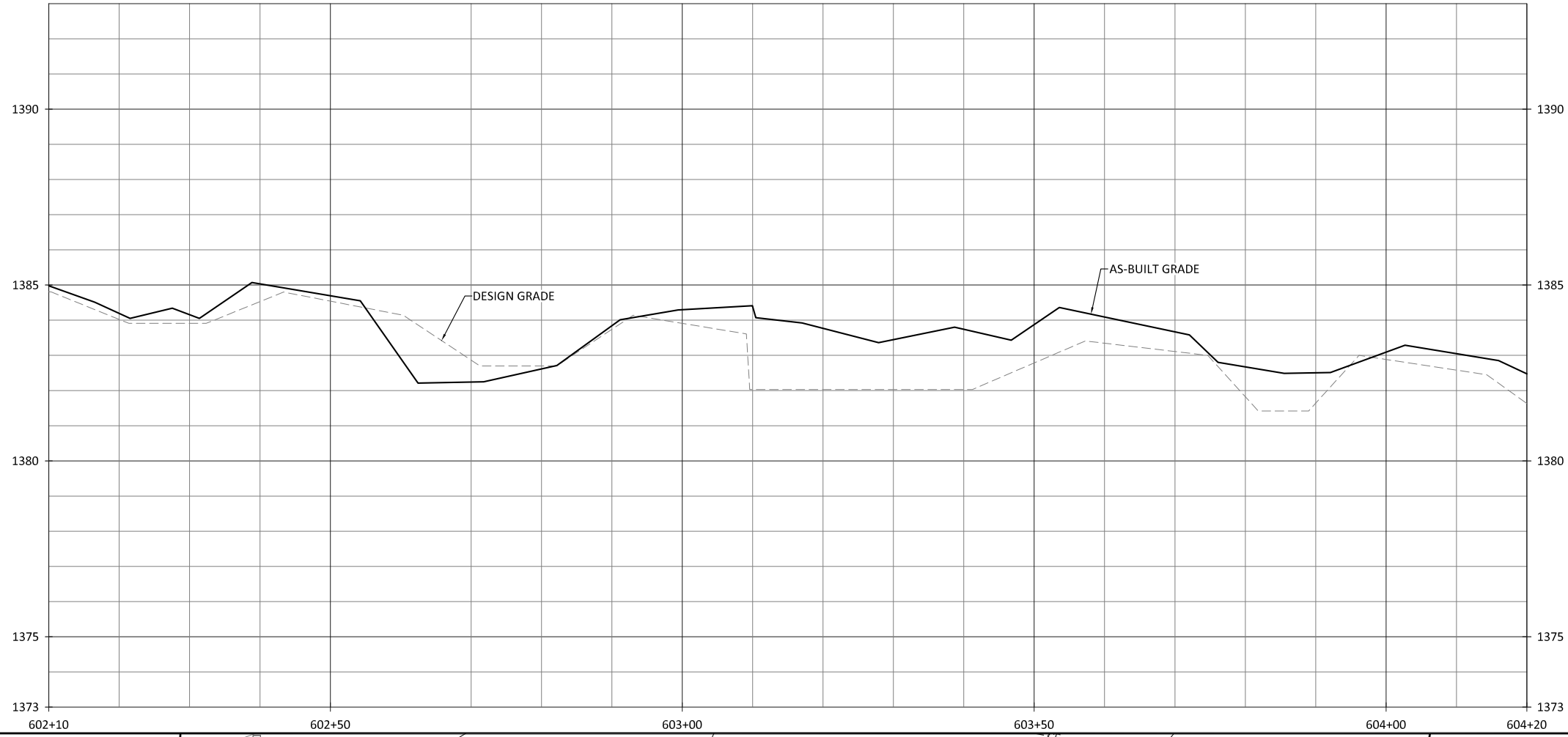
UT3
Stream Plan and Profile

Revisions:

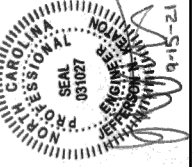
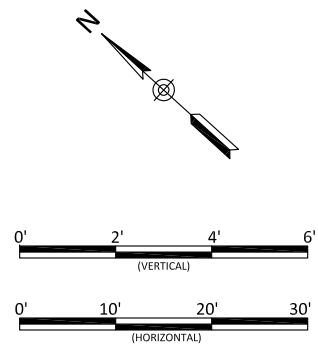
Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAW
Checked By: ANA

1.38

Sheet



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 600+34 - STA 602+60
231 LINEAR FEET OF STREAM WAS REALIGNED FOR BETTER CONSTRUCTABILITY THROUGH POND AREA.
 3. STA 603+56 - STA 606+69
313 LINEAR FEET OF STREAM WAS REALIGNED FOR BETTER CONSTRUCTABILITY THROUGH POND AREA.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

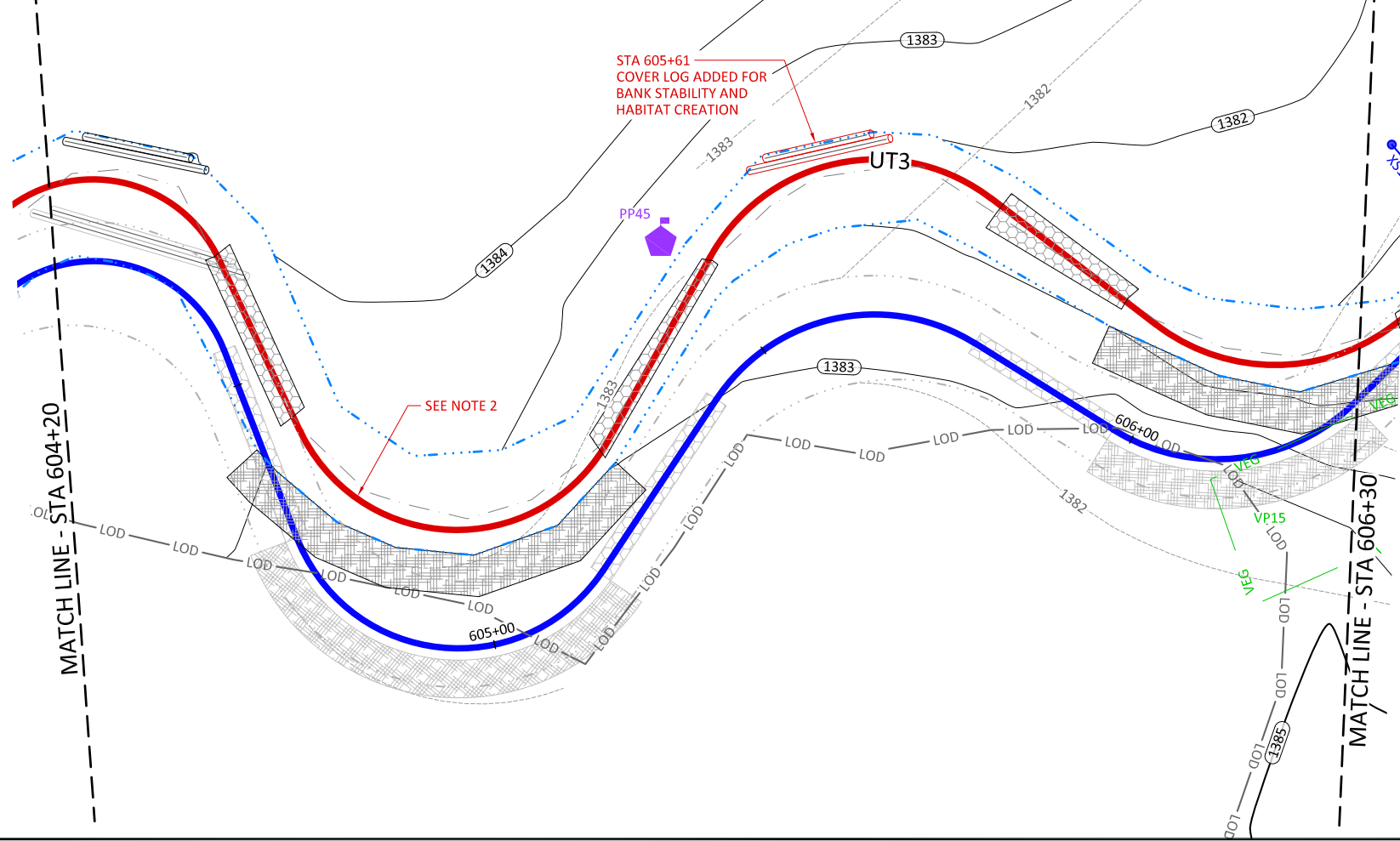
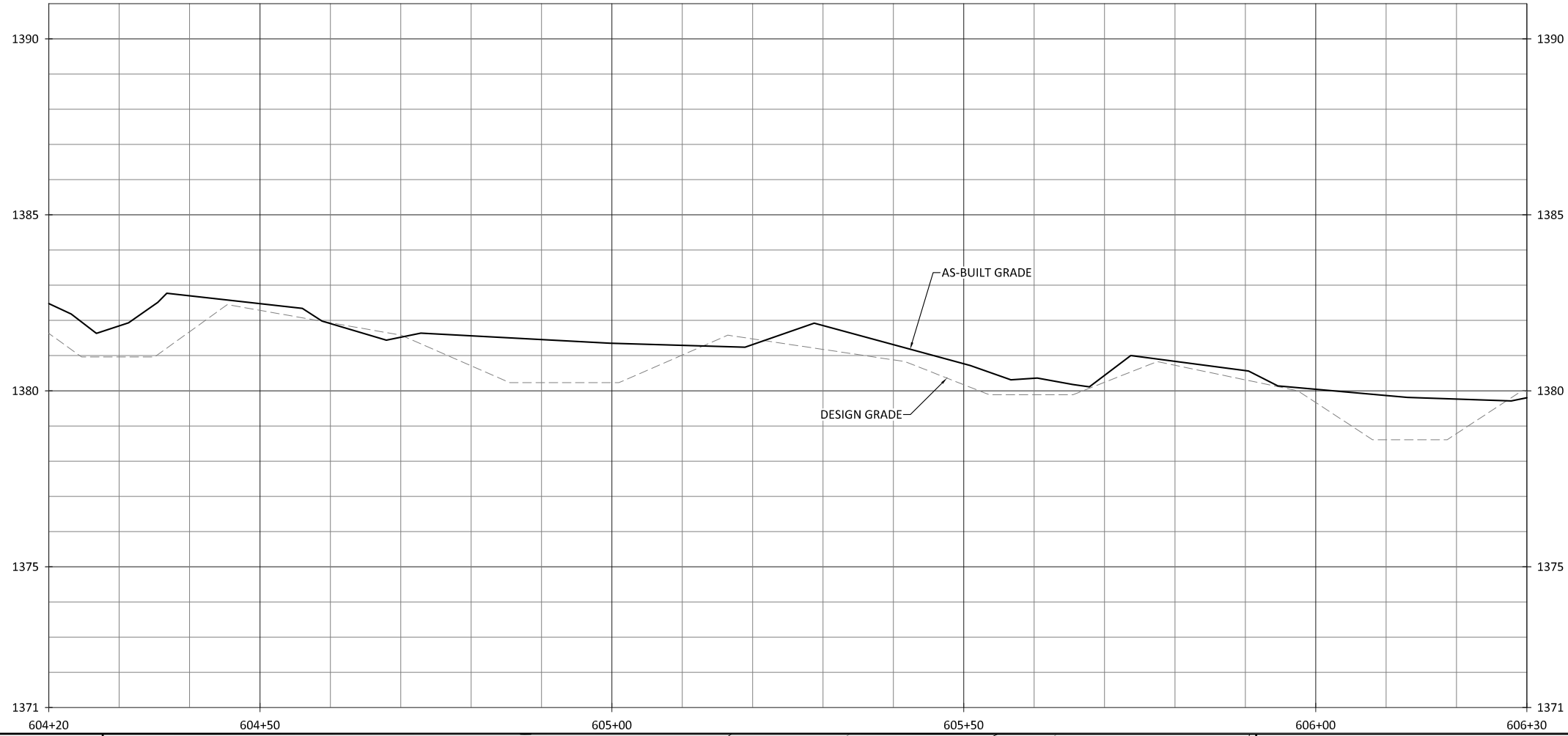
UT3
Stream Plan and Profile

Revisions:

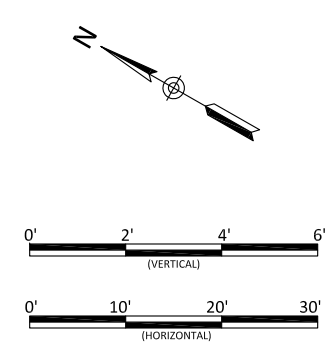
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.39

Sheet



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 603+56 - STA 606+69
313 LINEAR FEET OF STREAM WAS REALIGNED FOR BETTER CONSTRUCTABILITY THROUGH POND AREA.



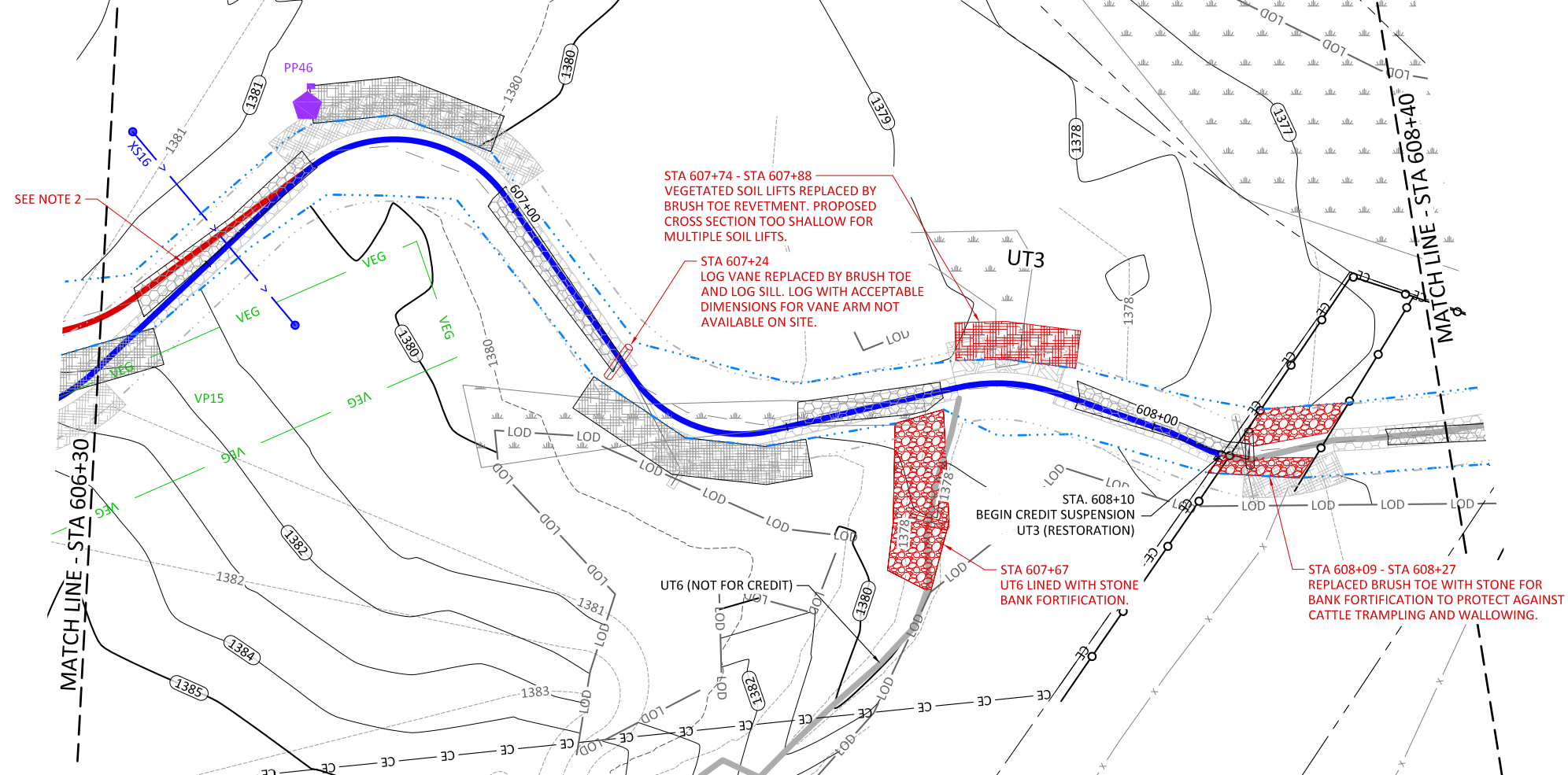
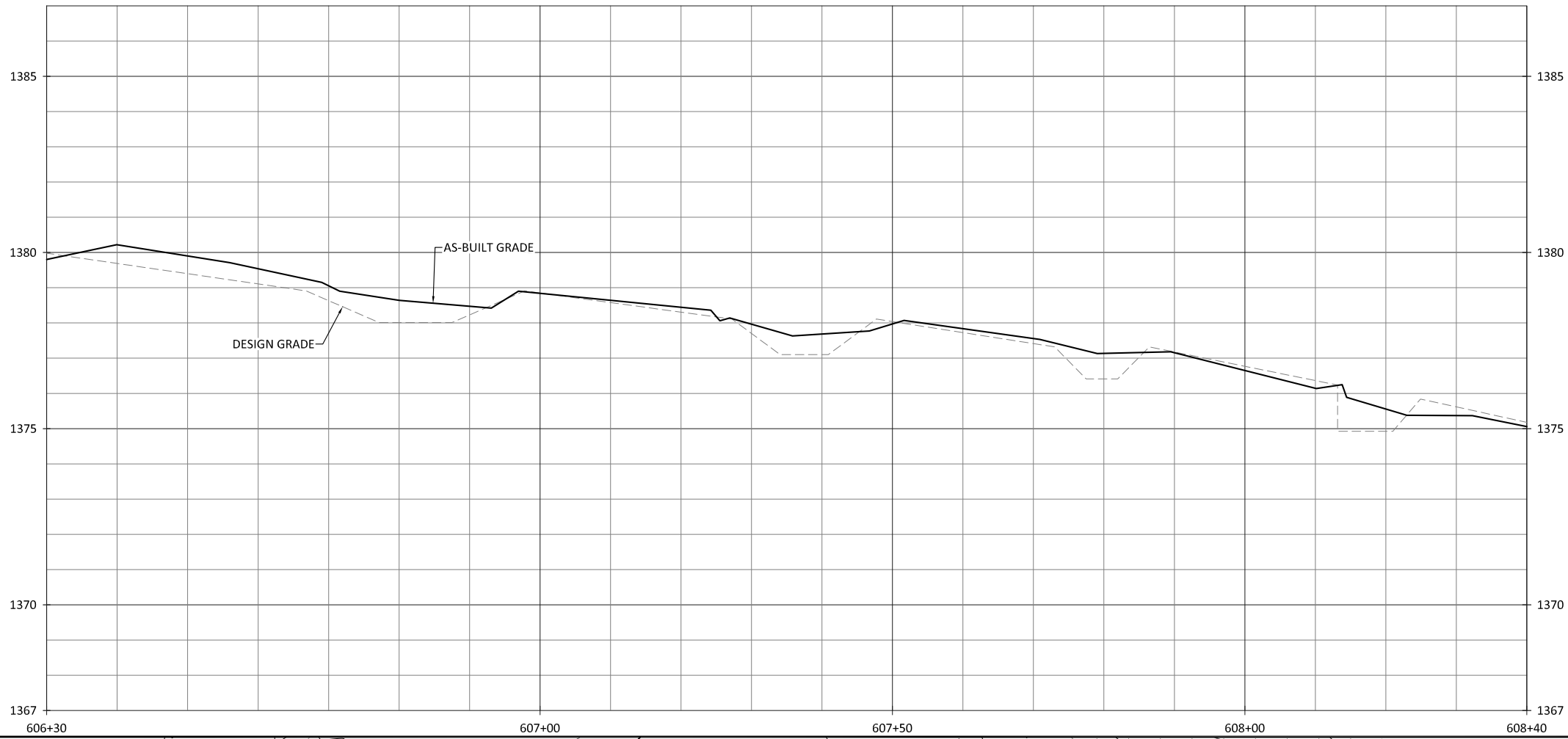
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT3
Stream Plan and Profile

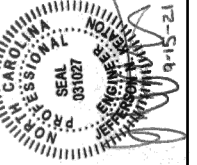
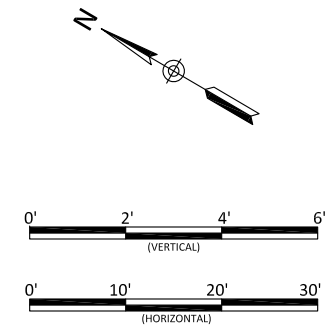
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.40
Sheet



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 603+56 - STA 606+69
313 LINEAR FEET OF STREAM WAS REALIGNED FOR BETTER CONSTRUCTABILITY THROUGH POND AREA.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

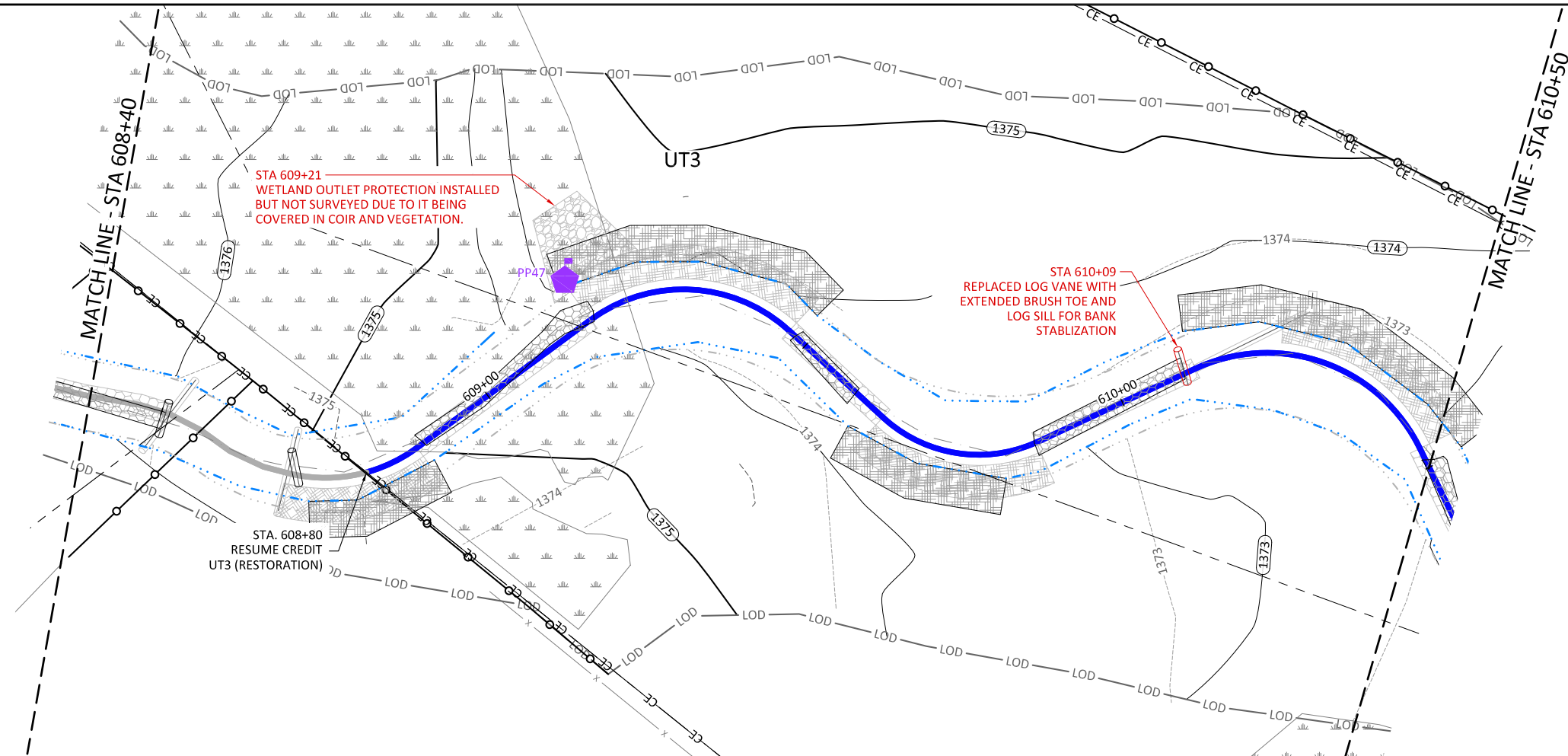
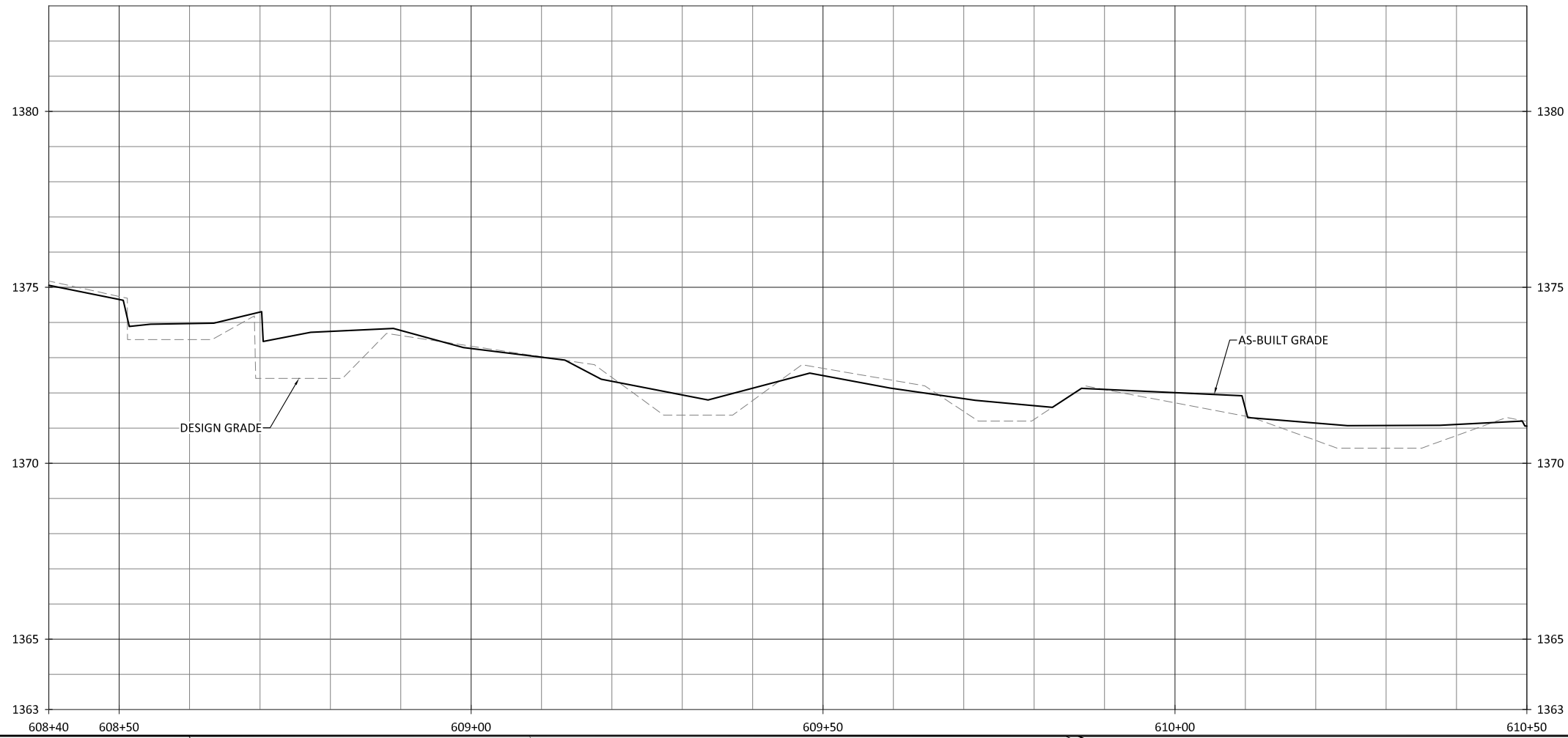
UT3
Stream Plan and Profile

Revisions:

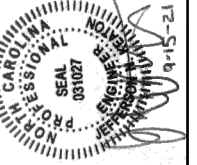
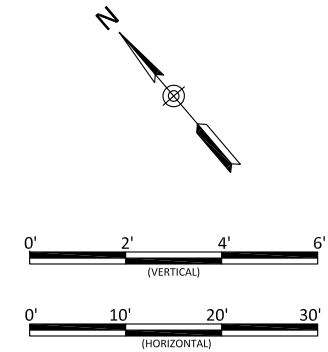
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.41

Sheet



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



Bug Headwaters Record Drawings
 Wilkes County, North Carolina

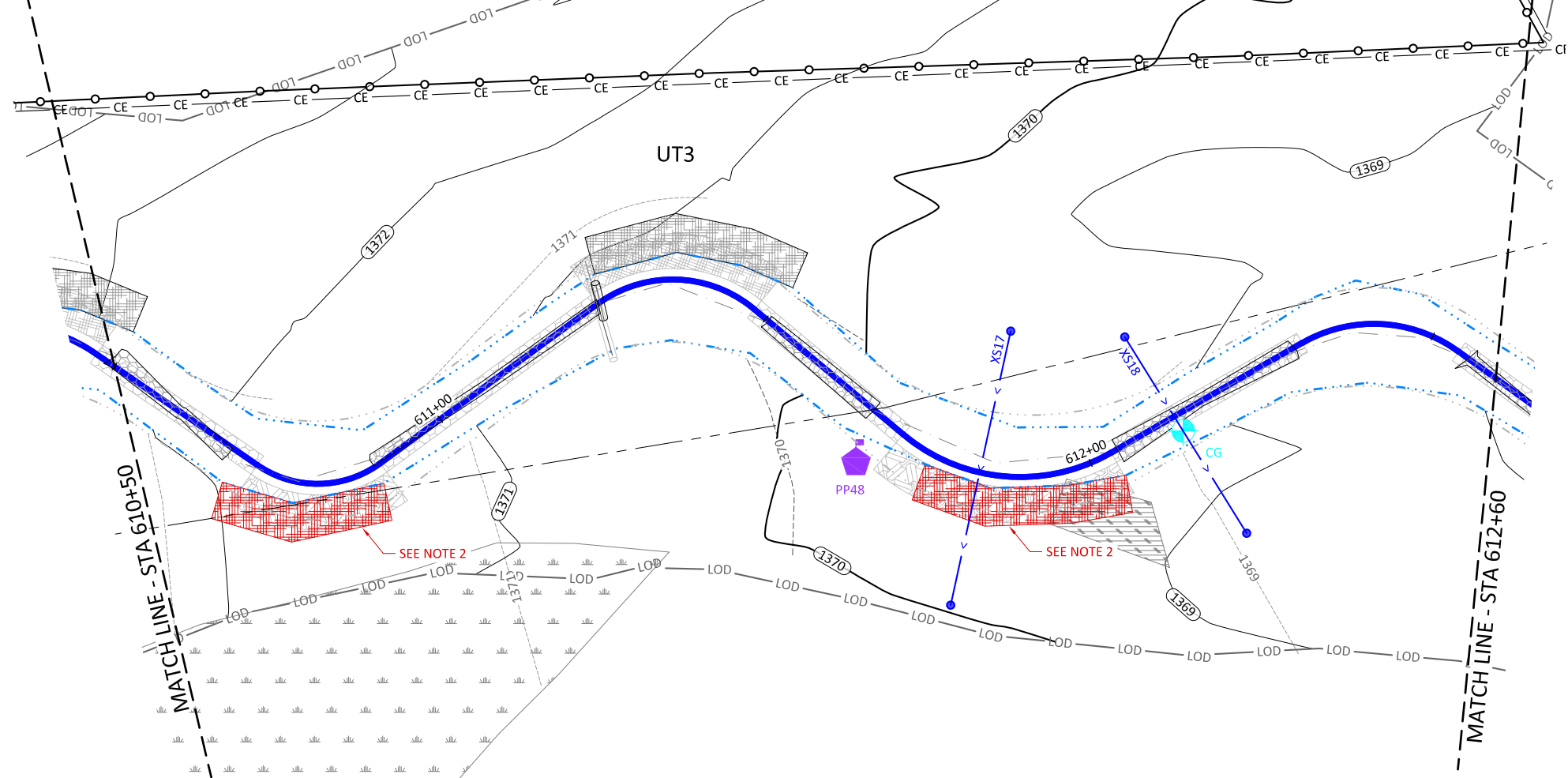
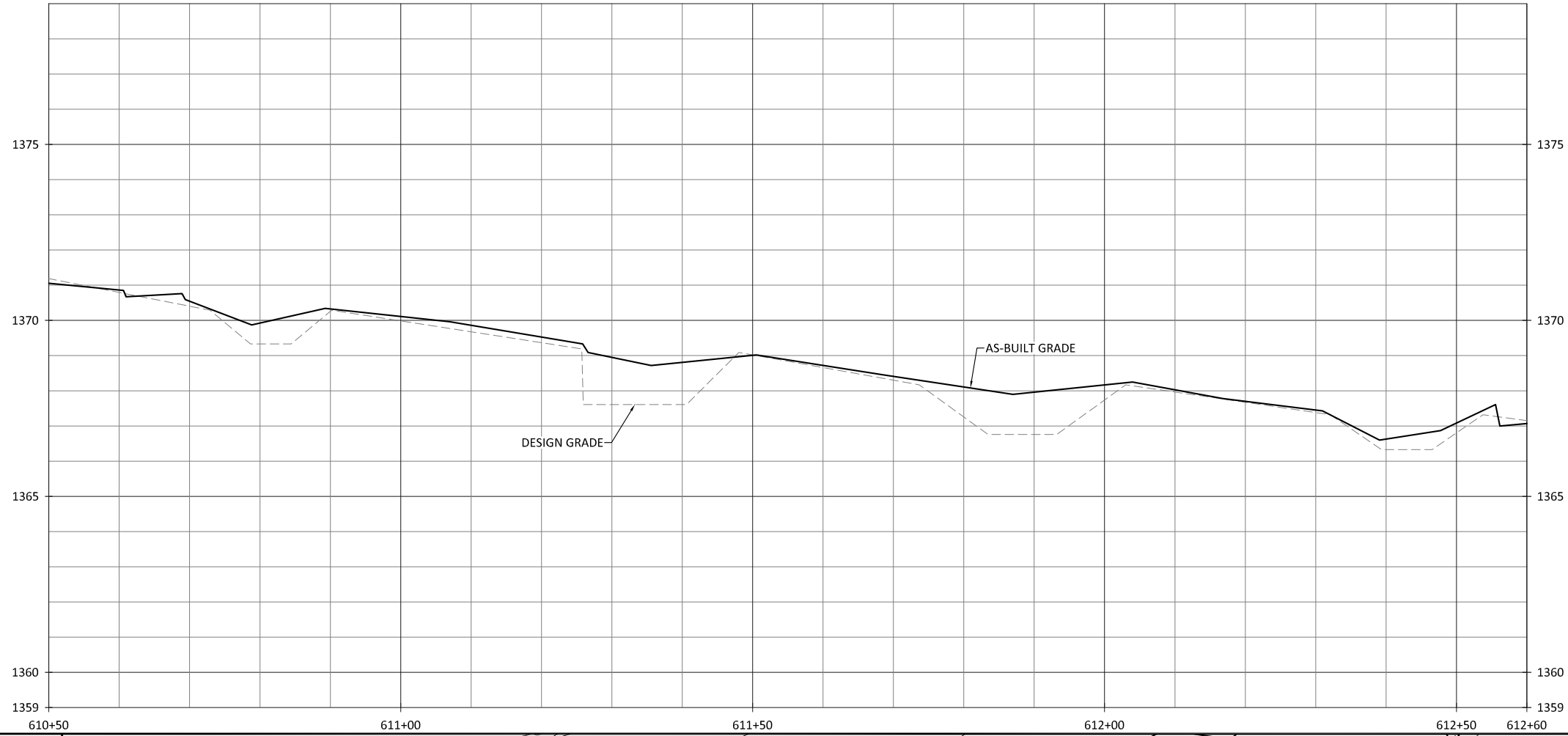
UT3
 Stream Plan and Profile

Revisions:

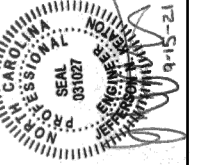
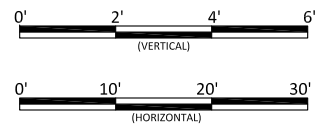
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.42

Sheet



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. STA 610+71 - STA 610+89 & STA 611+78 - STA 612+03 BRUSH TOE WAS USED INSTEAD OF SOIL LIFTS DUE TO CHANNEL DIMENSIONS NOT DEEP ENOUGH FOR MULTIPLE SOIL LIFTS.



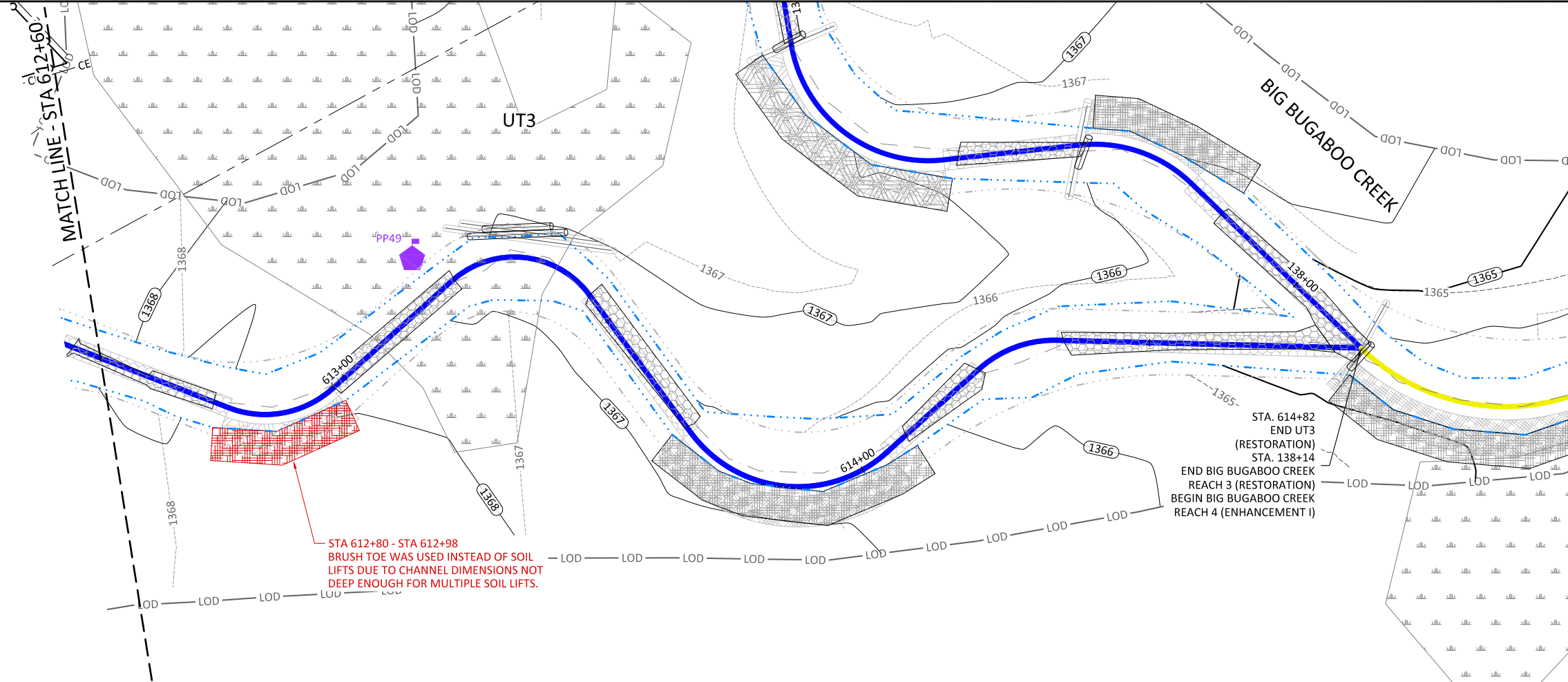
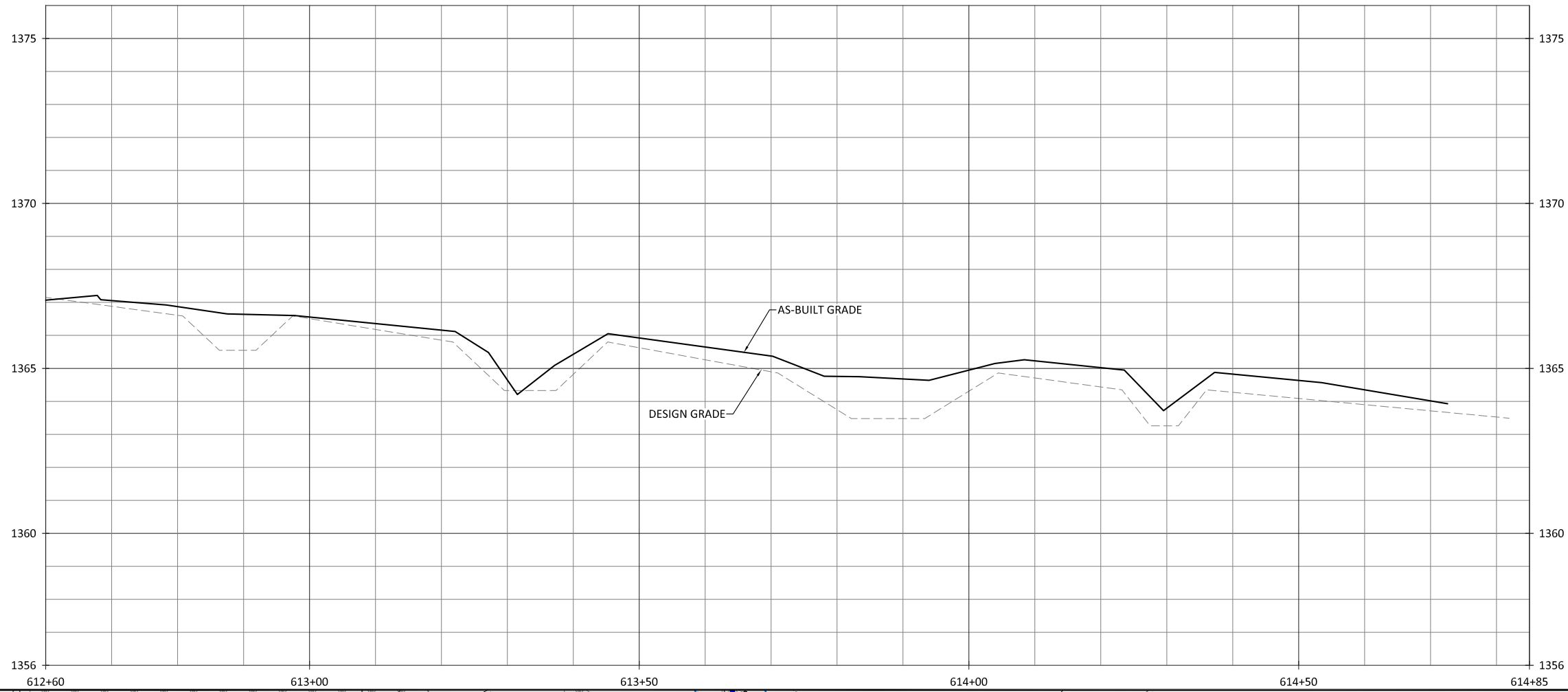
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT3
 Stream Plan and Profile

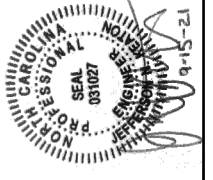
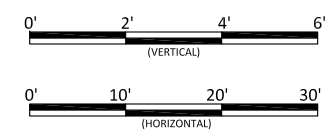
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

1.43



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR BIG BUGABOO CREEK IS ADDRESSED ON SHEETS 1.01 THROUGH 1.20.



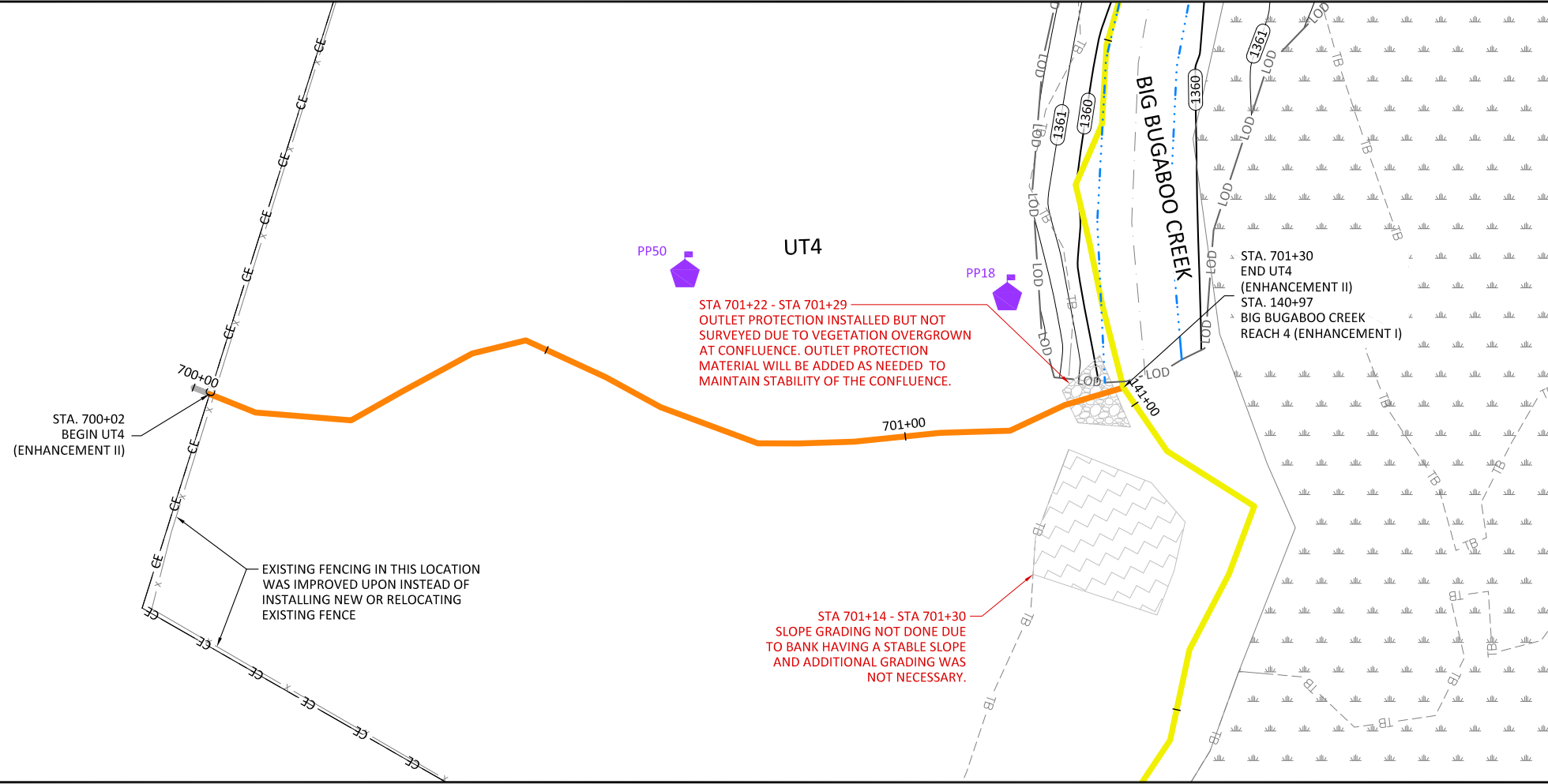
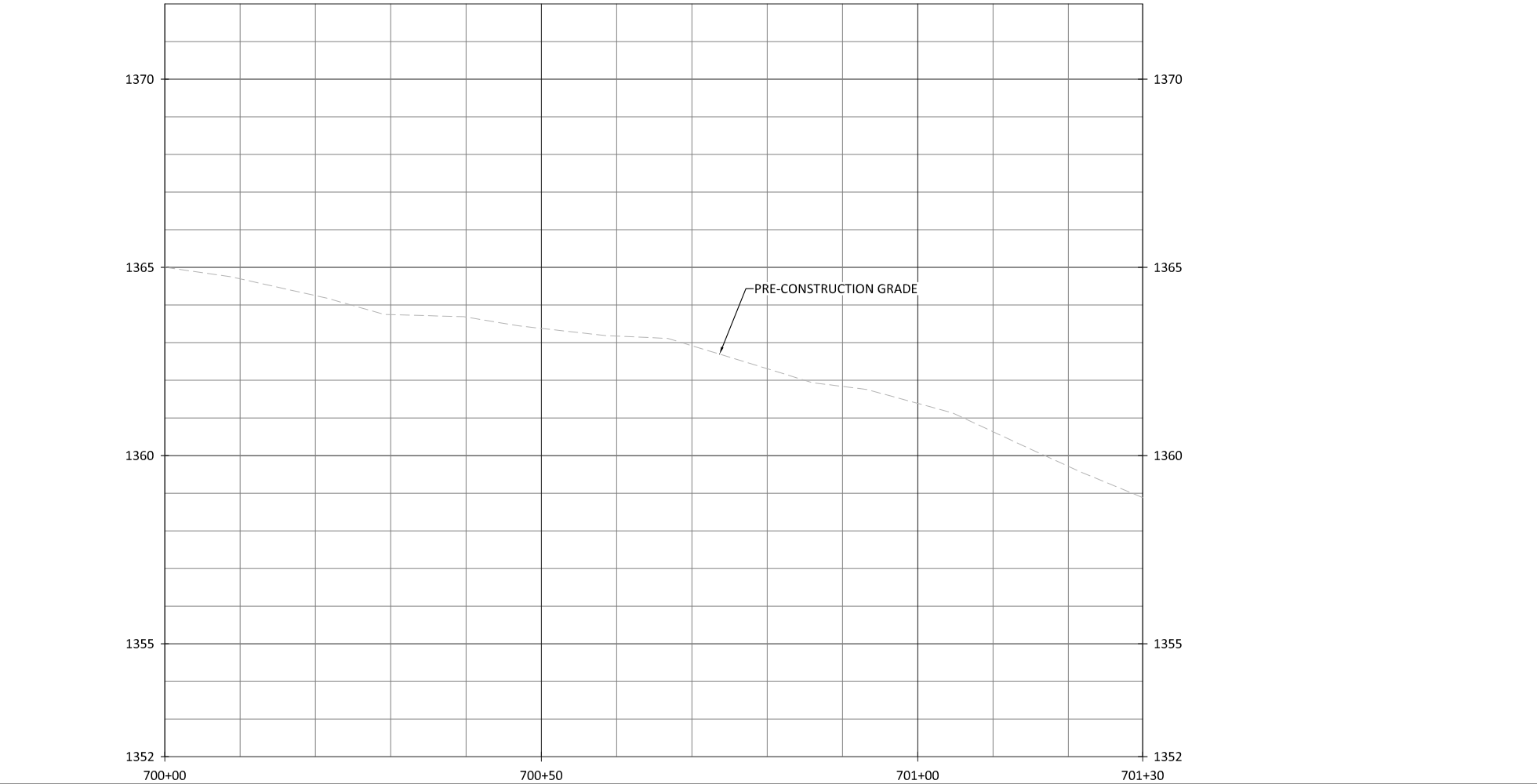
Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT3
Stream Plan and Profile

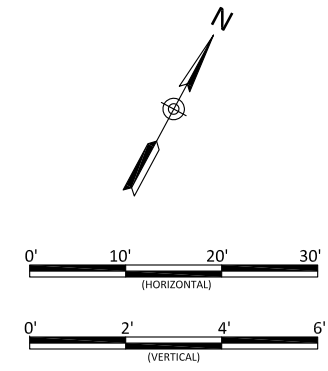
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

1.44



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR BIG BUGABOO CREEK IS ADDRESSED ON SHEETS 1.01 THROUGH 1.20.



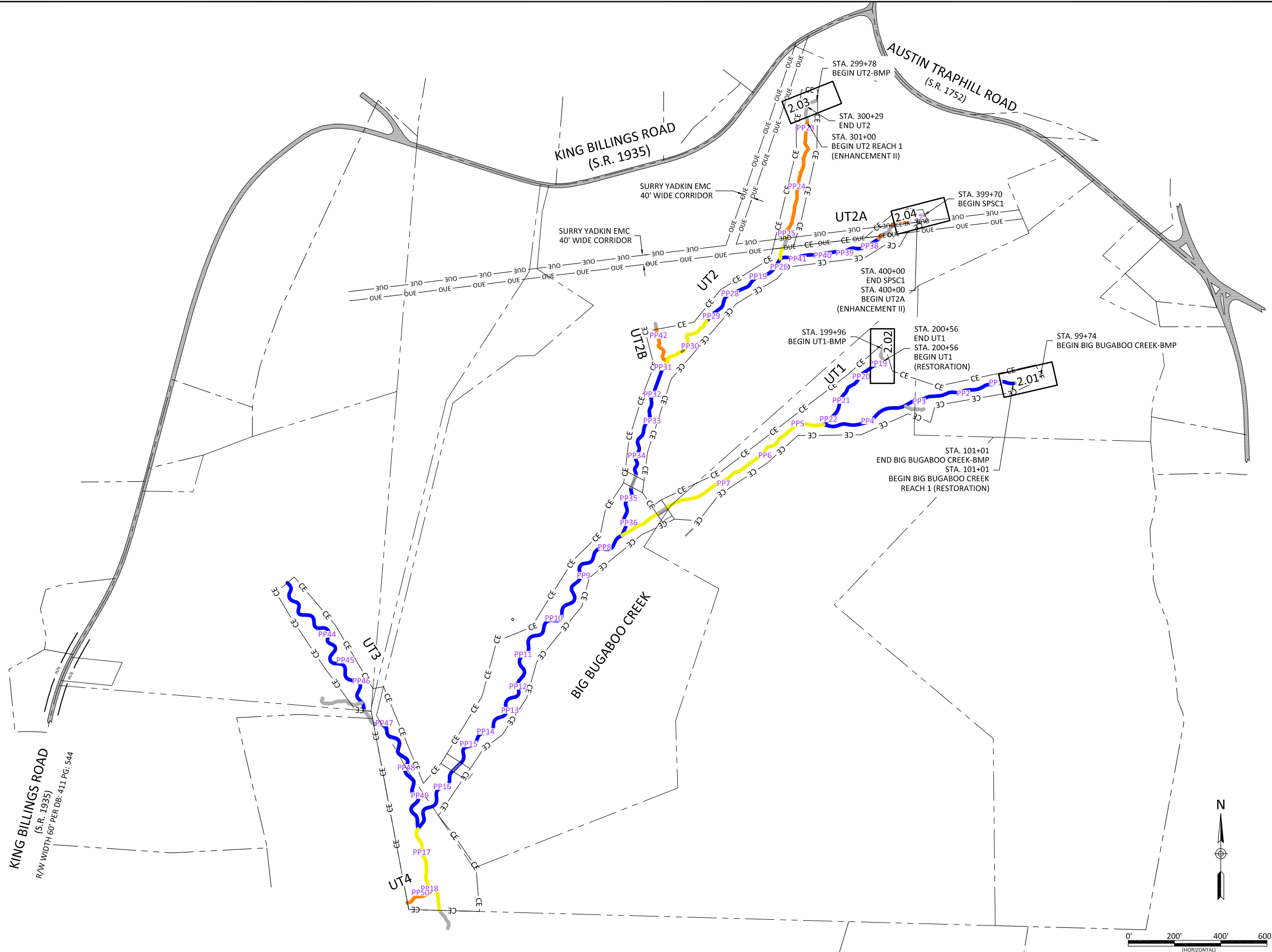
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT4
 Stream Plan and Profile

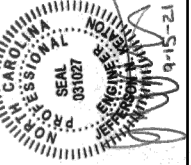
Revisions:

Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

1.45



KING BILLINGS ROAD
 (S.R. 1935)
 R/W WIDTH 60' PER DB: 411 PG: 544



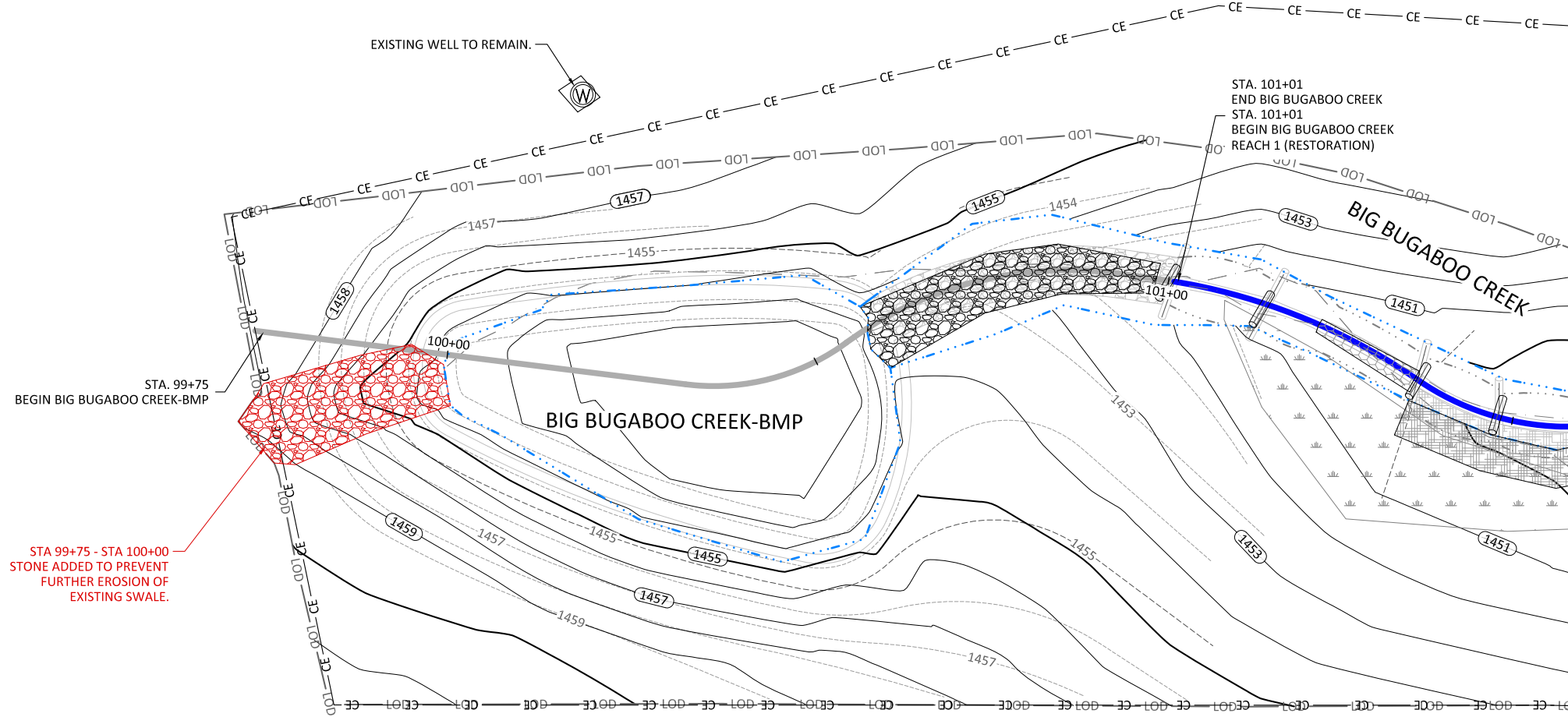
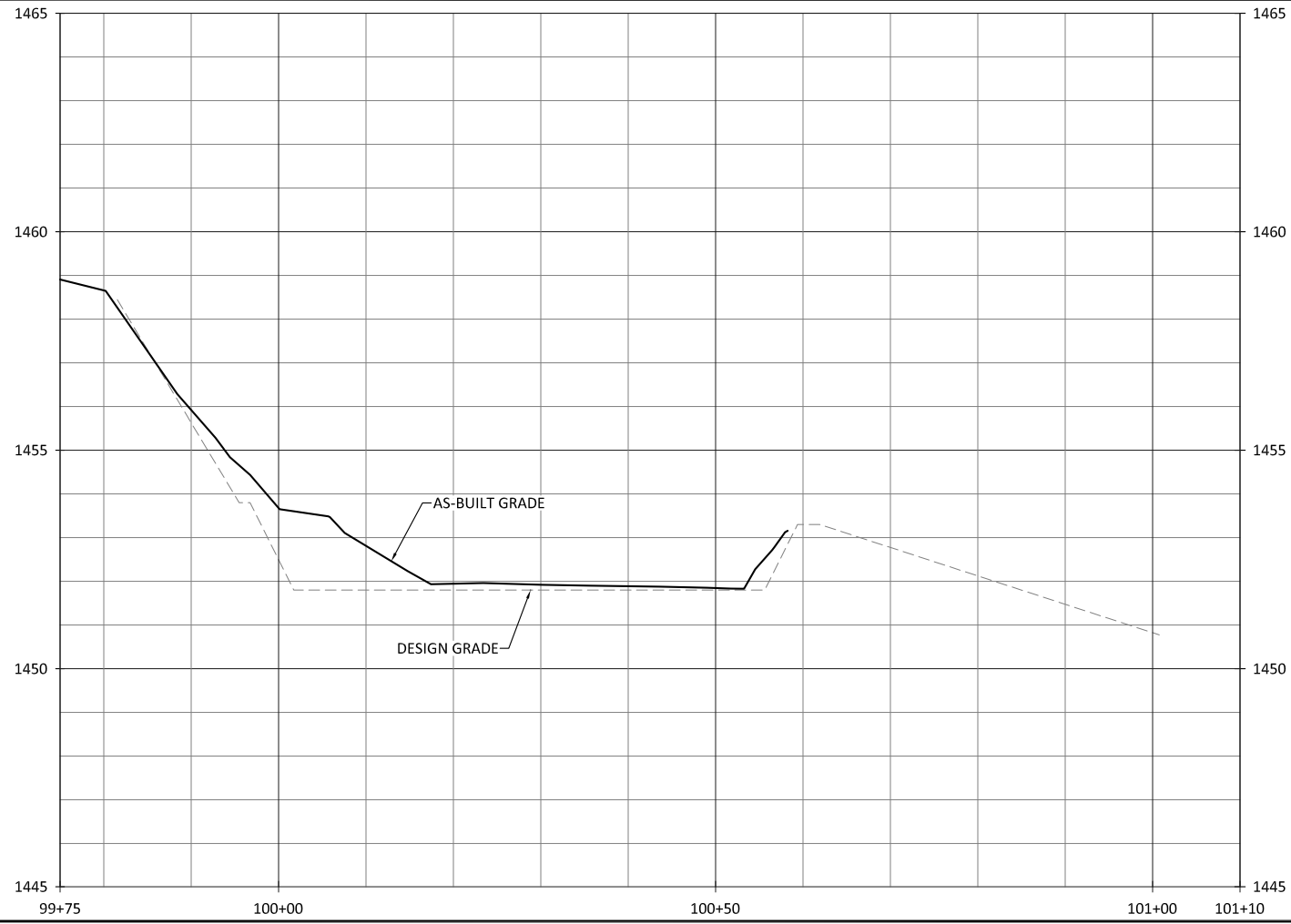
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

BMP Overview
 BMP Design

Revisions:

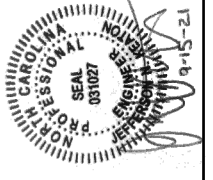
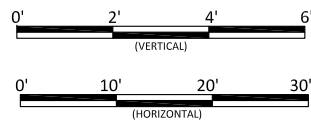
Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

2.00



STA 99+75 - STA 100+00
STONE ADDED TO PREVENT
FURTHER EROSION OF
EXISTING SWALE.

- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR BIG BUGABOO CREEK IS ADDRESSED ON SHEETS 1.01 THROUGH 1.20.

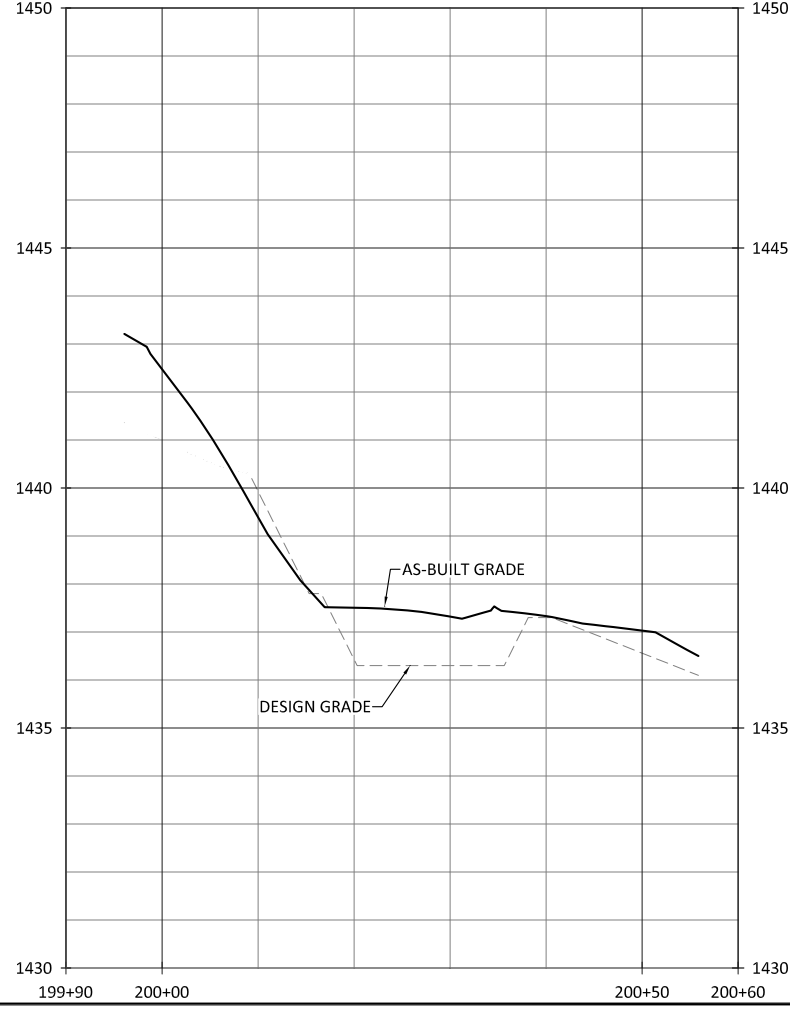
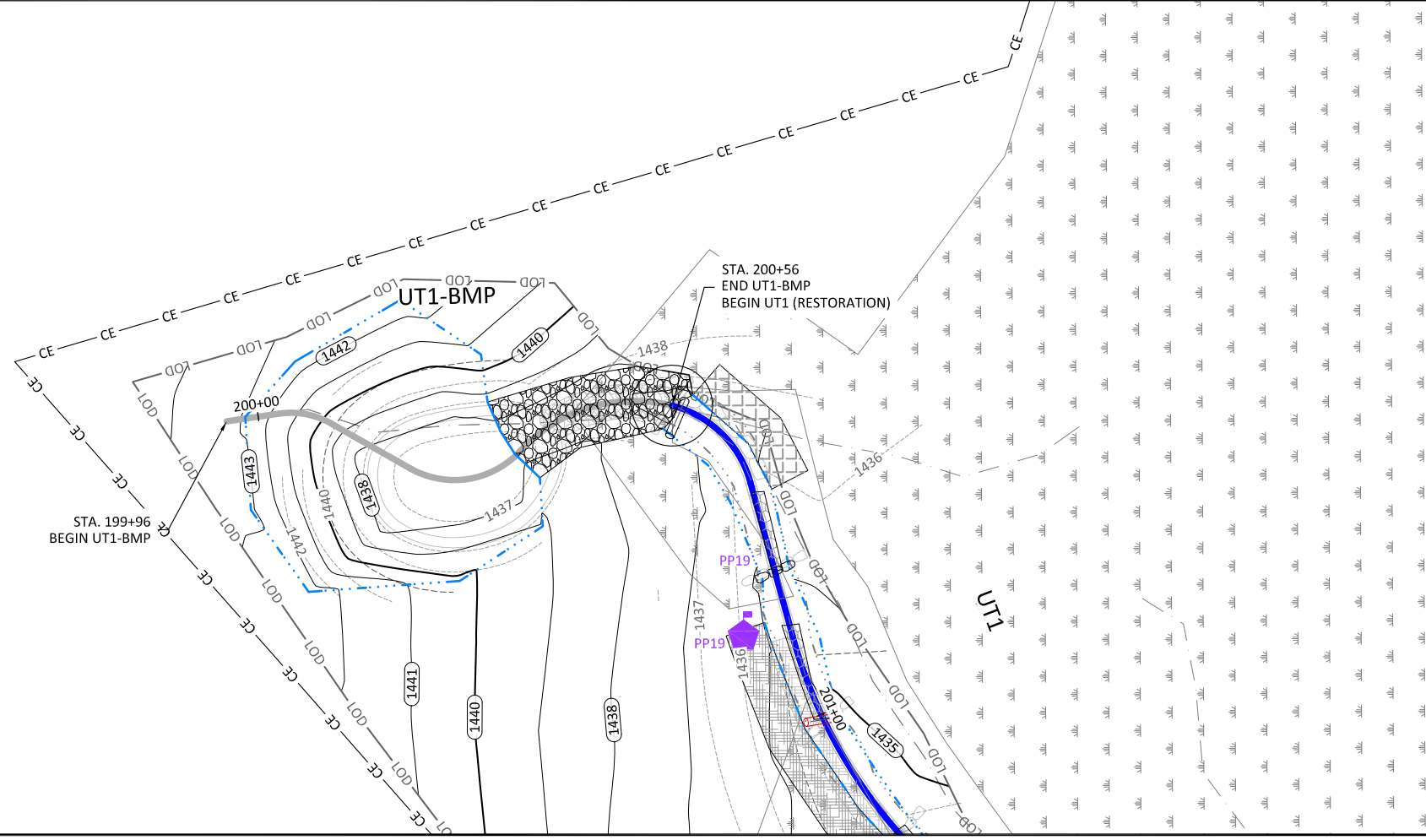


Bug Headwaters Record Drawings
Wilkes County, North Carolina
Big Bugaboo Creek-BMP
BMP Design

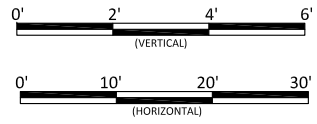
Revisions:

Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

2.01



- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT1 IS ADDRESSED ON SHEETS 1.21 THROUGH 1.22.



Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

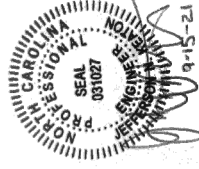
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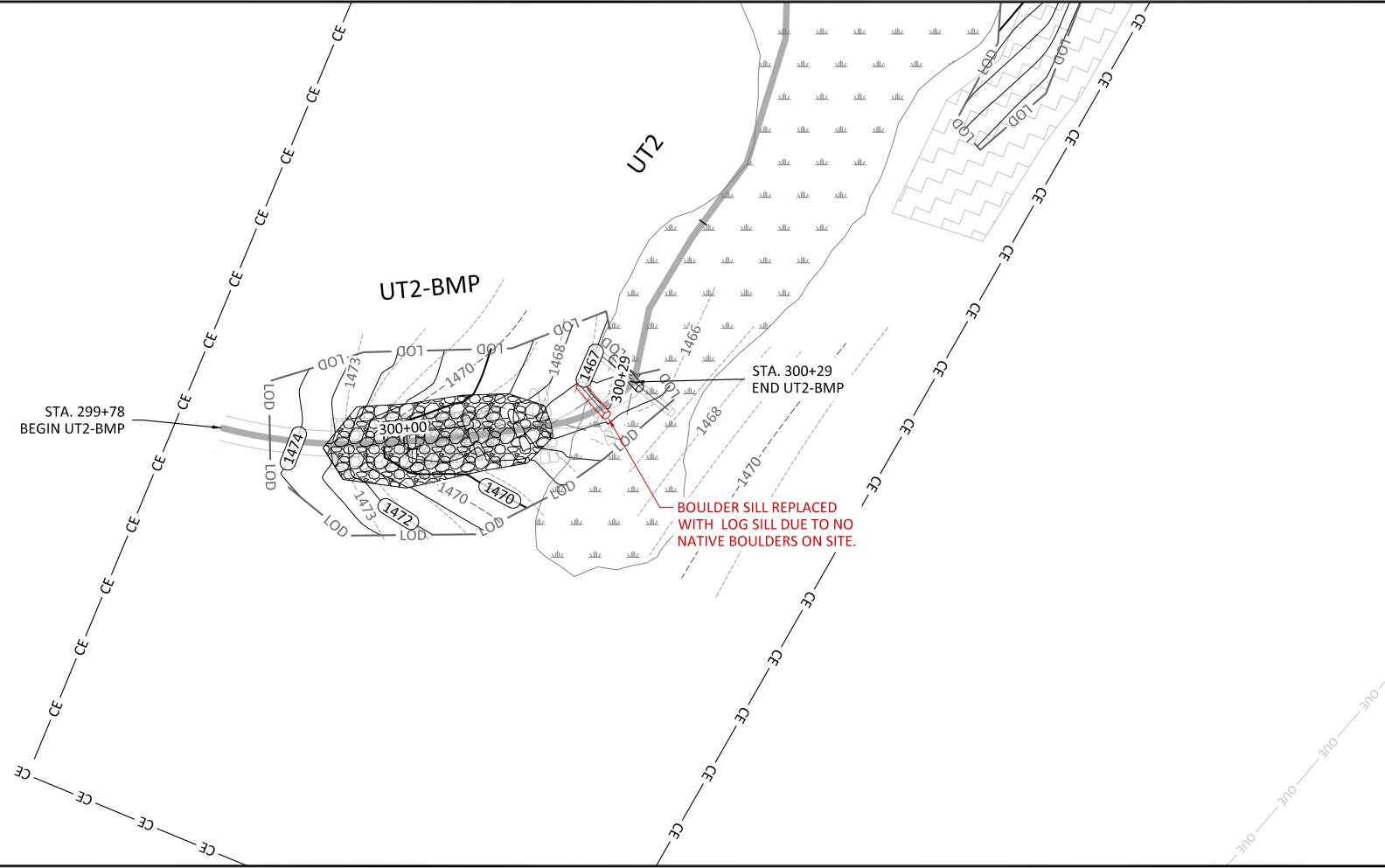
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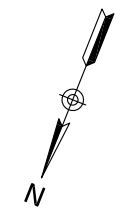
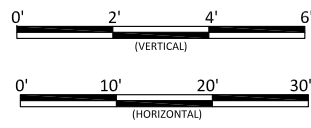
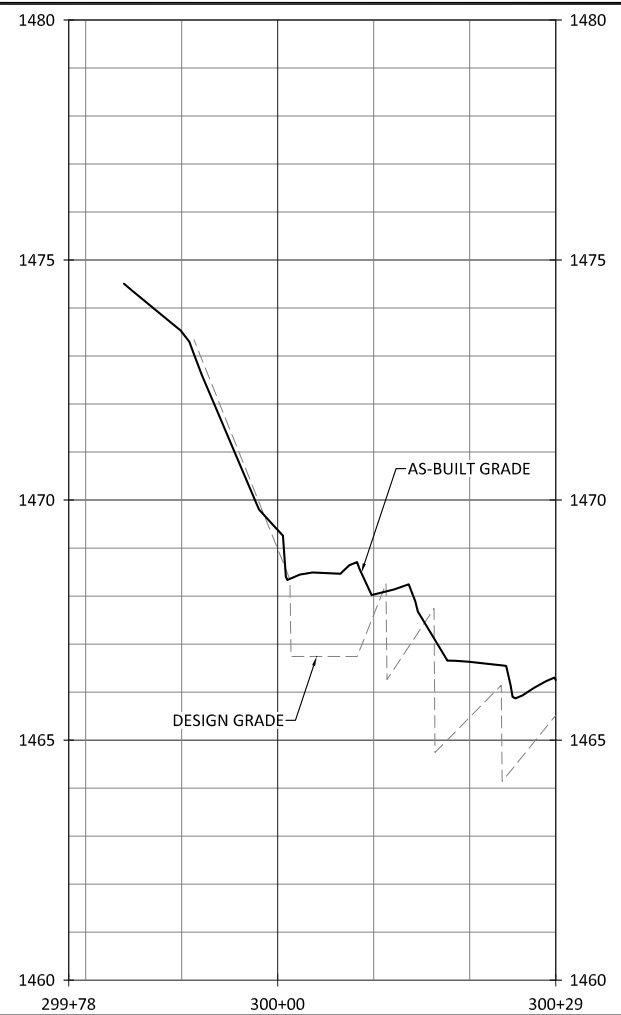
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

UT1-BMP
 BMP Design





- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2 IS ADDRESSED ON SHEETS 1.23 THROUGH 1.33.



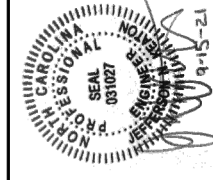
Bug Headwaters Record Drawings
 Wilkes County, North Carolina
 UT2-BMP
 Ephemeral Step Pool Stabilization

Revisions:

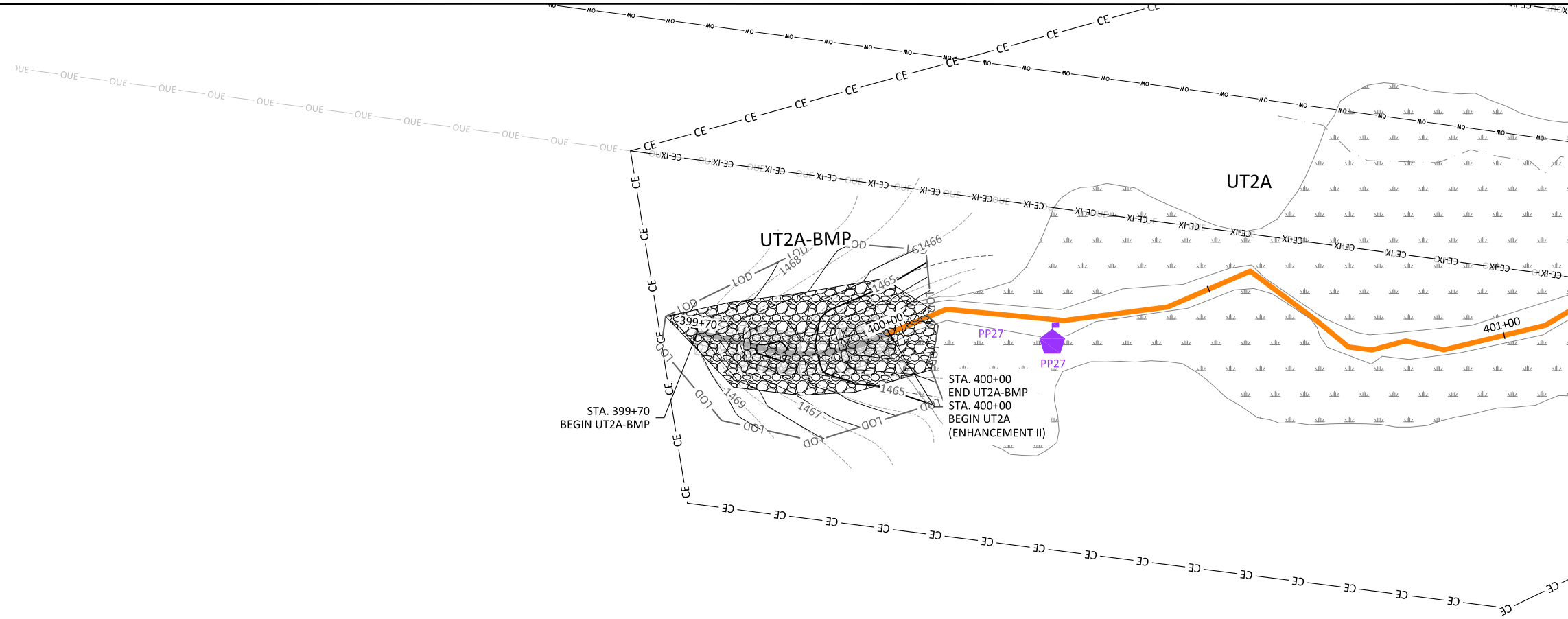
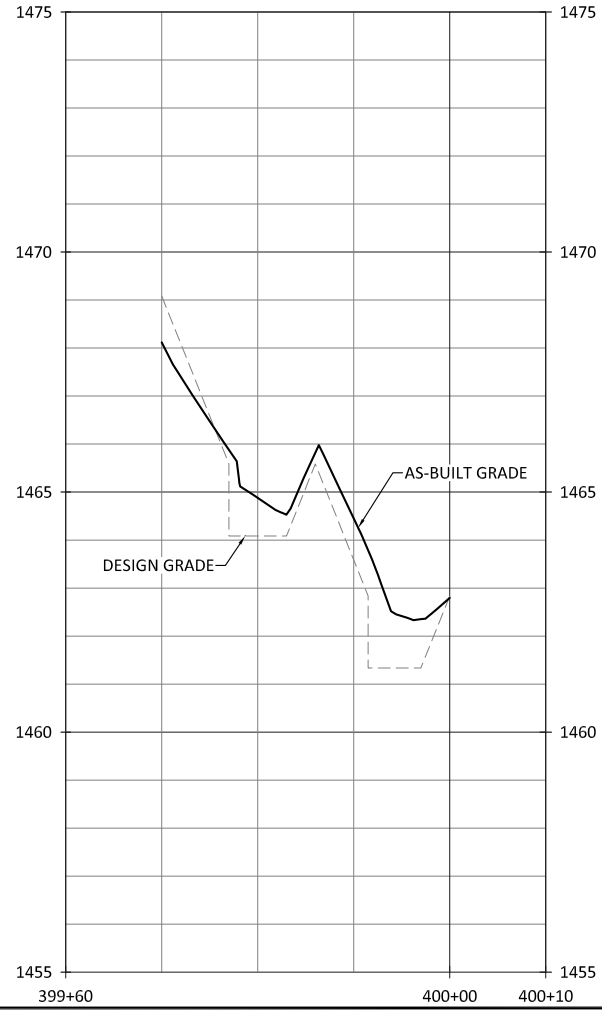
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

2.03

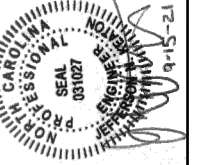
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- NOTES:
1. DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.
 2. AS-BUILT INFORMATION FOR UT2A IS ADDRESSED ON SHEETS 1.34 THROUGH 1.36.



Bug Headwaters Record Drawings
Wilkes County, North Carolina

UT2A-SPSC
 BMP Design

Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

2.04

Streambank Planting Zone 1 (1.1 acres)


Live Stakes						
Species	Common Name	Indiv. Spacing	Size	Stratum	Wetland Indicator Status	% of Stems
<i>Salix nigra</i>	Black Willow	3-6 ft.	0.5"-1.5" cal.	Shrub	OBL	35%
<i>Cornus ammomum</i>	Silky Dogwood	3-6 ft.	0.5"-1.5" cal.	Shrub	FACW	20%
<i>Salix sericea</i>	Silky Willow	3-6 ft.	0.5"-1.5" cal.	Shrub	OBL	25%
<i>Sambucus canadensis</i>	Elderberry	3-6 ft.	0.5"-1.5" cal.	Shrub	FACW	10%
<i>Cephalanthus occidentalis</i>	Buttonbush	3-6 ft.	0.5"-1.5" cal.	Shrub	OBL	10%
						100%
Herbaceous Plugs						
<i>Juncus effusus</i>	Common Rush	4 ft.	1.0"- 2.0" plug	Herb	FACW	40%
<i>Cyperus strigosus</i>	False Nutsedge	4 ft.	1.0"- 2.0" plug	Herb	FACW	15%
<i>Carex lurida</i>	Lurid Sedge	4 ft.	1.0"- 2.0" plug	Herb	OBL	15%
<i>Carex crinita</i>	Fringed Sedge	4 ft.	1.0"- 2.0" plug	Herb	OBL	15%
<i>Scirpus cyperinus</i>	Woolgrass	4 ft.	1.0"- 2.0" plug	Herb	OBL	15%
						100%


Streambank Planting Zone 2 (0.58 acres)


Live Stakes						
Species	Common Name	Indiv. Spacing	Min. Size	Stratum	Wetland Indicator Status	% of Stems
<i>Cornus ammomum</i>	Silky Dogwood	3-6 ft.	0.5"-1.5" cal.	Shrub	FACW	30%
<i>Salix sericea</i>	Silky Willow	3-6 ft.	0.5"-1.5" cal.	Shrub	OBL	30%
<i>Sambucus canadensis</i>	Elderberry	3-6 ft.	0.5"-1.5" cal.	Shrub	FACW	15%
<i>Cephalanthus occidentalis</i>	Buttonbush	3-6 ft.	0.5"-1.5" cal.	Shrub	OBL	15%
<i>Physocarpus opulifolium</i>	Ninebark	3-6 ft.	0.5"-1.5" cal.	Shrub	FACW	10%
						100%
Herbaceous Plugs						
<i>Juncus effusus</i>	Common Rush	4 ft.	1.0"- 2.0" plug	Herb	FACW	40%
<i>Cyperus strigosus</i>	False Nutsedge	4 ft.	1.0"- 2.0" plug	Herb	FACW	15%
<i>Carex lurida</i>	Lurid Sedge	4 ft.	1.0"- 2.0" plug	Herb	OBL	15%
<i>Carex crinita</i>	Fringed Sedge	4 ft.	1.0"- 2.0" plug	Herb	OBL	15%
<i>Scirpus cyperinus</i>	Woolgrass	4 ft.	1.0"- 2.0" plug	Herb	OBL	15%
						100%


NOTES:


- DEVIATIONS FROM THE DESIGN WILL BE SHOWN IN RED.

 Zone 1 - Streambank Planting - Big Bugaboo Creek Reach 3 and Reach 4, UT2 Reach 4, UT3

 Zone 2 - Streambank Planting - Big Bugaboo Creek Reach 1 and Reach 2, UT1, UT2 Reach 1 and Reach 24, UT2B

 Zone 3 - Buffer Planting Zone

 Zone 4 - Wetland Planting Zone

 Zone 5 - Permanent Seeding Outside Easement

BMP Obligate Species Planting Zone (0.01 acres)

Herbaceous Plugs						
Species	Common Name	Indiv. Spacing	Size	Stratum	Wetland Indicator Status	% of Stems
<i>Juncus effusus</i>	Common Rush	4 ft.	1.0"- 2.0" plug	Herb	FACW	30%
<i>Sparganium americanum</i>	Eastern Bur Reed	4 ft.	1.0"- 2.0" plug	Herb	OBL	10%
<i>Sagittaria latifolia</i>	Duck Potato	4 ft.	1.0"- 2.0" plug	Herb	OBL	30%
<i>Scirpus cyperinus</i>	Woolgrass	4 ft.	1.0"- 2.0" plug	Herb	OBL	10%
<i>Carex lurida</i>	Lurid Sedge	4 ft.	1.0"- 2.0" plug	Herb	OBL	20%
						100%

Wetland Planting Zone (9.4 acres)

Bare Root						
Species	Common Name	Indiv. Spacing	Calliper Size	Stratum	Wetland Indicator Status	% of Stems
<i>Platanus occidentalis</i>	Sycamore	6-12 ft.	0.25"-1.0"	Canopy	FACW	18%
<i>Ulmus americana</i>	American Elm	6-12 ft.	0.25"-1.0"	Canopy	FACW	10%
<i>Betula nigra</i>	River Birch	6-12 ft.	0.25"-1.0"	Canopy	FACW	48% 19%
<i>Acer negundo</i>	Boxelder	6-12 ft.	0.25"-1.0"	Canopy	FAC	45% 16%
<i>Ulmus rubra</i>	Slippery Elm	6-12 ft.	0.25"-1.0"	Canopy	FAC	6%
<i>Ainus serrulata</i>	Tag Alder	6-12 ft.	0.25"-1.0"	Shrub	OBL	3%
<i>Nyssa sylvatica</i>	Black Gum	6-12 ft.	0.25"-1.0"	Canopy	FAC	15%
<i>Quercus phellos</i>	Willow Oak	6-12 ft.	0.25"-1.0"	Canopy	FAC	45% 16%
						100%

Note: Wetland zone species were planted on 6' spacing in rows spaced 12' apart.

NOTE:

- TAG ELDER WAS NOT AVAILABLE. SPECIES COPPOSITION AND PLANTING PERCENTAGES WERE REVISED ACCORDINGLY.

Buffer Planting Zone (9.6 acres)

Bare Root						
Species	Common Name	Indiv. Spacing	Calliper Size	Stratum	Wetland Indicator Status	% of Stems
<i>Platanus occidentalis</i>	Sycamore	6-12 ft.	0.25"-1.0"	Canopy	FACW	15%
<i>Quercus rubra</i>	Northern Red Oak	6-12 ft.	0.25"-1.0"	Canopy	FACU	10%
<i>Betula nigra</i>	River Birch	6-12 ft.	0.25"-1.0"	Canopy	FACW	15%
<i>Morus rubra</i>	Red Mullberry	6-12 ft.	0.25"-1.0"	Canopy	FACU	5%
<i>Nyssa sylvatica</i>	Blackgum	6-12 ft.	0.25"-1.0"	Canopy	FAC	10%
<i>Ulmus americana</i>	American Elm	6-12 ft.	0.25"-1.0"	Canopy	FACW	10%
<i>Liriodendron tulipifera</i>	Tulip Poplar	6-12 ft.	0.25"-1.0"	Canopy	FACU	3%
<i>Quercus phellos</i>	Willow Oak	6-12 ft.	0.25"-1.0"	Canopy	FAC	15%
<i>Diospyros virginiana</i>	Common Persimmon	6-12 ft.	0.25"-1.0"	Canopy	FAC	7%
<i>Acer negundo</i>	Boxelder	6-12 ft.	0.25"-1.0"	Canopy	FAC	5%
<i>Prunus serotina</i>	Black Cherry	6-12 ft.	0.25"-1.0"	Canopy	FACU	5%
						100%

Permanent Seeding Outside Easement (7.8 acres)

Approved Dates	Species Name	Common Name	Stratum	Density (lbs/acre)	Percentage
All Year	<i>Festuca arundinacea</i>	Tall Fescue	Herb	40	70%
All Year	<i>Festuca rubra</i>	Creeping Red Fescue	Herb	40	10%
All Year	<i>Dactylis glomerata</i>	Orchardgrass	Herb	40	20%
					100%

Permanent Riparian Seeding (9.6 acres)

Pure Live Seed (20 lbs/acre)					
Approved Dates	Species Name	Common Name	Stratum	Wetland Indicator Status	lbs/acre
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	FACW	2.0
All Year	<i>Schizachyrium scoparium</i>	Little Bluestem	Herb	FACU	1.8
All Year	<i>Sorghastrum nutans</i>	Indian Grass	Herb	FACU	2.0
All Year	<i>Chasmanthium latifolium</i>	River Oats	Herb	FACU	1.0
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	FACW	3.0
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	FAC	2.5
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	OBL	2.0
All Year	<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	FACU	1.0
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	FACU	1.0
All Year	<i>Bidens aristosa</i>	Bur-marigold	Herb	FACW	1.0
All Year	<i>Chamaecrista fasciculata</i> var. <i>fasciculata</i>	Partridge Pea	Herb	FACU	1.0
All Year	<i>Achillea millefolium</i>	Yarrow	Herb	FACU	0.5
All Year	<i>Juncus coriaceous</i>	Leathery Rush	Herb	FACW	0.5
All Year	<i>Juncus tenuis</i>	Path Rush	Herb	FAC	0.5
All Year	<i>Pycnanthemum tenuifolium</i>	Slender Mountain Mint	Herb	FACW	0.2
					20.0

Permanent Wetland Seeding (7.1 acres)






Pure Live Seed (20 lbs/acre)					
Approved Dates	Species Name	Common Name	Stratum	Wetland Indicator Status	Density (lbs/acre)
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	FACW	1.2
All Year	<i>Agrostis hyemalis</i>	Winter Bentgrass	Herb	FAC	1.0
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	FACW	2.0
All Year	<i>Sparganium americanum</i>	Eastern Bur Reed	Herb	OBL	0.1
All Year	<i>Panicum virgatum</i>	Switchgrass	Herb	FAC	2.0
All Year	<i>Tripsacum dactyloides</i>	Eastern Gamagrass	Herb	FACW	2.5
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	FAC	3.0
All Year	<i>Caex lurida</i>	Lurid Sedge	Herb	OBL	0.5
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	OBL	2.0
All Year	<i>Carex lupulina</i>	Hop Sedge	Herb	OBL	0.5
All Year	<i>Juncus effusus</i>	Common Rush	Herb	FACW	2.0
All Year	<i>Carex frankii</i>	Frank's Sedge	Herb	OBL	1.0
All Year	<i>Scirpus cyperinus</i>	Woolgrass	Herb	OBL	0.2
All Year	<i>Peltandra virginica</i>	Arrow Arum	Herb	OBL	0.4
All Year	<i>Bidens aristosa</i>	Bur-Marigold	Herb	FACW	1.6
					20.0

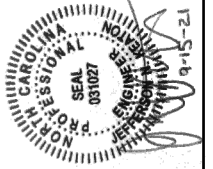
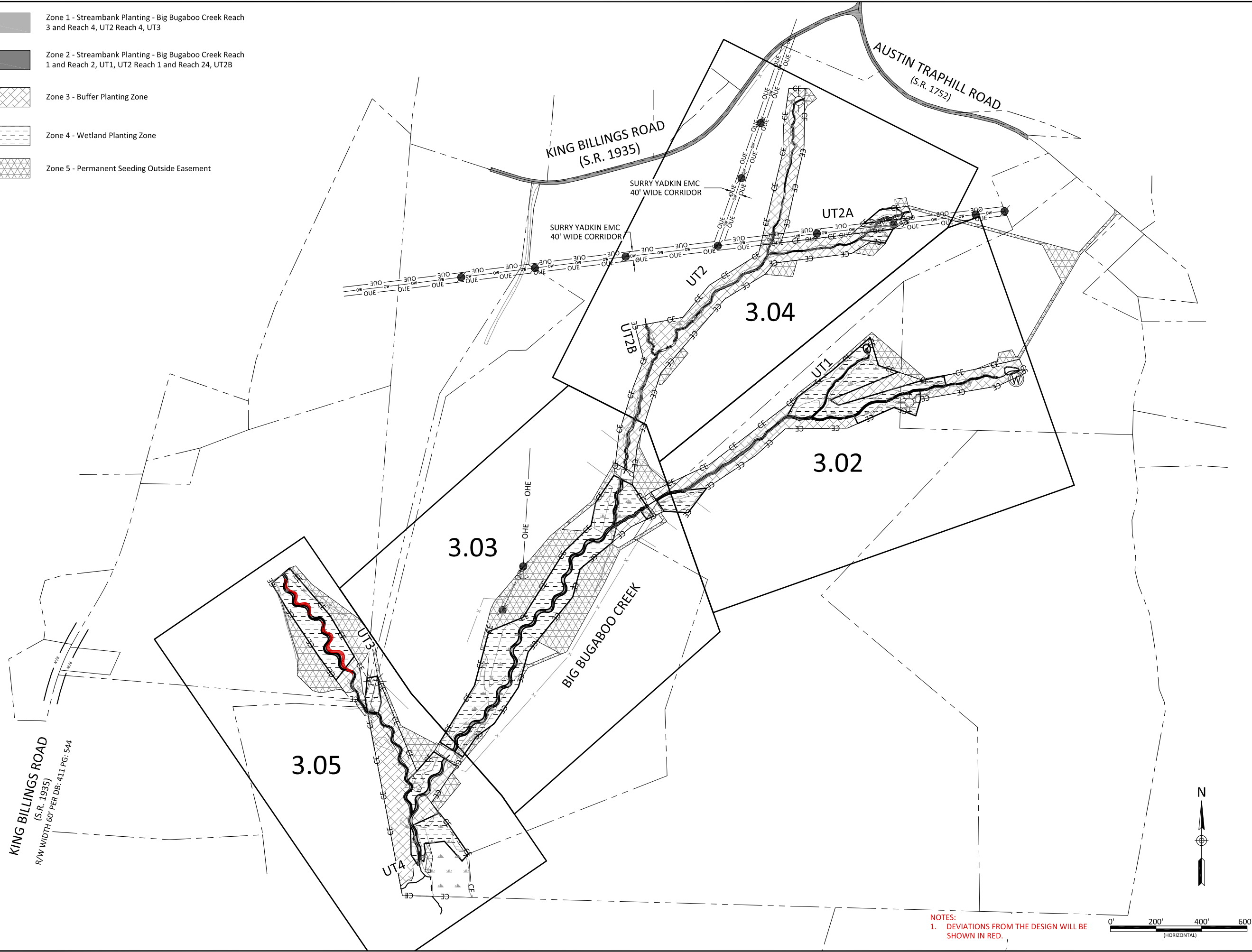
Temporary Seeding (24.6 acres)

Pure Live Seed				
Approved Dates	Species Name	Common Name	Stratum	Density (lbs/acre)
Aug 15 - May 1	<i>Secale cereale</i>	Rye Grain	Herb	80
May 1 - Aug 15	<i>Setaria italica</i>	German Millet	Herb	50

Planting Notes:

- Non-hatched areas within easement are currently vegetated and were planted as needed to achieve target density. Buffer planting occurred within the Limits of Disturbance.
- Buffer zone species were planted on 6' spacing in rows spaced 12' apart.
- Wetland Indicator Status data sourced from USDA Plant Database.
- Permanent riparian seed was used for seeding Zone 3.
- Permanent wetland seeding was used for Zone 4 and UT3 and UT4 BMPs.
- BMP obligate species herbaceous plugs were installed around perimeter of UT3 and UT4 BMPs at elevations specified on Sheets 3.07 and 3.09.

-  Zone 1 - Streambank Planting - Big Bugaboo Creek Reach 3 and Reach 4, UT2 Reach 4, UT3
-  Zone 2 - Streambank Planting - Big Bugaboo Creek Reach 1 and Reach 2, UT1, UT2 Reach 1 and Reach 24, UT2B
-  Zone 3 - Buffer Planting Zone
-  Zone 4 - Wetland Planting Zone
-  Zone 5 - Permanent Seeding Outside Easement








Bug Headwaters Record Drawings
Wilkes County, North Carolina
Planting Overview
Planting Plan

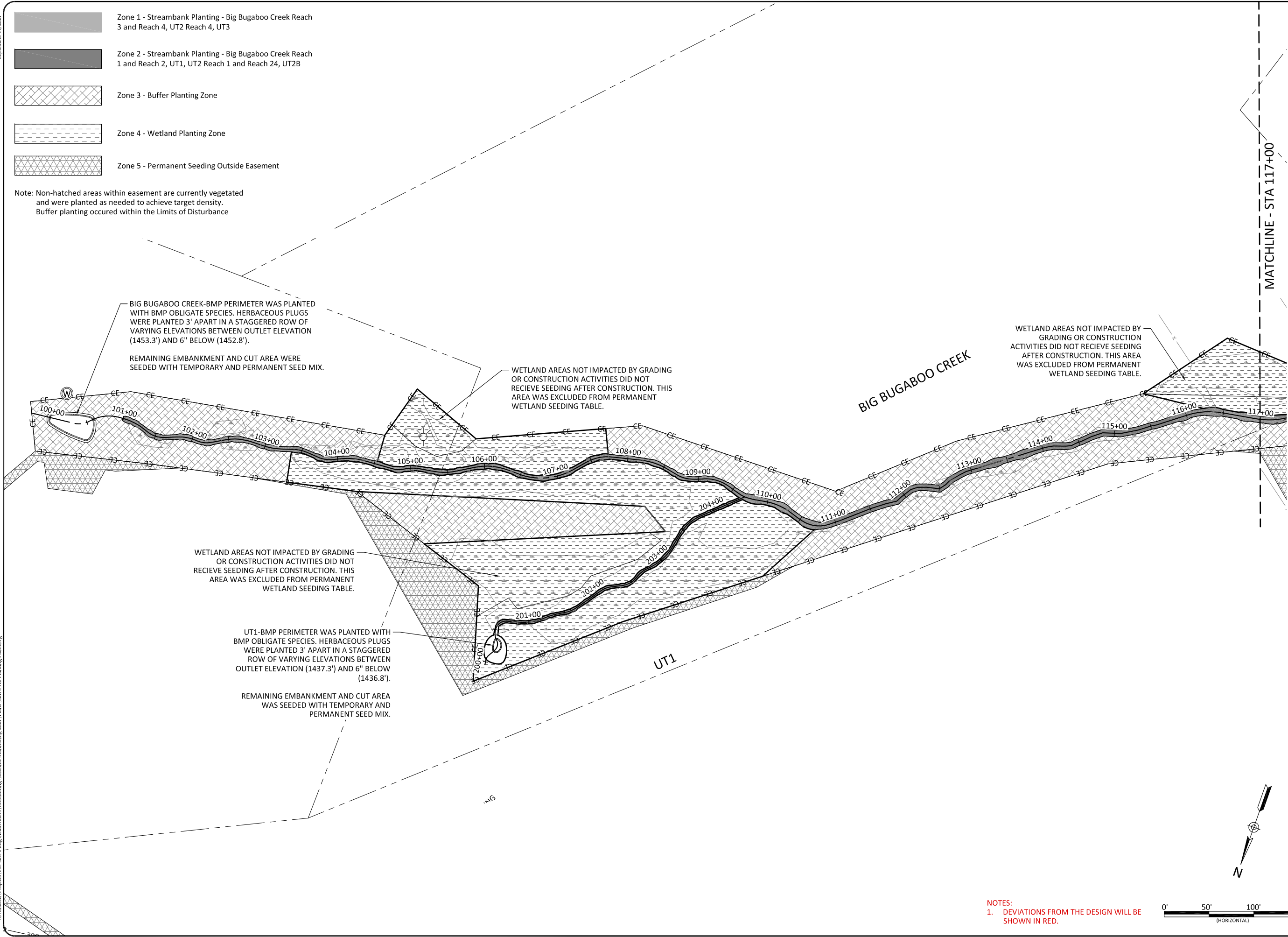
Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

3.01

-  Zone 1 - Streambank Planting - Big Bugaboo Creek Reach 3 and Reach 4, UT2 Reach 4, UT3
-  Zone 2 - Streambank Planting - Big Bugaboo Creek Reach 1 and Reach 2, UT1, UT2 Reach 1 and Reach 24, UT2B
-  Zone 3 - Buffer Planting Zone
-  Zone 4 - Wetland Planting Zone
-  Zone 5 - Permanent Seeding Outside Easement

Note: Non-hatched areas within easement are currently vegetated and were planted as needed to achieve target density. Buffer planting occurred within the Limits of Disturbance



BIG BUGABOO CREEK-BMP PERIMETER WAS PLANTED WITH BMP OBLIGATE SPECIES. HERBACEOUS PLUGS WERE PLANTED 3' APART IN A STAGGERED ROW OF VARYING ELEVATIONS BETWEEN OUTLET ELEVATION (1453.3') AND 6" BELOW (1452.8').

REMAINING EMBANKMENT AND CUT AREA WERE SEEDED WITH TEMPORARY AND PERMANENT SEED MIX.

WETLAND AREAS NOT IMPACTED BY GRADING OR CONSTRUCTION ACTIVITIES DID NOT RECEIVE SEEDING AFTER CONSTRUCTION. THIS AREA WAS EXCLUDED FROM PERMANENT WETLAND SEEDING TABLE.

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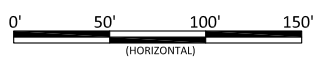
UT1-BMP PERIMETER WAS PLANTED WITH BMP OBLIGATE SPECIES. HERBACEOUS PLUGS WERE PLANTED 3' APART IN A STAGGERED ROW OF VARYING ELEVATIONS BETWEEN OUTLET ELEVATION (1437.3') AND 6" BELOW (1436.8').

REMAINING EMBANKMENT AND CUT AREA WAS SEEDED WITH TEMPORARY AND PERMANENT SEED MIX.

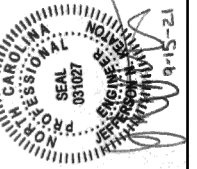
MATCHLINE - STA 117+00

BIG BUGABOO CREEK

UT1



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








Bug Headwaters Record Drawings
Wilkes County, North Carolina

Planting Plan

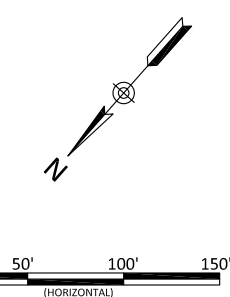
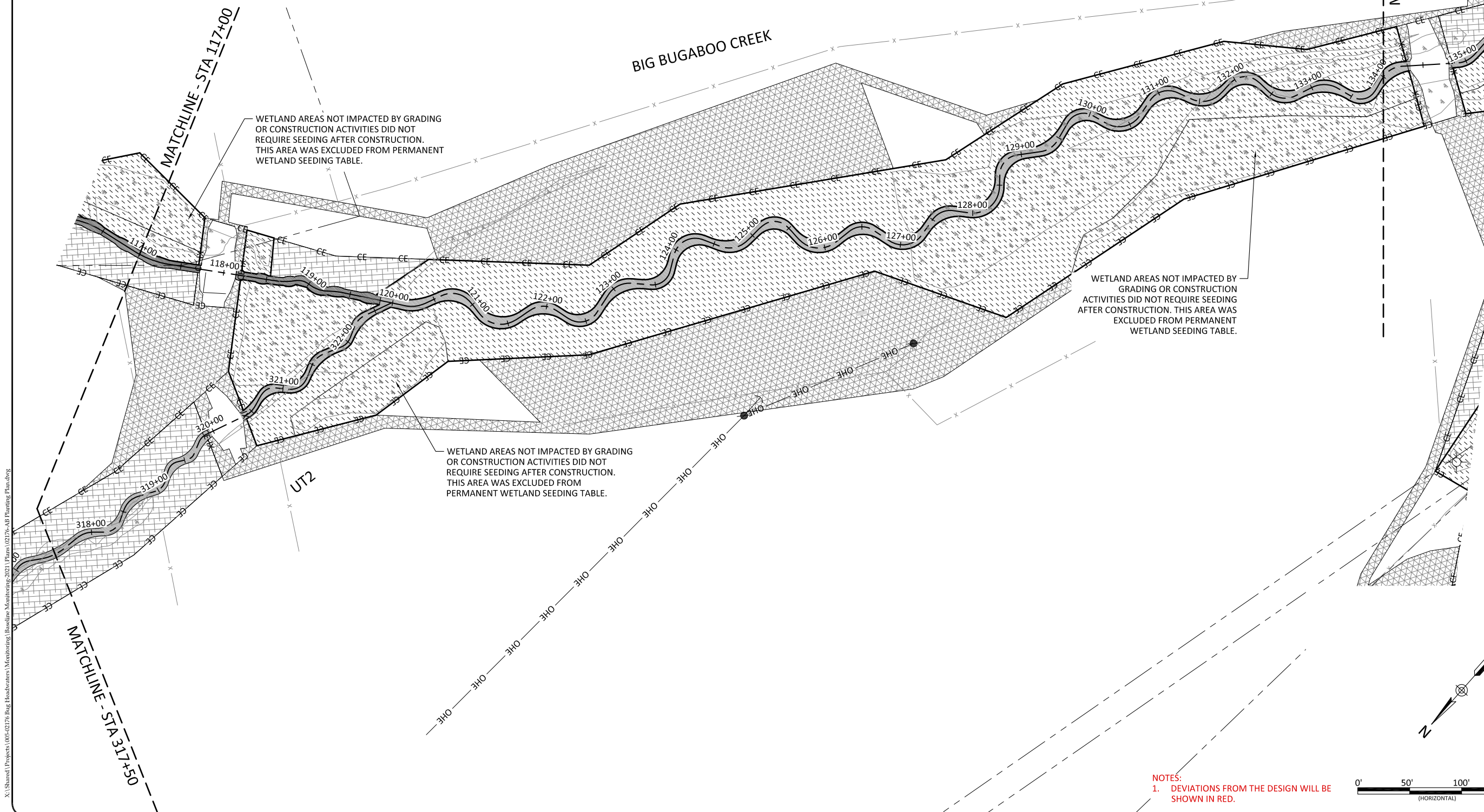
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Project Engineer: NMM
Drawn By: CAW
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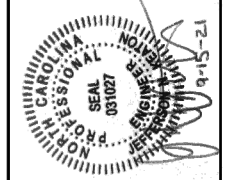
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-  Zone 1 - Streambank Planting - Big Bugaboo Creek Reach 3 and Reach 4, UT2 Reach 4, UT3
-  Zone 2 - Streambank Planting - Big Bugaboo Creek Reach 1 and Reach 2, UT1, UT2 Reach 1 and Reach 24, UT2B
-  Zone 3 - Buffer Planting Zone
-  Zone 4 - Wetland Planting Zone
-  Zone 5 - Permanent Seeding Outside Easement

Note: Non-hatched areas within easement are currently vegetated and were planted as needed to achieve target density. Buffer planting occurred within the Limits of Disturbance



NOTES:
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Bug Headwaters Record Drawings
Wilkes County, North Carolina

Planting Plan

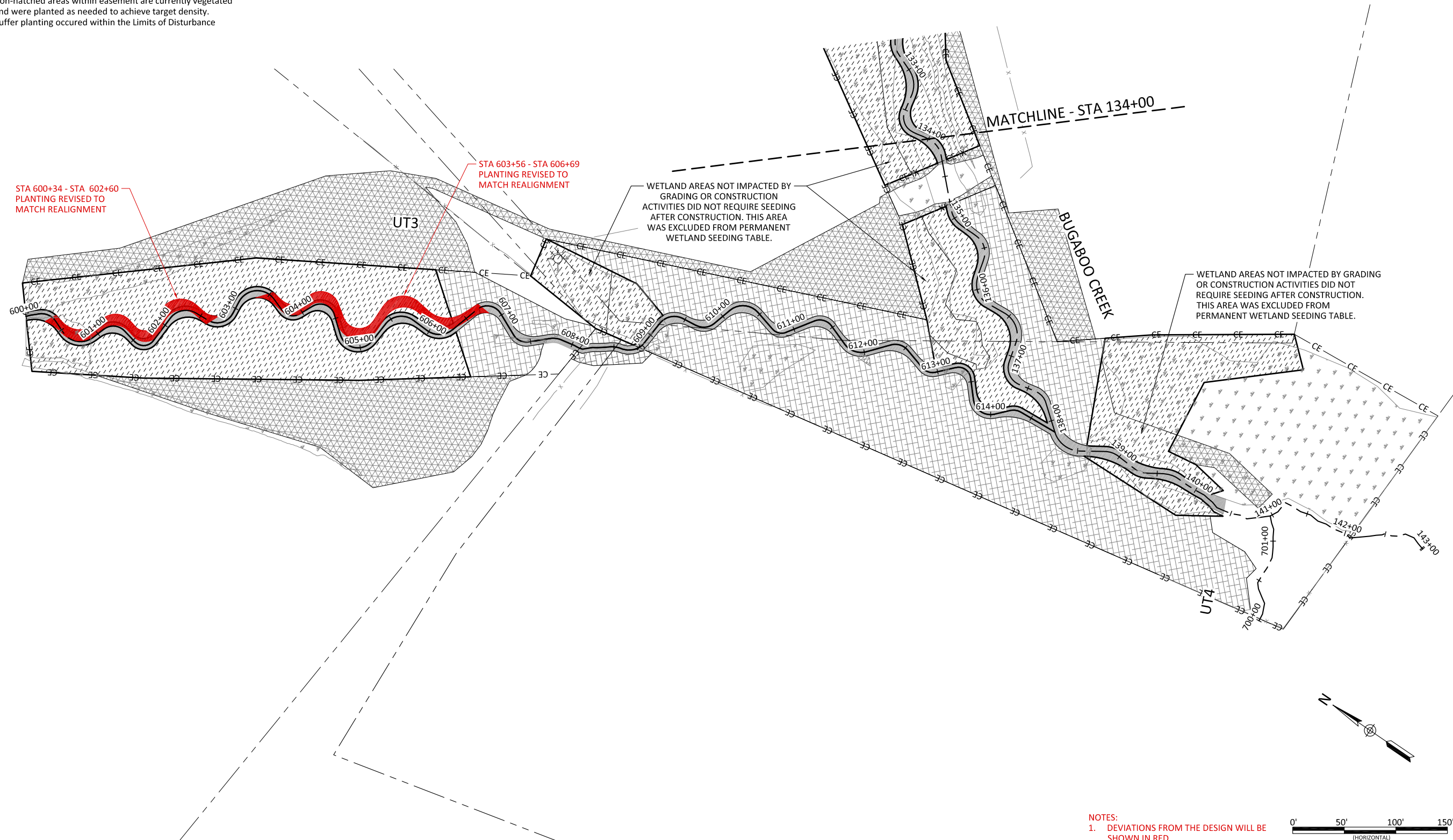
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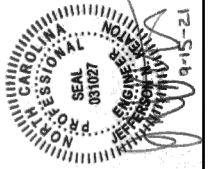
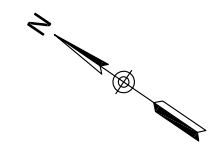
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-  Zone 1 - Streambank Planting - Big Bugaboo Creek Reach 3 and Reach 4, UT2 Reach 4, UT3
-  Zone 2 - Streambank Planting - Big Bugaboo Creek Reach 1 and Reach 2, UT1, UT2 Reach 1 and Reach 24, UT2B
-  Zone 3 - Buffer Planting Zone
-  Zone 4 - Wetland Planting Zone
-  Zone 5 - Permanent Seeding Outside Easement

Note: Non-hatched areas within easement are currently vegetated and were planted as needed to achieve target density. Buffer planting occurred within the Limits of Disturbance



NOTES:
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Bug Headwaters Record Drawings
Wilkes County, North Carolina






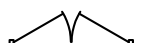

Planting Plan

Revisions:

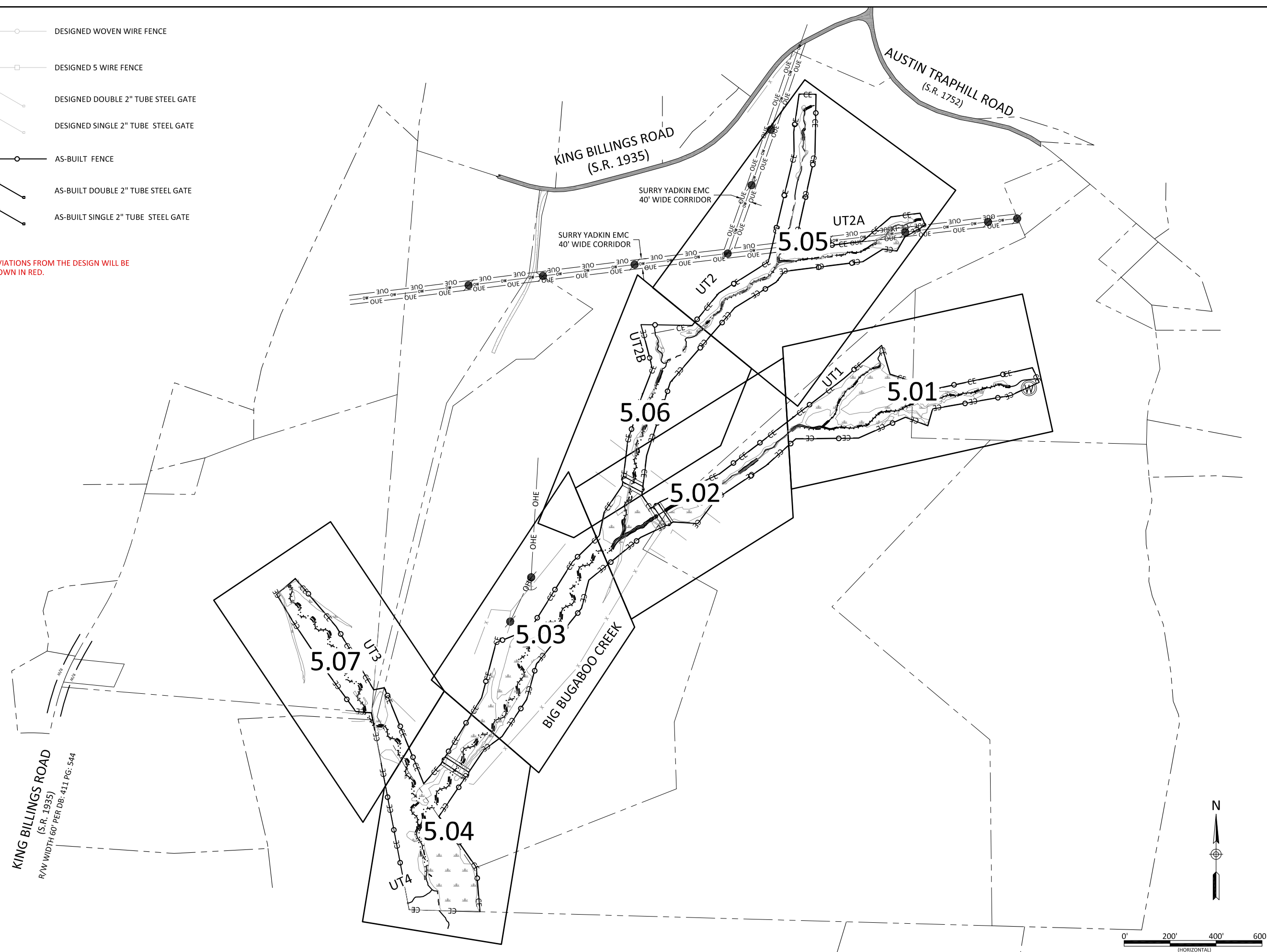
Date: 09.18.2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA

3.05

September 14, 2021
X:\Shared Projects\005-02176 Bug Headwaters\Monitoring\Baseline\Monitoring\2021\Plans\02176-AF Fencing Overview.dwg

-  DESIGNED WOVEN WIRE FENCE
-  DESIGNED 5 WIRE FENCE
-  DESIGNED DOUBLE 2" TUBE STEEL GATE
-  DESIGNED SINGLE 2" TUBE STEEL GATE
-  AS-BUILT FENCE
-  AS-BUILT DOUBLE 2" TUBE STEEL GATE
-  AS-BUILT SINGLE 2" TUBE STEEL GATE

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

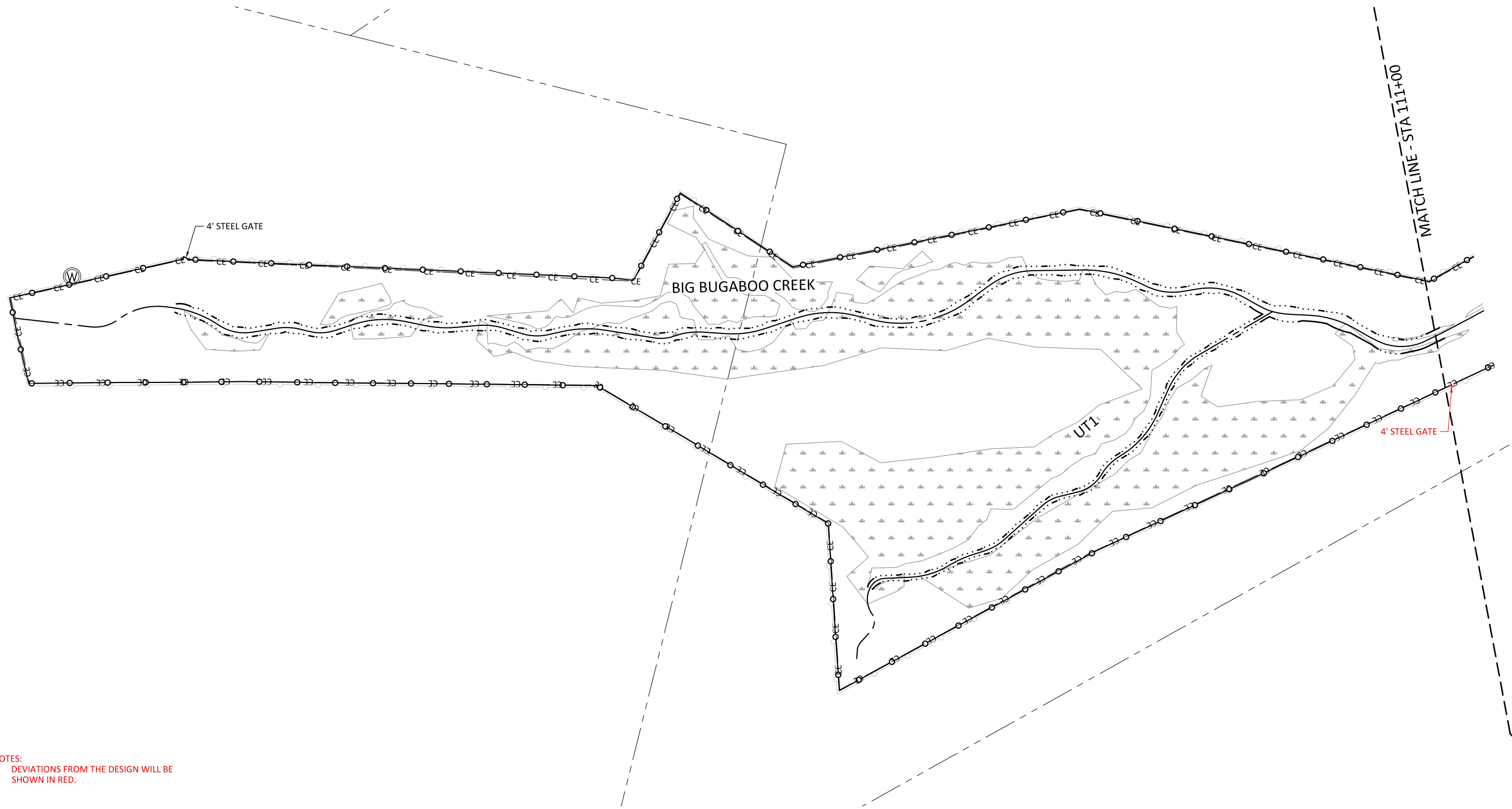


Bug Headwaters Record Drawings
Wilkes County, North Carolina
Fencing Overview
Fencing Plan






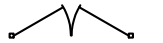

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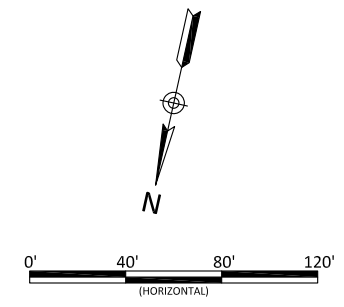
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Sheet



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

-  DESIGNED WOVEN WIRE FENCE
-  DESIGNED 5 WIRE FENCE
-  DESIGNED DOUBLE 2" TUBE STEEL GATE
-  DESIGNED SINGLE 2" TUBE STEEL GATE
-  AS-BUILT FENCE
-  AS-BUILT DOUBLE 2" TUBE STEEL GATE
-  AS-BUILT SINGLE 2" TUBE STEEL GATE

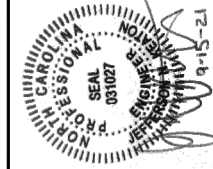


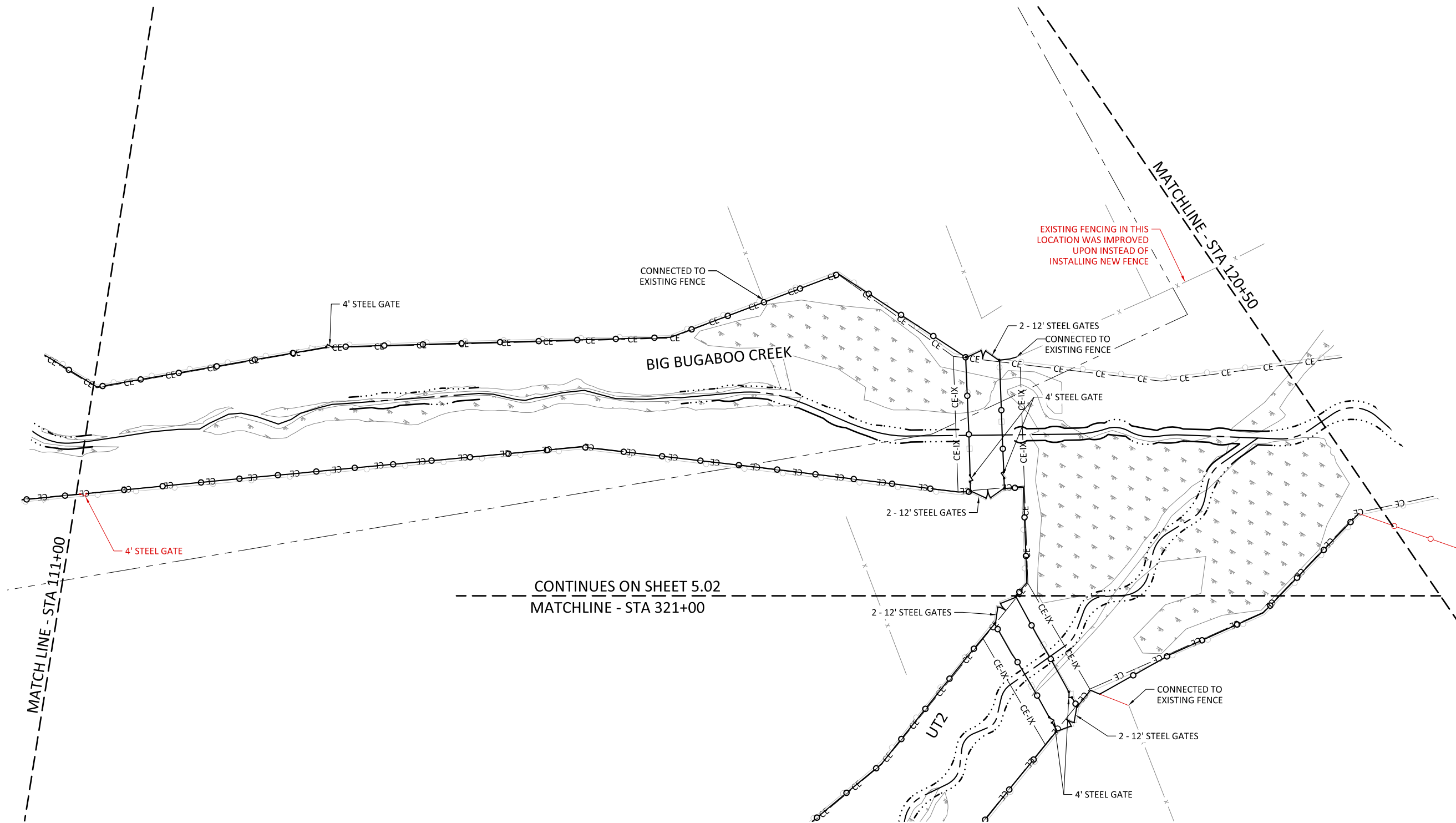
Bug Headwaters Record Drawings
 Wilkes County, North Carolina

Fencing Plan





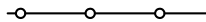
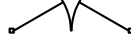

Date:	09/18/2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

5.01

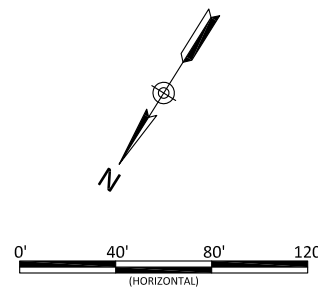




CONTINUES ON SHEET 5.02
MATCHLINE - STA 321+00

-  DESIGNED WOVEN WIRE FENCE
-  DESIGNED 5 WIRE FENCE
-  DESIGNED DOUBLE 2" TUBE STEEL GATE
-  DESIGNED SINGLE 2" TUBE STEEL GATE
-  AS-BUILT FENCE
-  AS-BUILT DOUBLE 2" TUBE STEEL GATE
-  AS-BUILT SINGLE 2" TUBE STEEL GATE

NOTES:
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Bug Headwaters Record Drawings
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Fencing Plan

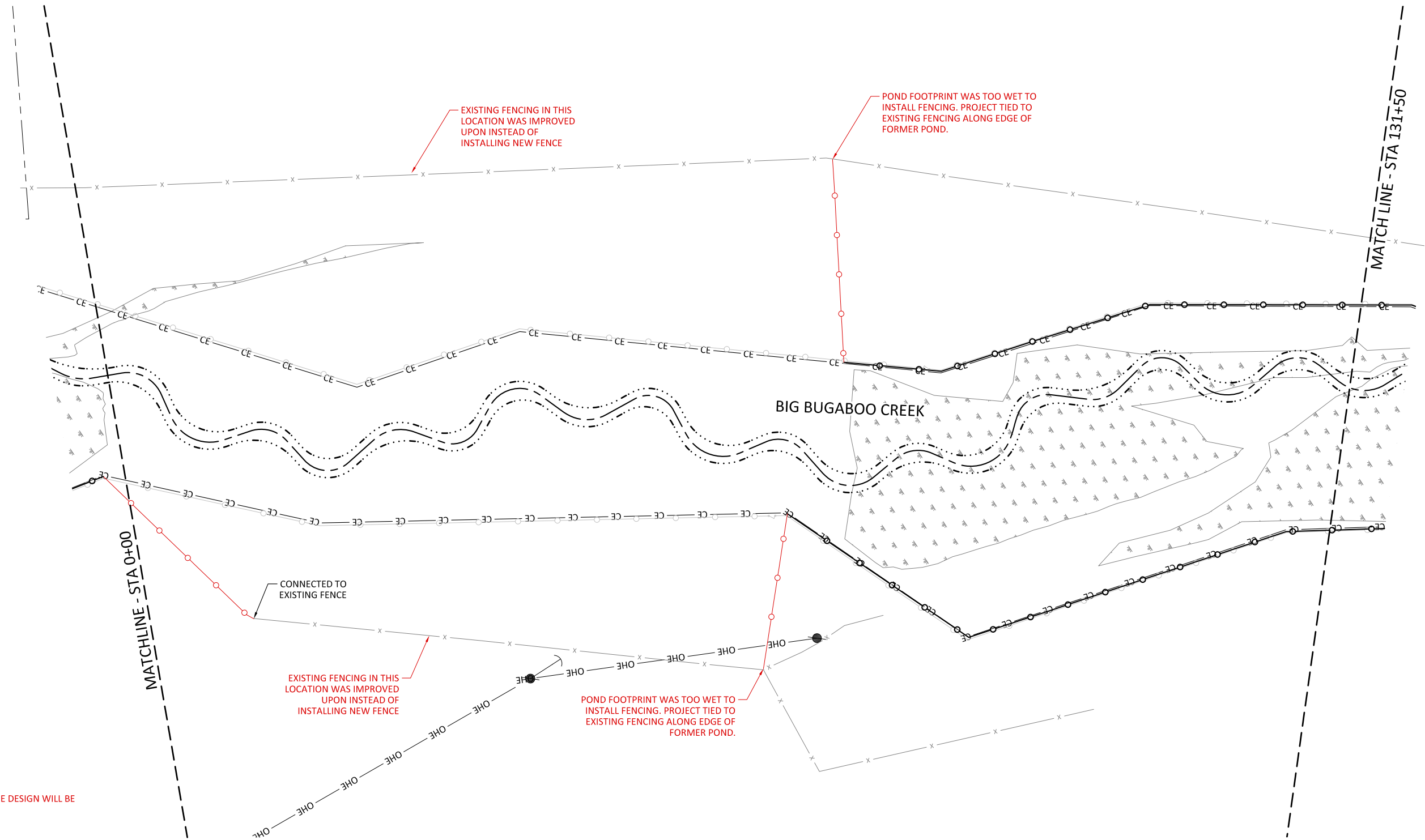
Revisions:

Date: 09/18/2020
Job Number: 005-02176
Project Engineer: NMM
Drawn By: CAV
Checked By: ANA






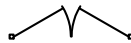

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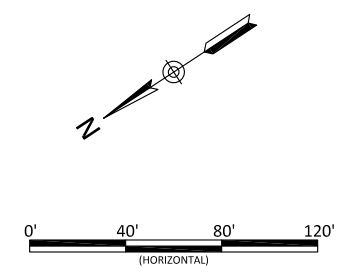
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-  DESIGNED WOVEN WIRE FENCE
-  DESIGNED 5 WIRE FENCE
-  DESIGNED DOUBLE 2" TUBE STEEL GATE
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-  AS-BUILT FENCE
-  AS-BUILT DOUBLE 2" TUBE STEEL GATE
-  AS-BUILT SINGLE 2" TUBE STEEL GATE



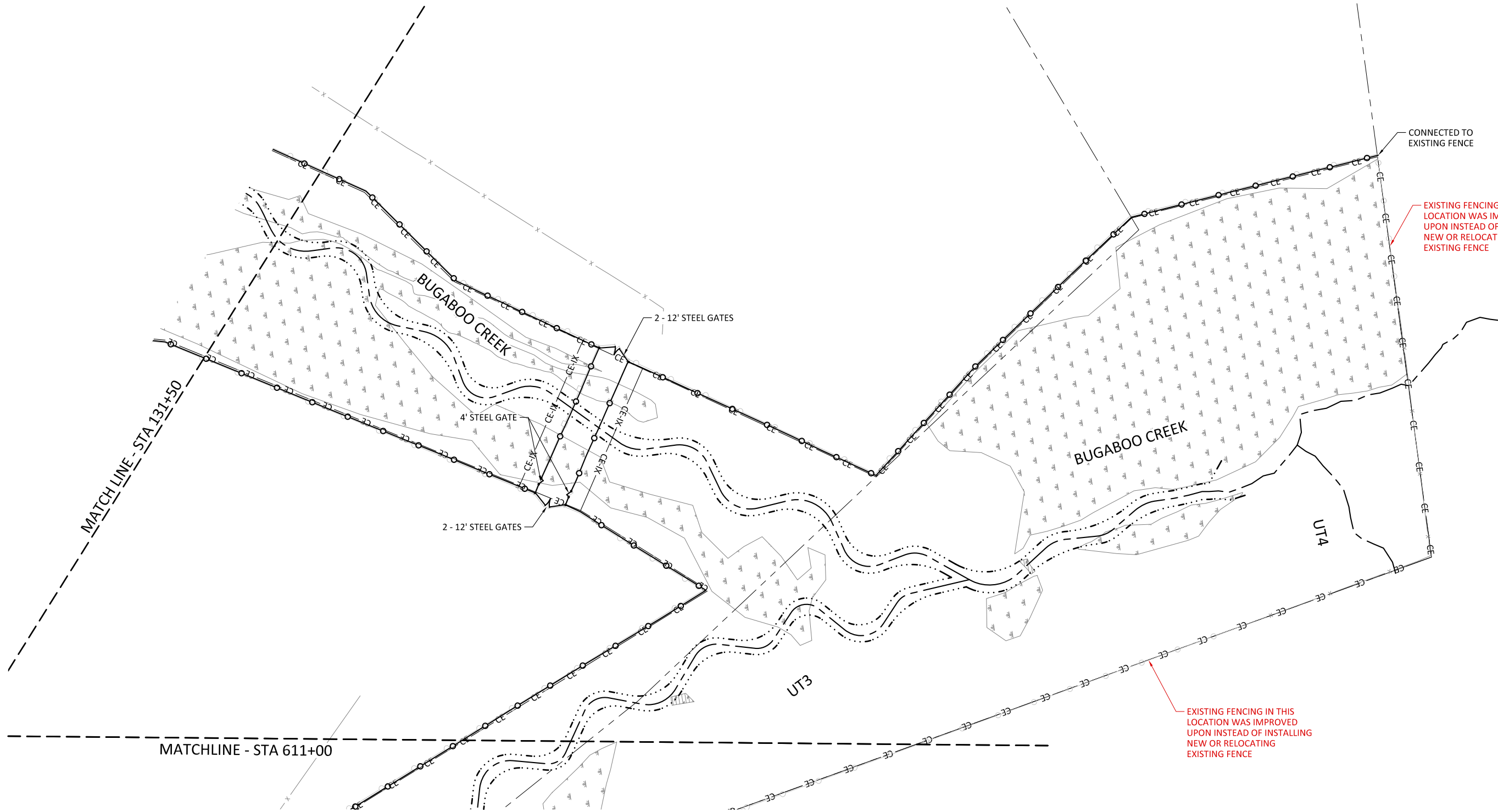
Bug Headwaters Record Drawings
 Wilkes County, North Carolina


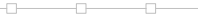





Fencing Plan

Revisions:

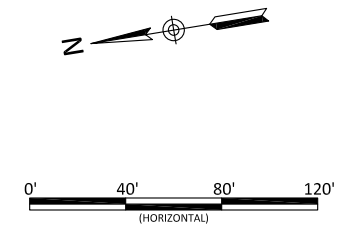
Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

5.03



-  DESIGNED WOVEN WIRE FENCE
-  DESIGNED 5 WIRE FENCE
-  DESIGNED DOUBLE 2" TUBE STEEL GATE
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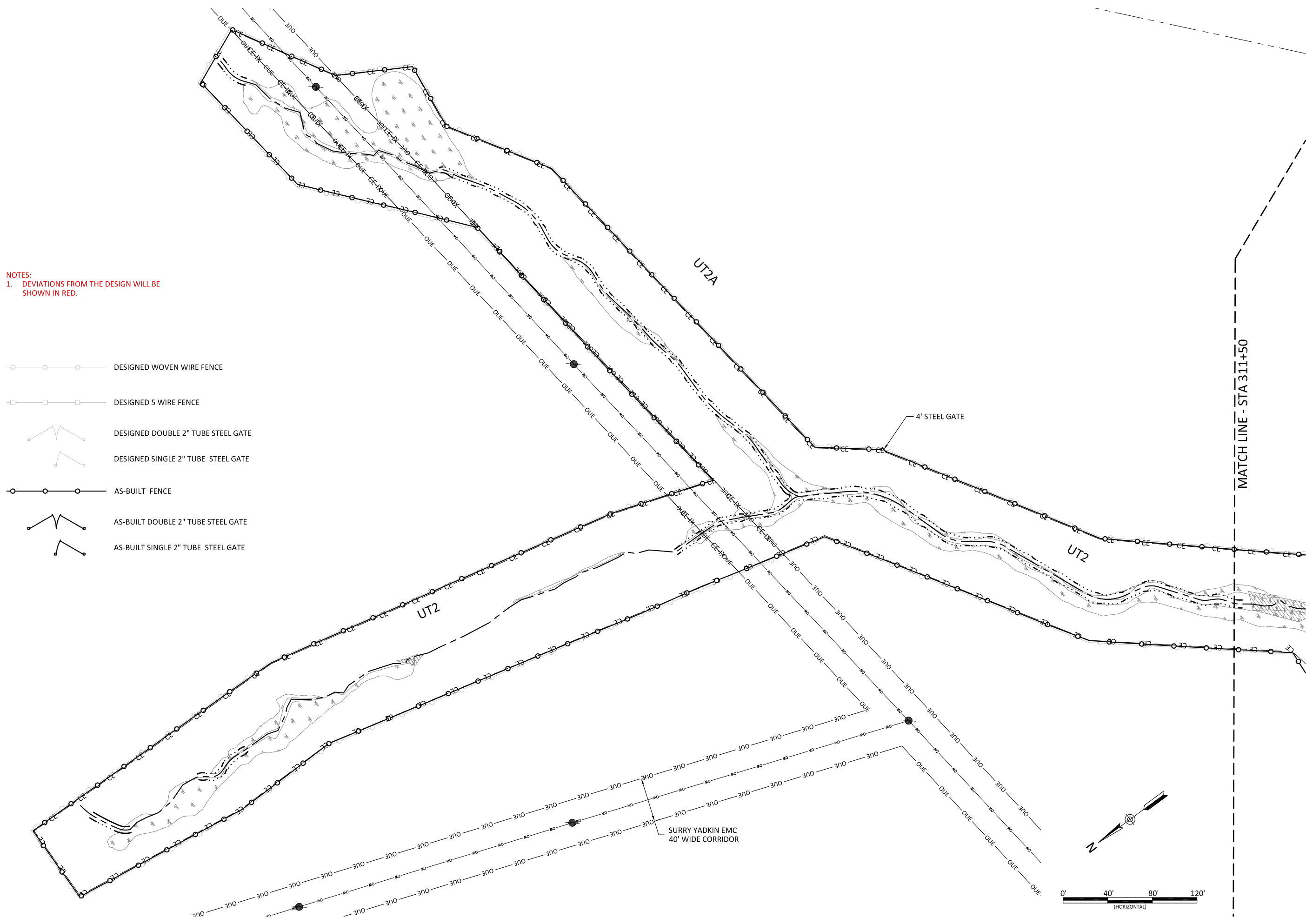
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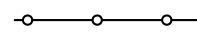
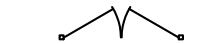

Revisions:

Date:	09.18.2020
Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

5.04



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

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-  DESIGNED SINGLE 2" TUBE STEEL GATE
-  AS-BUILT FENCE
-  AS-BUILT DOUBLE 2" TUBE STEEL GATE
-  AS-BUILT SINGLE 2" TUBE STEEL GATE



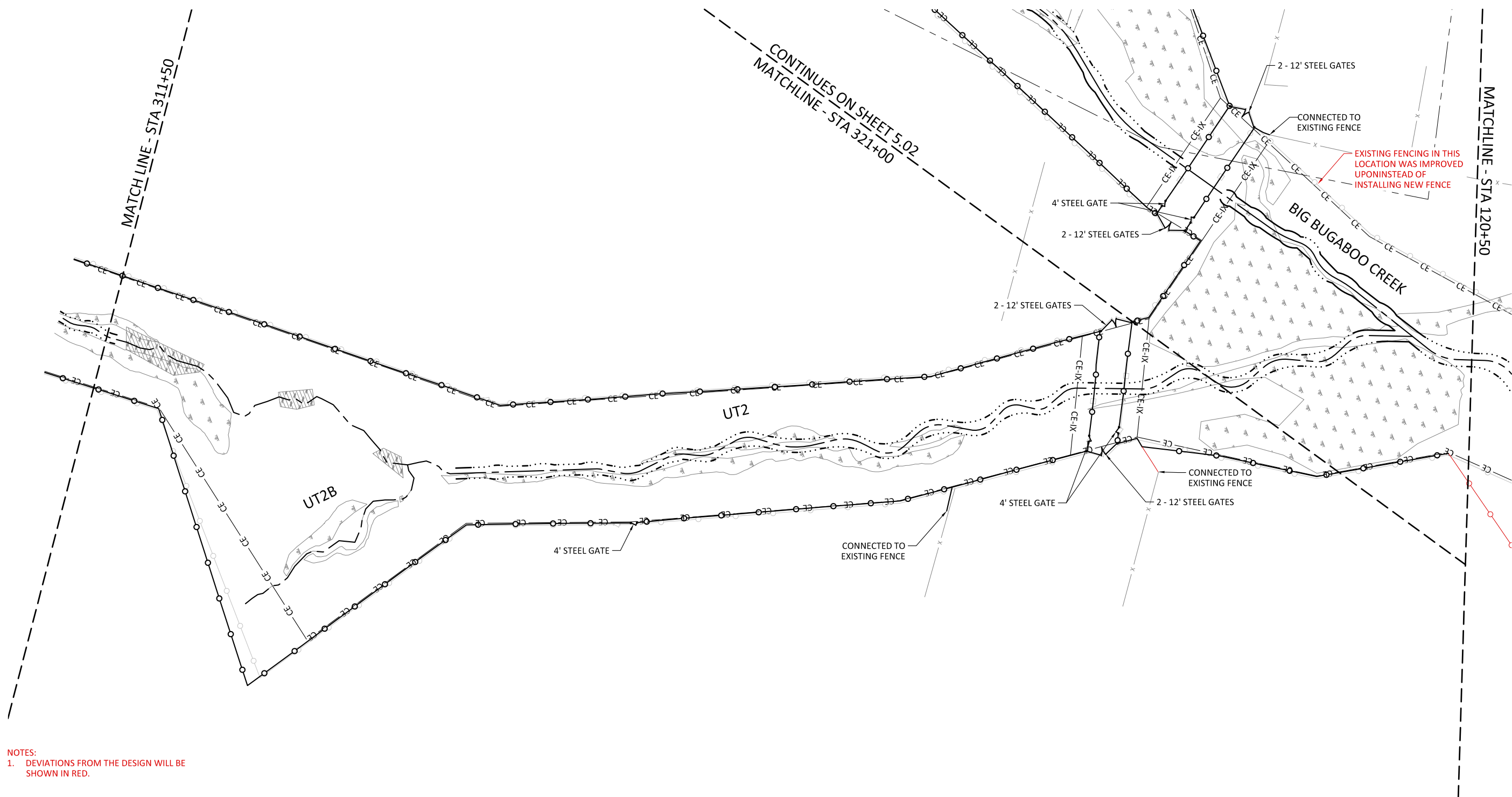
Bug Headwaters Record Drawings
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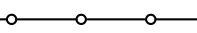
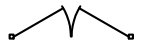

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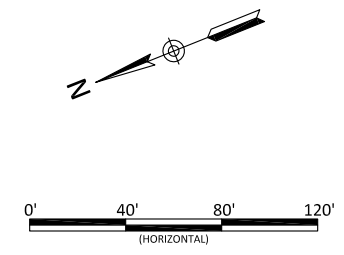
Date: 09.18.2020
 Job Number: 005-02176
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: ANA

5.05



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

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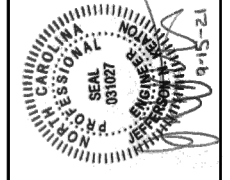


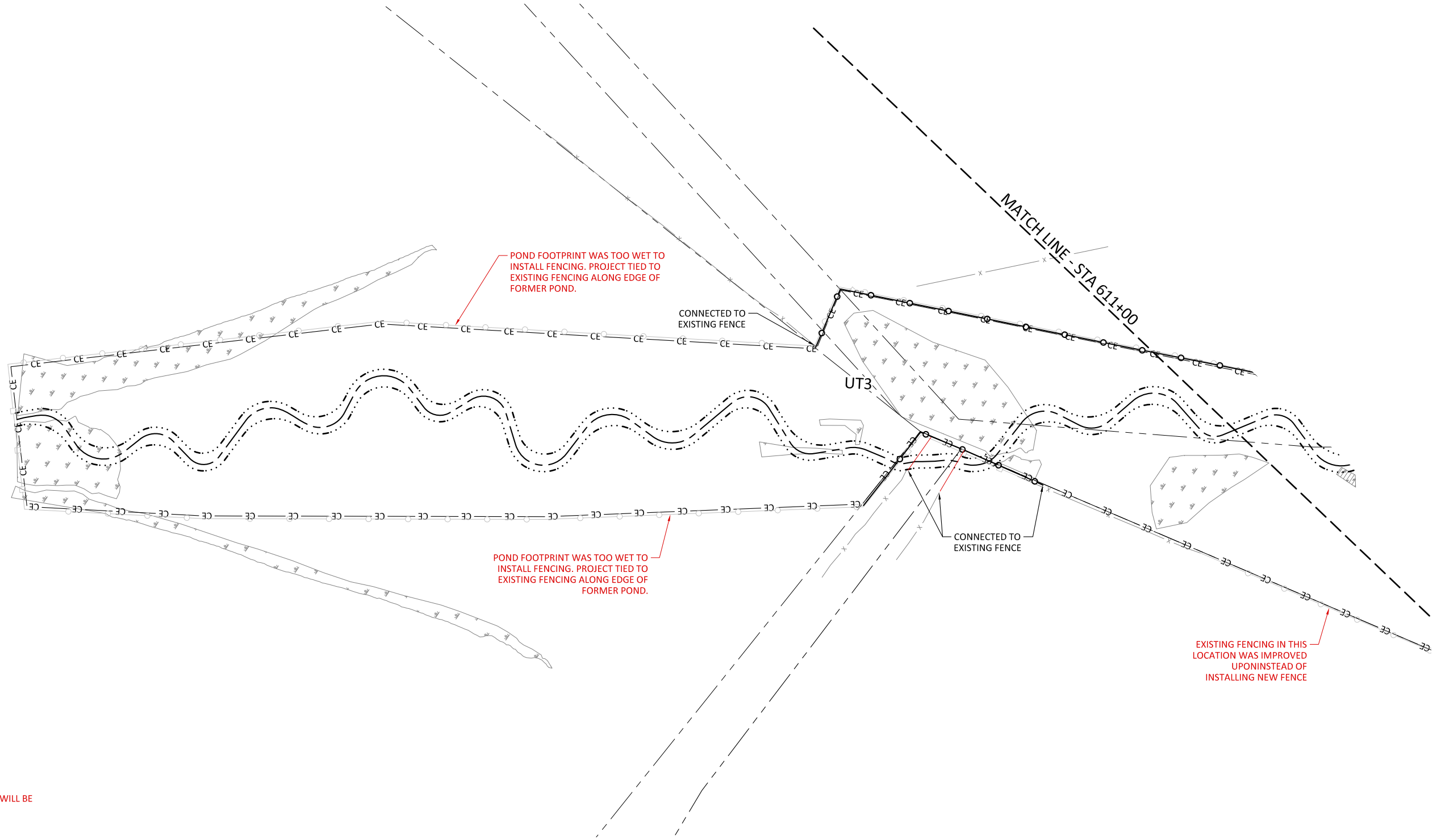
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Wilkes County, North Carolina

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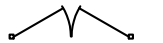

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Job Number:	005-02176
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

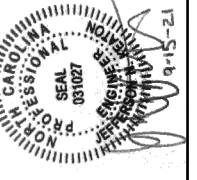
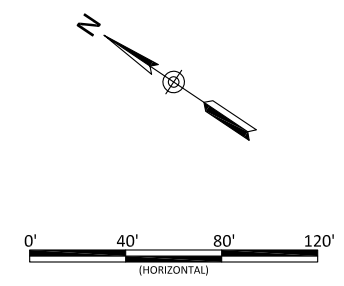
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-  AS-BUILT SINGLE 2" TUBE STEEL GATE



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Revisions:

Date: 09.18.2020
 Job Number: 005-02176
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 Drawn By: CAV
 Checked By: ANA

5.07