



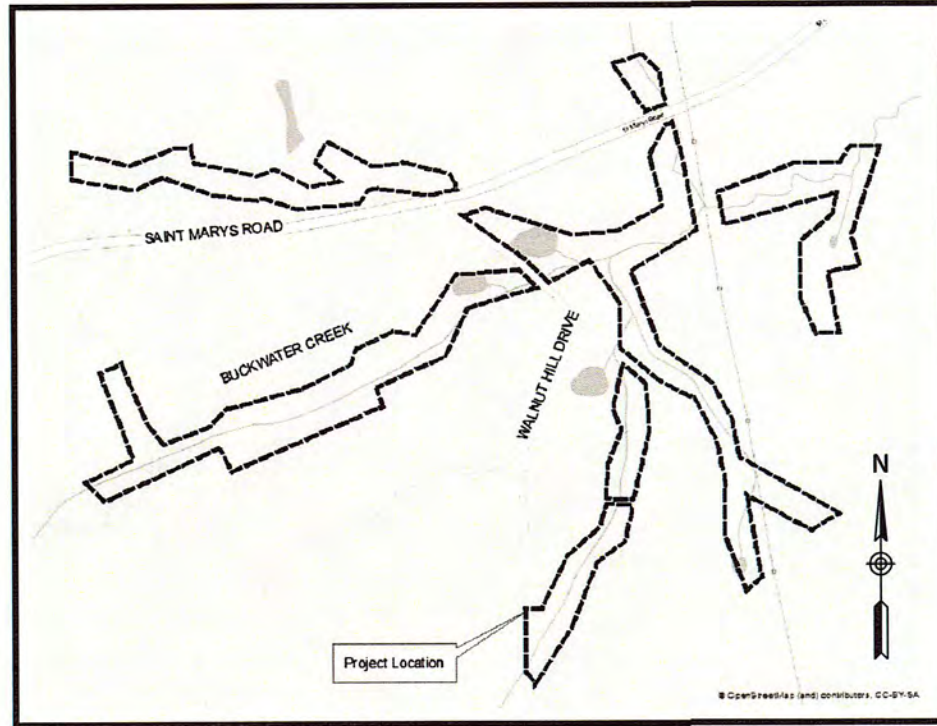
Buckwater Mitigation Site

Neuse River Basin 03020201

Orange County, North Carolina

for

NCDEQ Division of Mitigation Services



Vicinity Map
Not to Scale



**FINAL AS-BUILT AND
RECORD DRAWINGS
SEPTEMBER 9, 2019**

CERTIFICATE OF SURVEY AND ACCURACY

I, DREW VAN DUINKERKEN, 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 "WILDLANDS ENGINEERING, INC., BUCKWATER MITIGATION SITE", JOB #: 1810129-AB, DATED: SEPTEMBER 11, 2019; 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 OBTAIN BETWEEN THE DATES OF 1/14/19 - 09/06/19; THAT THE CONTOURS SHOWN AS BROKEN LINES MAY NOT MEET THE STATED STANDARD; THAT ALL COORDINATES ARE BASED ON NAD 83 (NSRS 2011) AND ALL ELEVATIONS ARE BASED ON NAVD 88; THAT THIS MAP MEETS THE SPECIFICATIONS FOR TOPOGRAPHIC SURVEYS AS STATED IN TITLE 21, CHAPTER 56, SECTION .1606; THAT THIS MAP WAS NOT PREPARED IN ACCORDANCE WITH G.S. 47-30, AS AMENDED AND DOES NOT REPRESENT AN OFFICIAL BOUNDARY SURVEY.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 12TH DAY OF SEPTEMBER, 2019.

Drew Van Duinkerken
DREW VAN DUINKERKEN, PLS L-5010



Stream Origins		
Stream	Latitude	Longitude
Buckwater Creek	N 36° 06' 12.03"	W 79° 01' 58.42"
T1	N 36° 06' 35.12"	W 79° 01' 22.97"
T3	N 36° 06' 02.67"	W 79° 01' 29.82"
T4A	N 36° 06' 07.29"	W 79° 01' 14.34"
T4B	N 36° 06' 10.15"	W 79° 01' 10.30"
T6	N 36° 06' 29.57"	W 79° 02' 00.32"
T6A	N 36° 06' 30.15"	W 79° 01' 43.18"
T6B	N 36° 06' 30.42"	W 79° 01' 52.43"
T7	N 36° 06' 20.39"	W 79° 01' 10.08"
T7A	N 36° 06' 23.86"	W 79° 01' 08.58"
T8	N 36° 06' 18.60"	W 79° 01' 57.23"
T9	N 36° 06' 13.04"	W 79° 01' 51.99"

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	T2: 1.27-1.29
	T3: 1.17-1.27
	T4: 1.33-1.38
	T4A: 1.30-1.33
	T4B: 1.39-1.41
	T5: 1.50-1.57
	T6: 1.42-1.50
	T6A: 1.58-1.59
	T6B: 1.60
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	T7A: 1.66
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Planting Plan	2.1

Project Directory

Engineering:
Wildlands Engineering, Inc.
License No. F-0831
312 West Millbrook Road, Suite 225
Raleigh, NC 27609
Chris Roessler, Project Manager
Nicole Macaluso Millns, PE
919-851-9986

Owner:
NCDEQ Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652
Jeff Schaffer
919-707-8308

NCDEQ Contract No. 006829

Surveying:
Kee Mapping & Surveying, PA
111 Central Avenue
Asheville, NC 28801
Brad Kee, PLS
828-645-8275

DMS ID No. 97084



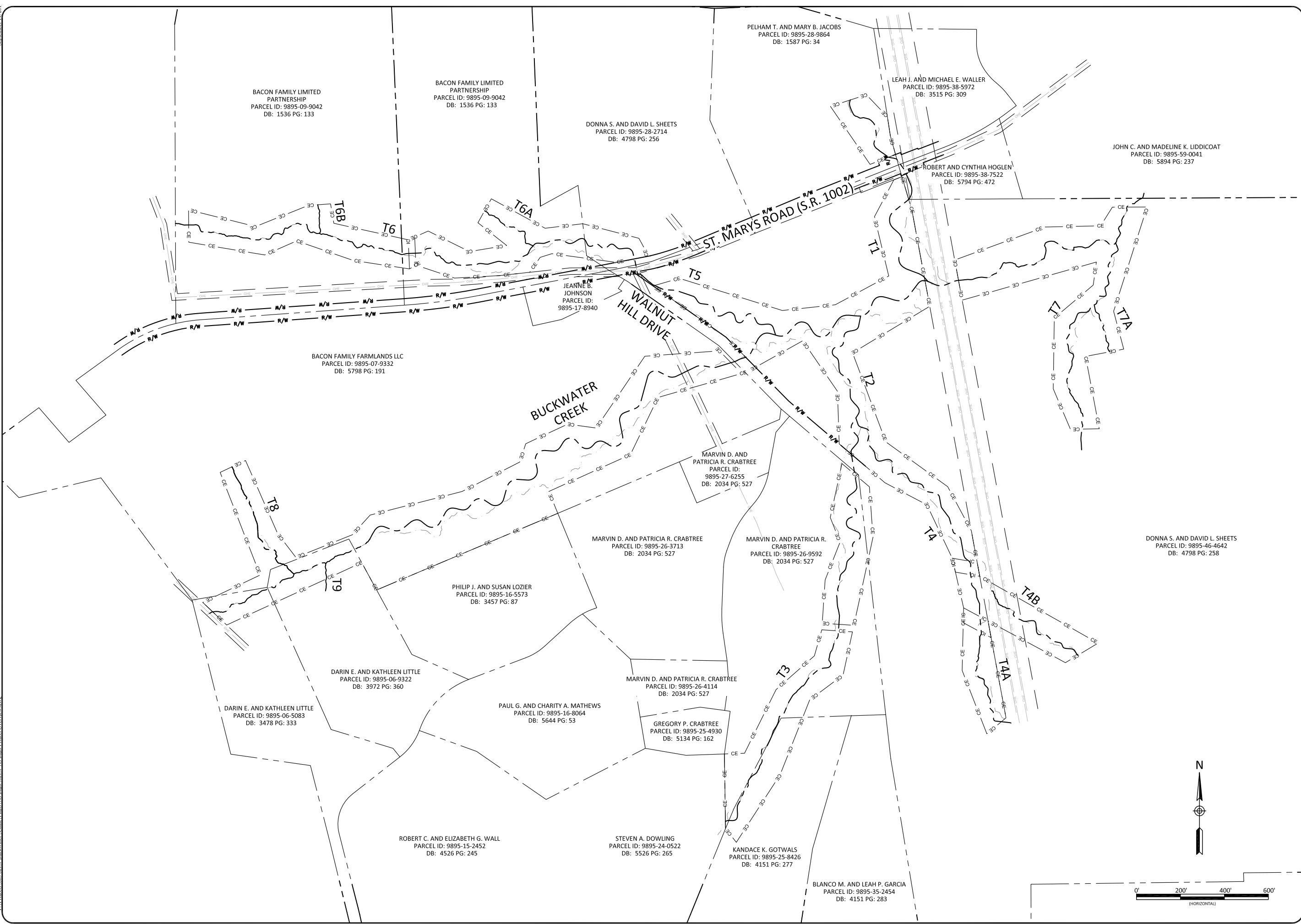
Buckwater Mitigation Site
Orange County, North Carolina


Title Sheet

Date:	07/01/2019
Job Number:	005-02157
Project Engineer:	NJAN
Drawn By:	CAV
Checked By:	JTL


0.1

September 11, 2019
F:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\02157-As-Built-Project-Overview.dwg





WILDLANDS
ENGINEERING
312 W. Millbrook Road, Ste 225
Raleigh, NC 27606
Tel: 919.875.0996
Fax: 919.875.0996
Firm License No. F-0831



WILLIAM J. WILLIAMS
PROFESSIONAL ENGINEER
No. 27458
Civil
North Carolina

Buckwater Mitigation Site

Orange County, North Carolina

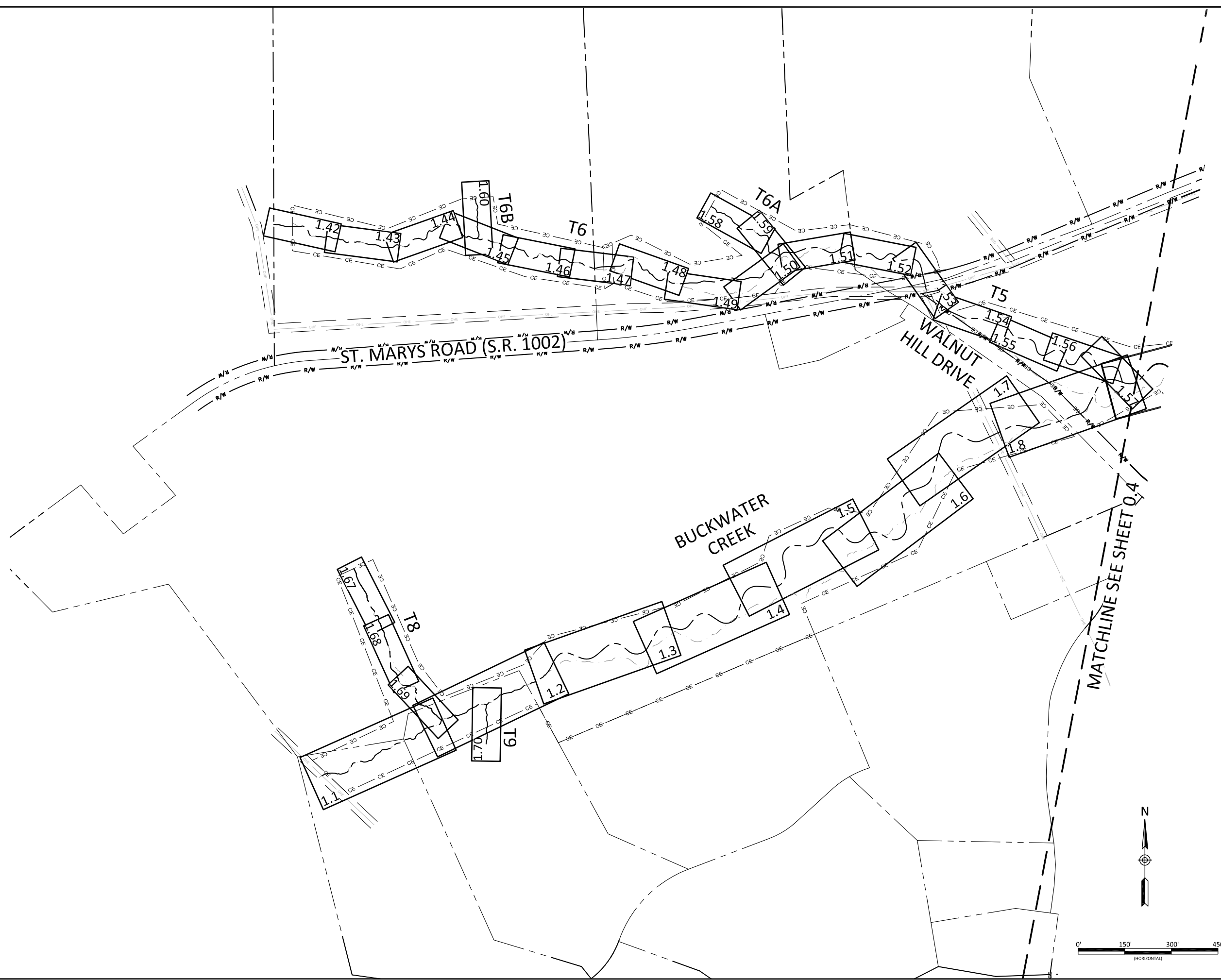
Project Overview

Revisions:

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

0.2

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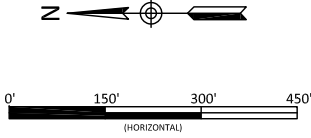
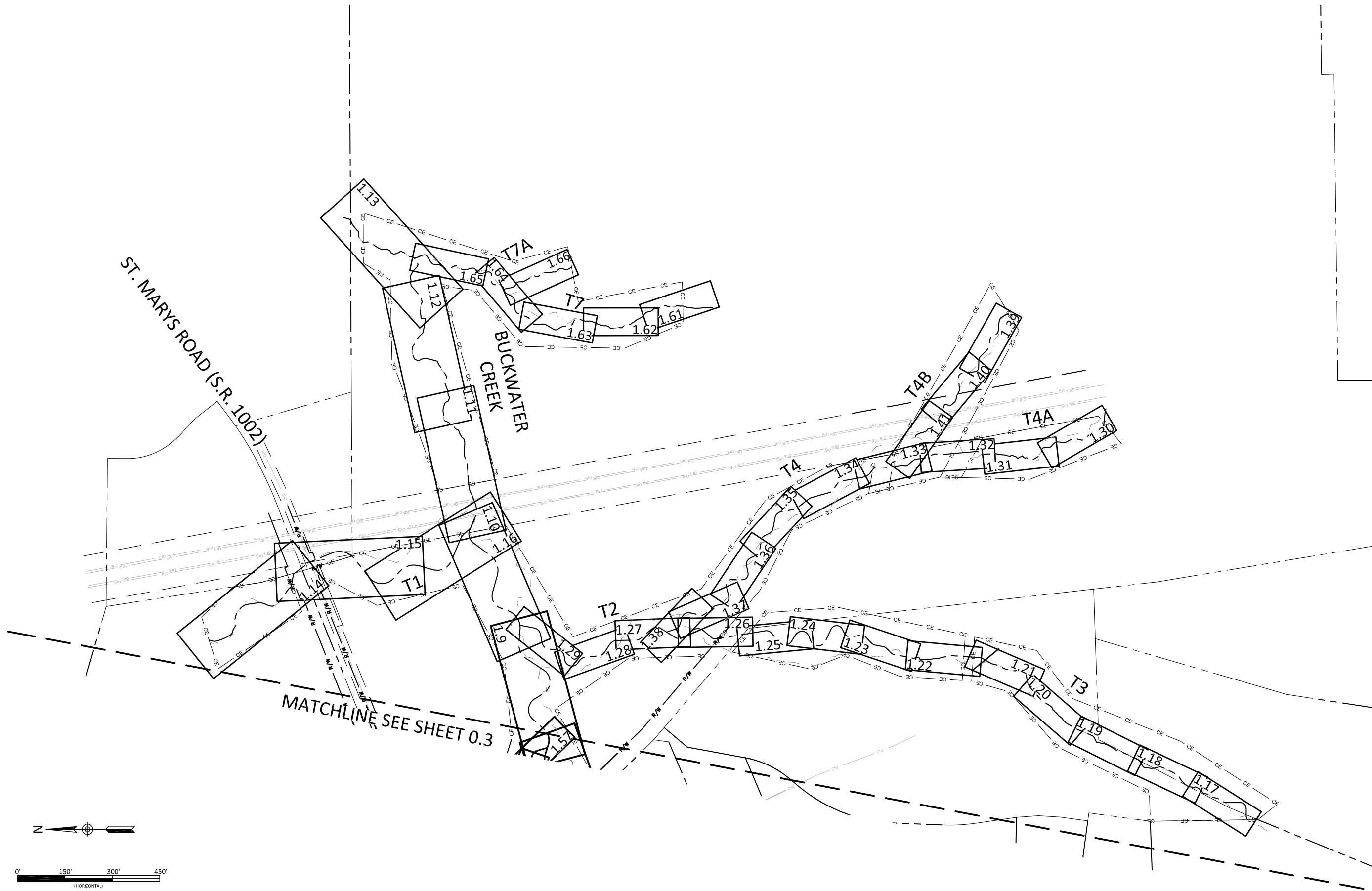


Buckwater Mitigation Site
Orange County, North Carolina
 Project Overview

Revisions:

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

0.3

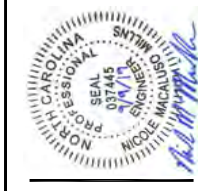


Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:

0.4

Buckwater Mitigation Site
 Orange County, North Carolina
 Project Overview



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Existing Features

	Existing Property Boundary
	Existing Right-of-way
	Existing Gas Easement
	Existing Overhead Electric Utility Line
	Existing Gas Line
	Existing Fiber Optic Cable Line
	Existing Tree Line
	Existing Tree
	Existing Utility Pole
	Existing Wetlands
	Existing Bedrock
	Existing Farm Road

Design Features

	Designed BANKFULL
	Designed 5' Major Contour
	Designed 1' Minor Contour
	Designed Thalweg
	Designed Farm Road Realignment
	Designed Riffle
	Designed Log Sill
	Designed Angled Log Sill
	Designed Log Vane
	Designed Log J-Hook
	Designed Root Wad
	Designed Rock Step Pools
	Designed Vegetated Soil Lift
	Designed Brush Toe
	Designed Boulder Toe
	Designed Boulder Sill
	Designed Transplanted Sod Mats
	Designed Permanent Culvert Crossing
	Designed Permanent Ford Crossing
	Designed Lunker Log
	Designed Rock Cascade
	Designed Stream Bank Grading

As-Built Features

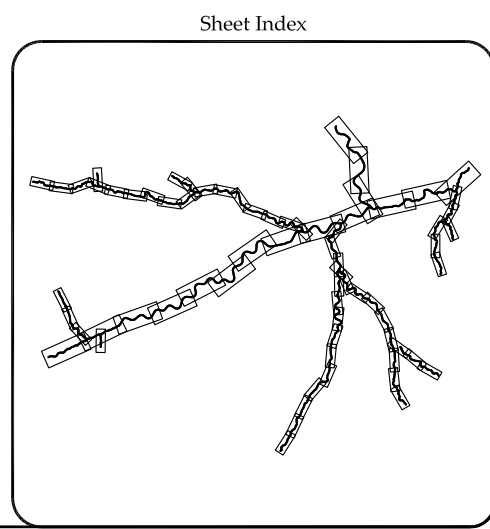
	Conservation Easement
	Internal Crossing
	As-Built Stream Alignment - Restoration
	As-Built Stream Alignment - Enhancement I
	As-Built Stream Alignment - Enhancement II
	As-Built Stream Alignment - Not For Credit
	Limits of Disturbance
	Cross section
	As-Built 5' Major Contour
	As-Built 1' Minor Contour
	As-Built Fence
	As-Built Riffle
	As-Built Log Sill
	As-Built Angled Log Sill
	As-Built Log Vane
	As-Built Log J-Hook
	As-Built Root Wad
	As-Built Rock Step Pools
	As-Built Vegetated Soil Lift
	As-Built Brush Toe
	As-Built Boulder Toe
	As-Built Boulder Sill
	As-Built Transplanted Sod Mats
	As-Built Permanent Culvert Crossing
	As-Built Permanent Ford Crossing
	As-Built Lunker Log
	As-Built Rock Cascade
	As-Built Vernal Pool
	As-Built Streambank Grading

	VP#	Vegetation Plot
	Gauge	
	Photo Point	



Buckwater Mitigation Site Orange County, North Carolina

General Notes and Symbols

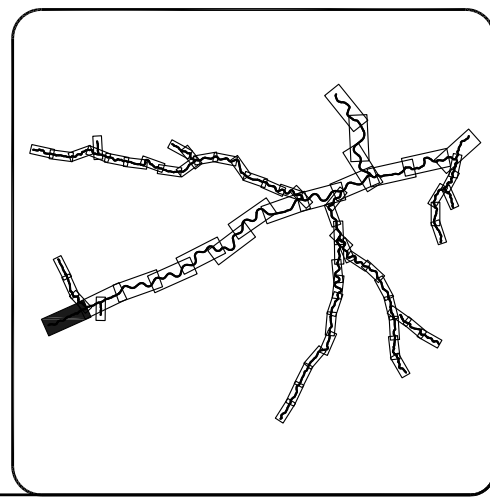
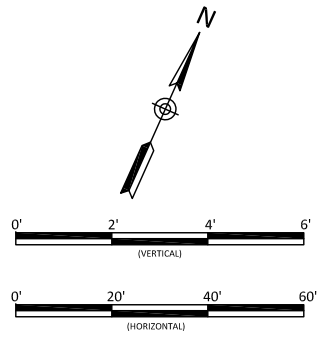
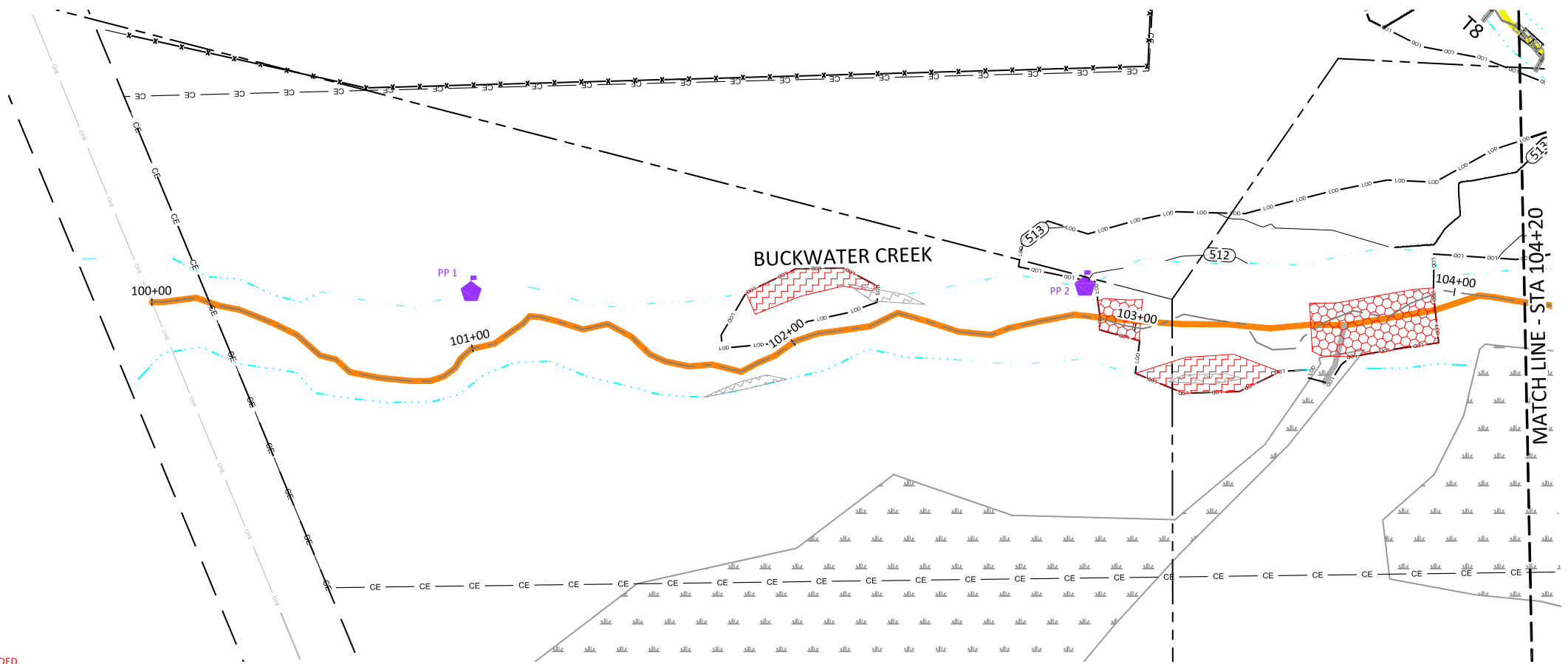
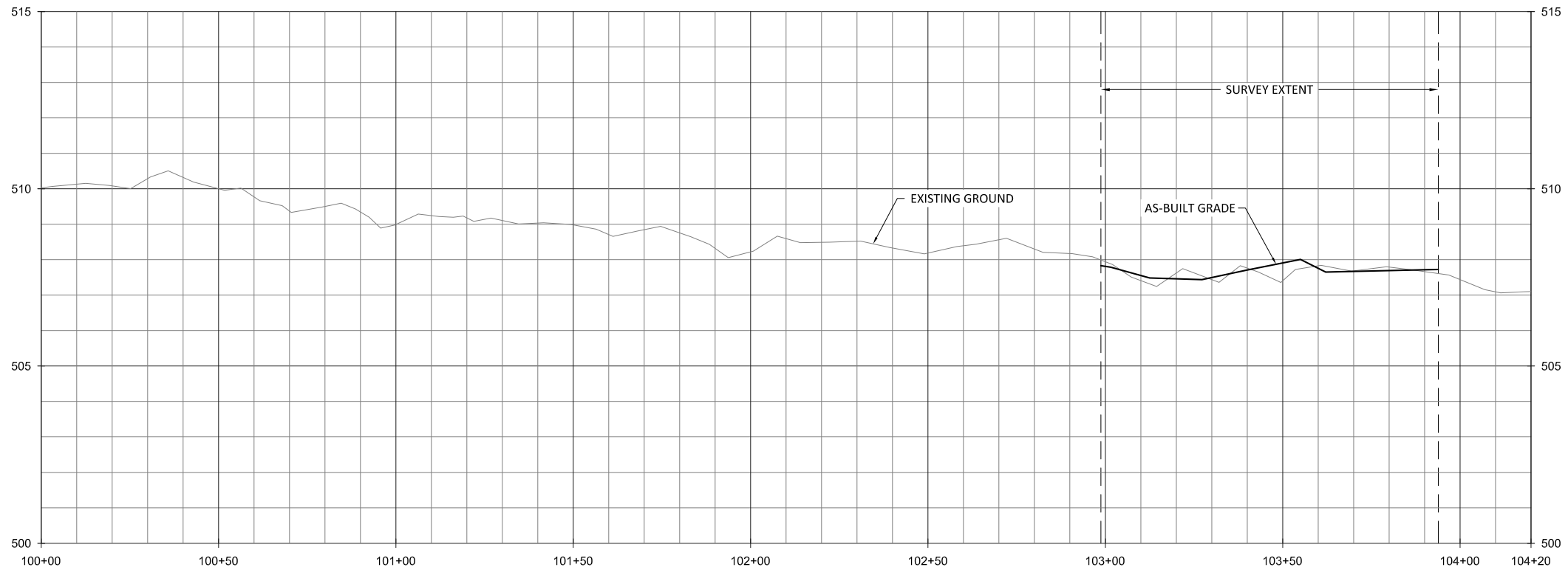


Revisions:	


Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

0.5


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NOTE:
 1. STA 102+96 RIFFLE WAS ADDED.
 2. STA 103+67 RIFFLE WAS ADDED
 (SEE NOTE 1 SHEET 1.2).



WILDLANDS
 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 Tel: 919.851.0996
 Fax: 919.851.0998
 Firm License No. F-0831



Buckwater Mitigation Site
 Orange County, North Carolina

Buckwater Creek Reach 1
 Stream Plan and Profile

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

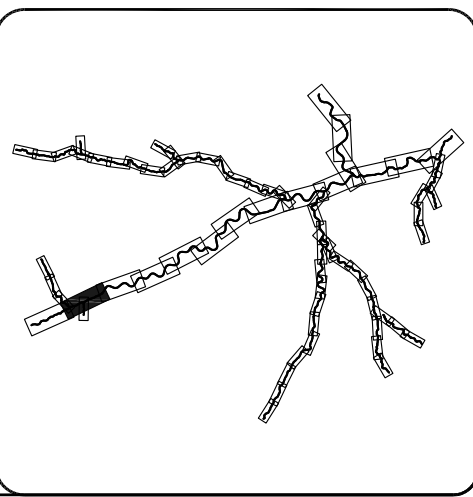
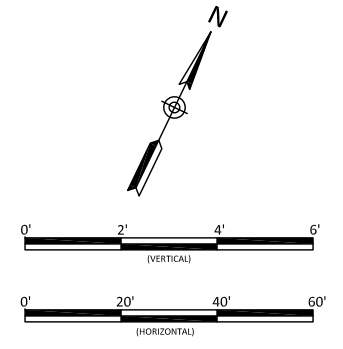
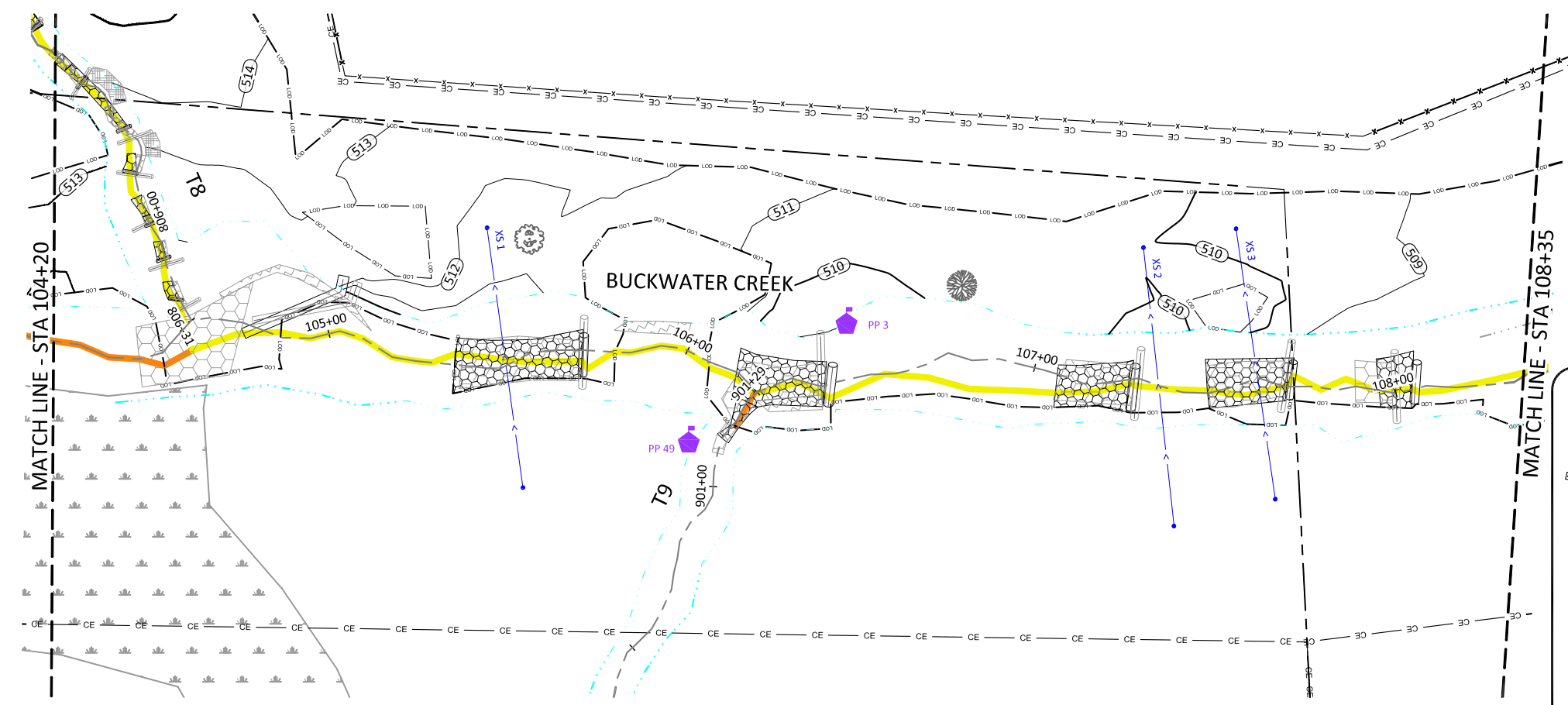
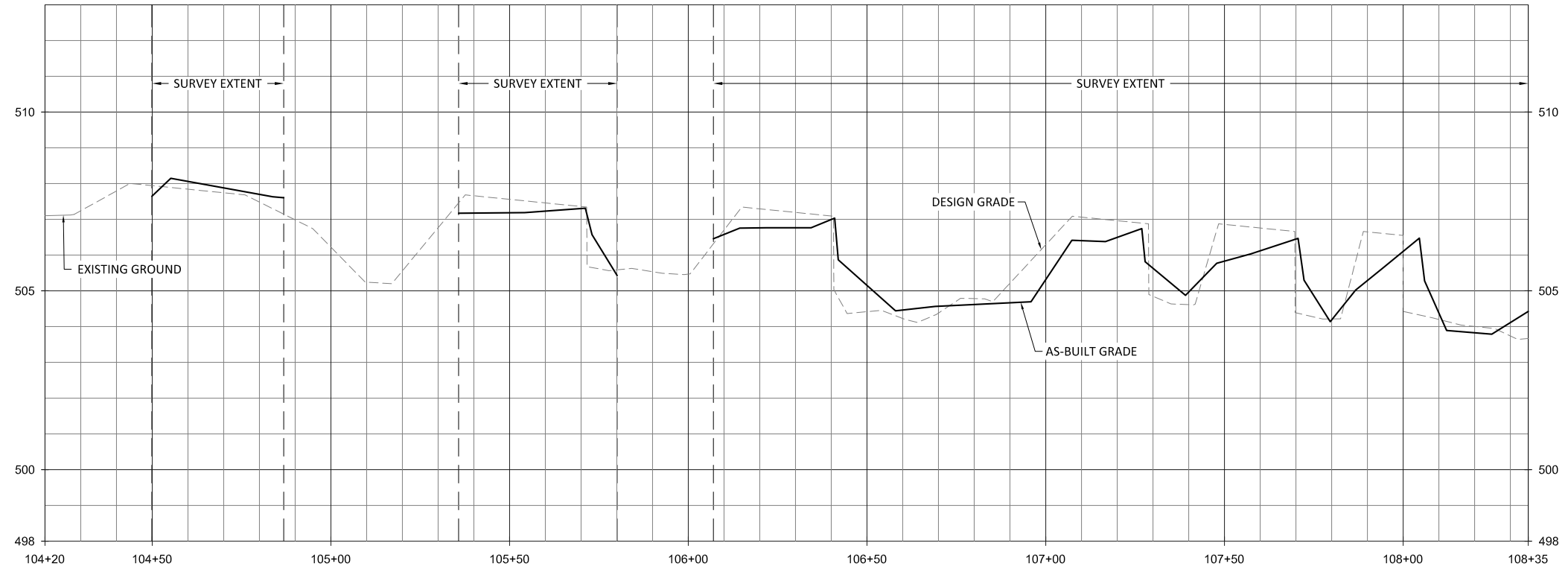
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No.	Description


1.1

Sheet


September 11, 2019
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NOTE:
 1. STA 104+58: RIFFLE WAS INSTALLED UPSTREAM (SEE NOTE 2 SHEET 1.1).



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 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 Tel: 919.851.0996
 Fax: 919.851.0998
 Firm License No. F-0831



Buckwater Mitigation Site
 Orange County, North Carolina

Buckwater Creek Reaches 1, 2 & 3
 Stream Plan and Profile

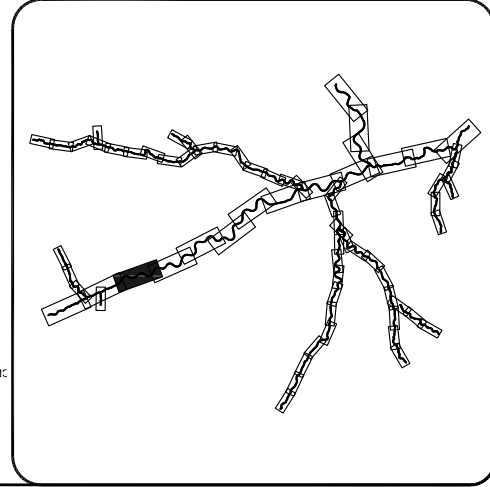
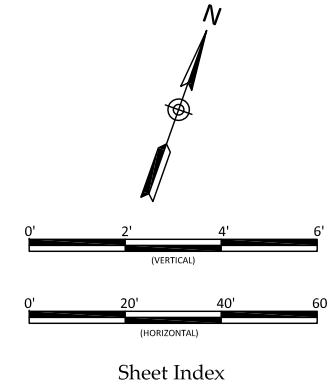
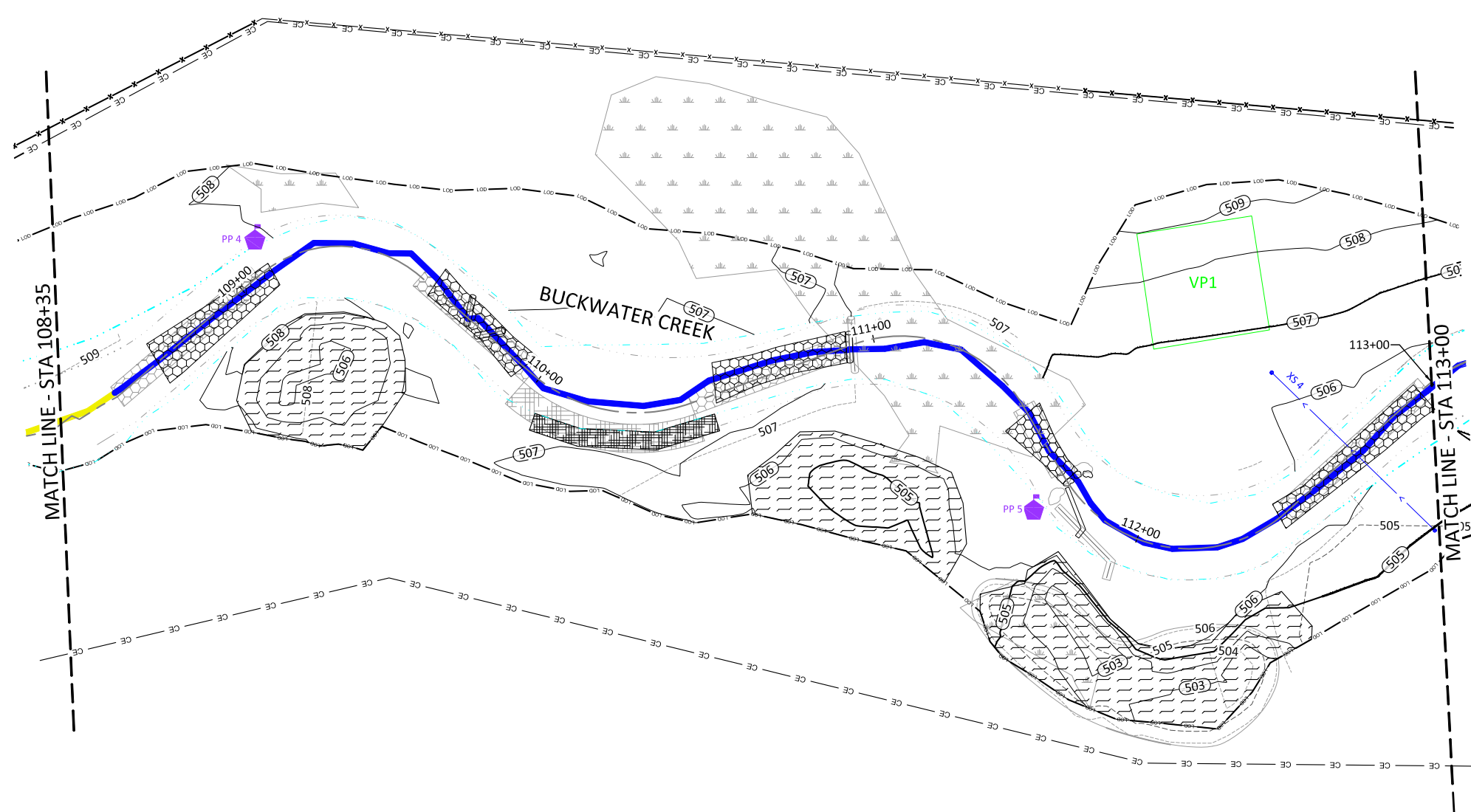
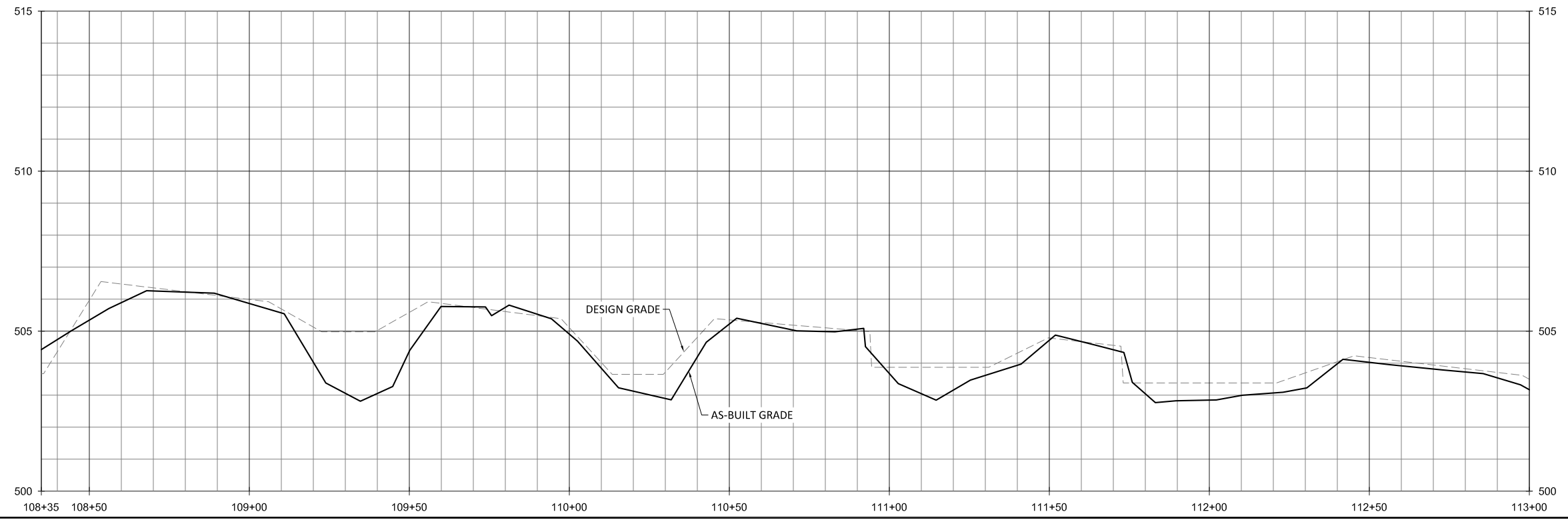
Date: 07.01.2019
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 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:

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September 11, 2019
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Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reaches 3 & 4
 Stream Plan and Profile

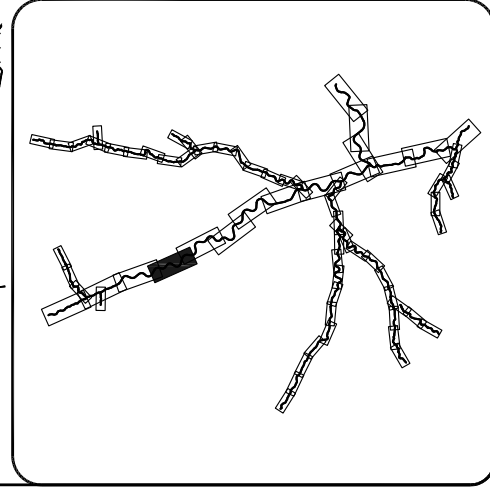
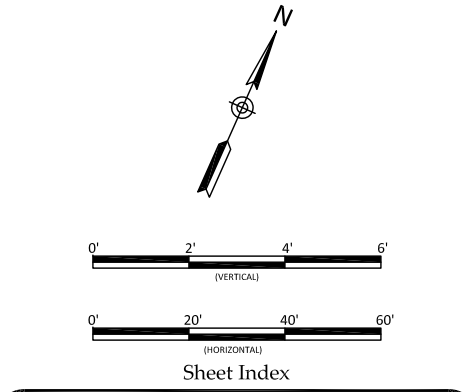
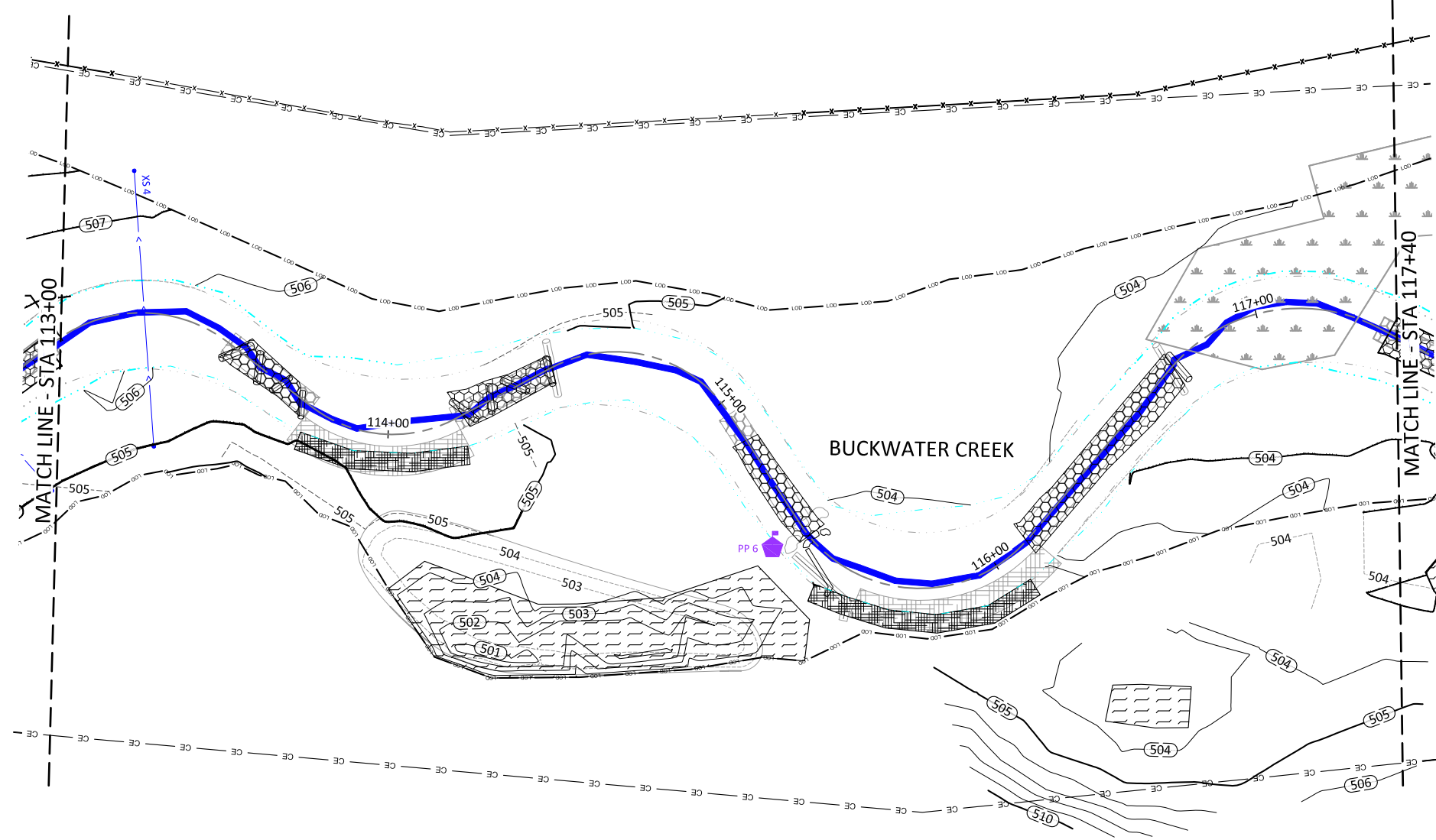
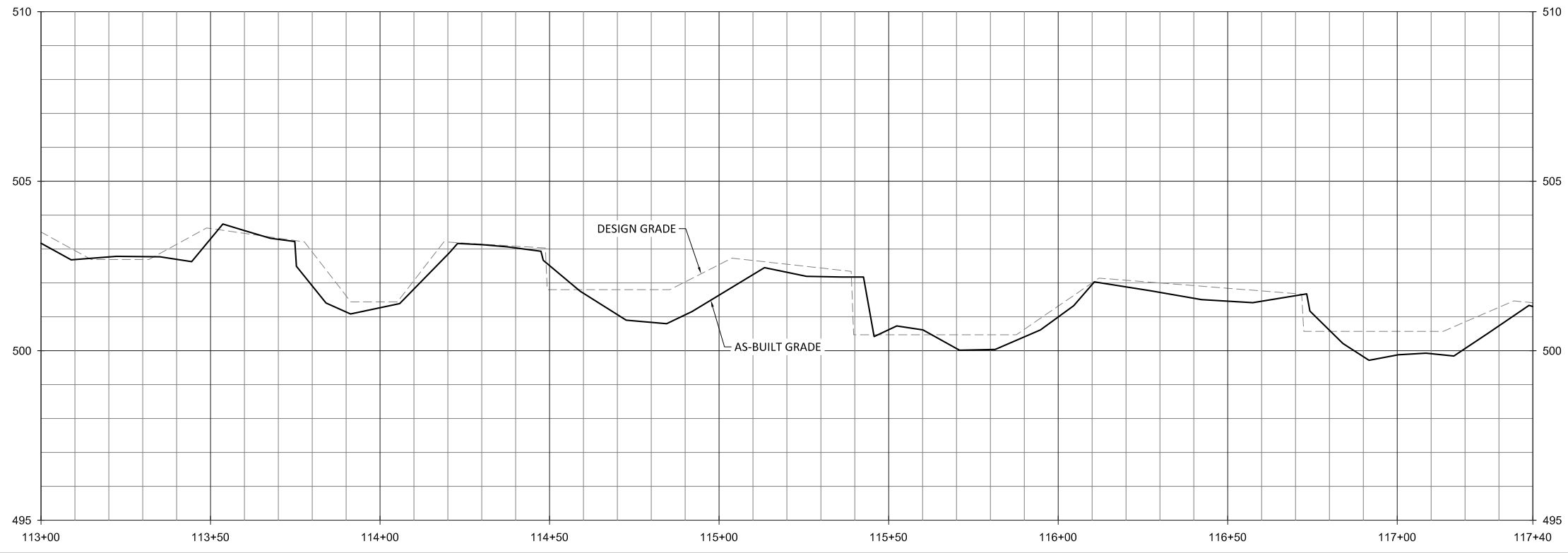
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Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.3


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September 11, 2019
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 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 P: 919.851.0996
 F: 919.851.0931
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Buckwater Mitigation Site
 Orange County, North Carolina

Buckwater Creek Reach 4
 Stream Plan and Profile

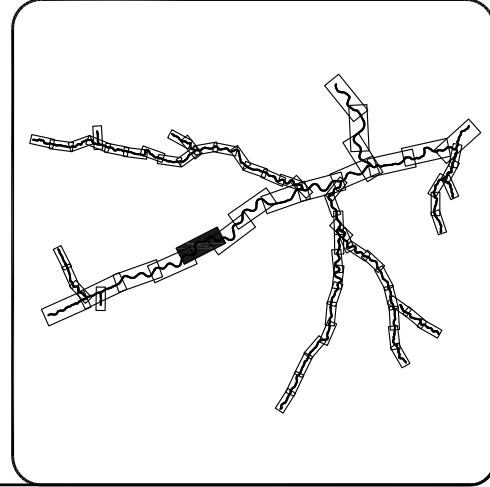
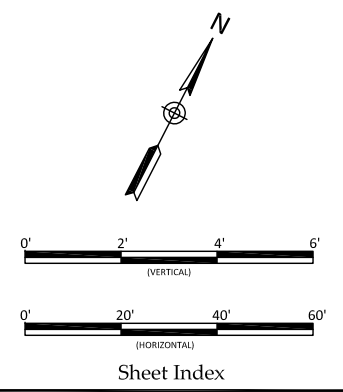
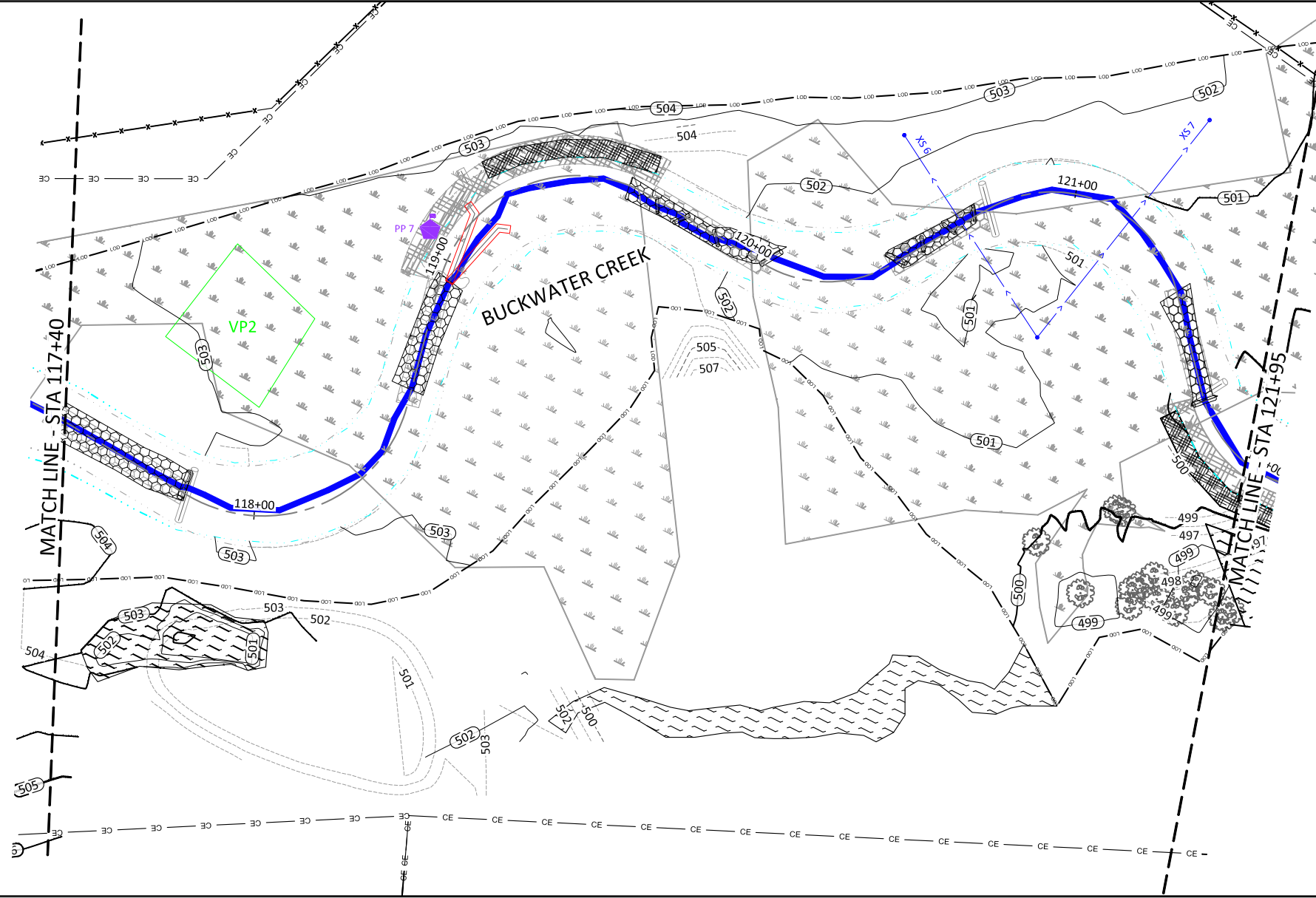
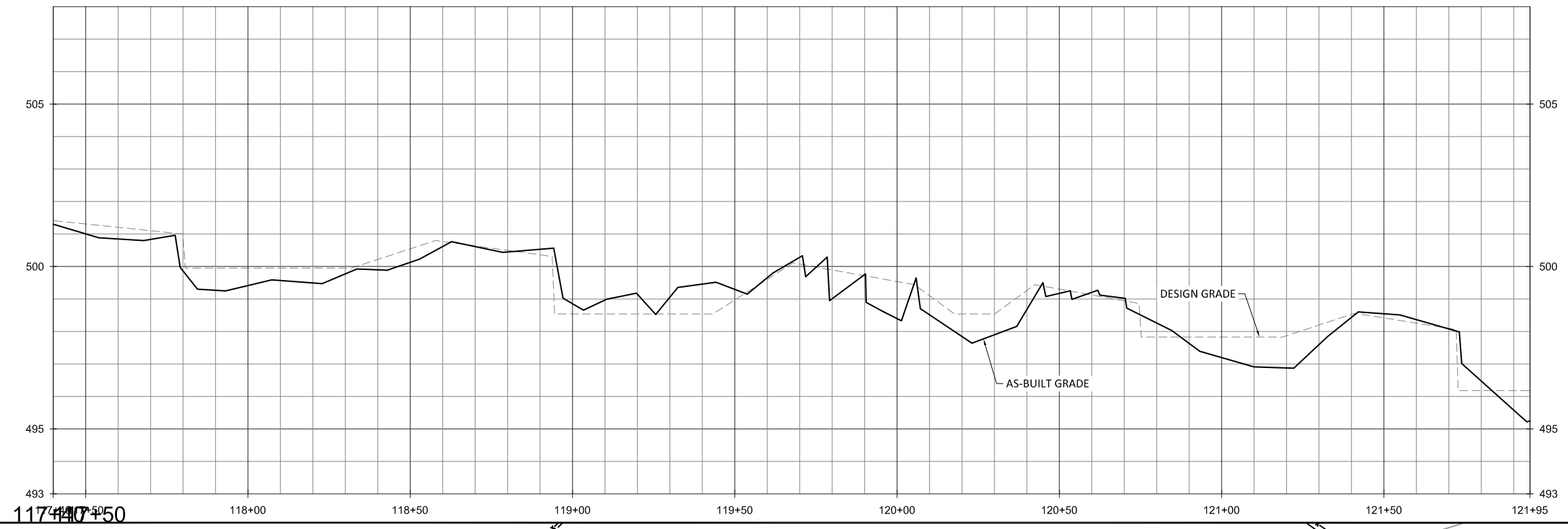
Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:


1.4

Sheet


September 11, 2019
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- NOTE:**
1. STA 118+86: A LOG CROSS VANE WAS INSTALLED INSTEAD OF A LOG J HOOK.
 2. STA 119+44: POOL SHALLOW NOT INSTALLED DUE TO FIELD CONDITIONS.



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 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 Phone: 919.851.0996
 Fax: 919.851.0997
 Firm License No. F-0831



Buckwater Mitigation Site
 Orange County, North Carolina

Buckwater Creek Reach 4
 Stream Plan and Profile

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

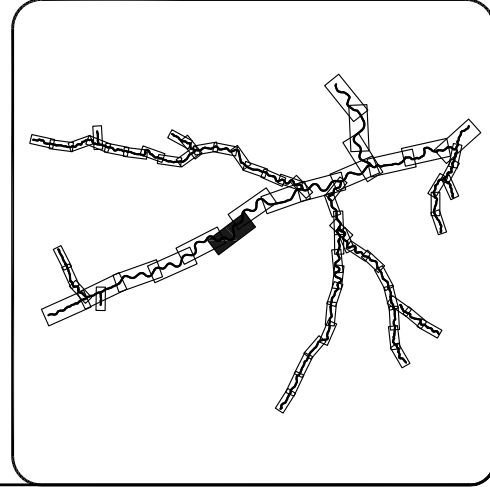
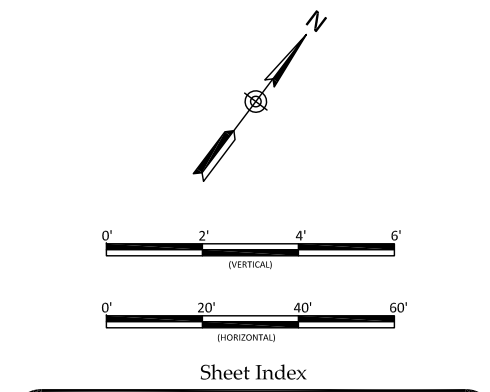
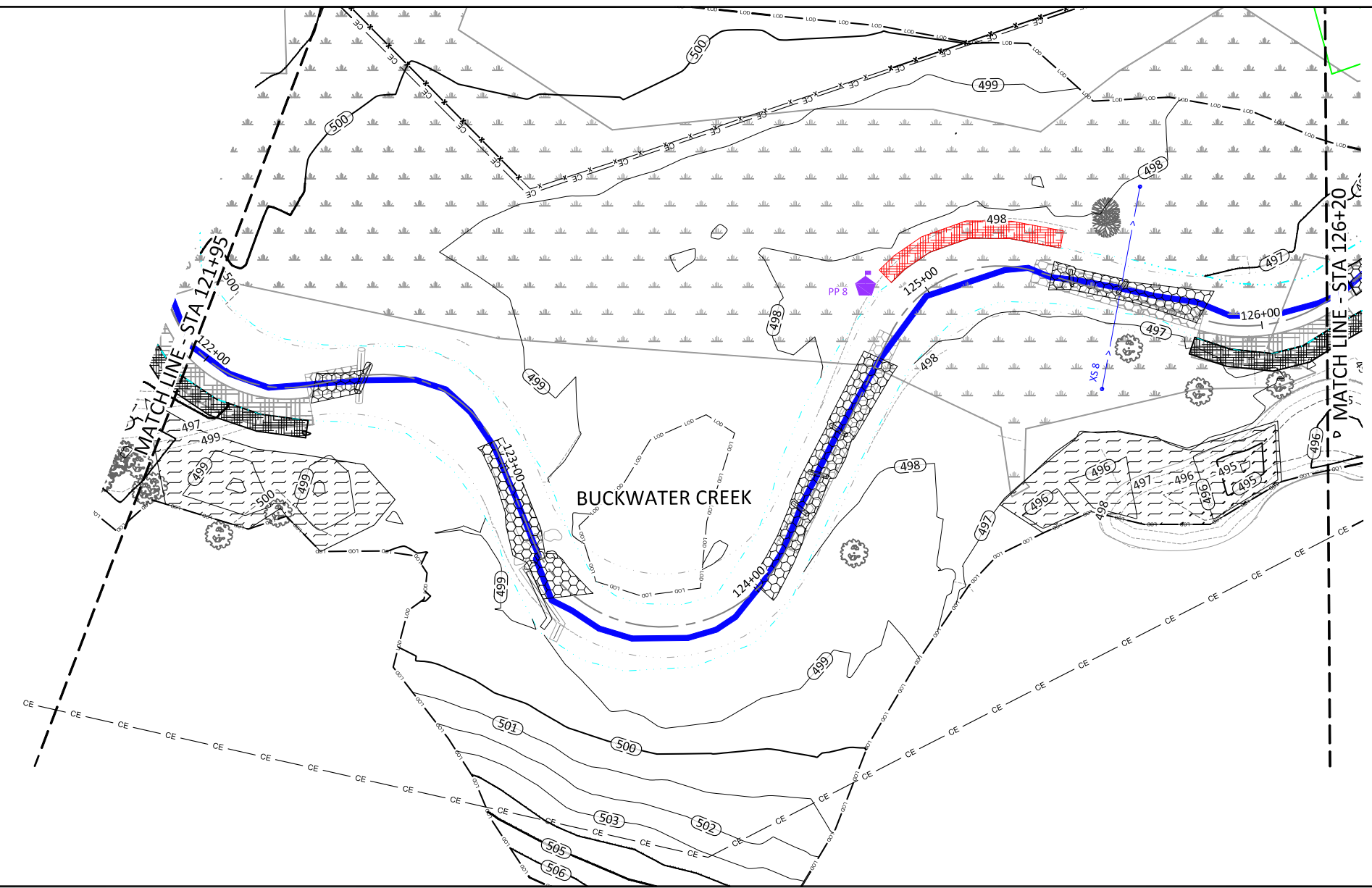
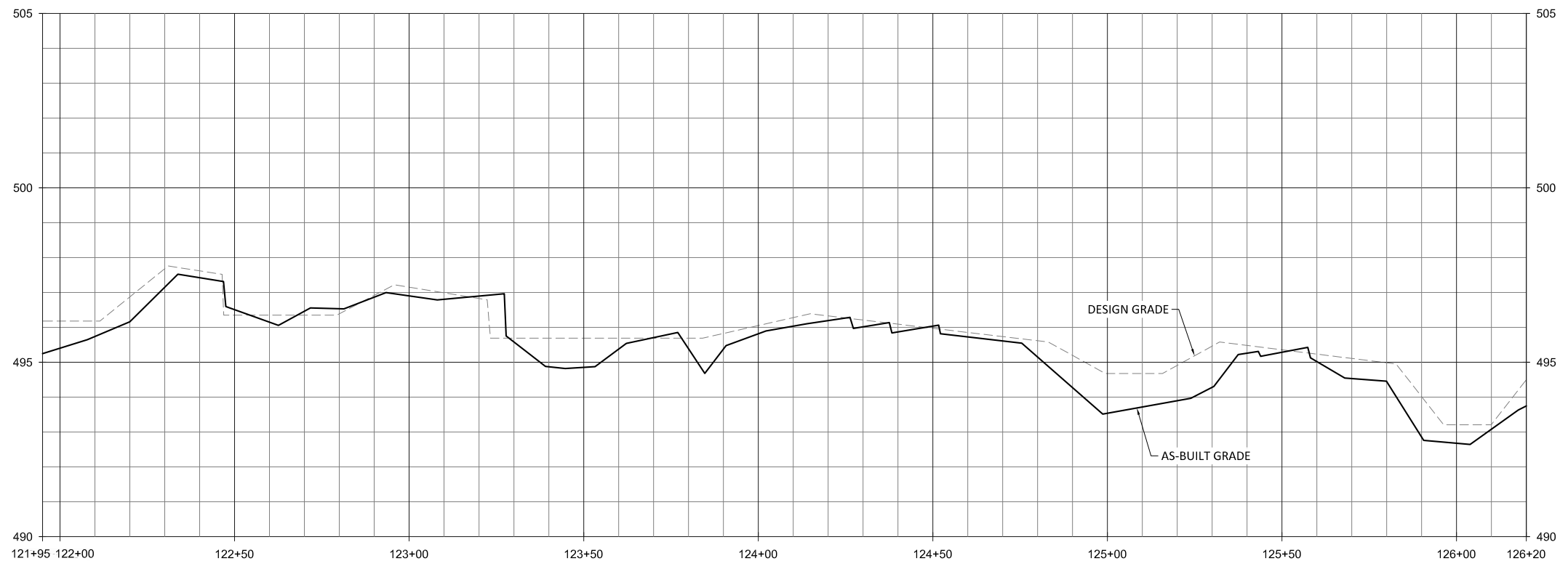
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No.	Description


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September 11, 2019
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NOTE:
 1. STA 125+14: BRUSH TOE WAS INSTALLED.



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 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 Tel: 919.851.0996
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Buckwater Mitigation Site
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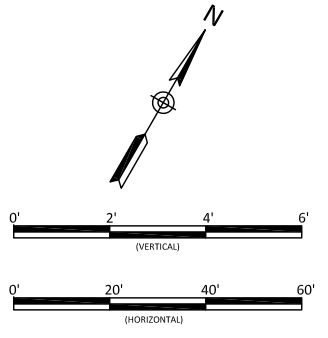
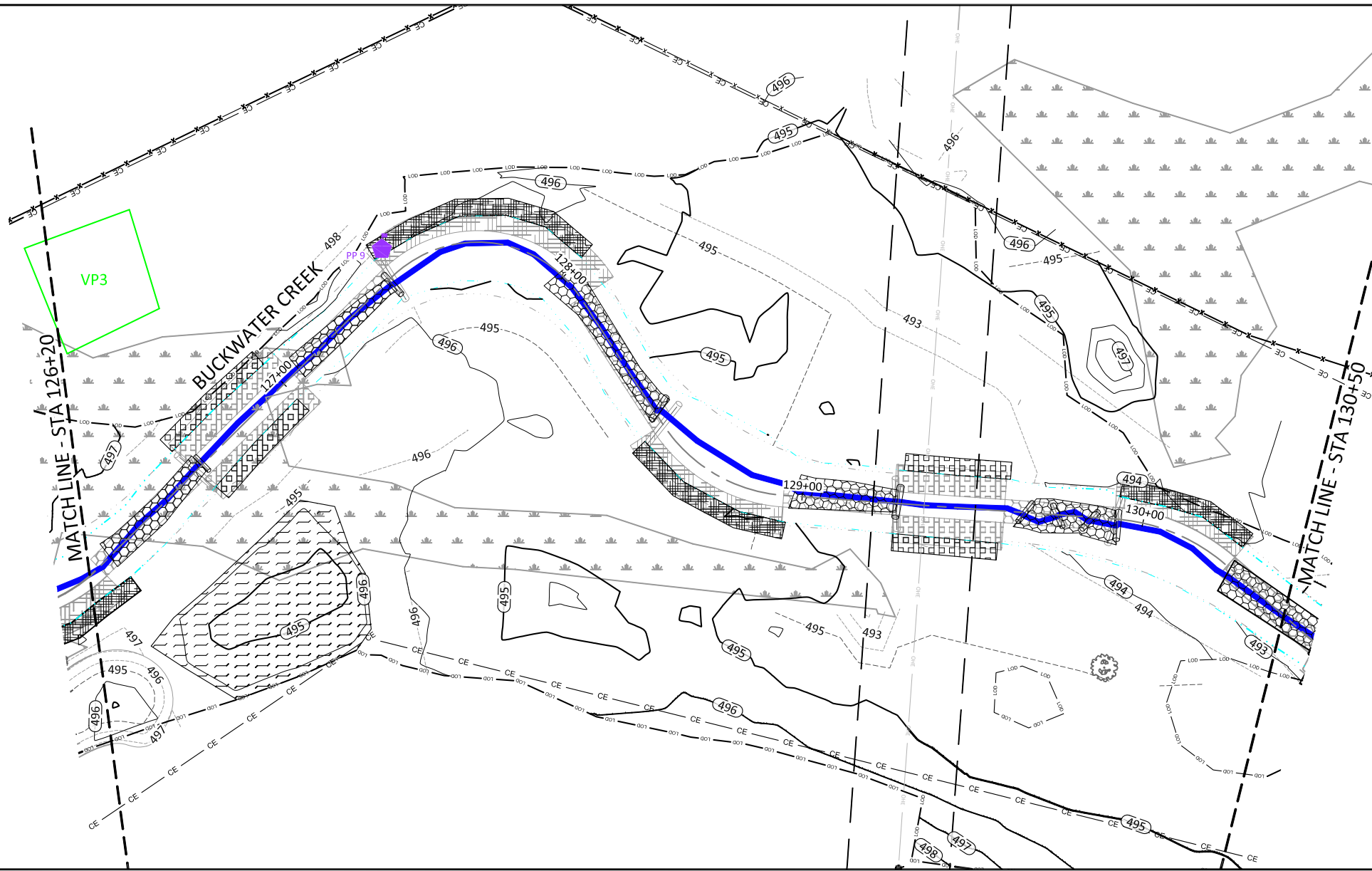
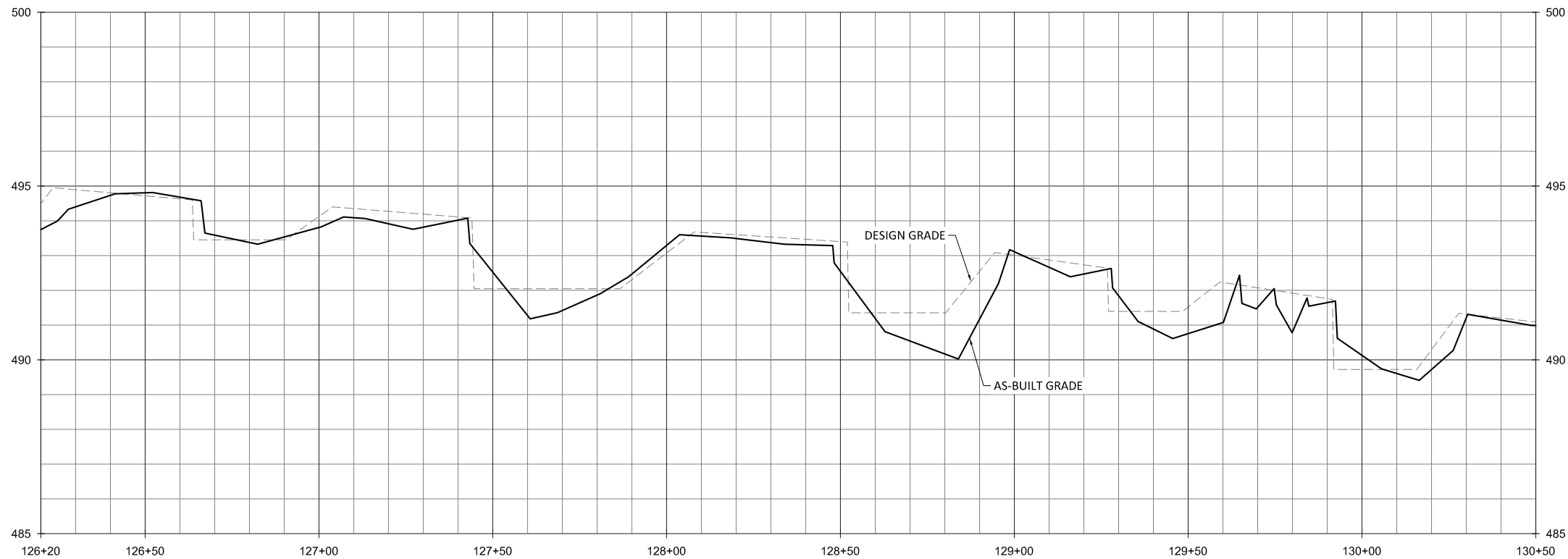
Buckwater Creek Reach 4
 Stream Plan and Profile

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

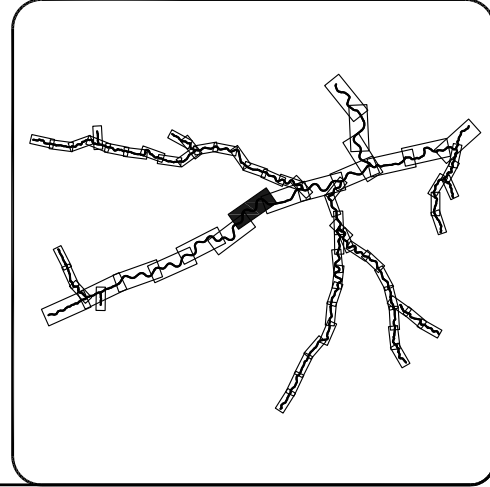
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Sheet Index

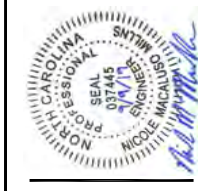


Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reach 4
 Stream Plan and Profile

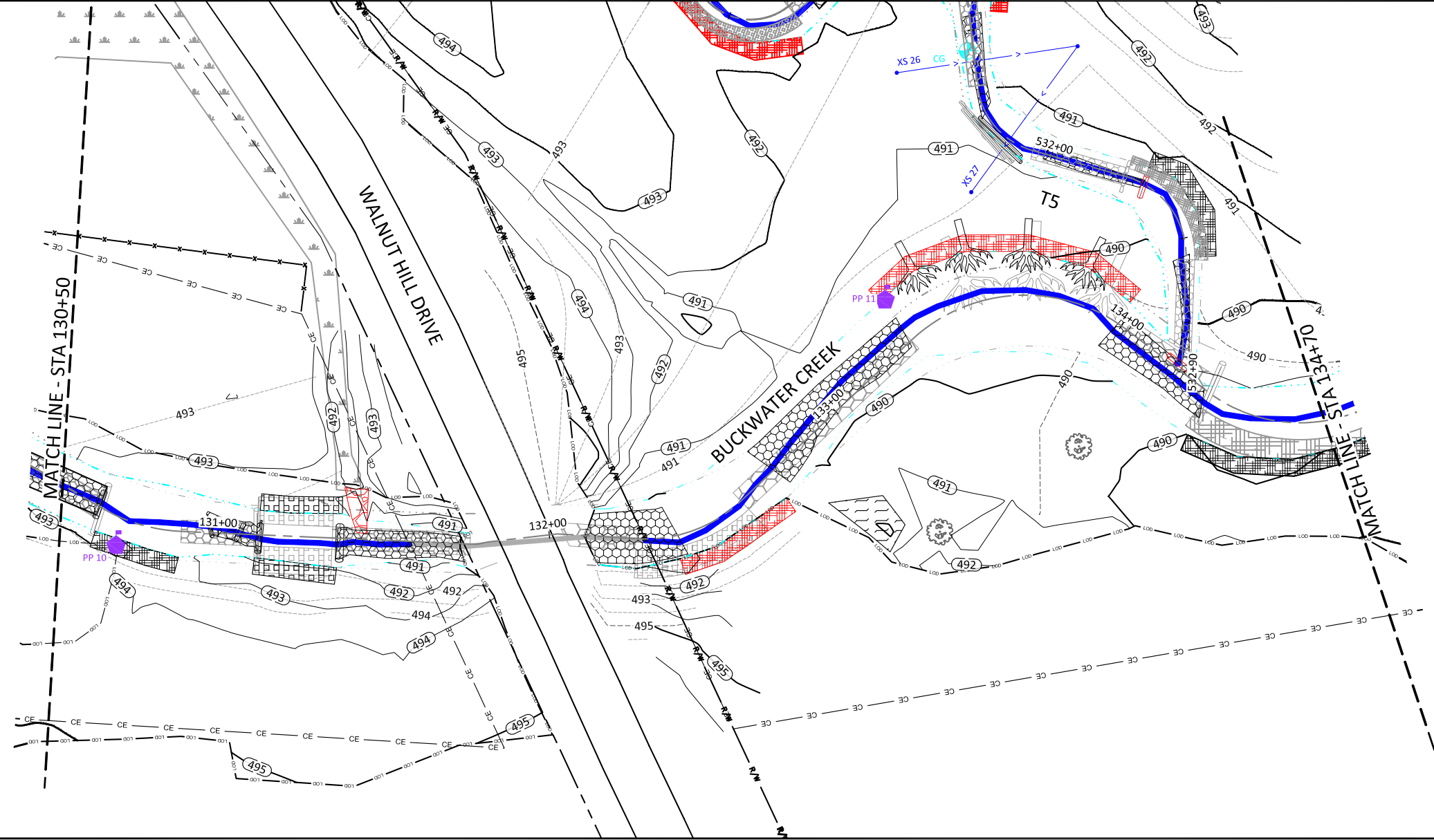
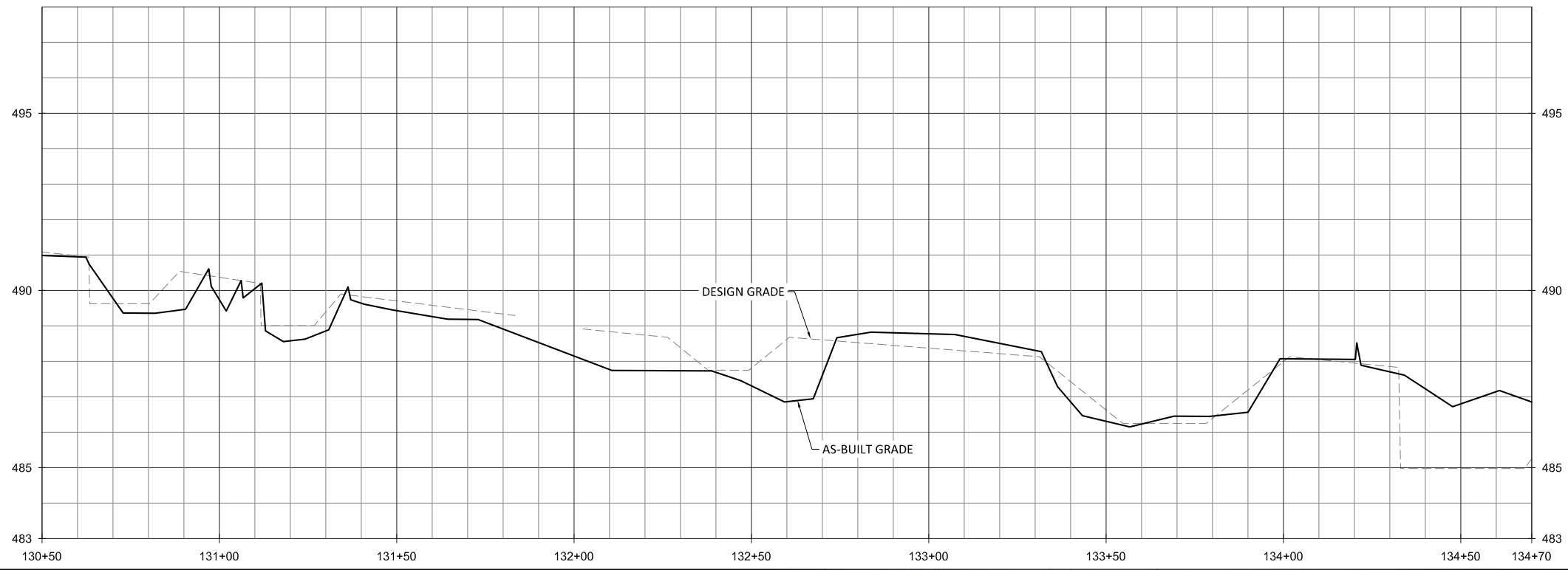
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Drawn By:	CAW
Checked By:	JTL

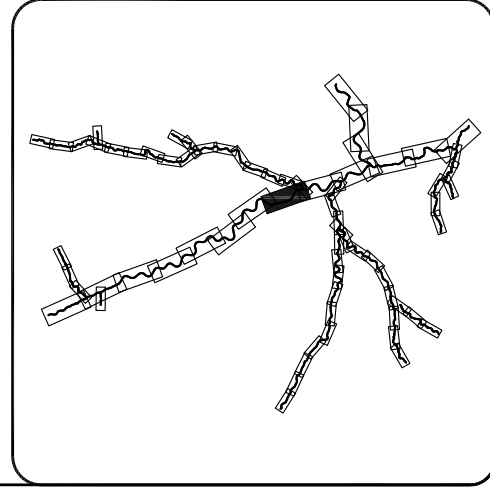
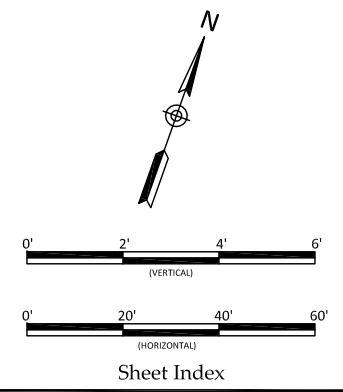
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September 11, 2019
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- NOTE:**
1. STA 131+36: A RIPRAP OUTLET WAS INSTALLED.
 2. STA 132+50: BRUSH TOE WAS INSTALLED INSTEAD OF SOD MAT.
 3. STA 133+62: BRUSH TOE WAS ADDED WITH THE ROOT WADS.
 4. STA 134+34: LOG SILL WAS NOT INSTALLED DUE TO FIELD CONDITIONS.





WILDLANDS
 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 P: 919.833.0996
 F: 919.833.0996
 Firm License No. F-0831



Buckwater Mitigation Site
 Orange County, North Carolina
 Buckwater Creek Reaches 4 & 5
 Stream Plan and Profile

Revisions:

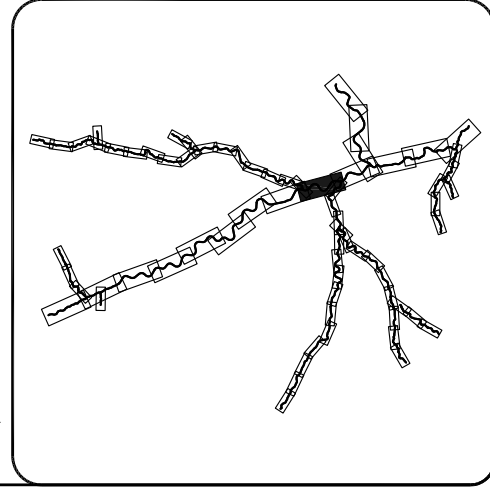
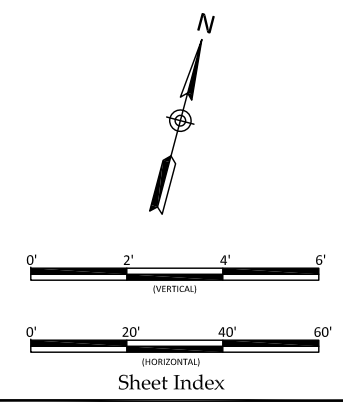
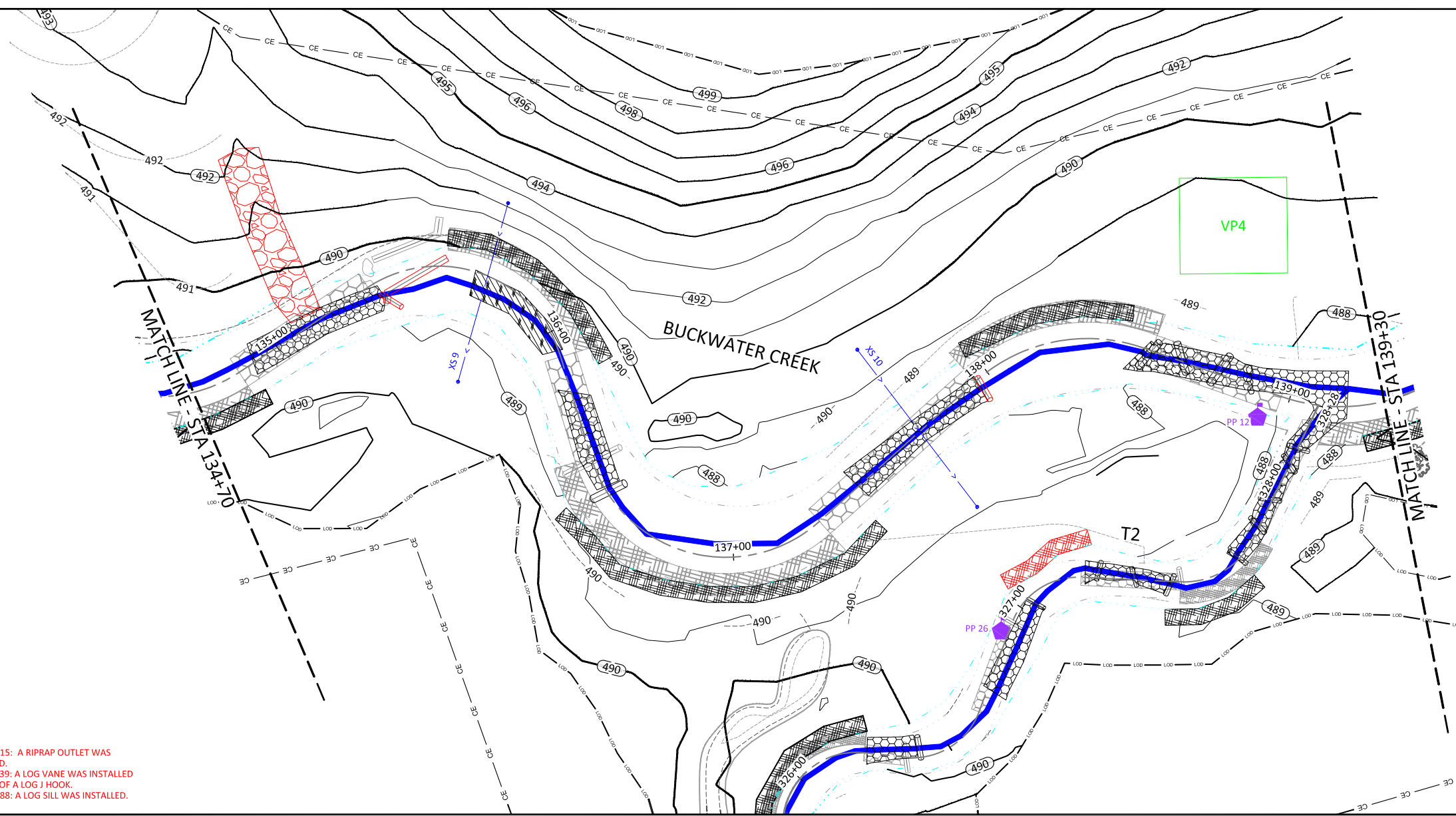
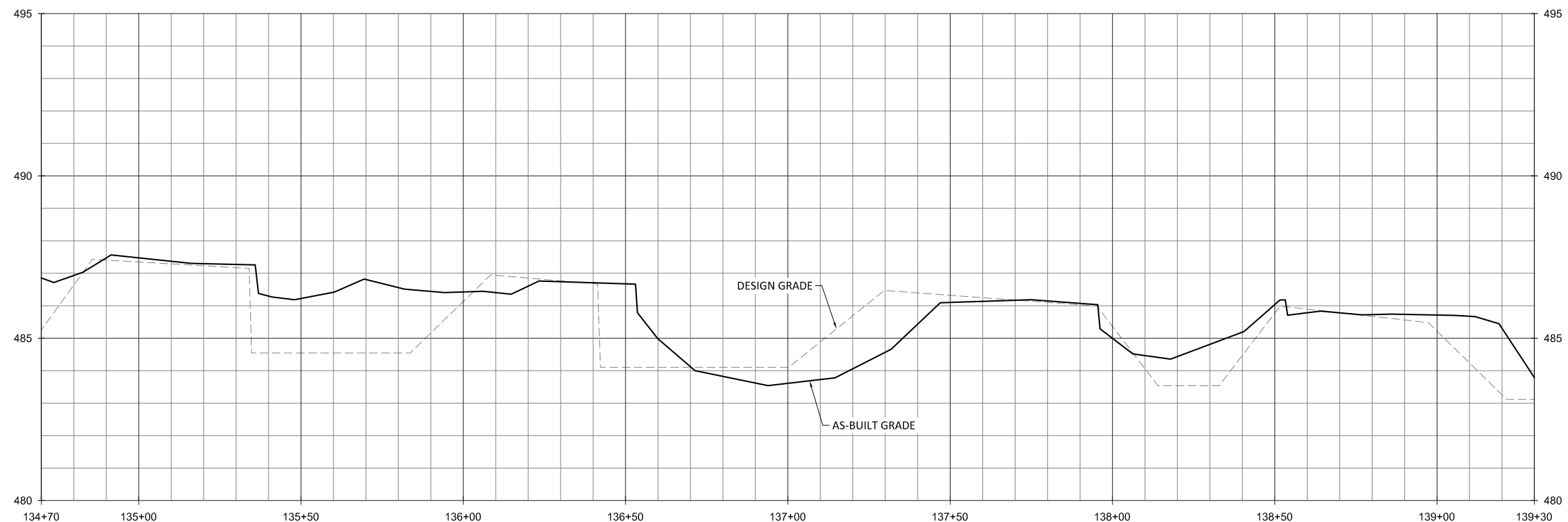
No.	Description

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL


1.8

Sheet


September 11, 2019
 P:\Projects\005-02157\Buckwater\Cadd\1 Plans\As-Built\Profile\Buckwater and T1.dwg



- NOTE:**
1. STA 135+15: A RIPRAP OUTLET WAS INSTALLED.
 2. STA 135+39: A LOG VANE WAS INSTALLED INSTEAD OF A LOG J HOOK.
 3. STA 137+88: A LOG SILL WAS INSTALLED.



WILDLANDS
 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 P: 919.851.0996
 F: 919.851.0996
 Firm License No. F-0831



Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reaches 5 & 6
 Stream Plan and Profile

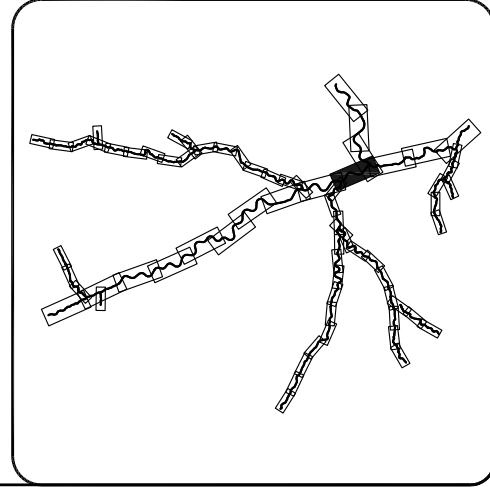
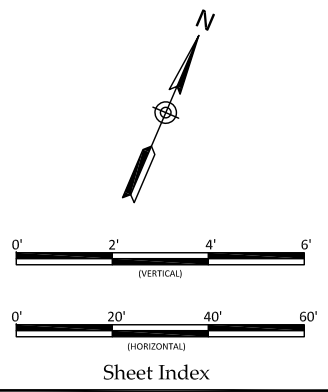
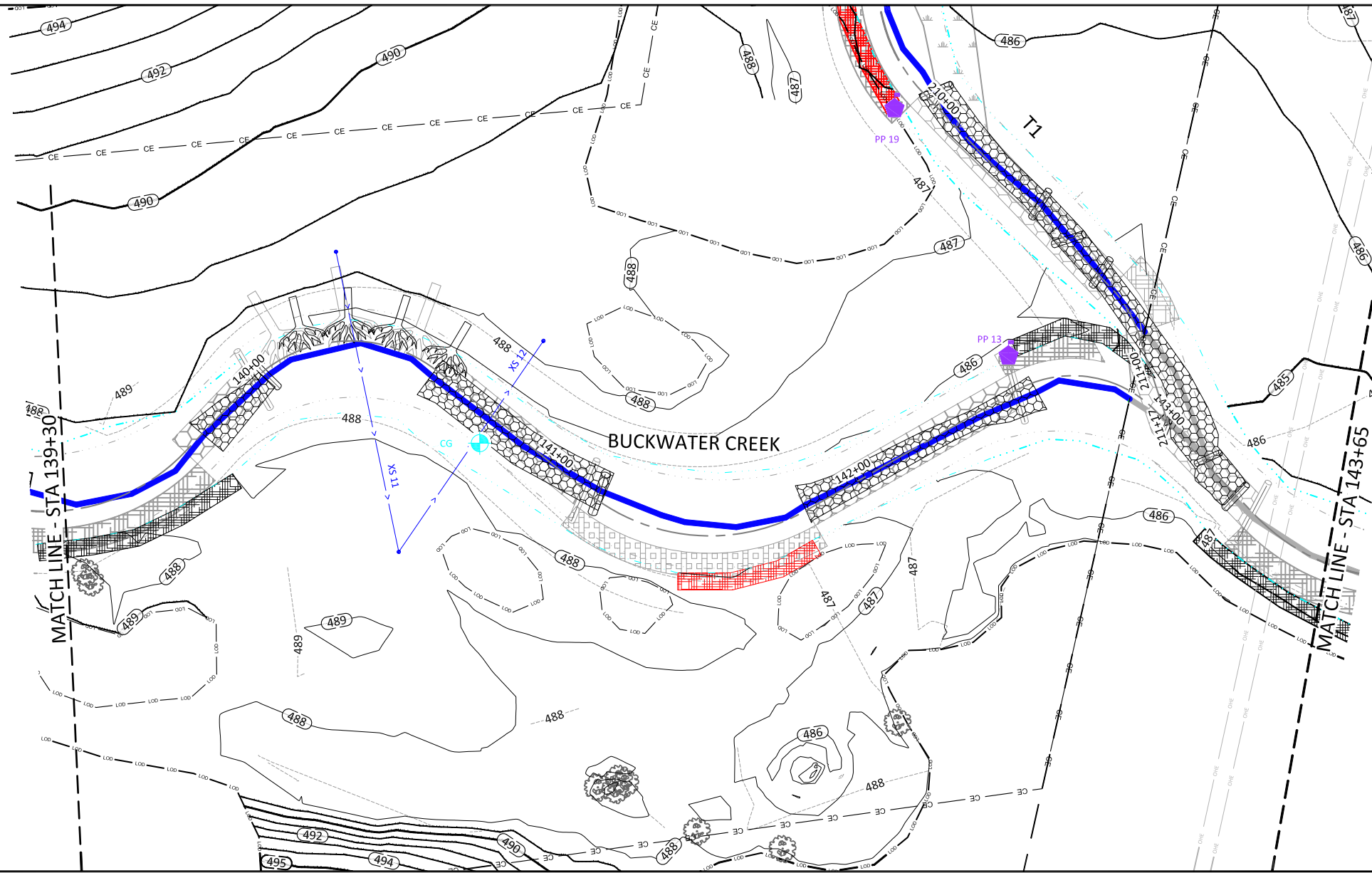
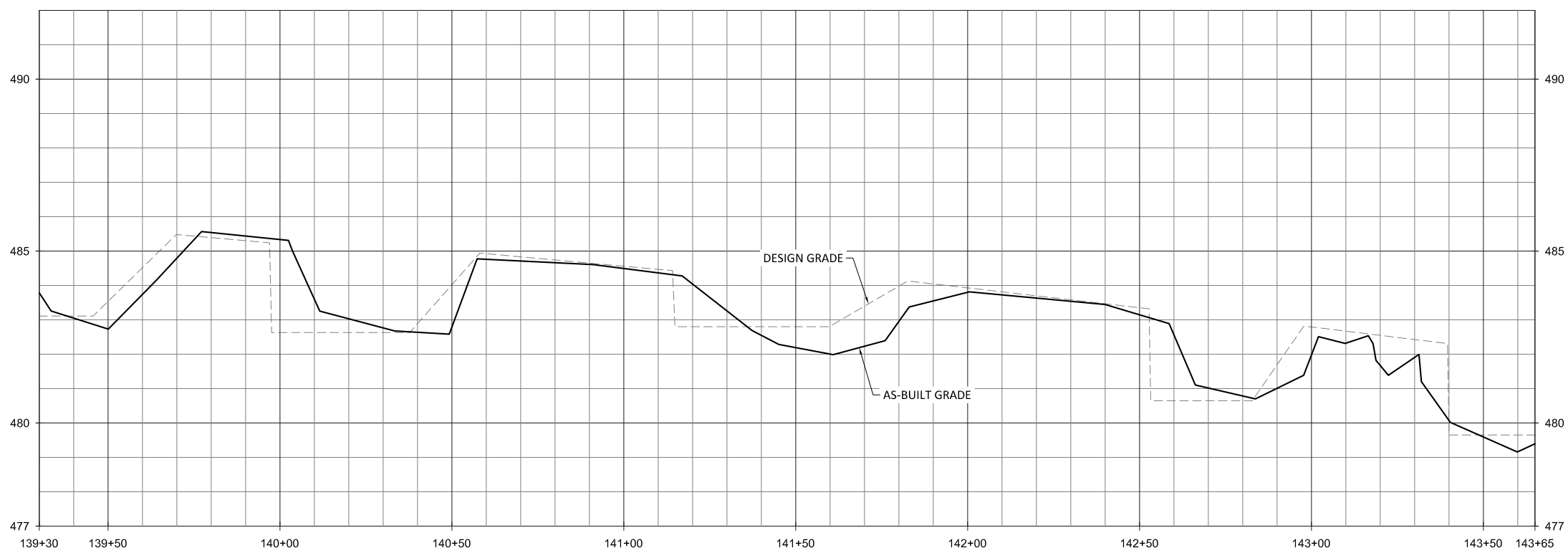
Revisions:	

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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September 11, 2019
 F:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\02157-As-Built-Profile-Buckwater-and-TI.dwg



- NOTE:**
1. STA 141+46: BRUSH TOE WAS INSTALLED INSTEAD OF SOD MATS.
 2. STA 142+53: LOG SILL WAS NOT INSTALLED DUE TO FIELD CONDITIONS.



Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reach 6
 Stream Plan and Profile

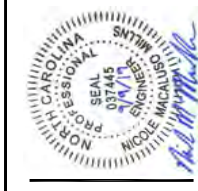
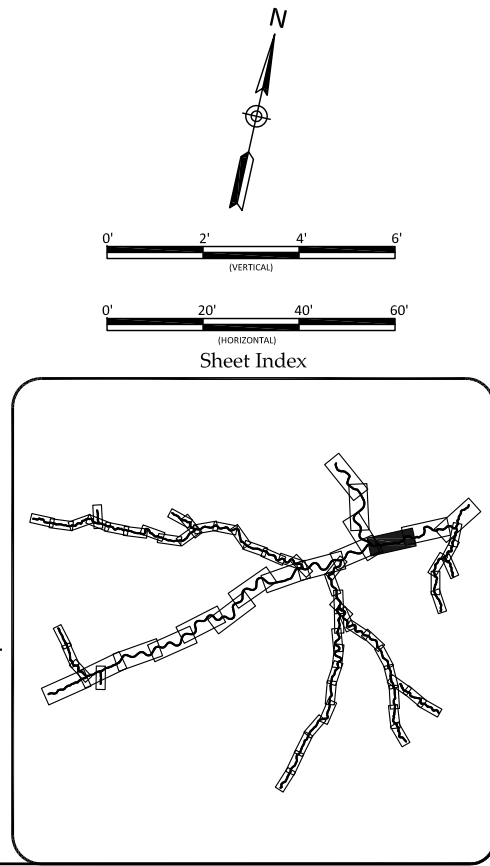
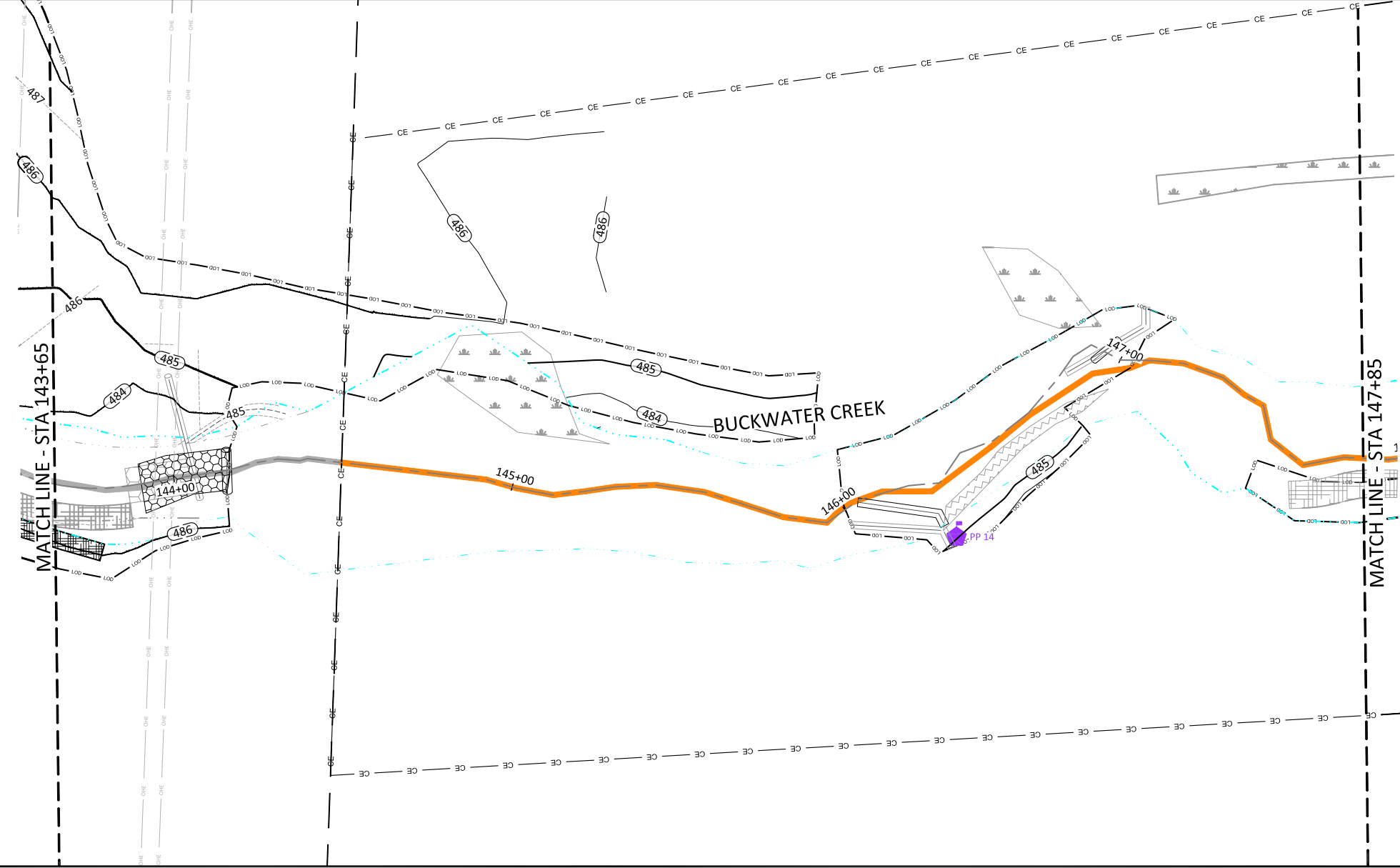
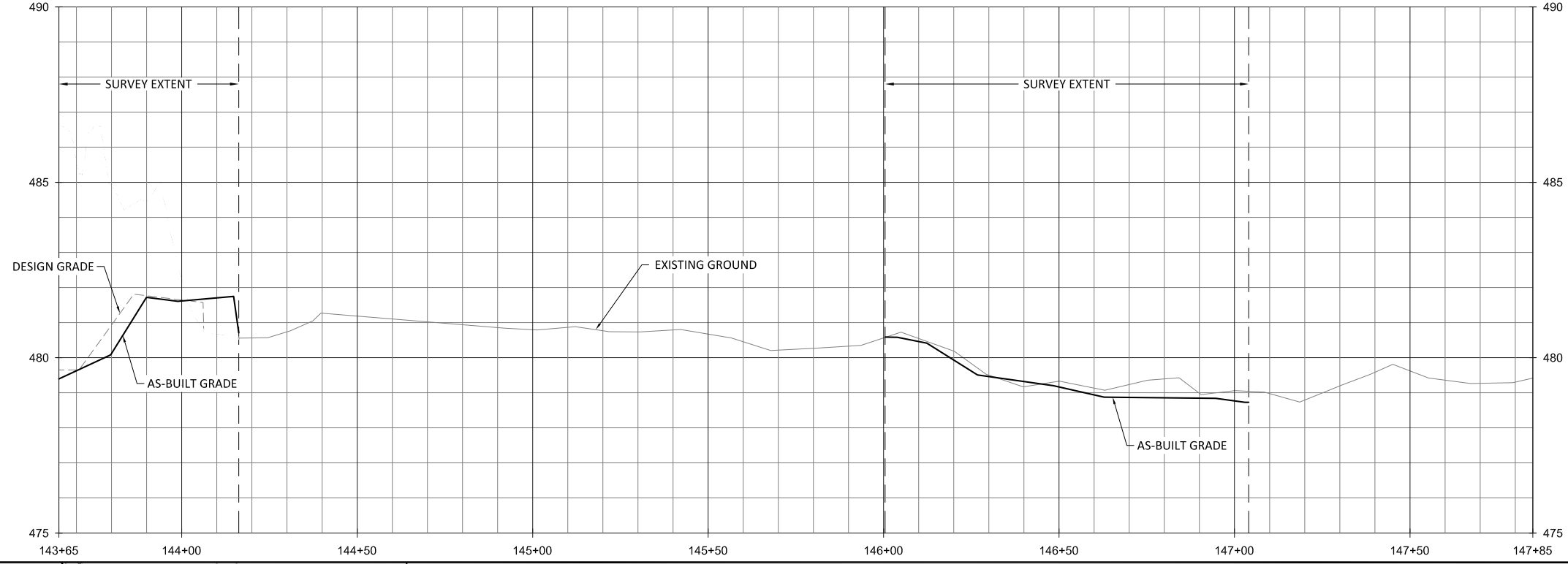
Revisions:	

Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

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 F:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\Profile\Buckwater and TL.dwg



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 F: 919.875.0931
 Firm License No. F-0831

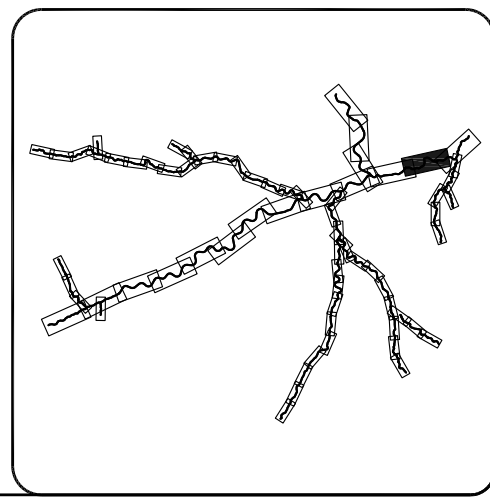
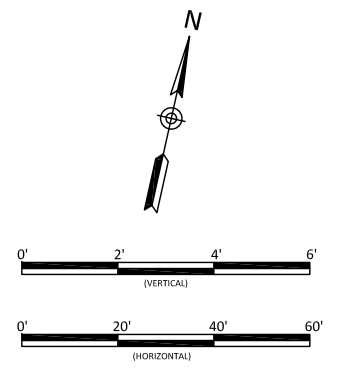
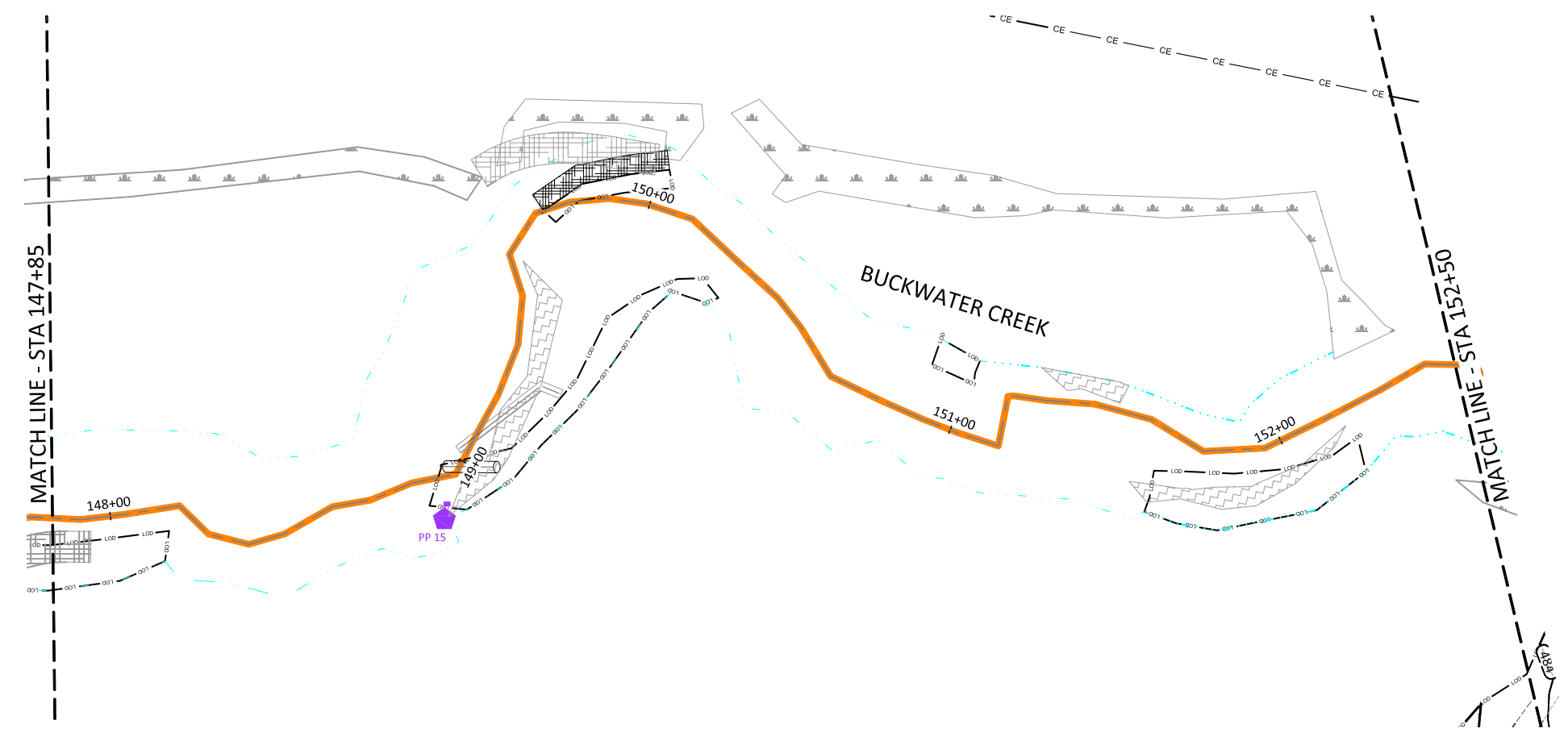
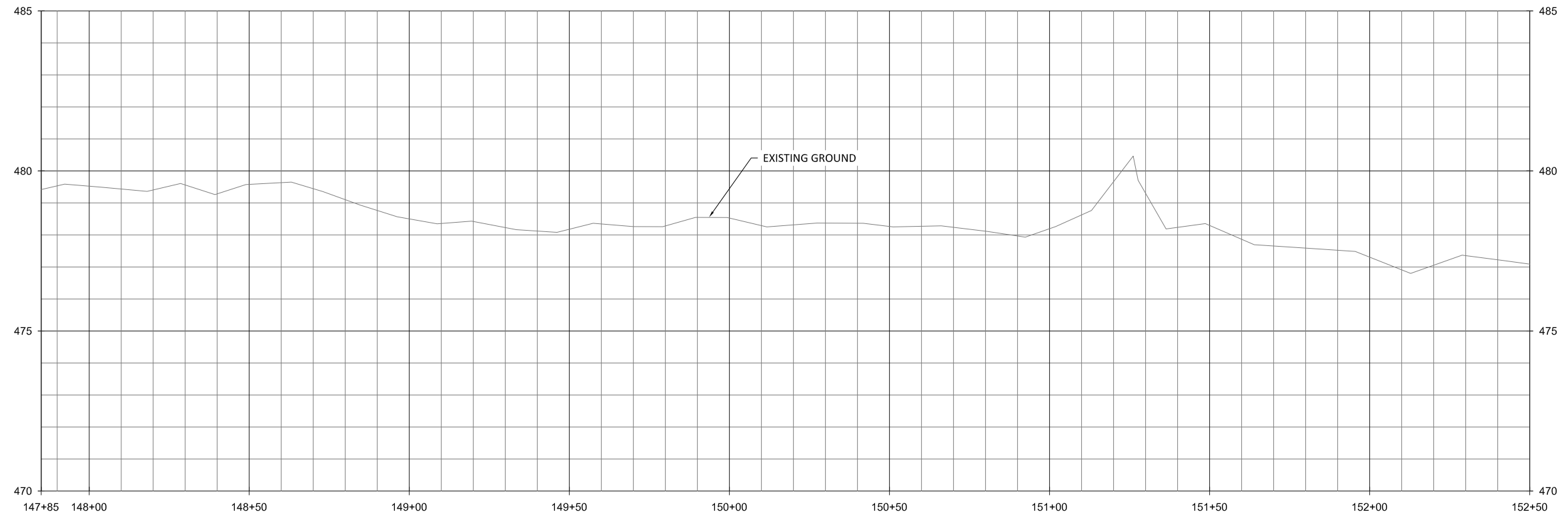
Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reaches 6 & 7
 Stream Plan and Profile

Revisions:

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.11

Sheet



Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reach 7
 Stream Plan and Profile

Revisions:

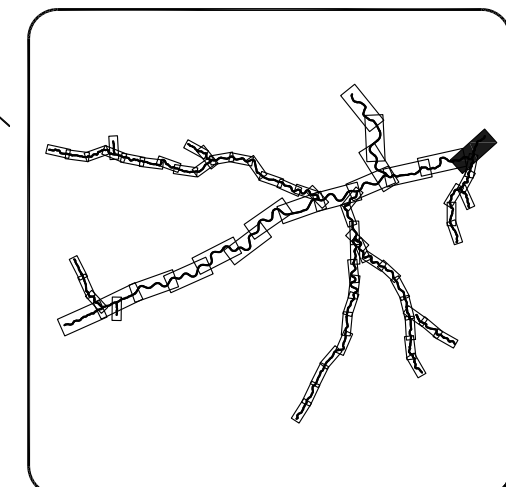
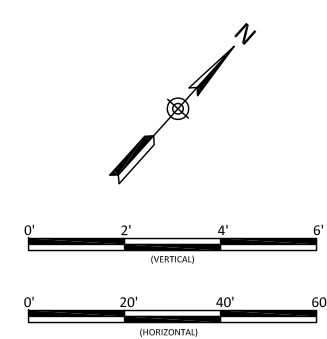
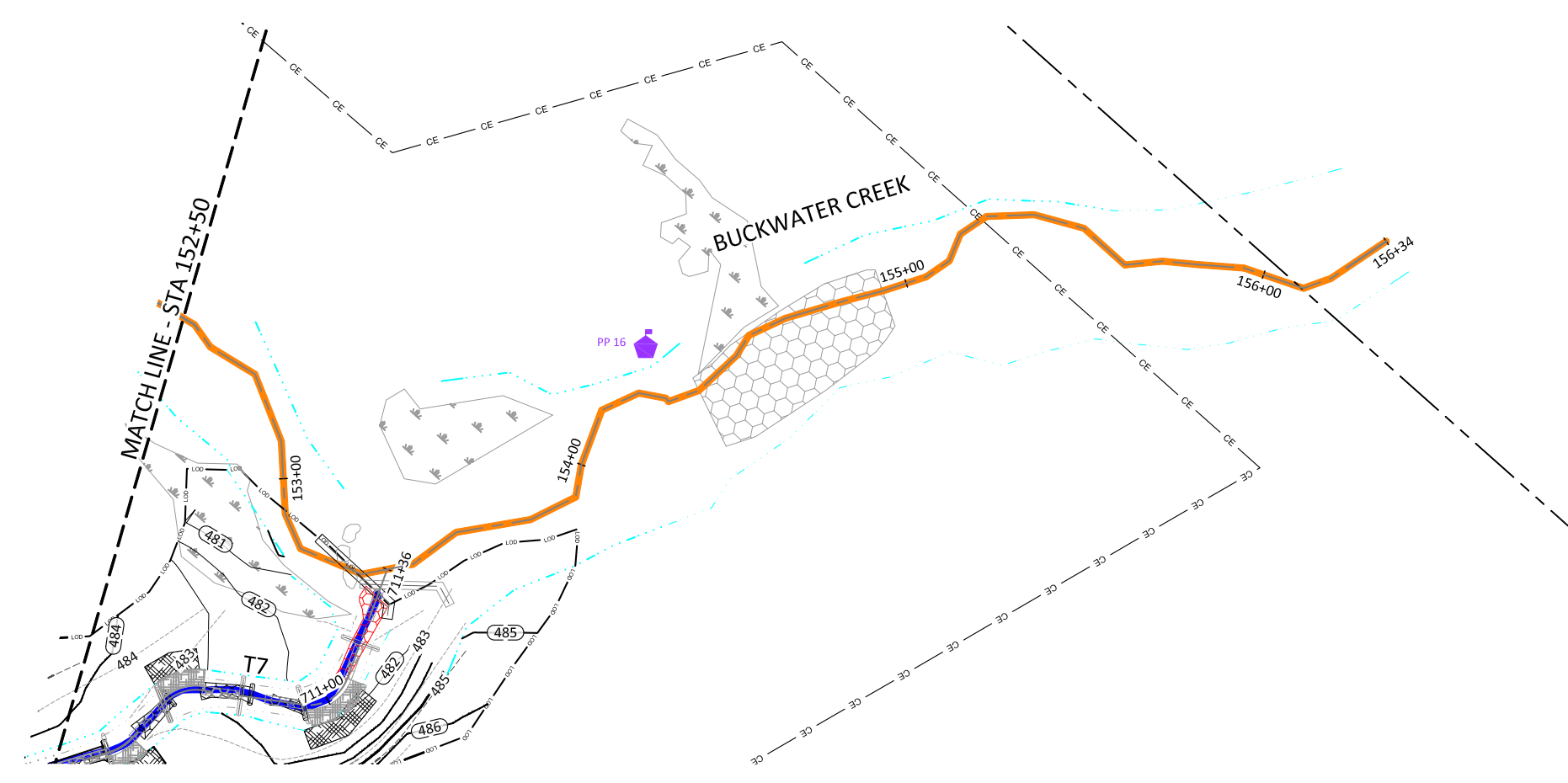
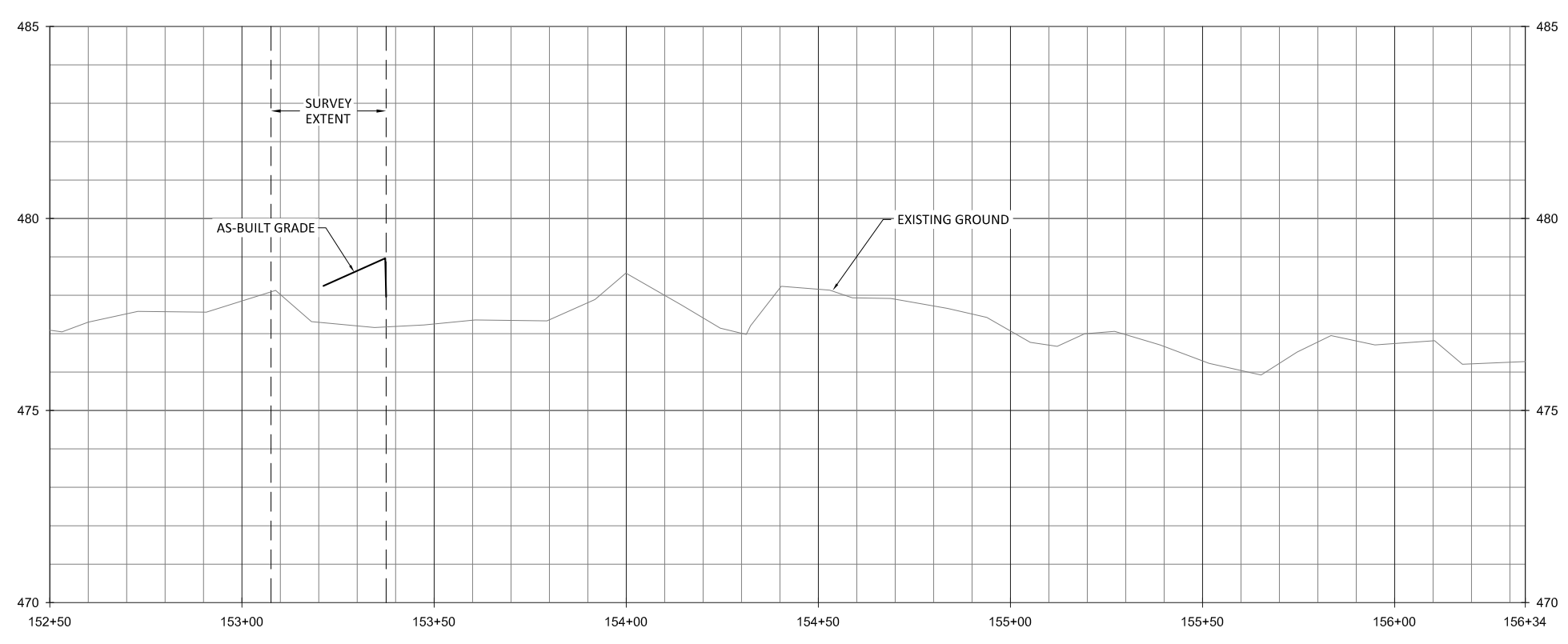
Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.12

Sheet



September 11, 2019
 E:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\Profile\Buckwater and T1.dwg



NOTE:
 1. STA 154+67: RIFFLE NATURALLY FORMS AND SHIFTS IN THIS AREA. NO RIFFLE WAS CONSTRUCTED.

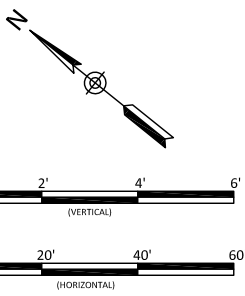
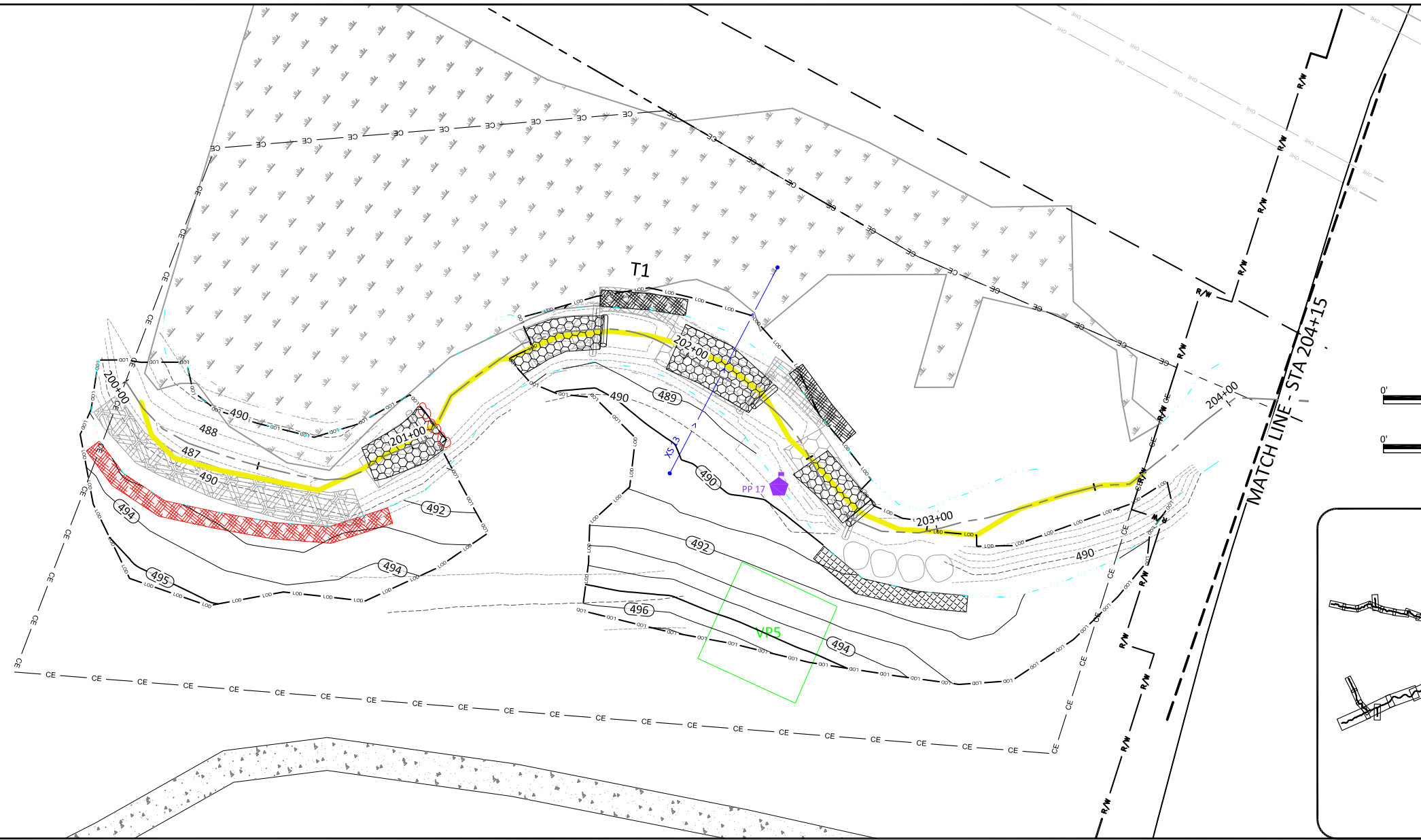
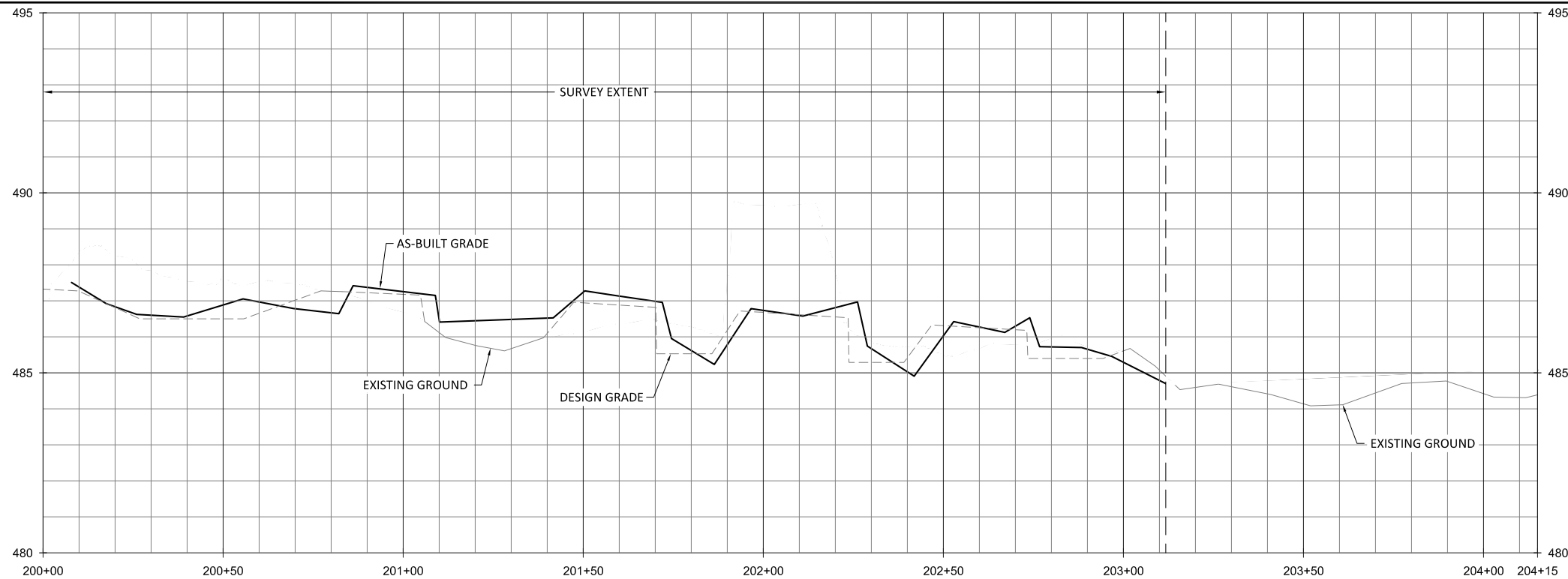
Buckwater Mitigation Site
Orange County, North Carolina
 Buckwater Creek Reaches 7 & 8
 Stream Plan and Profile

Date:	07/01/2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

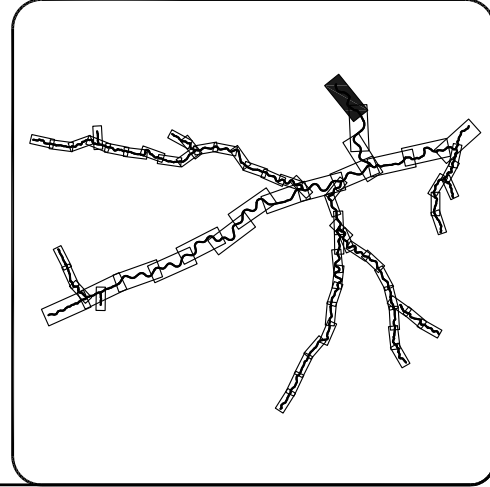
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Sheet Index



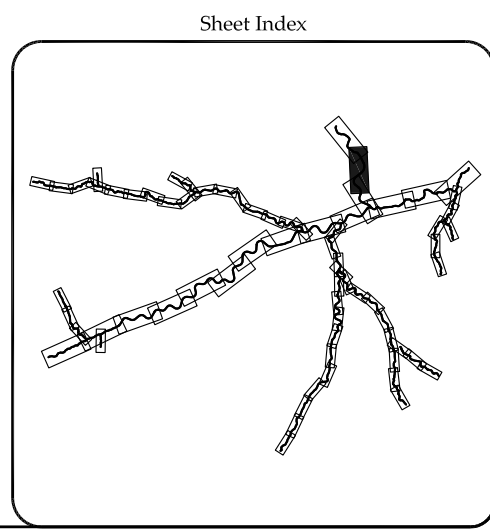
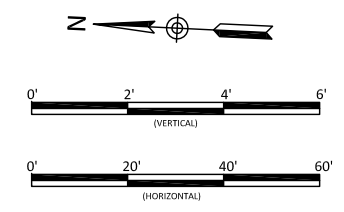
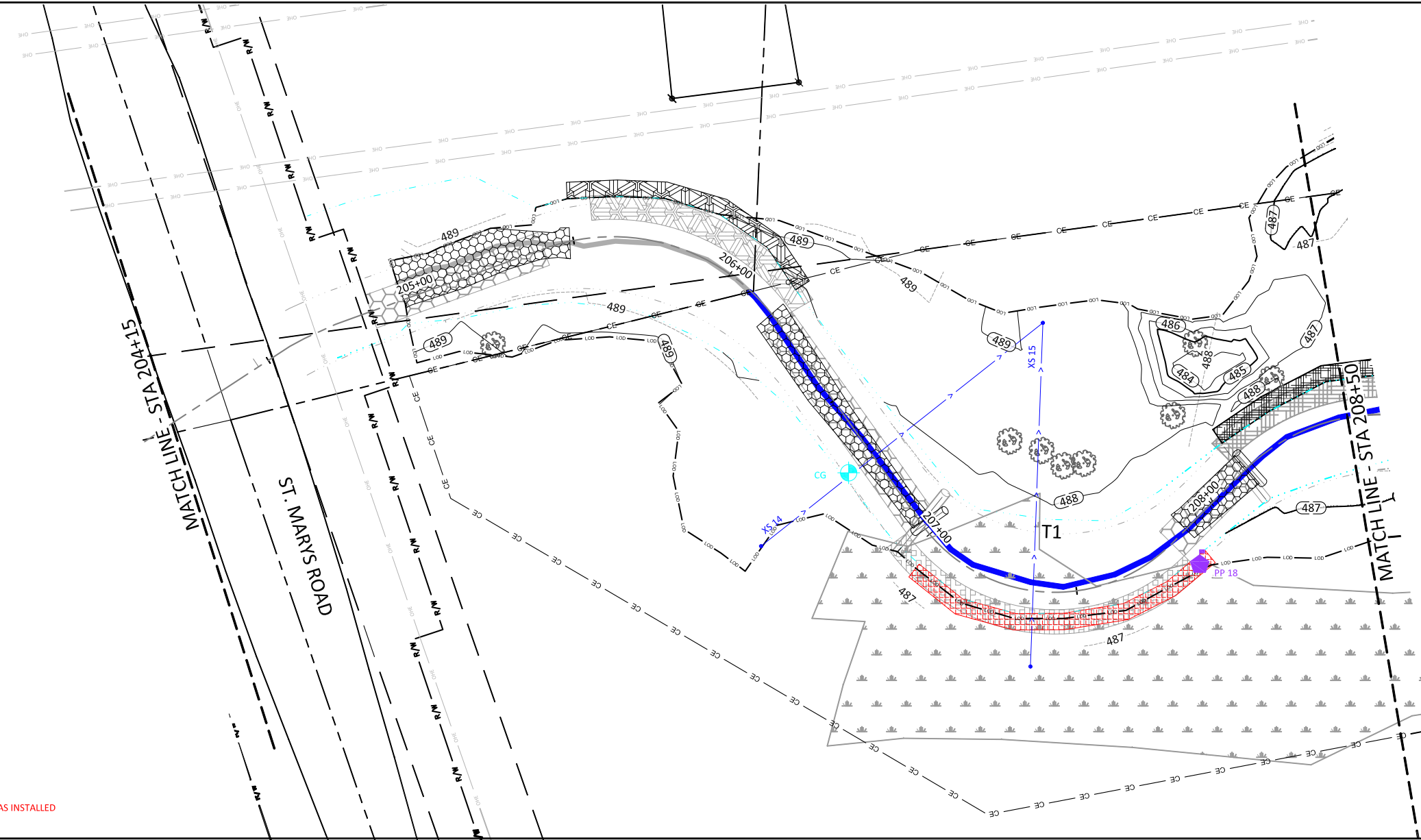
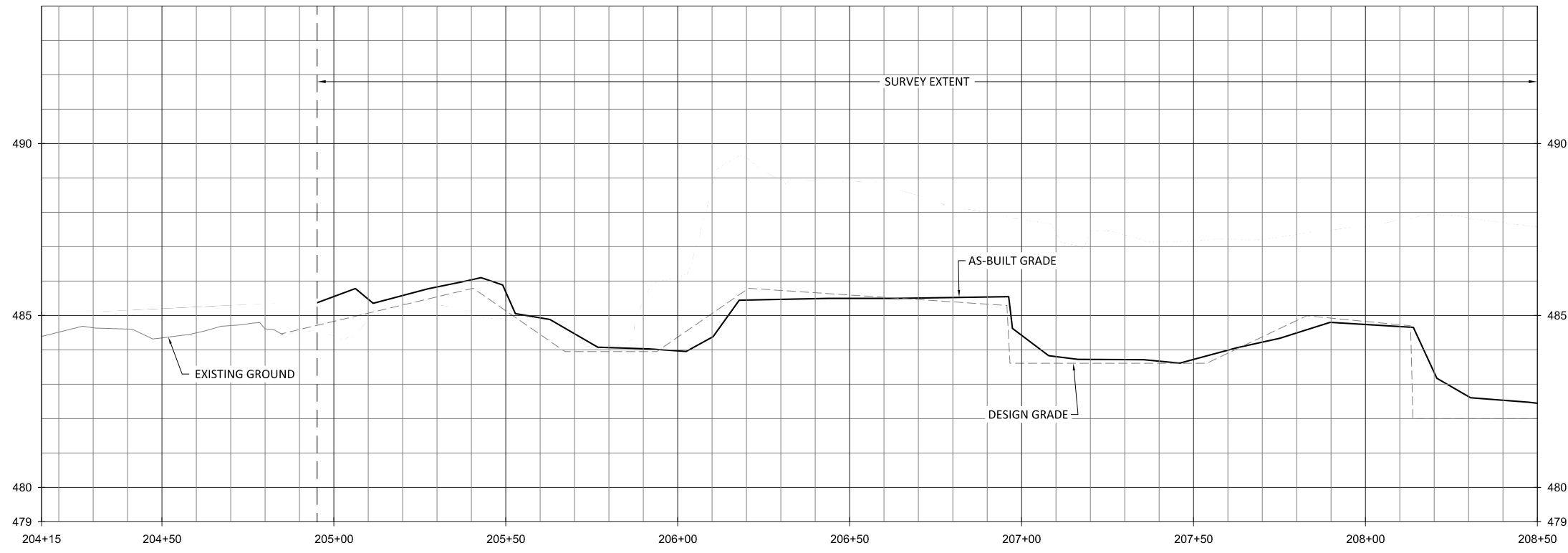
- NOTE:**
1. STA 200+54: BRUSH TOE WAS INSTALLED INSTEAD OF VEGETATED SOIL LIFT.
 2. STA 201+19: BOULDER SILL WAS INSTALLED INSTEAD OF A LOG SILL.




Buckwater Mitigation Site
Orange County, North Carolina
T1 Reach 1
Stream Plan and Profile

Revisions:


September 11, 2019
 F:\Projects\005-02157 Buckwater Creek\1 Plans\As-Built\Profile Buckwater and T1.dwg



NOTE:
 1. STA 207+54: BOULDER TOE WAS INSTALLED INSTEAD OF SOD MATS.



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Buckwater Mitigation Site

Orange County, North Carolina

T1 Reaches 1 & 2
 Stream Plan and Profile

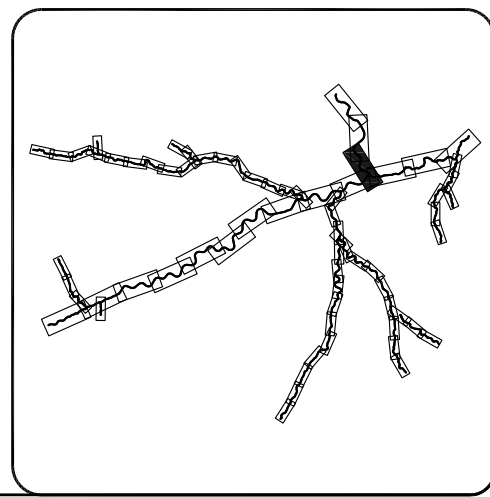
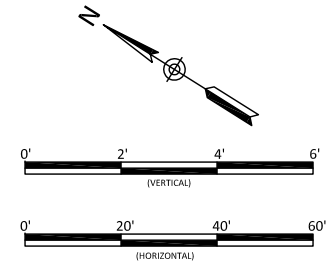
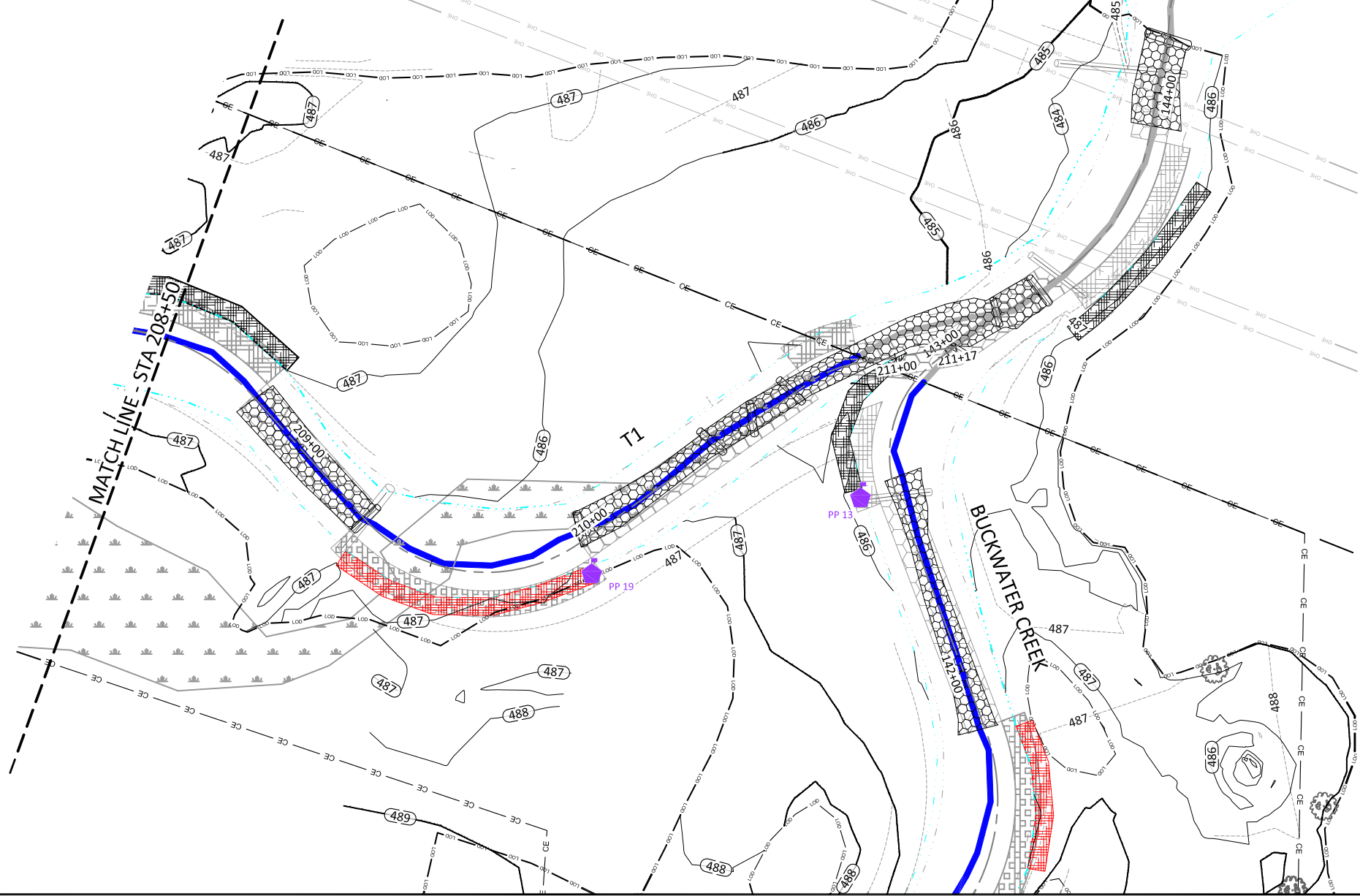
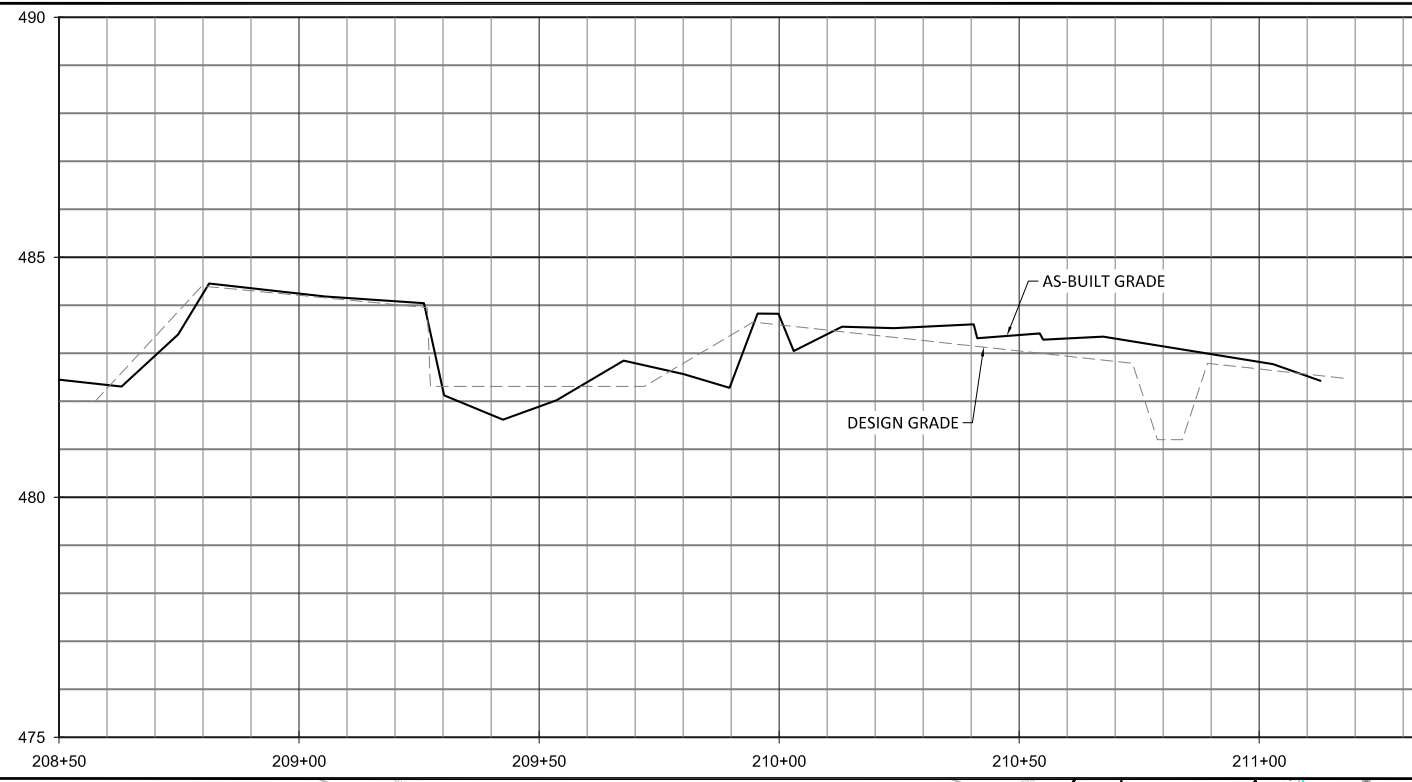
Revisions:

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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E:\Projects\005-02157-Buckwater-Creek-T1-Plans-As-Built\02157-As-Built-Profile-Buckwater-and-T1.dwg



NOTE:
1. STA 209+67: BRUSH TOE WAS INSTALLED INSTEAD OF SOD MATS.

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Buckwater Mitigation Site
Orange County, North Carolina
T1 Reach 2
Stream Plan and Profile

Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

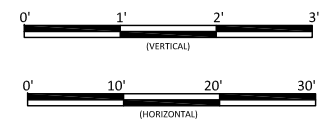
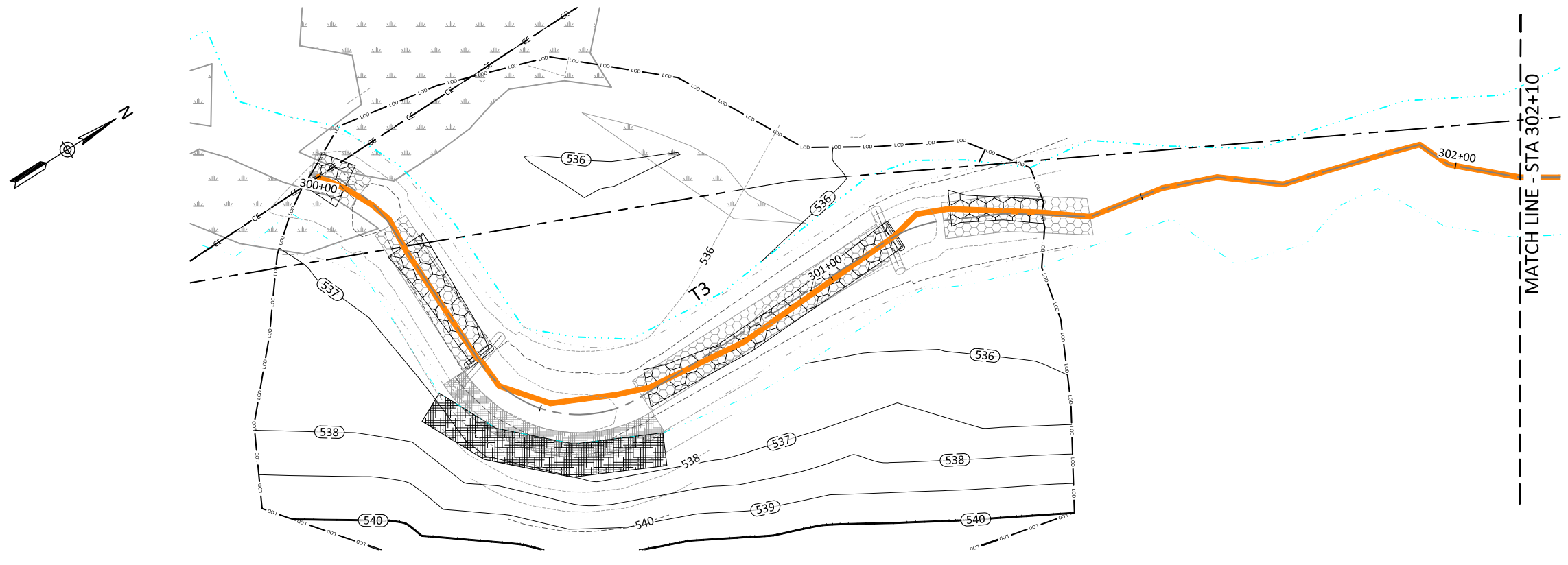
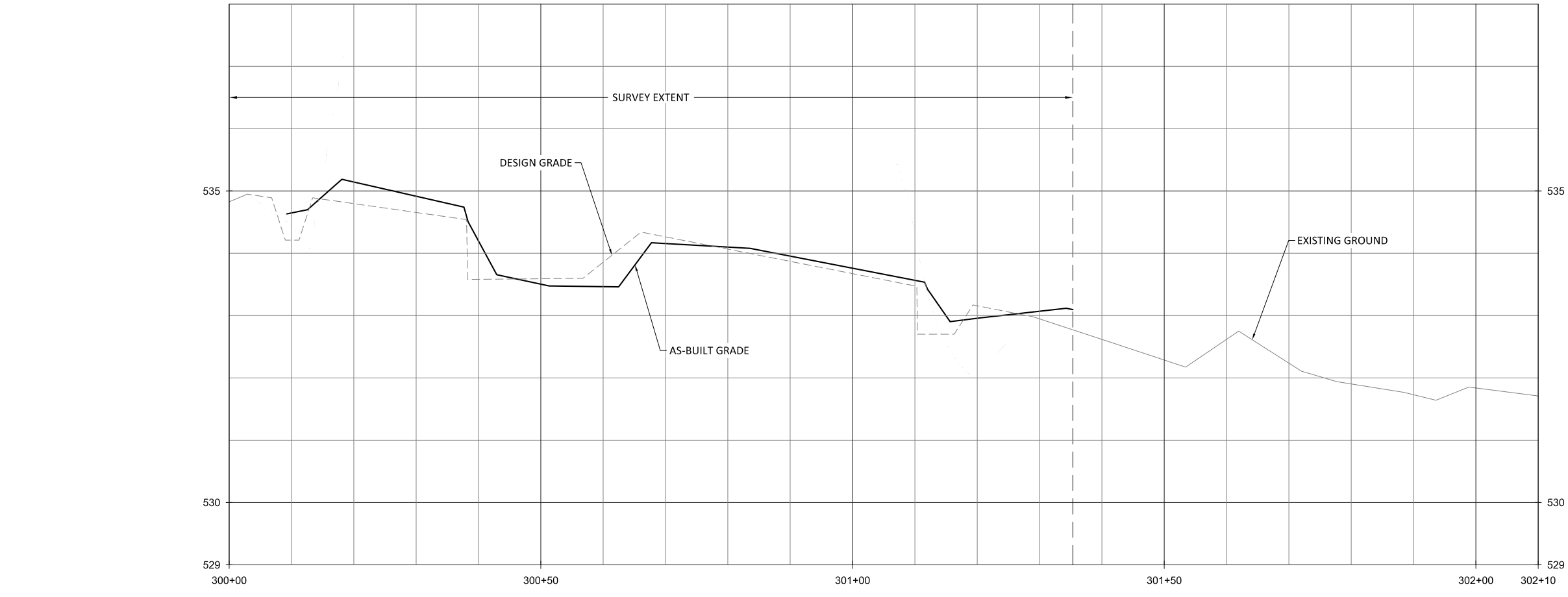
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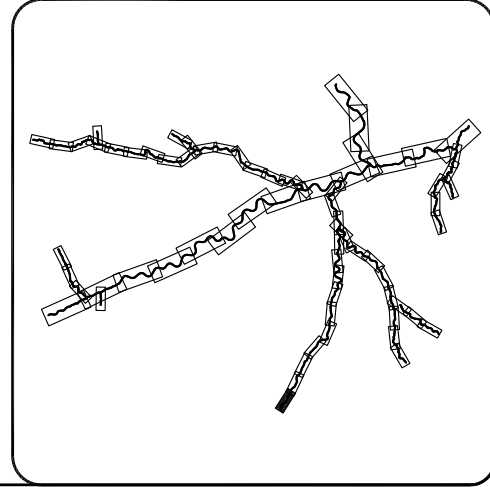
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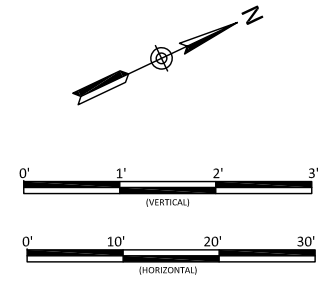
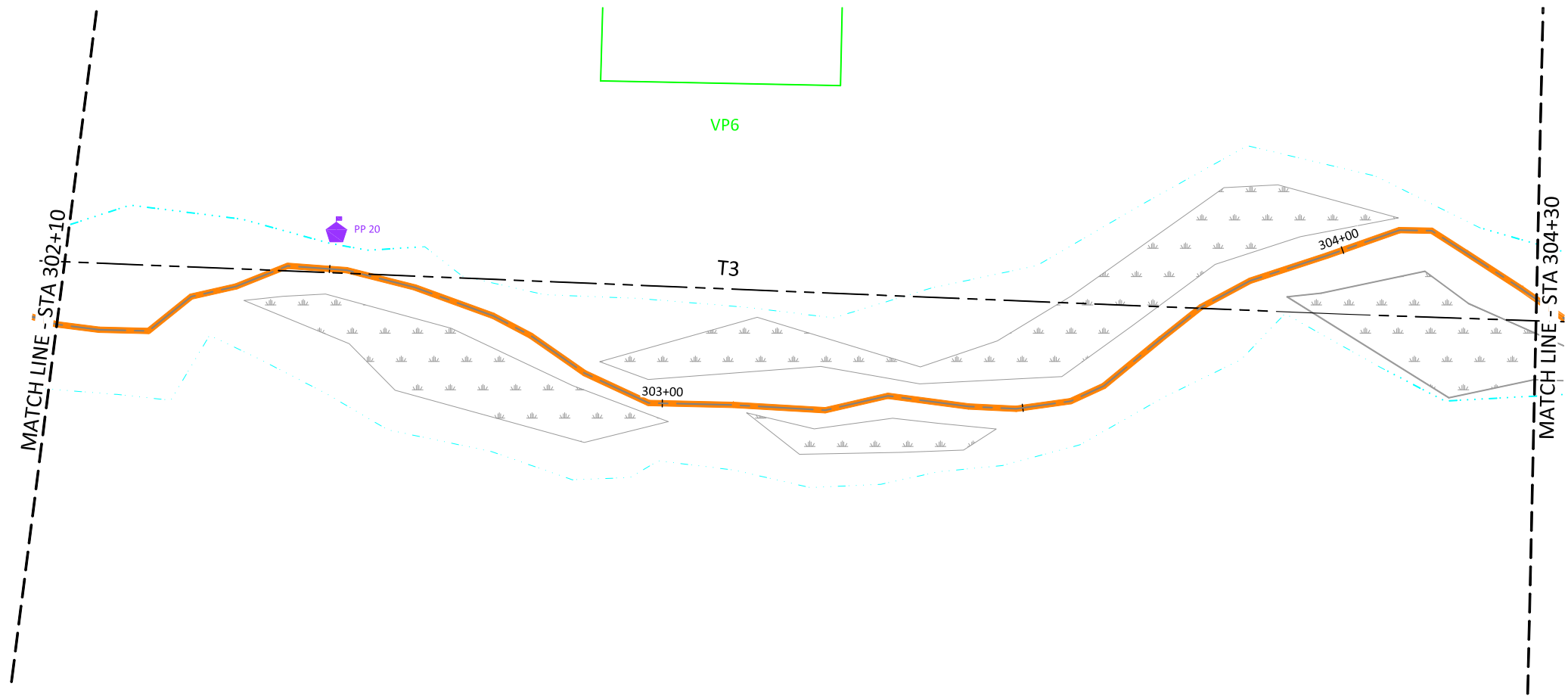
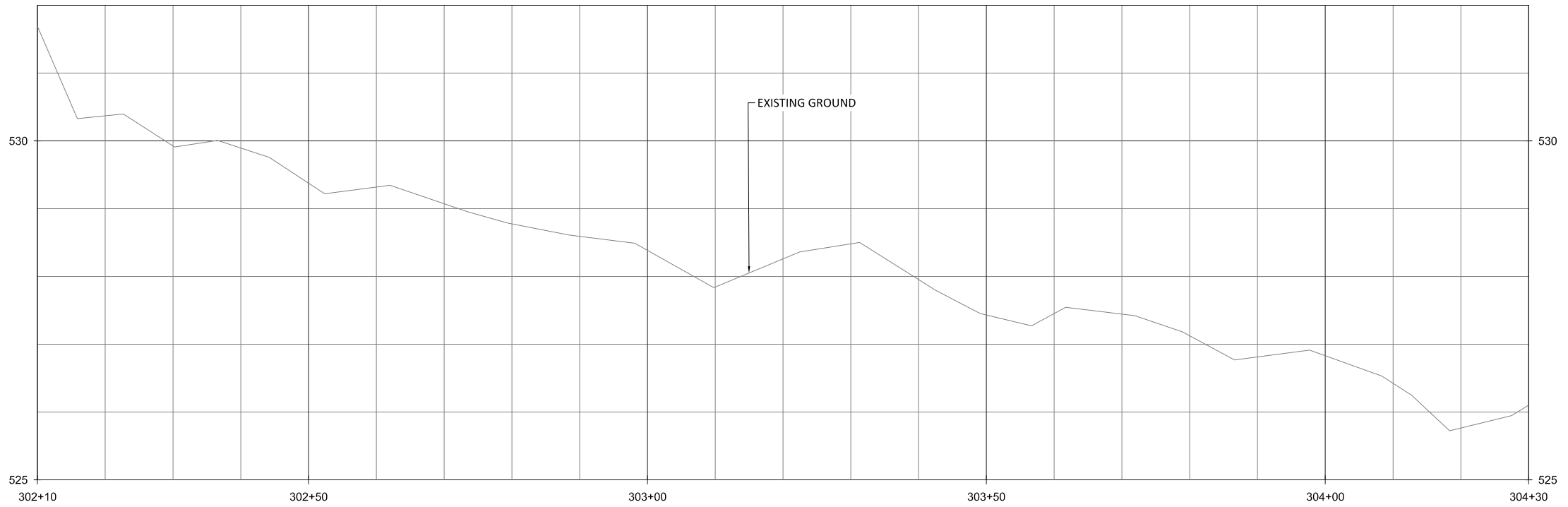
Buckwater Mitigation Site
 Orange County, North Carolina
 T3 Reach 1
 Stream Plan and Profile



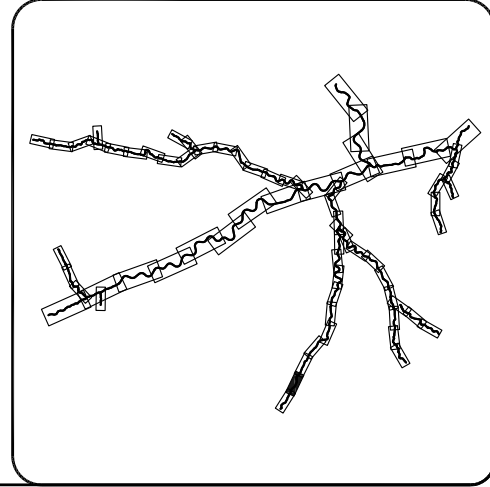
Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.17

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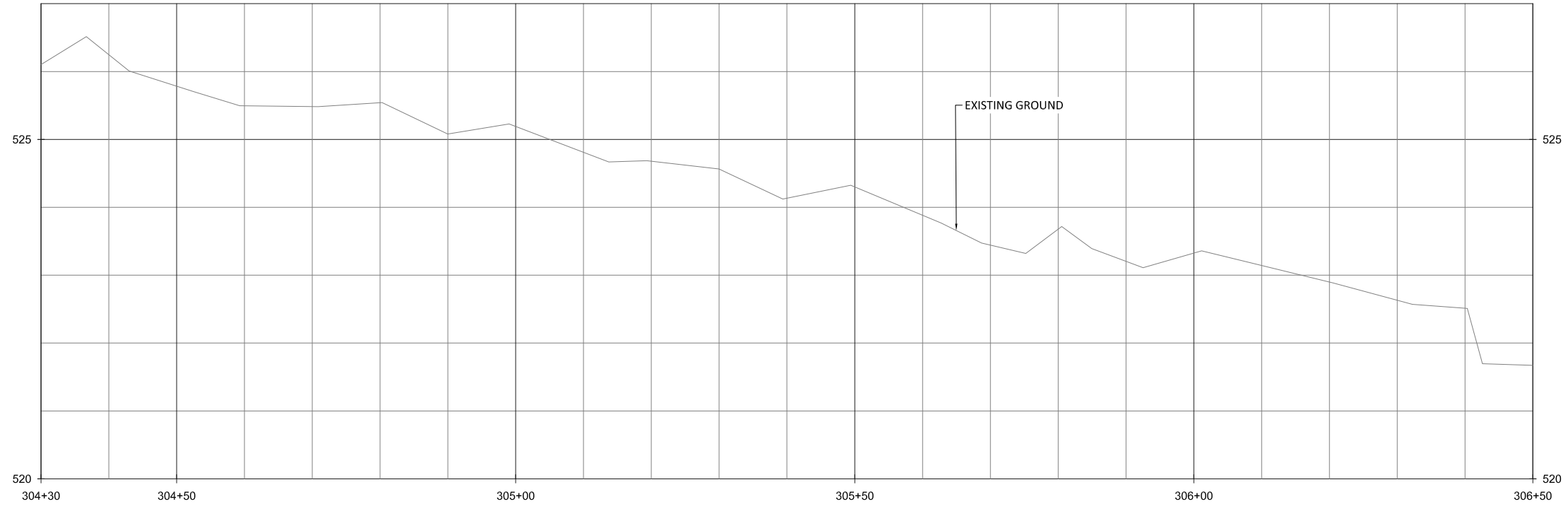
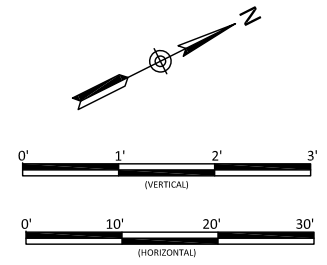
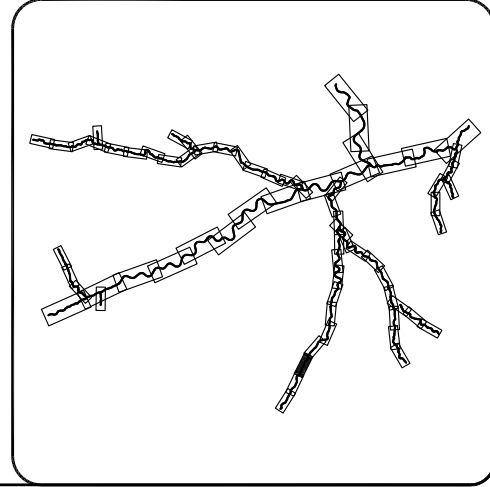
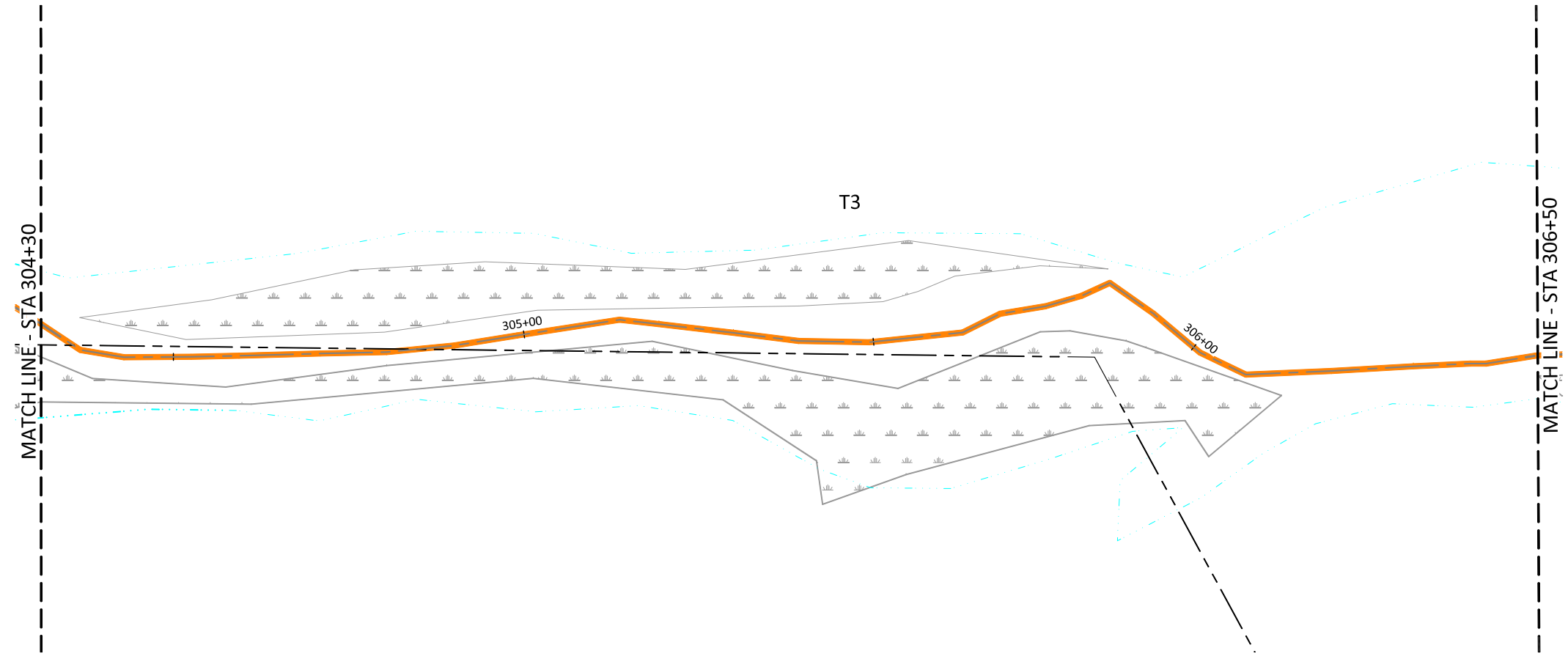
Buckwater Mitigation Site
Orange County, North Carolina

T3 Reach 1
Stream Plan and Profile

Revisions:

Date: 07/01/2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

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Buckwater Mitigation Site
Orange County, North Carolina

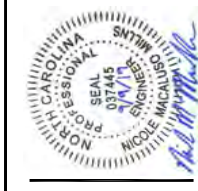
T3 Reach 1
Stream Plan and Profile

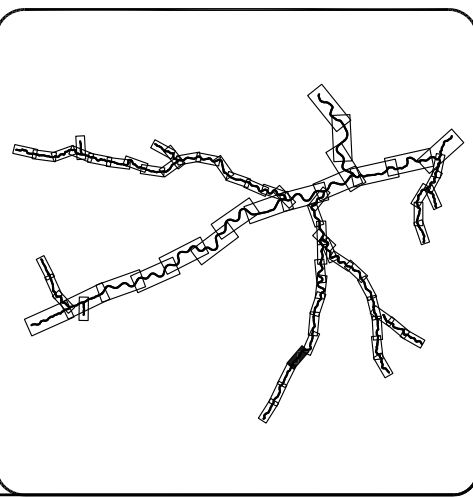
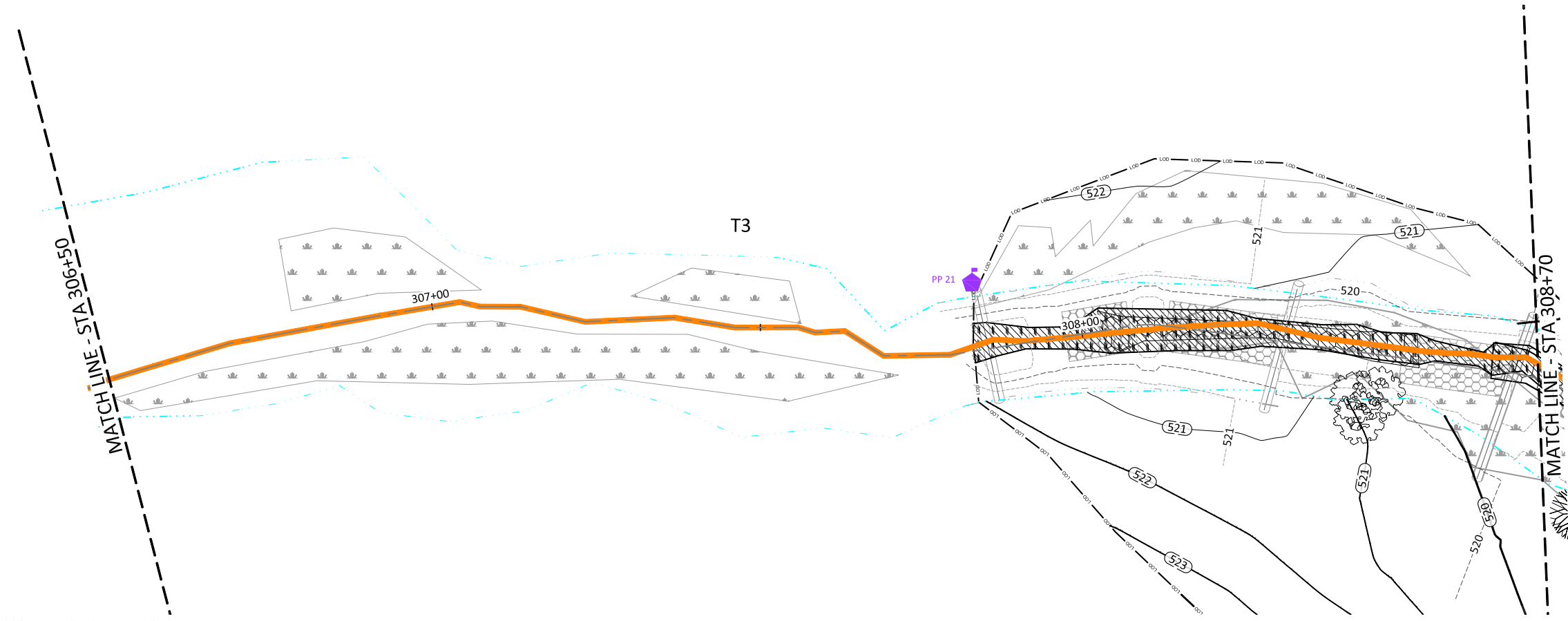
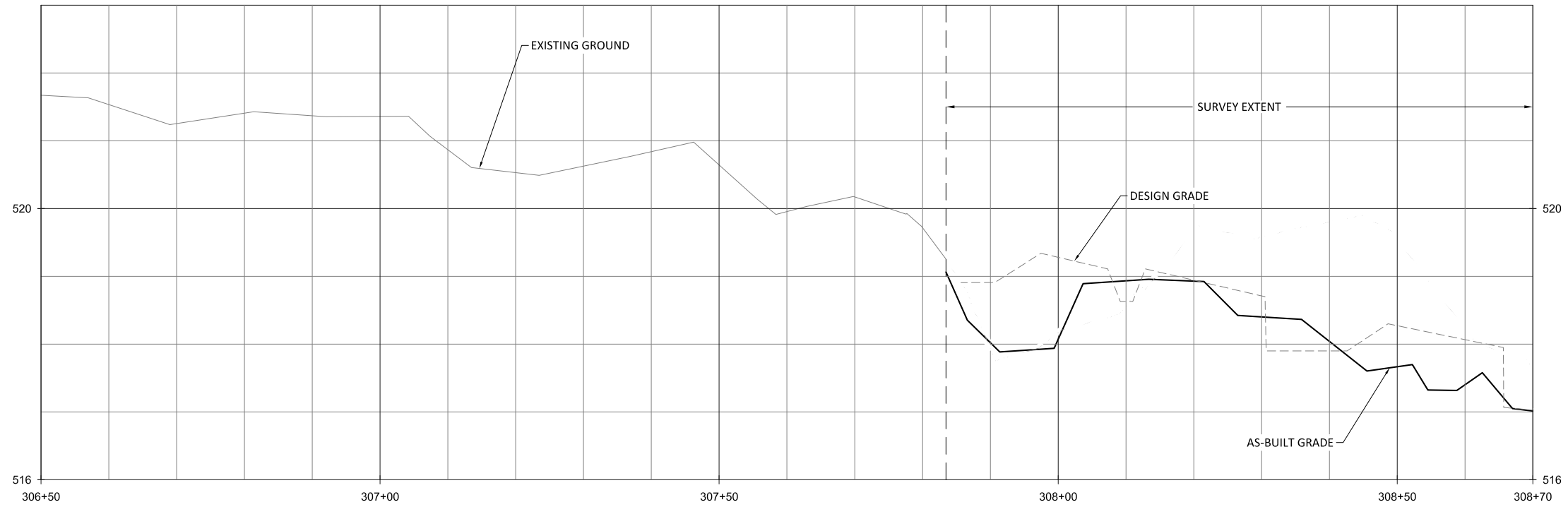
Revisions:

Date: 07/01/2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

1.19

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NOTE:
 1. NO LOG STRUCTURES INSTALLED DUE TO BEDROCK.



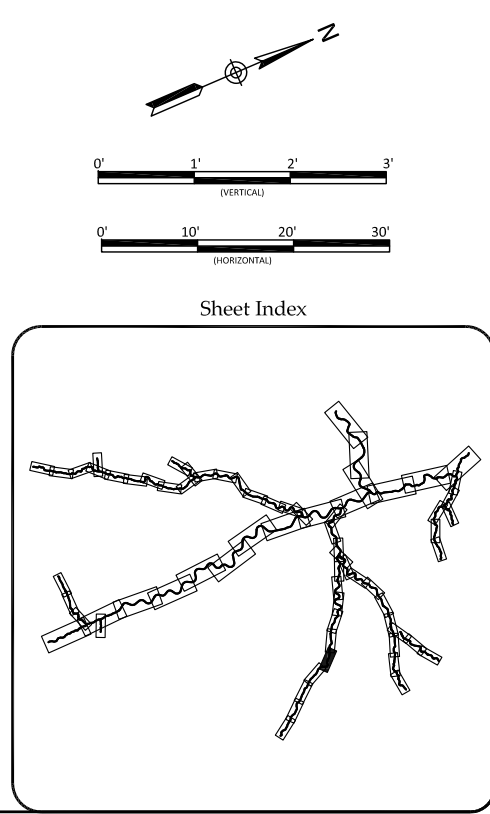
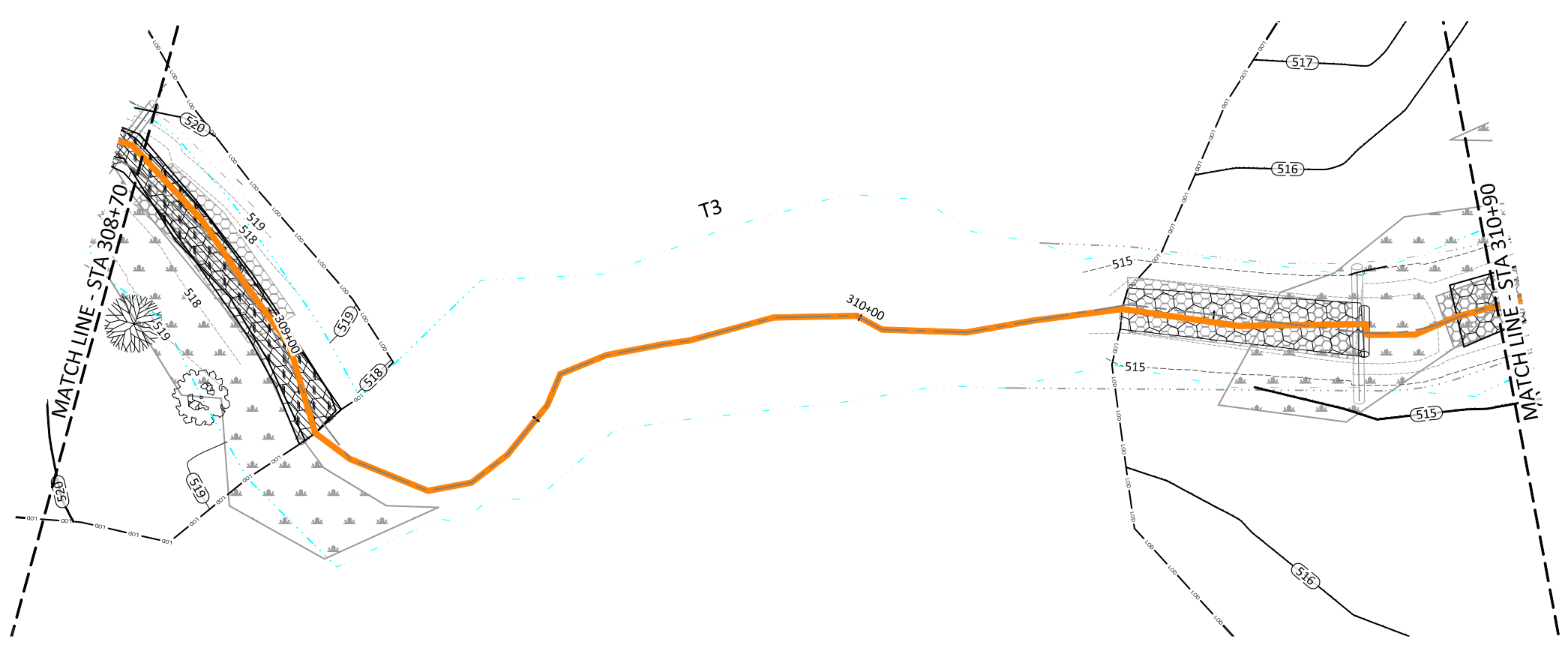
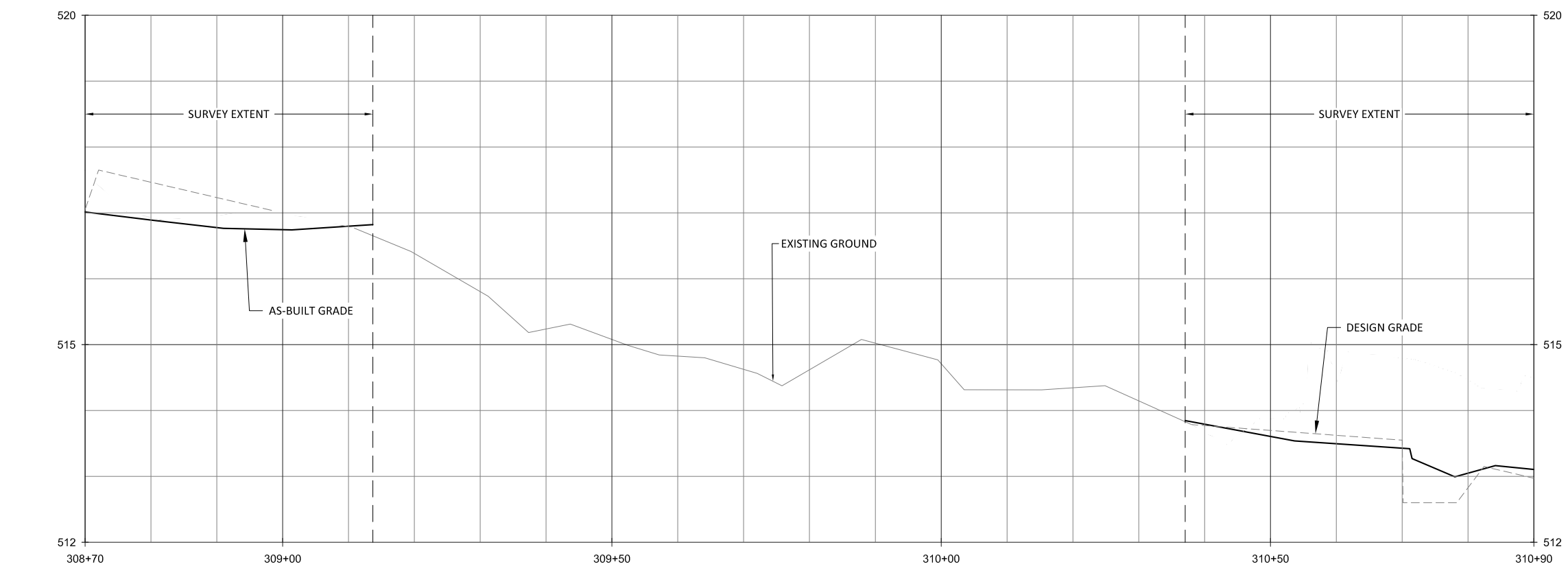
Buckwater Mitigation Site
Orange County, North Carolina
 T3 Reach 1
 Stream Plan and Profile

Revisions:

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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Buckwater Mitigation Site
Orange County, North Carolina
 T3 Reach 1
 Stream Plan and Profile

Revisions:	

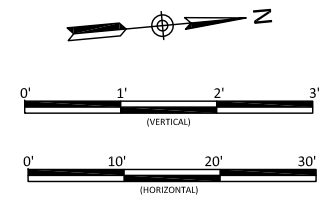
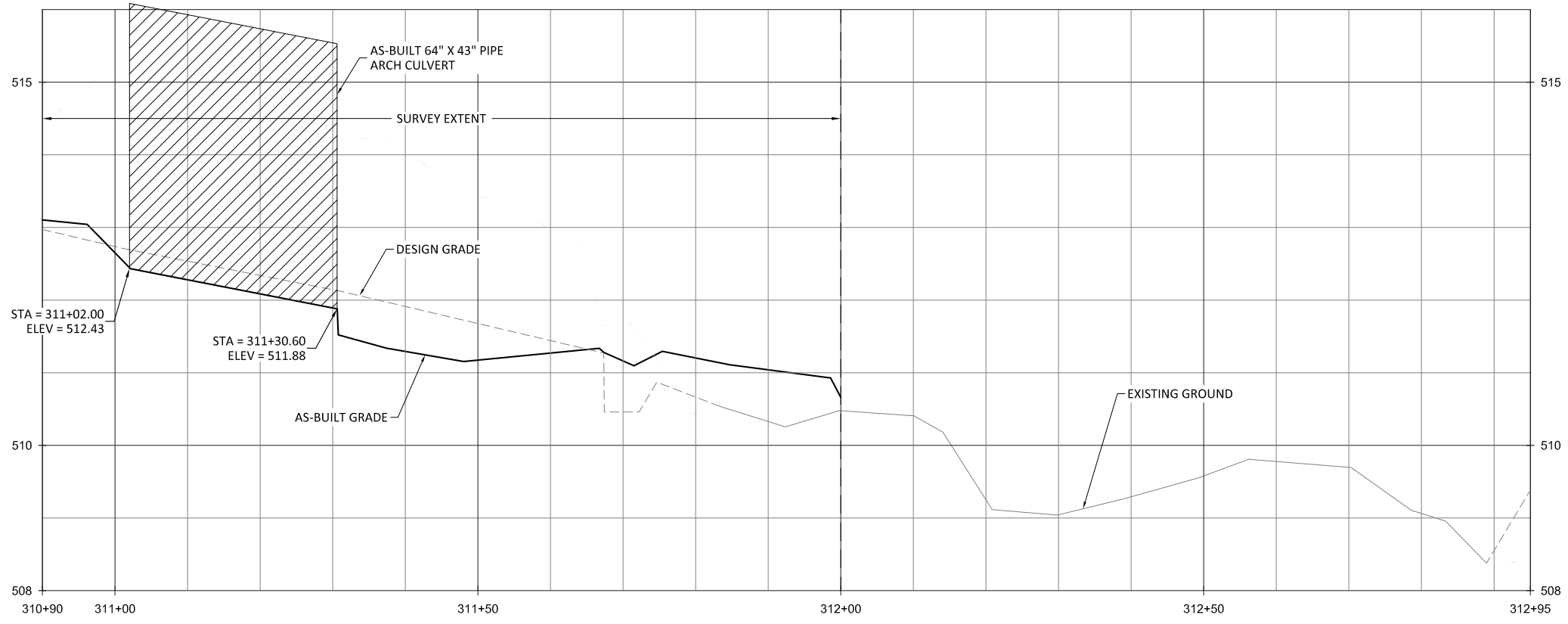
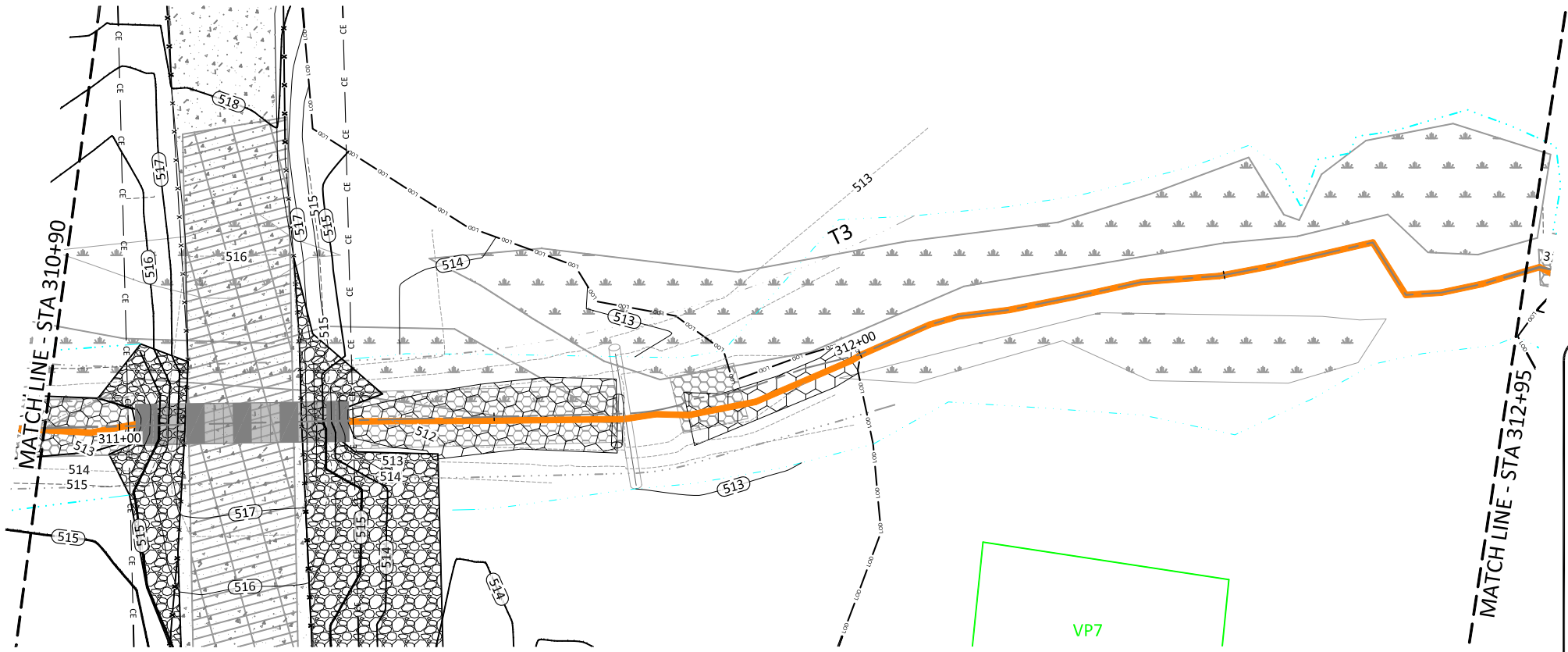
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 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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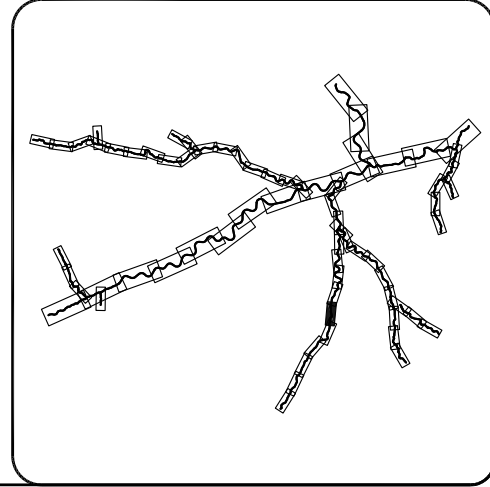
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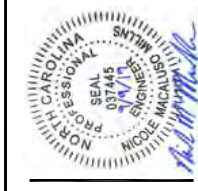


Buckwater Mitigation Site
Orange County, North Carolina
 T3 Reach 1
 Stream Plan and Profile

Date:	07/01/2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

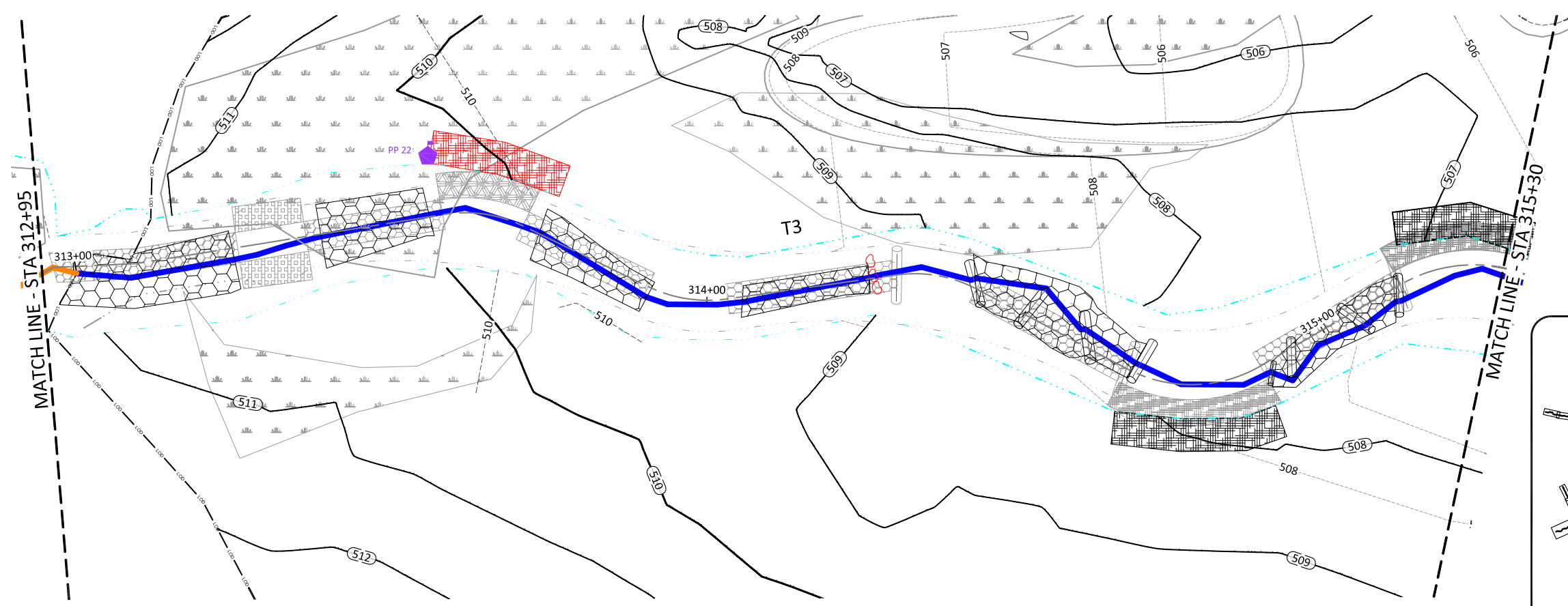
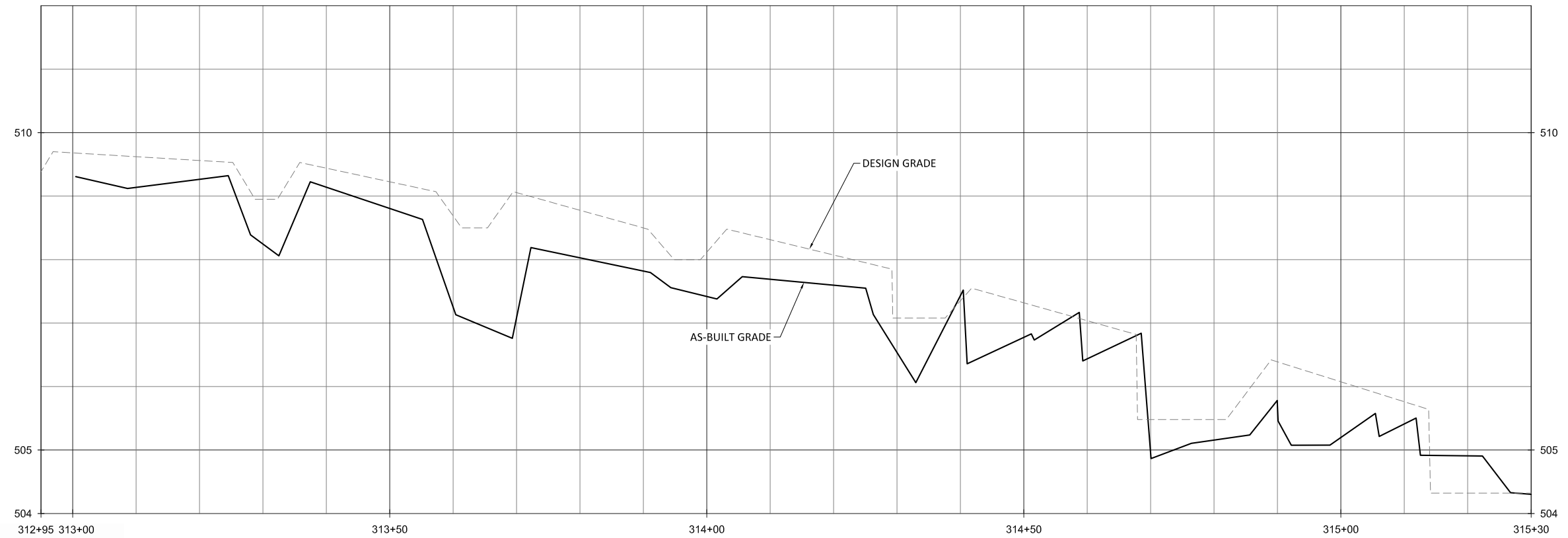
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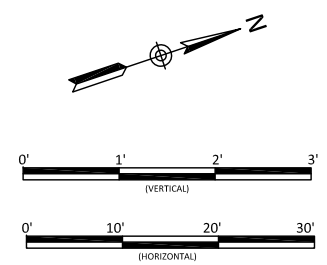


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 Firm License No. F-0831

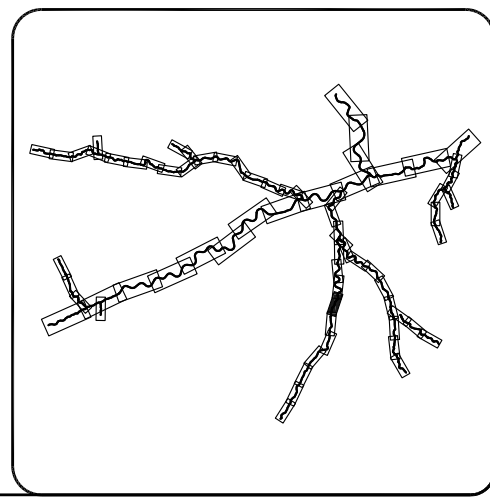
September 11, 2019
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- NOTE:**
1. STA 313+68: BRUSH TOE WAS INSTALLED INSTEAD OF VEGETATED SOIL LIFT.
 2. STA 314+32: BOULDER SILL INSTALLED INSTEAD OF LOG SILL.



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Buckwater Mitigation Site
 Orange County, North Carolina

T3 Reaches 1 & 2
 Stream Plan and Profile

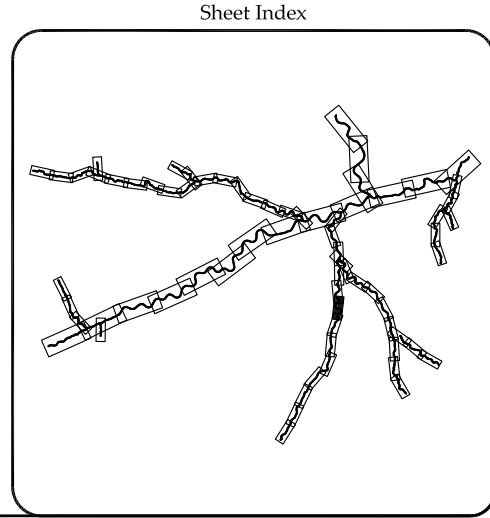
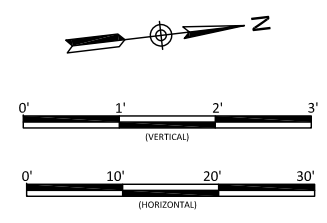
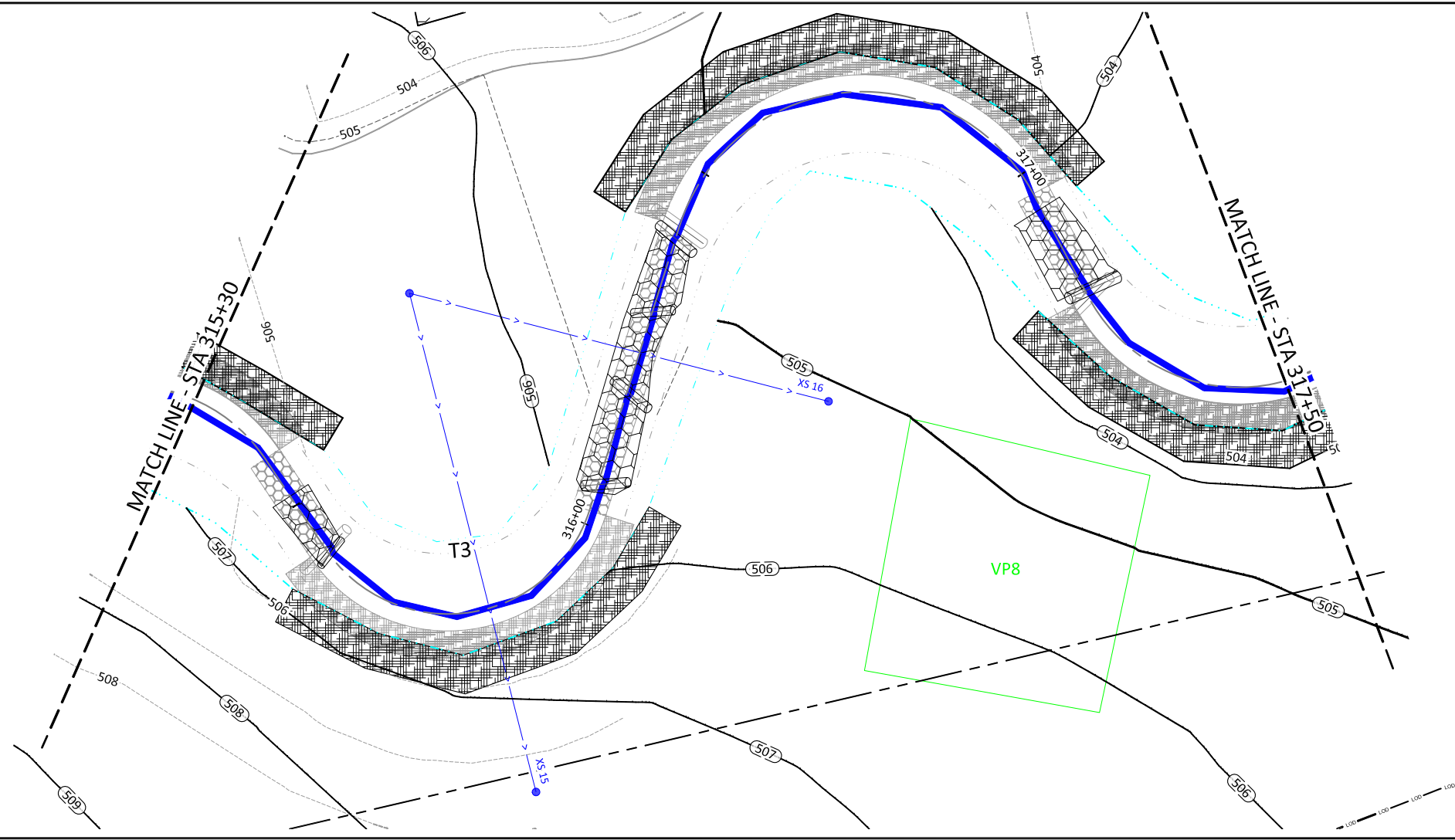
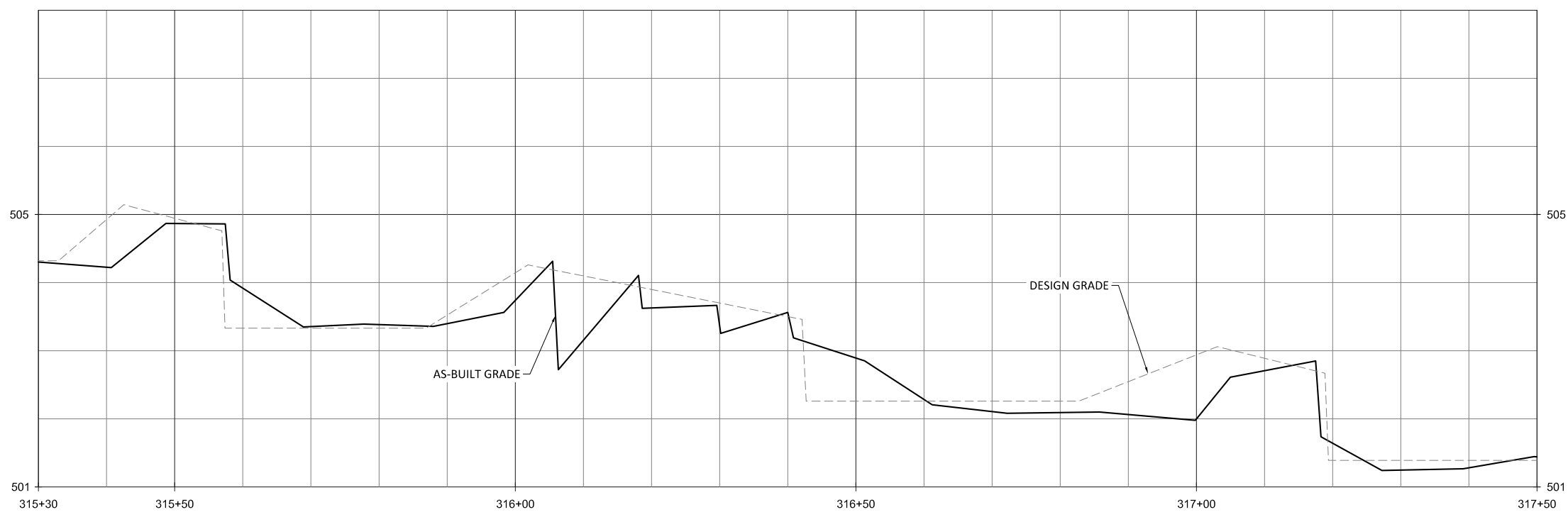
Revisions:

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 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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Buckwater Mitigation Site
 Orange County, North Carolina
 T3 Reach 2
 Stream Plan and Profile

Revisions:

Date	Job Number	Project Engineer	Drawn By	Checked By
07.01.2019	005-02157	NMM	CAW	JTL

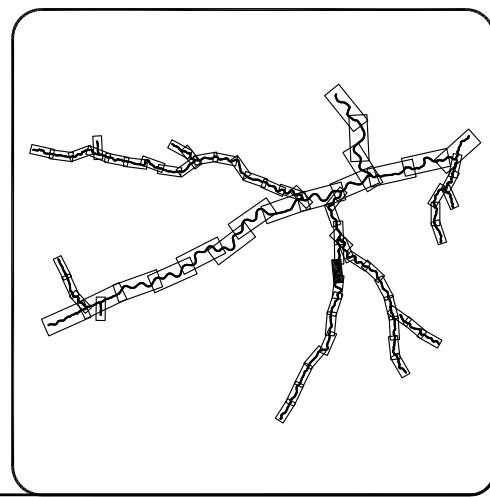
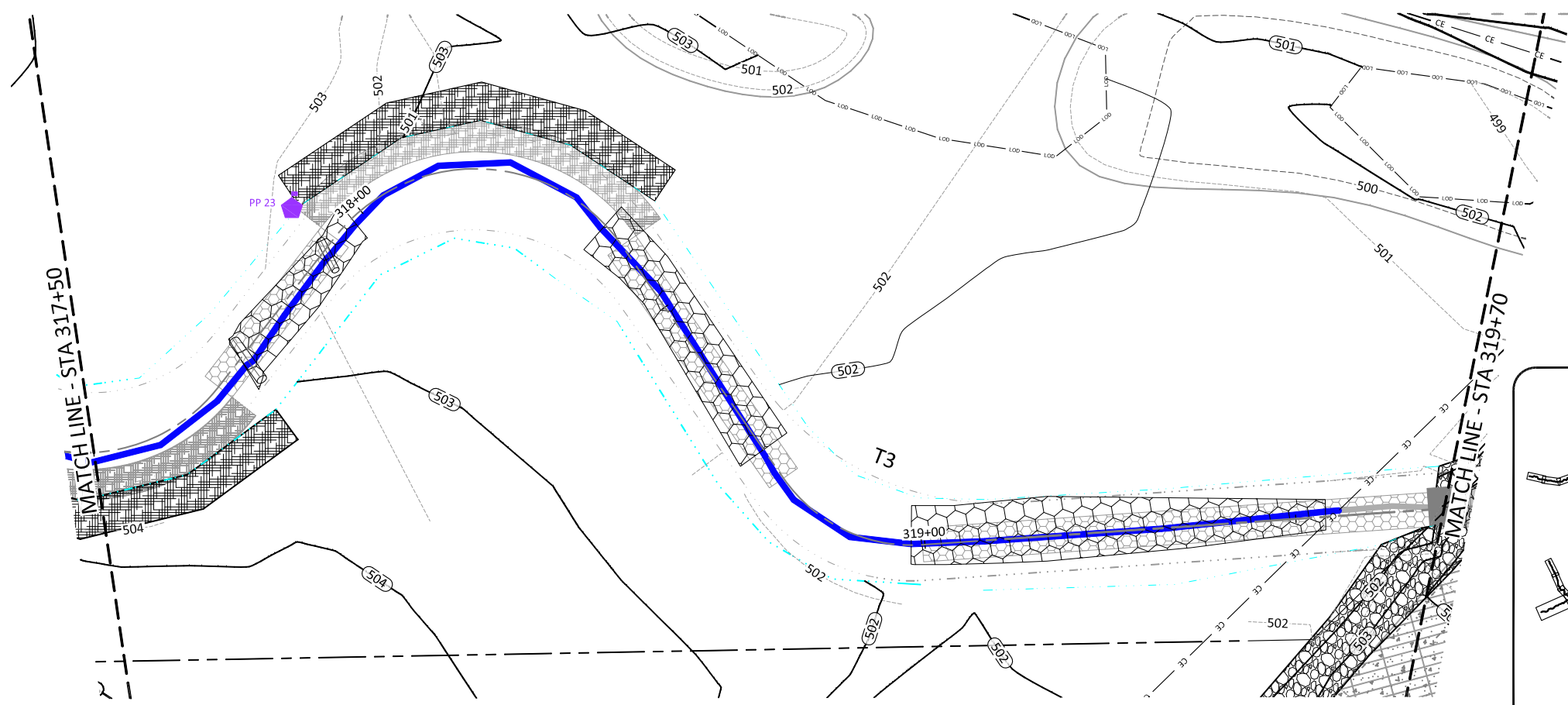
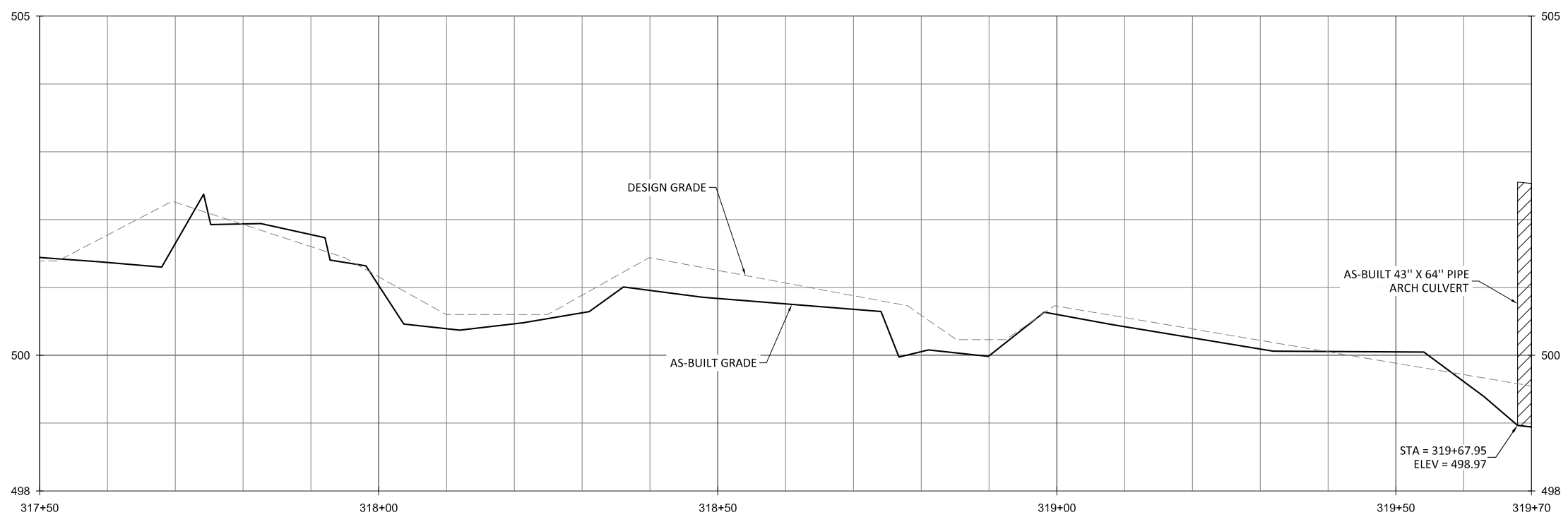
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 ENGINEERING
 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
 NCEM License No. 14118
 Firm License No. F-0831

Professional Seal: NORTH CAROLINA PROFESSIONAL SEAL CIVIL ENGINEER MICHAEL W. WILSON

September 11, 2019
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Buckwater Mitigation Site
Orange County, North Carolina
 T3 Reach 2
 Stream Plan and Profile

Revisions:	

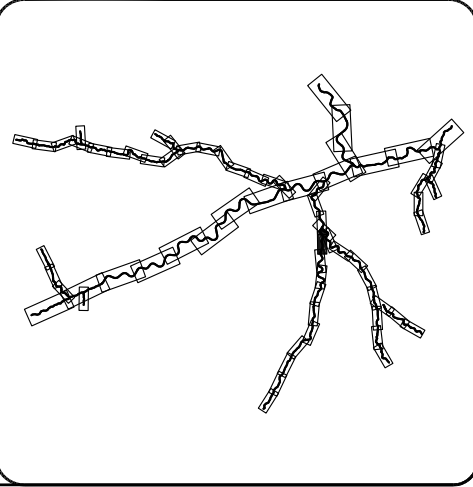
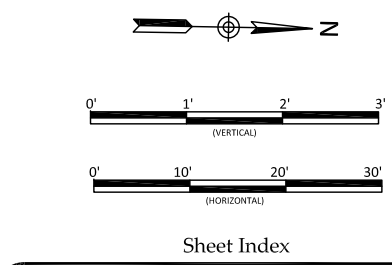
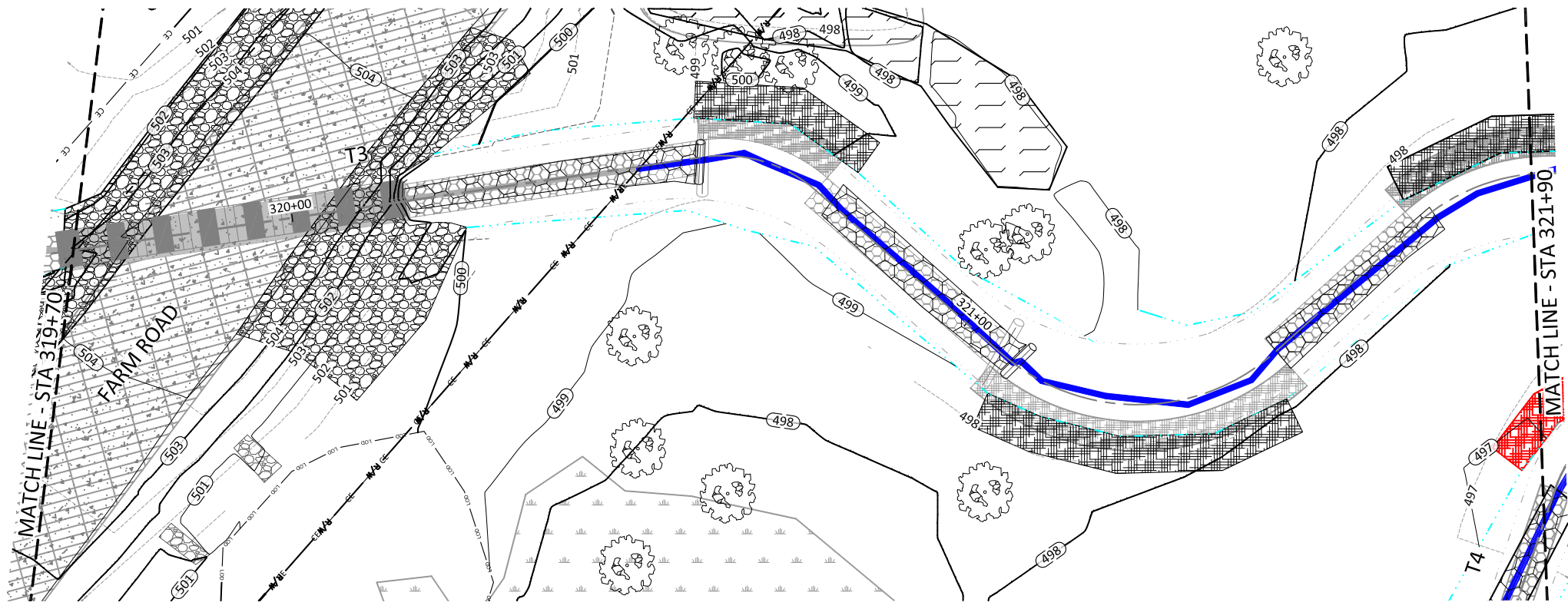
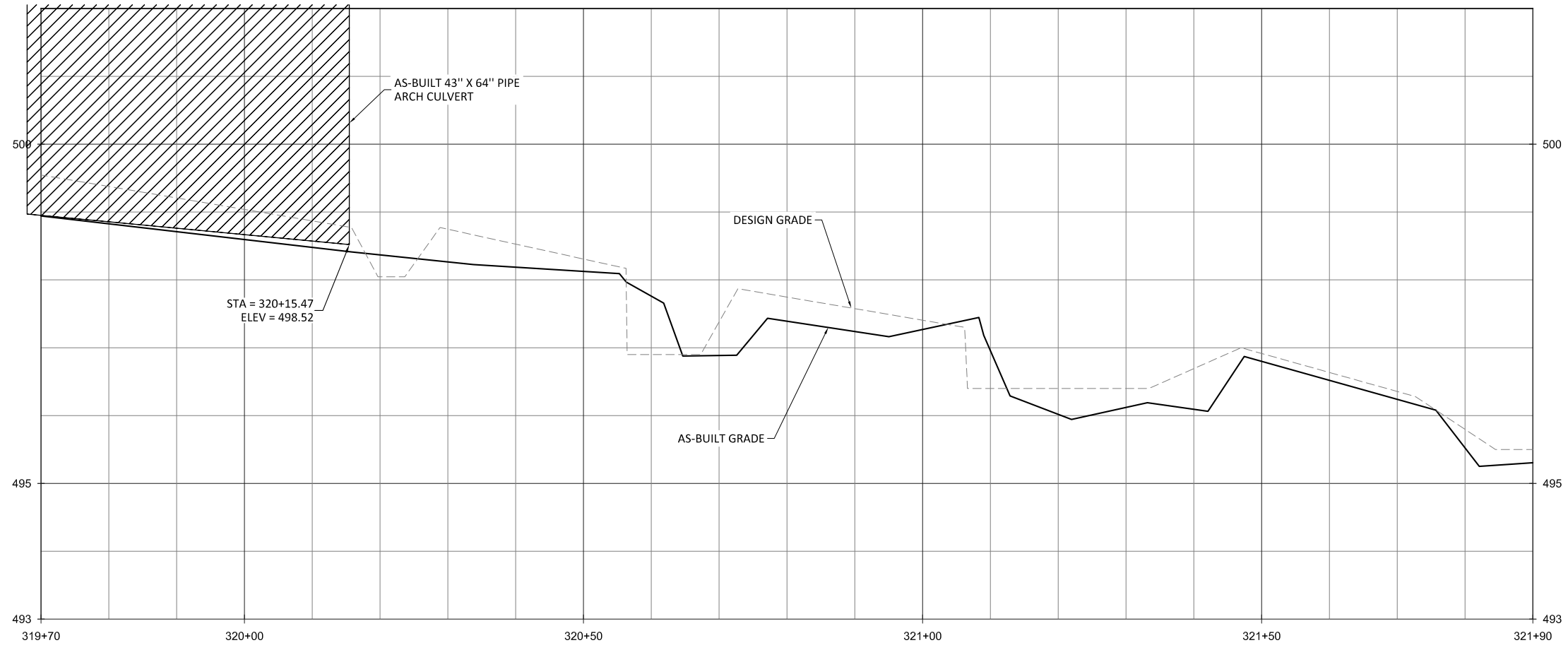
Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.25

Sheet



September 11, 2019
 F:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\Profiles\T3-T2 and T4A-T4-Box

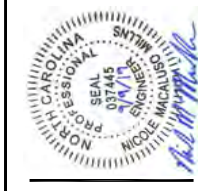


Buckwater Mitigation Site
Orange County, North Carolina
 T3 Reach 2
 Stream Plan and Profile

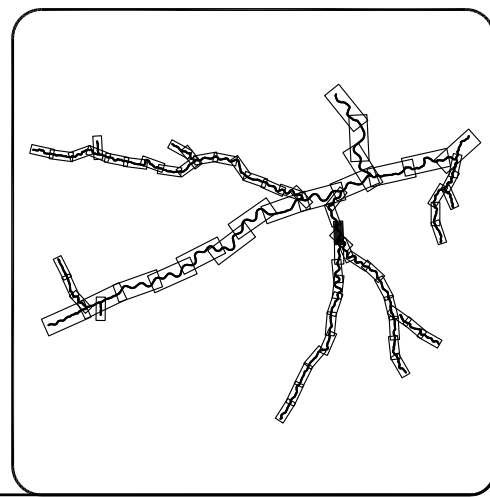
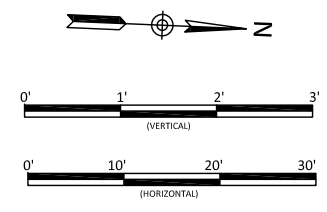
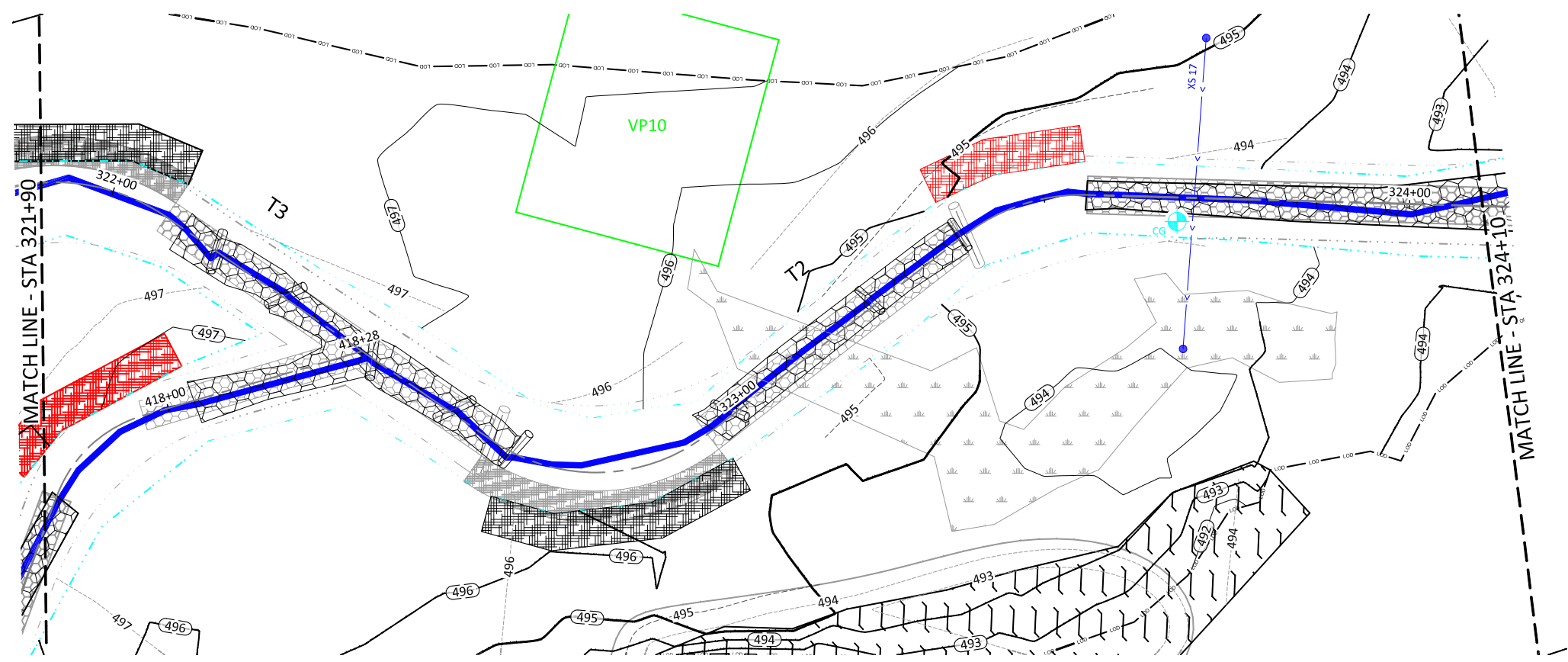
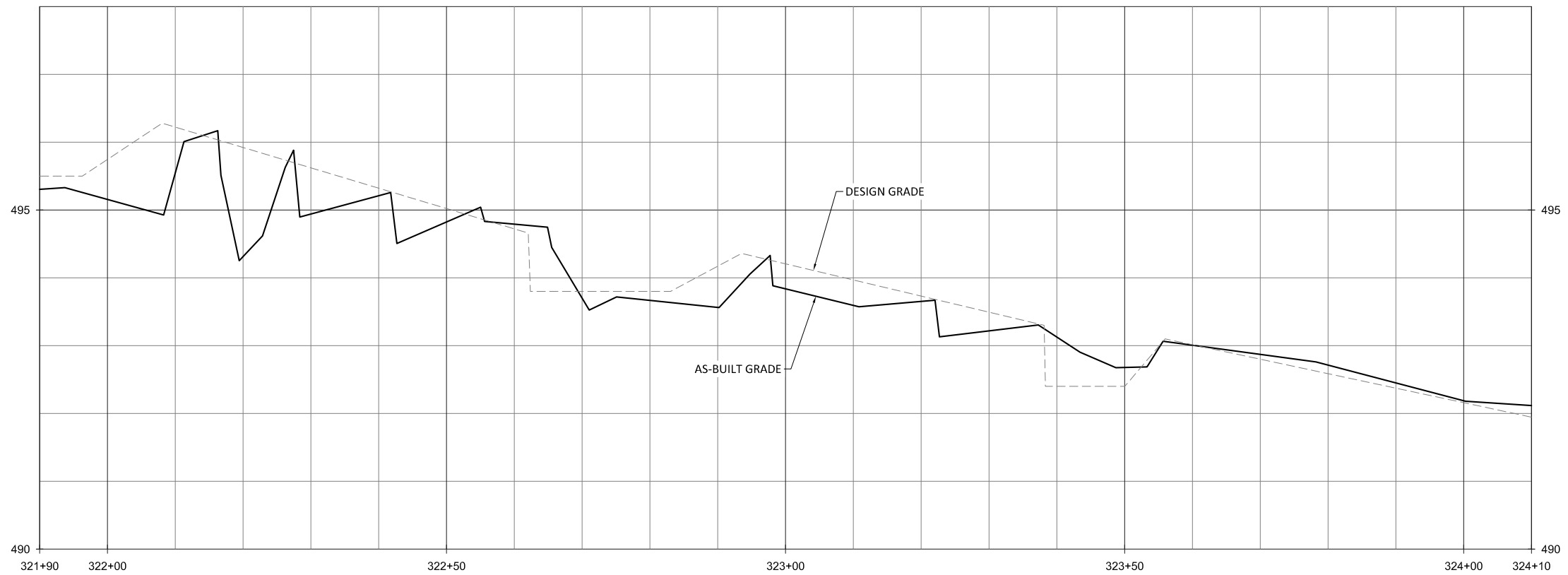
Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.26

Sheet



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 ENGINEERING
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 Raleigh, NC 27606
 Tel: 919.851.0996
 Fax: 919.851.0998
 Firm License No. F-0831



NOTE:
 1. STA 323+61: BRUSH TOE WAS INSTALLED.

Revisions:

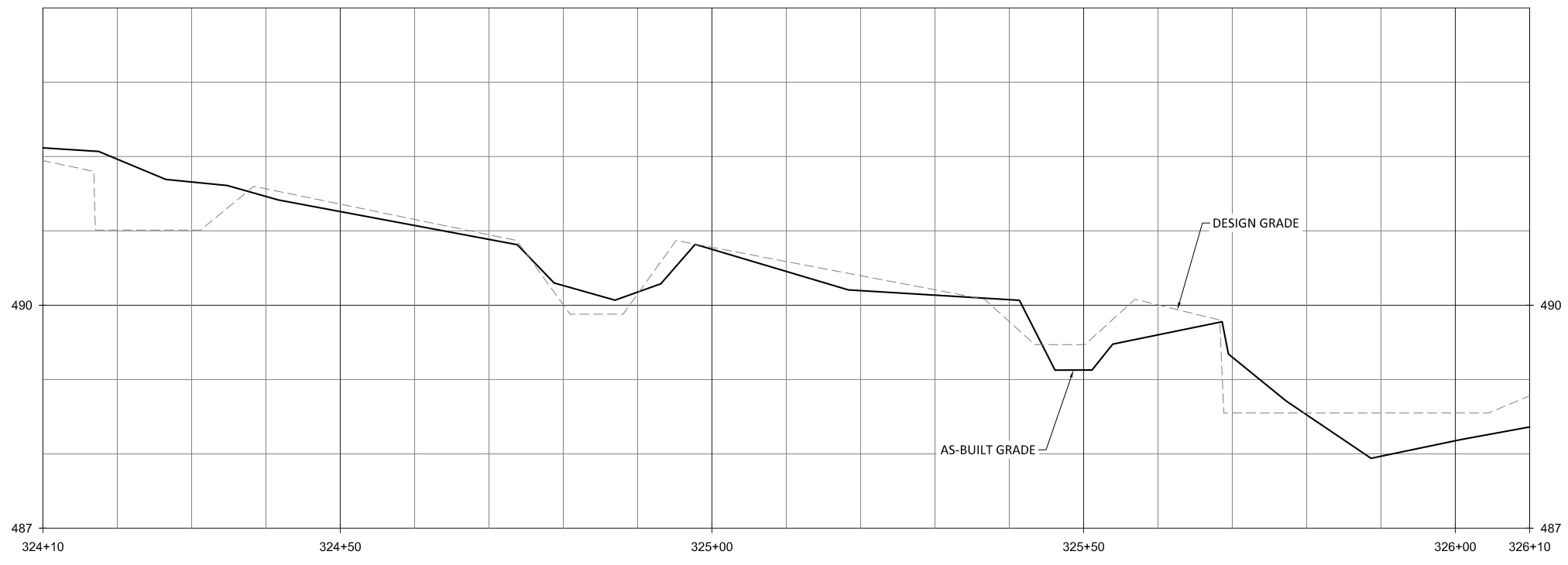
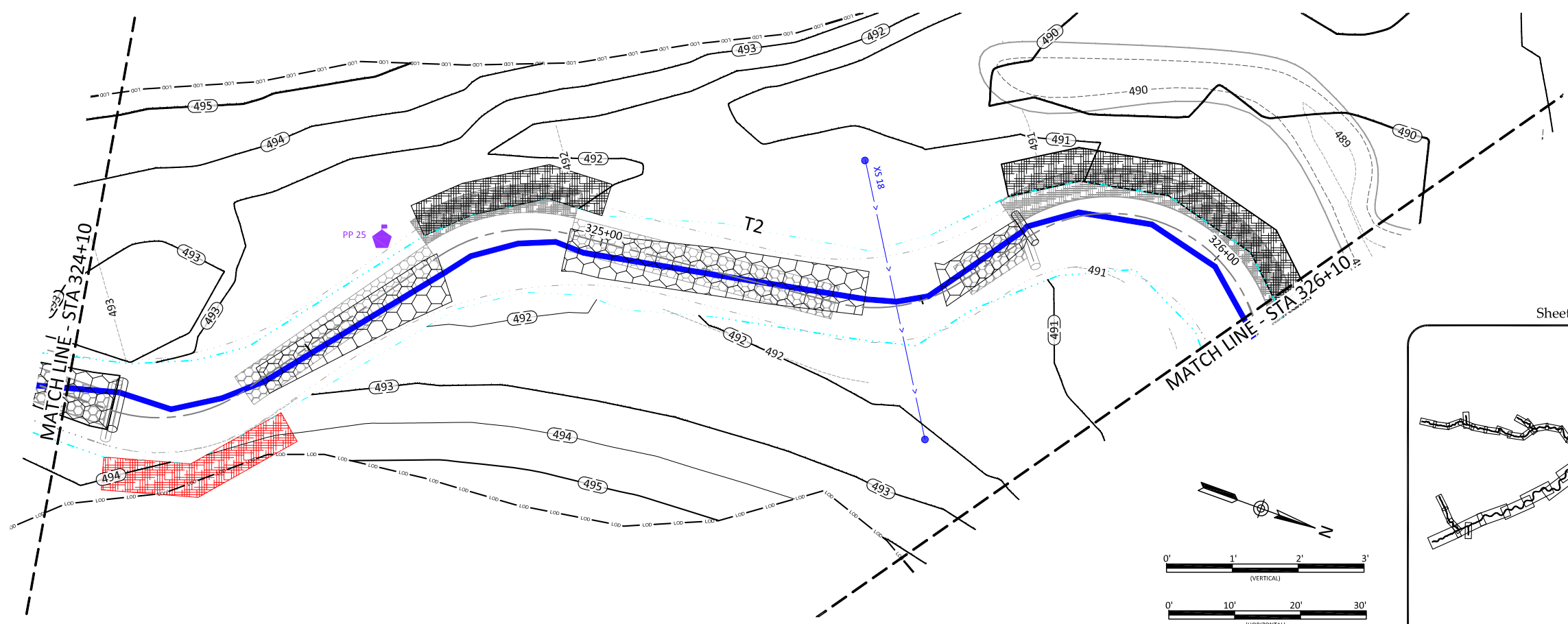
Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.27

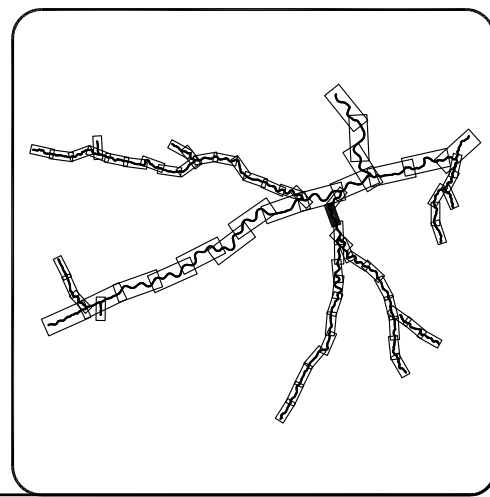
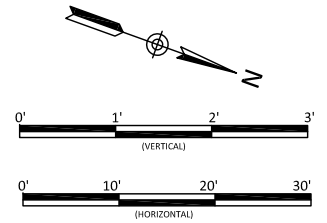
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Buckwater Mitigation Site
 Orange County, North Carolina
 T3 Reach 2 & T2
 Stream Plan and Profile





NOTE:
 1. STA 324+44: BRUSH TOE WAS INSTALLED.



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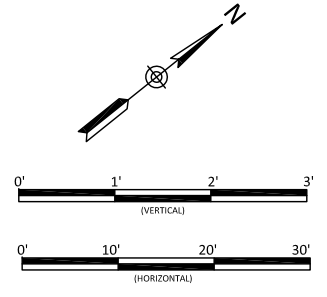
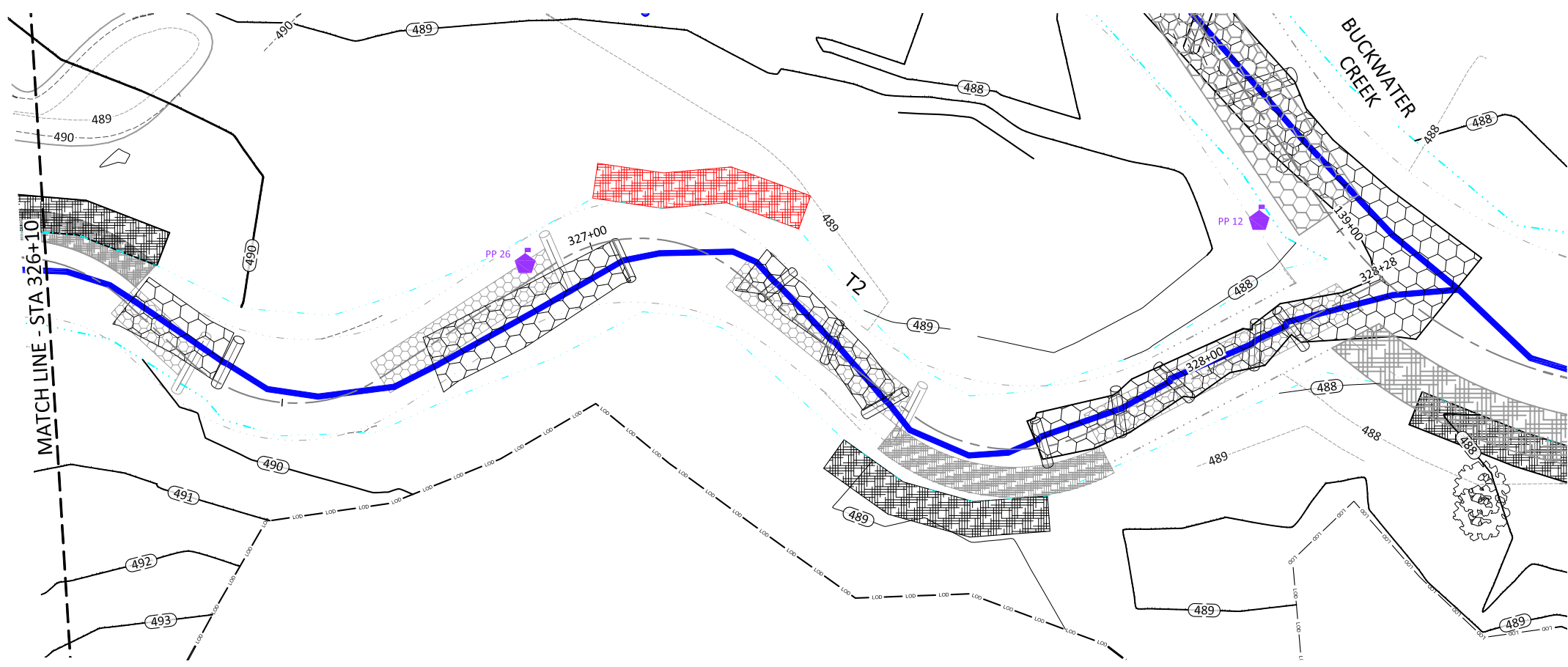
Buckwater Mitigation Site
Orange County, North Carolina

T2
Stream Plan and Profile

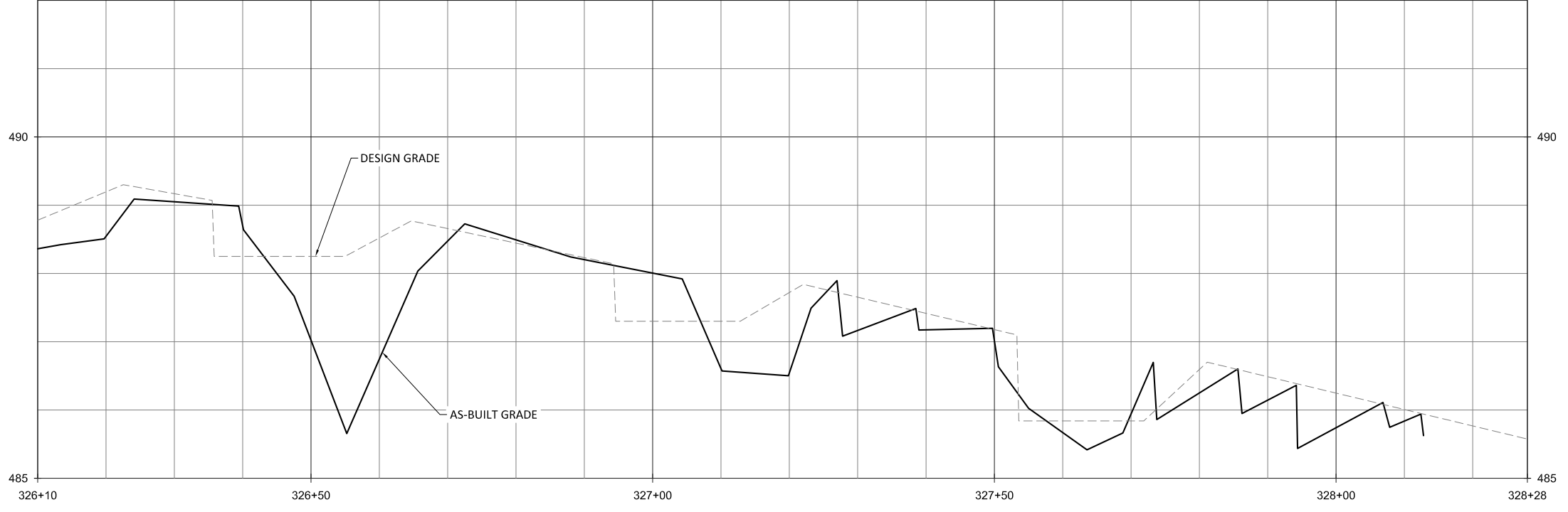
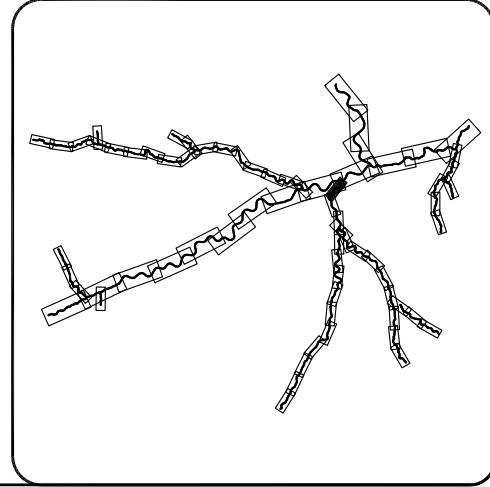
Date	Job Number	Project Engineer	Drawn By	Checked By
07/01/2019	005-02157	NMM	CAW	JTL

1.28


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NOTE:
 1. STA 327+25: BRUSH TOE WAS INSTALLED.



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 Firm License No. F-0831



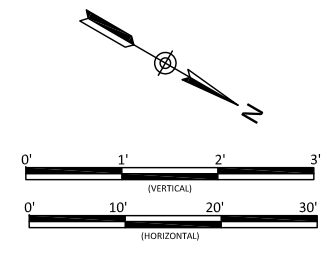
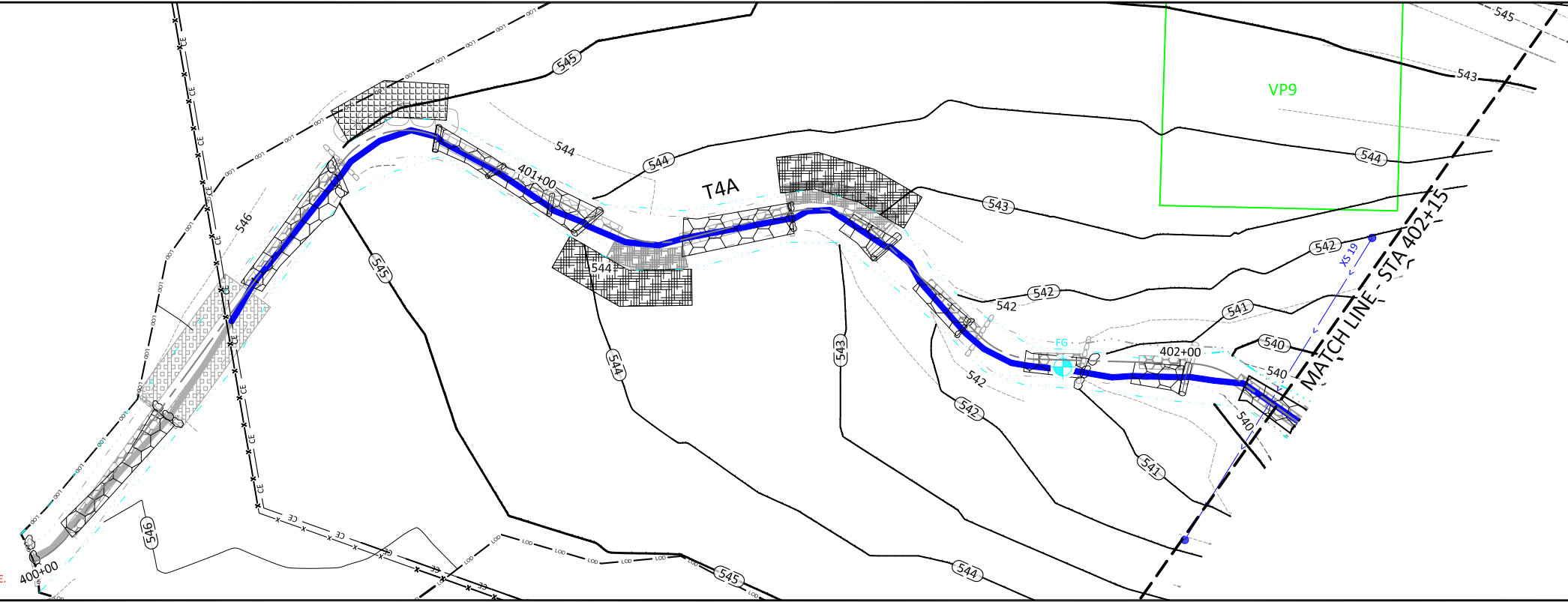
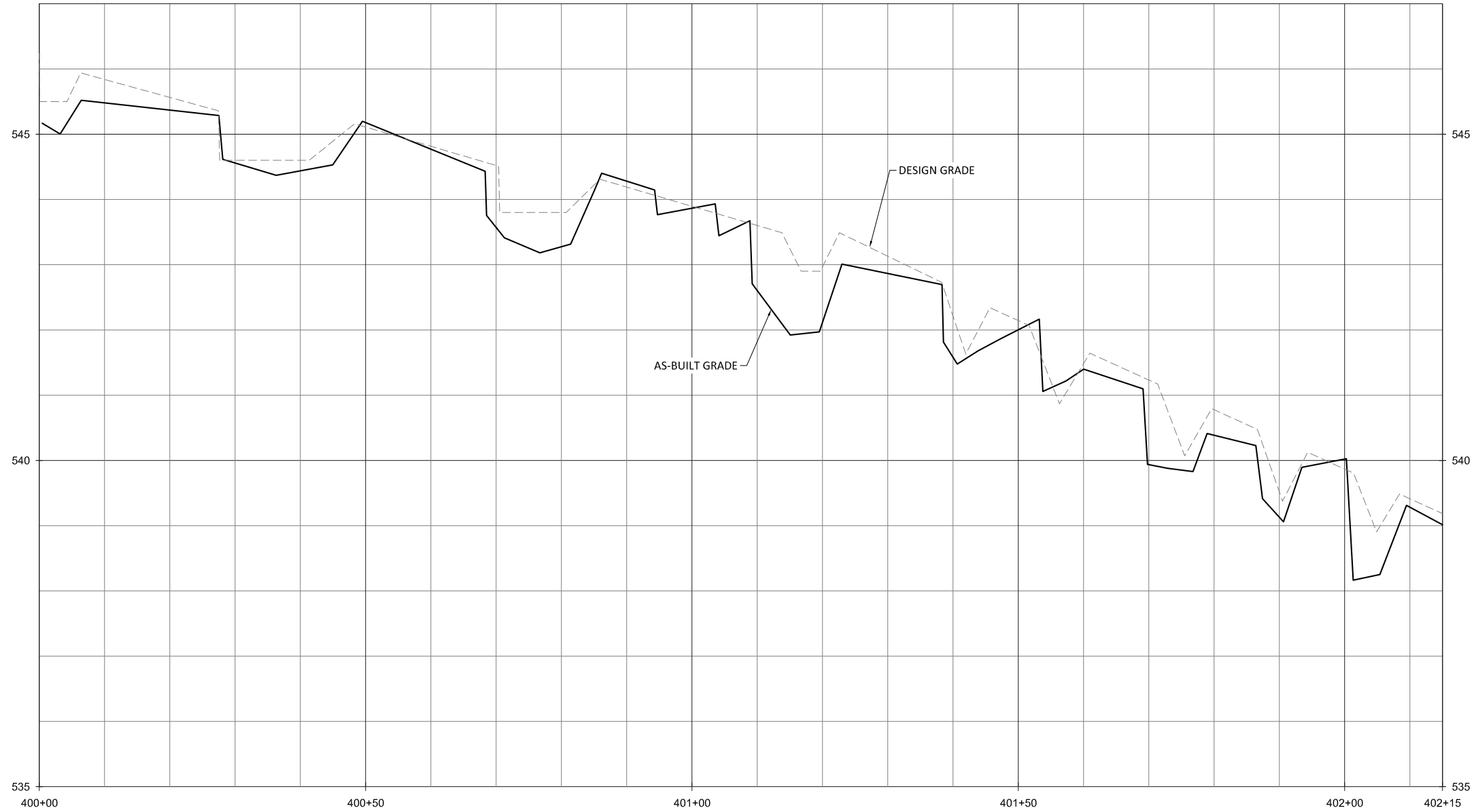
Buckwater Mitigation Site
 Orange County, North Carolina

T2
 Stream Plan and Profile

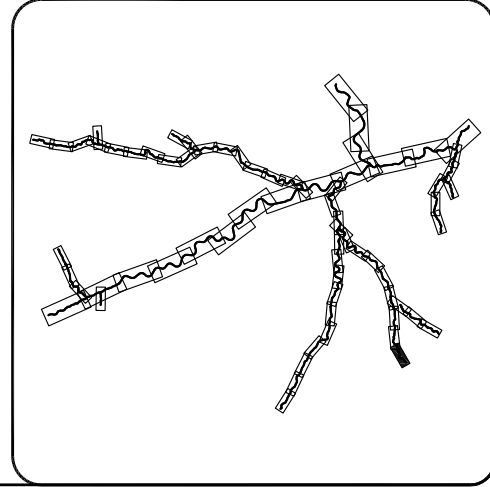
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Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:



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NOTE:
 1. STA 400+38': SOD MATS NOT INSTALLED. NO SOD AVAILABLE.

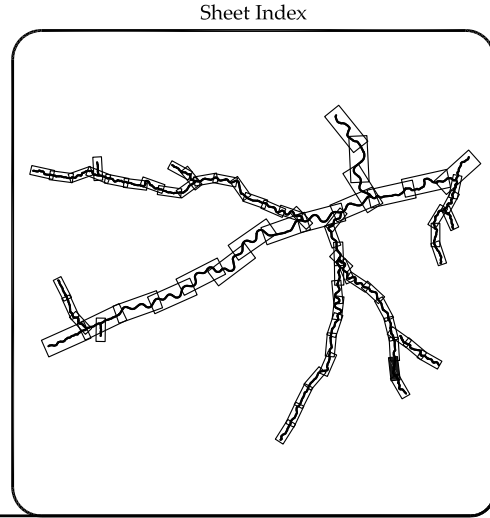
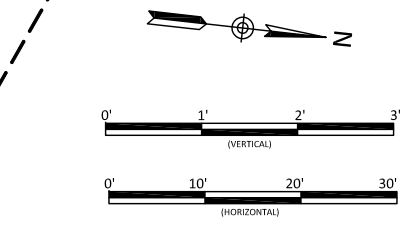
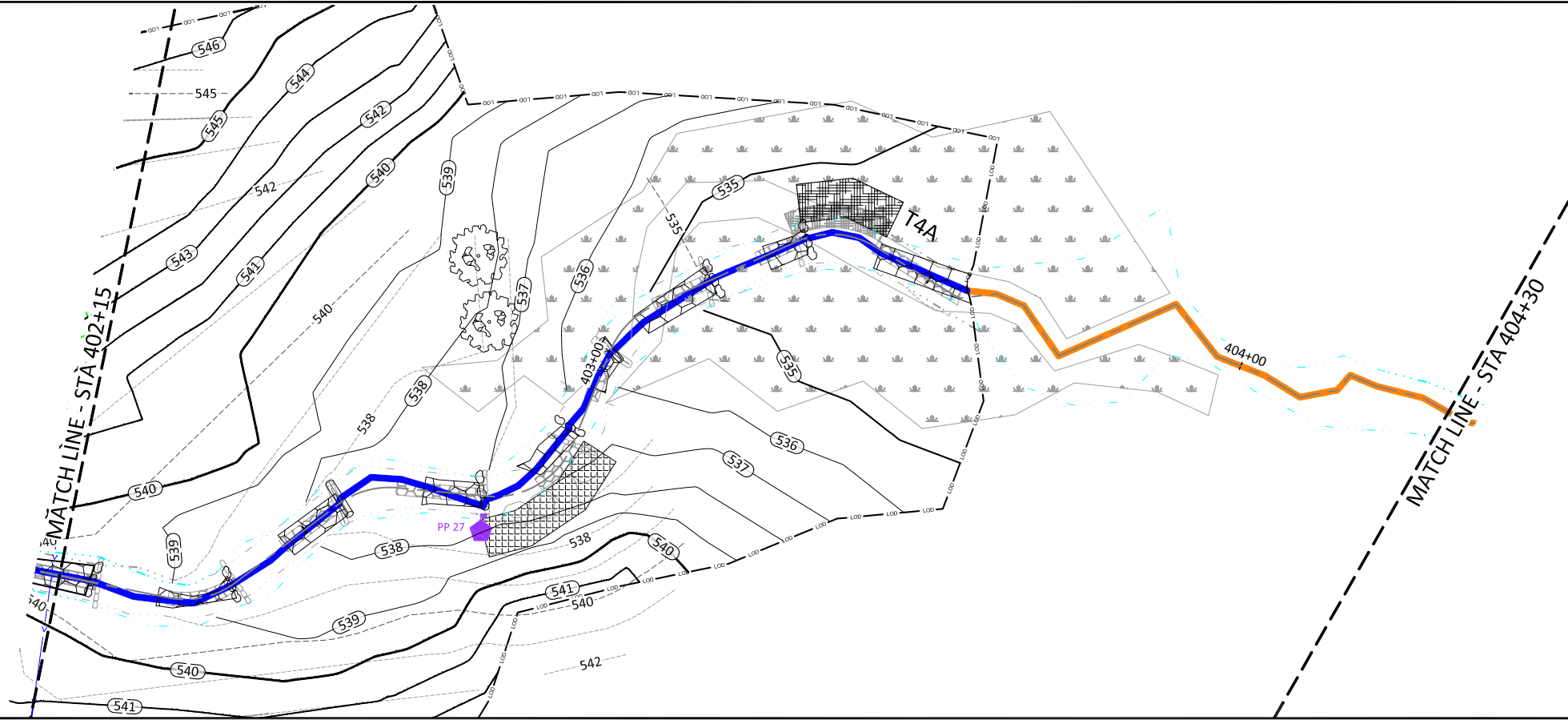
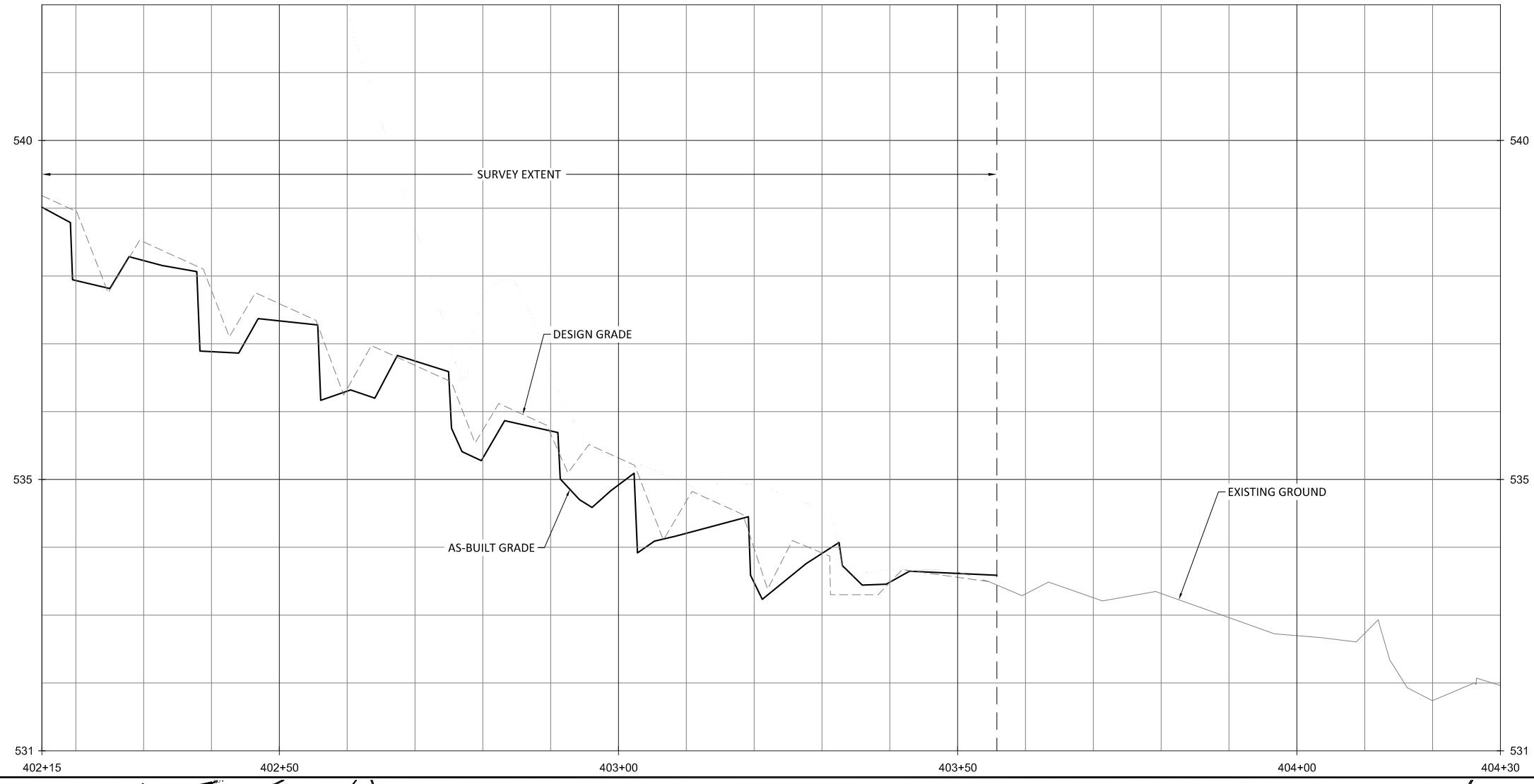


Buckwater Mitigation Site
Orange County, North Carolina
 T4A Reach 1
 Stream Plan and Profile

Revisions:

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.30



Buckwater Mitigation Site
Orange County, North Carolina
 T4A Reaches 1 & 2
 Stream Plan and Profile

Revisions:

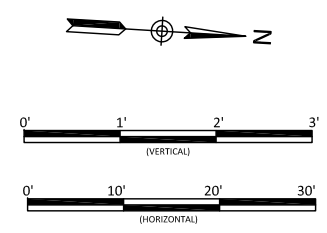
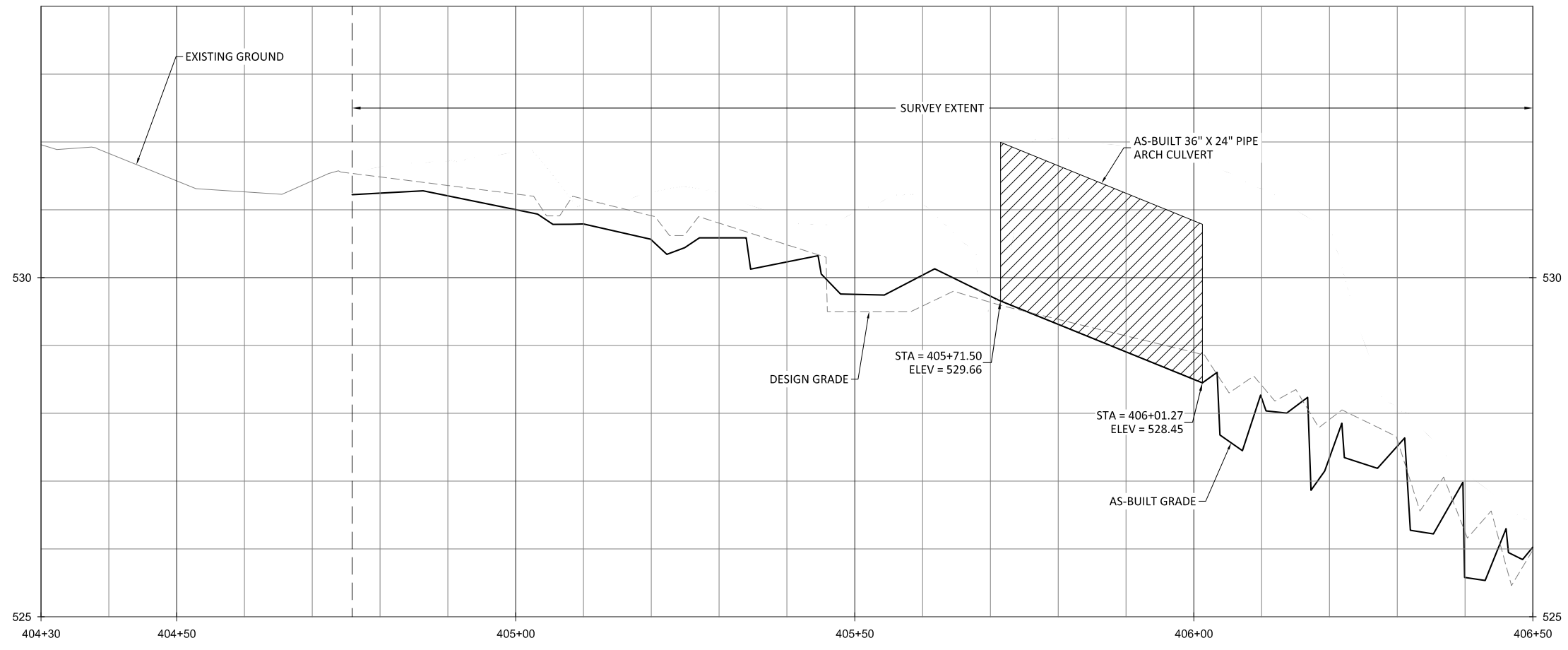
Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.31

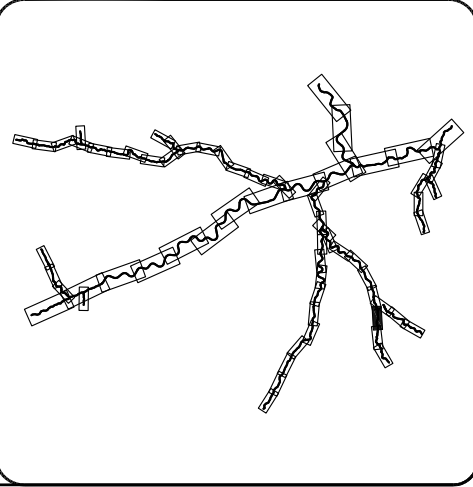
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September 11, 2019
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- NOTE:**
1. STA 405+45: LOG SILL WAS INSTALLED INSTEAD OF A BOULDER SILL.
 2. STA 405+56: SOD MATS NOT INSTALLED. NO SOD AVAILABLE.



Buckwater Mitigation Site
Orange County, North Carolina
 T4A Reaches 2 & 3
 Stream Plan and Profile

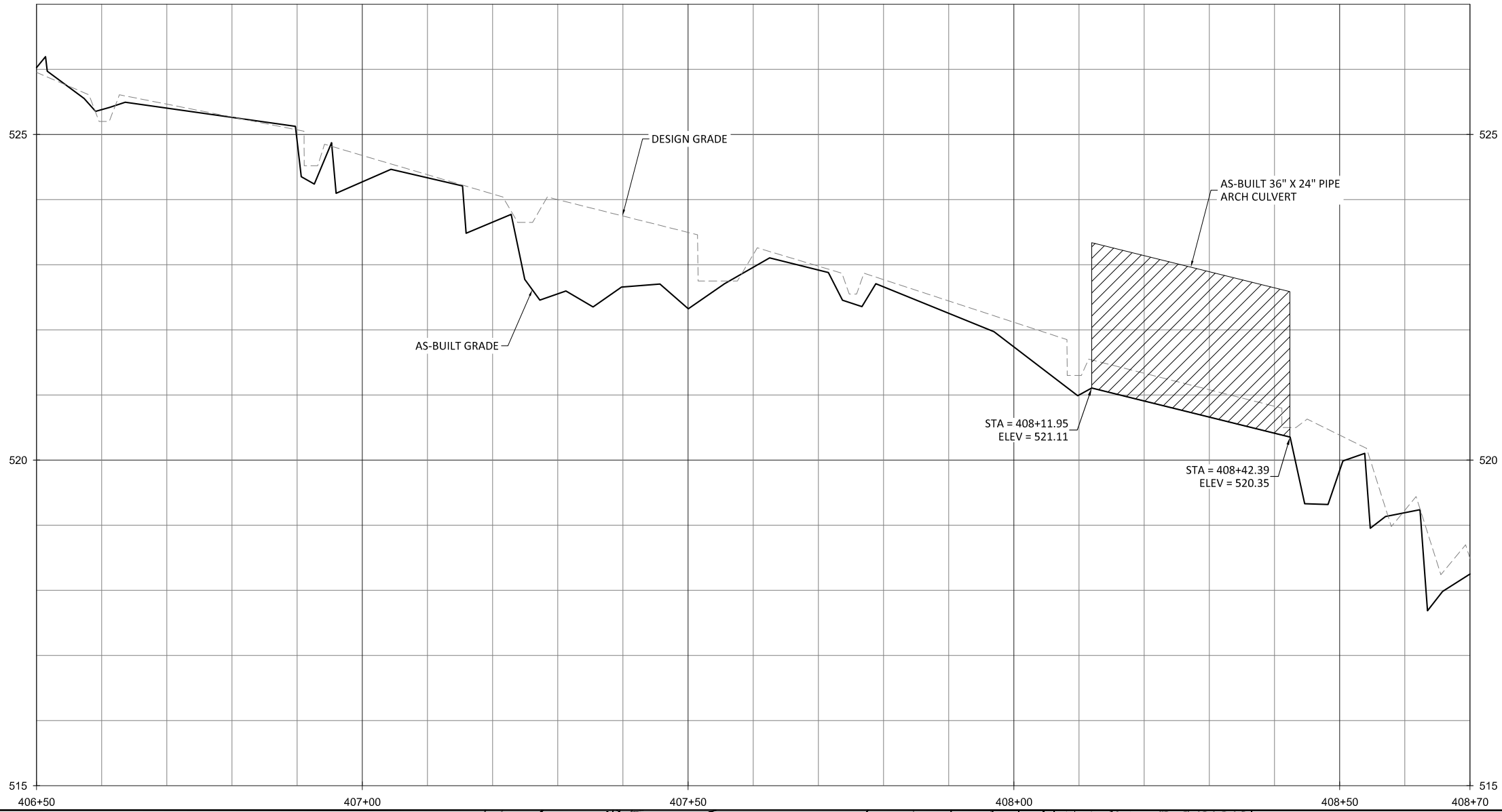
Revisions:

No.	Description

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

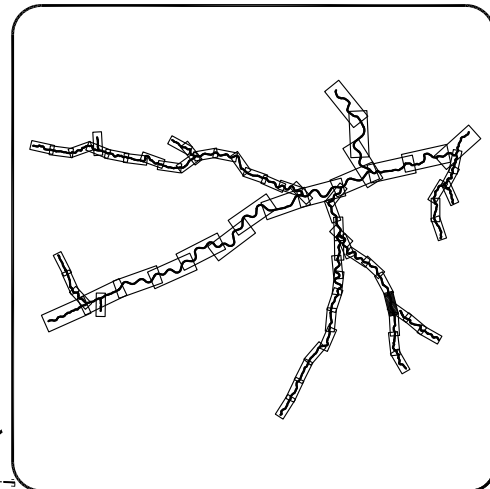
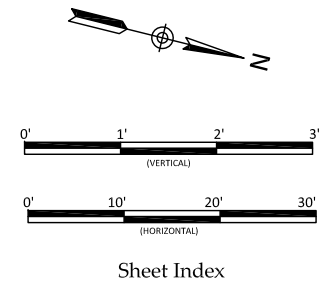
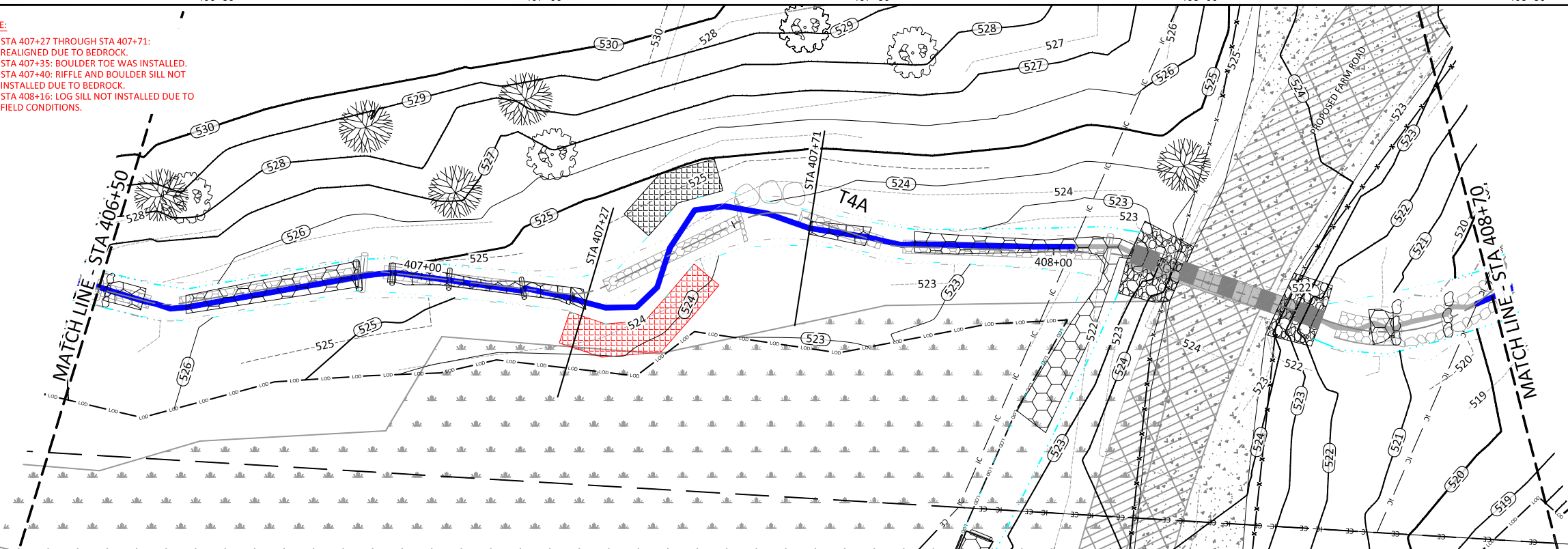
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Sheet



NOTE:

1. STA 407+27 THROUGH STA 407+71: REALIGNED DUE TO BEDROCK.
2. STA 407+35: BOULDER TOE WAS INSTALLED.
3. STA 407+40: RIFFLE AND BOULDER SILL NOT INSTALLED DUE TO BEDROCK.
4. STA 408+16: LOG SILL NOT INSTALLED DUE TO FIELD CONDITIONS.

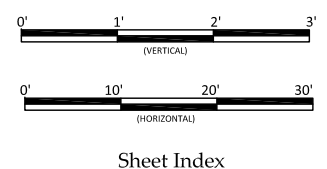
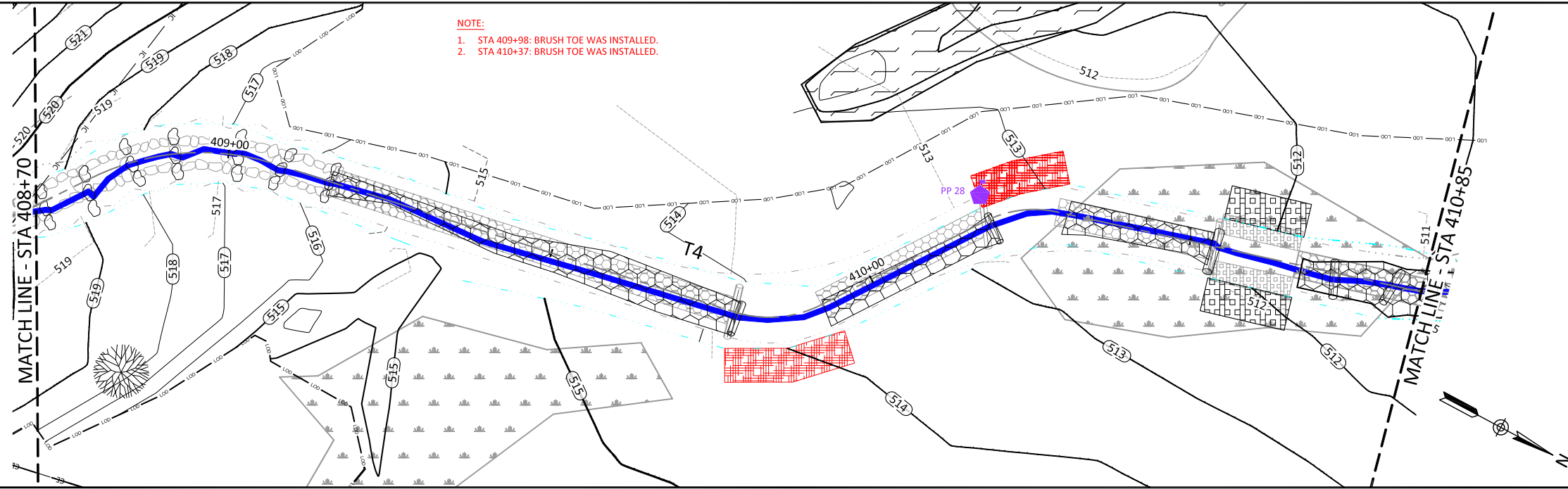
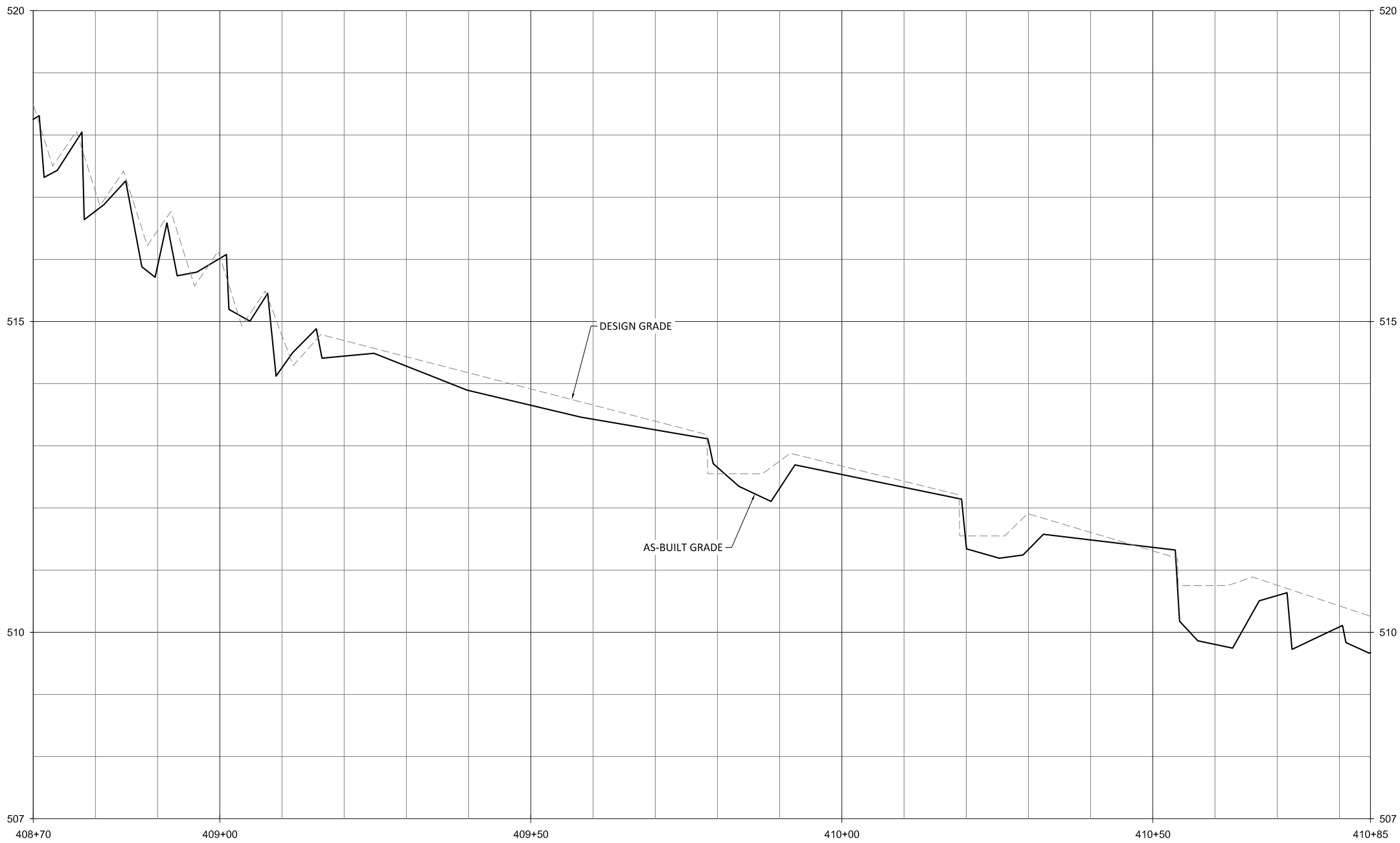


Buckwater Mitigation Site
Orange County, North Carolina
T4A Reach 3 & T4
Stream Plan and Profile

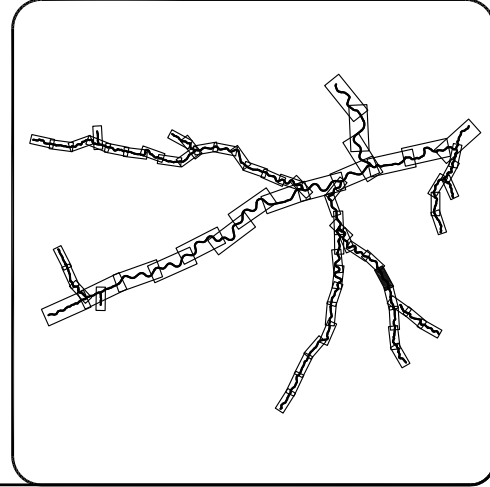
Revisions:

Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

1.33



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Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:

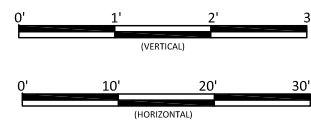
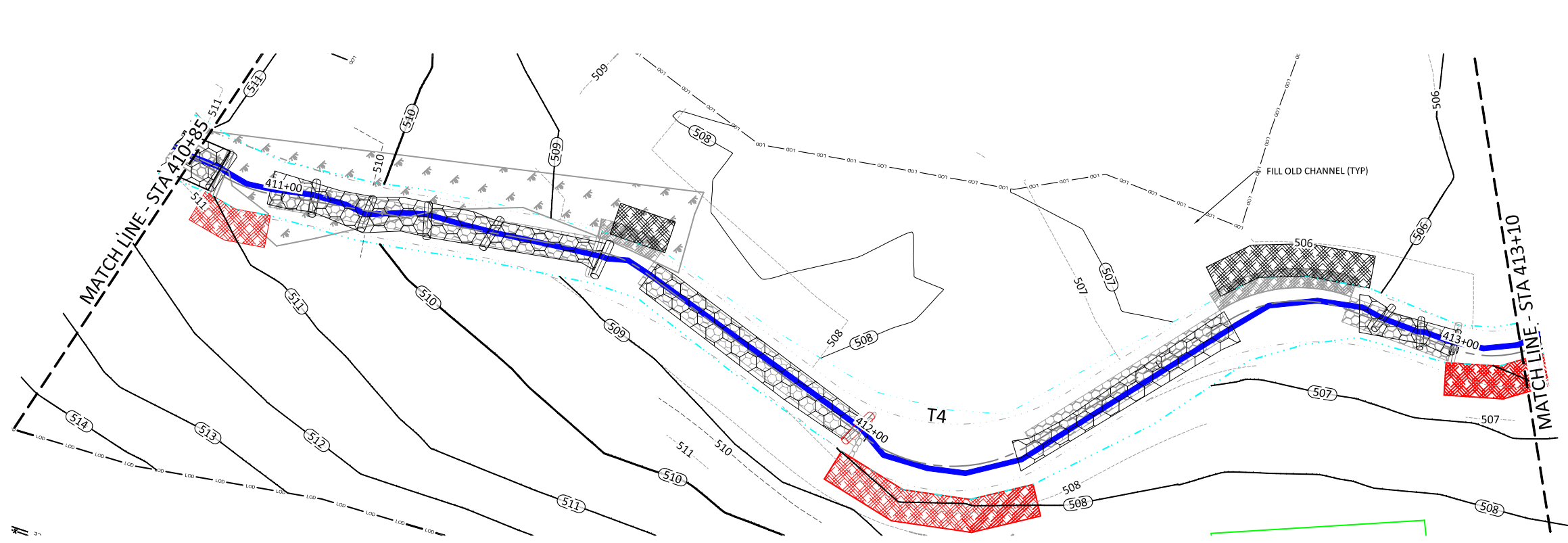
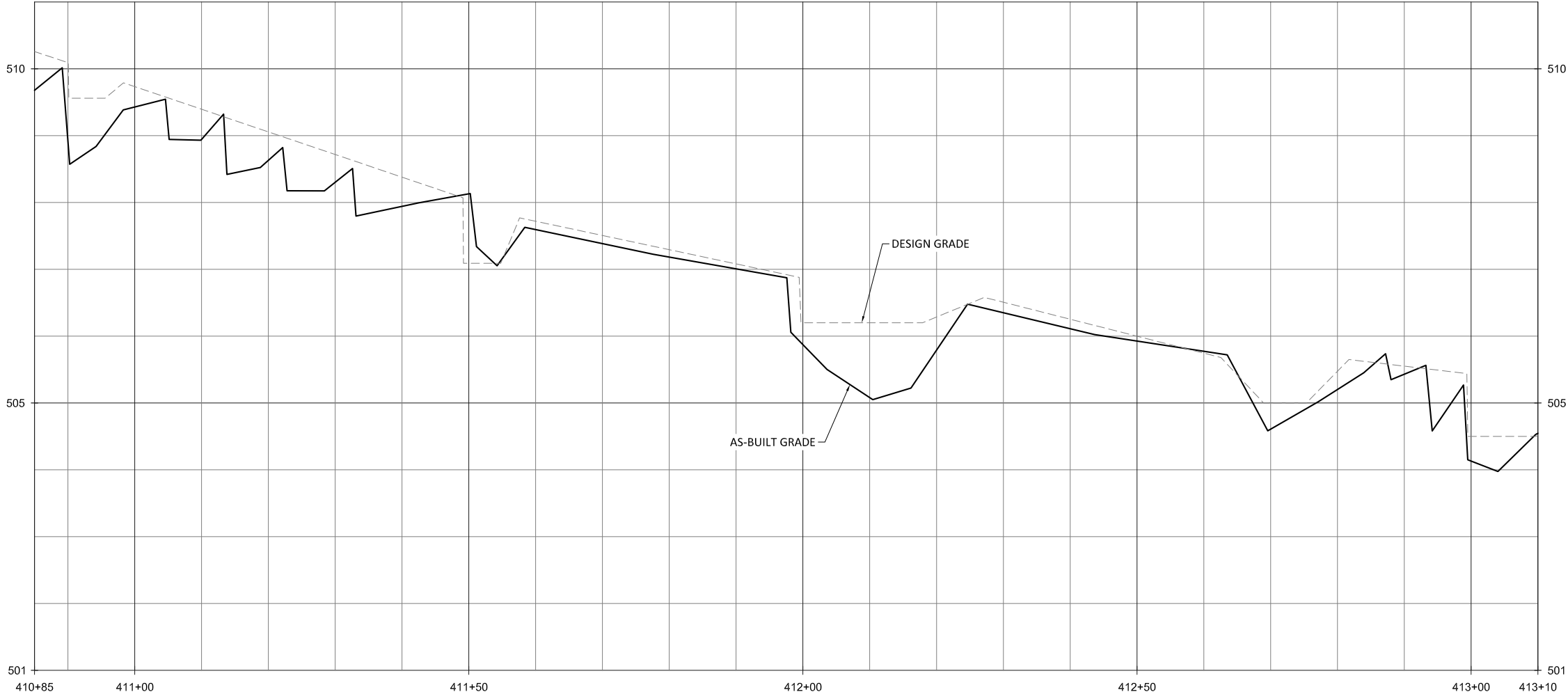
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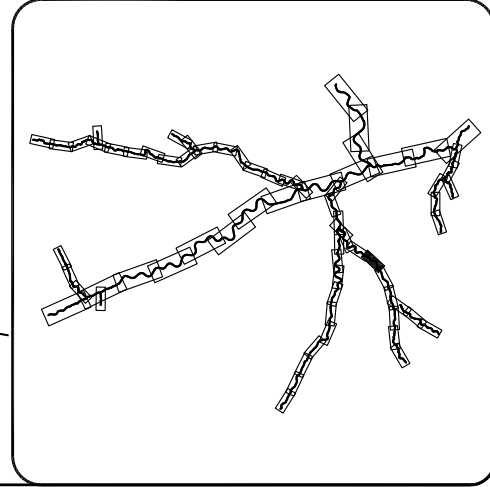
Buckwater Mitigation Site
 Orange County, North Carolina

T4
 Stream Plan and Profile





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- NOTE:**
1. STA 411+06: BRUSH TOE WAS INSTALLED.
 2. STA 411+98: LOG SILL WAS INSTALLED INSTEAD OF BOULDER SILL.
 3. STA 412+25: BRUSH TOE WAS INSTALLED.
 4. STA 413+19: BRUSH TOE WAS INSTALLED.



Buckwater Mitigation Site
Orange County, North Carolina

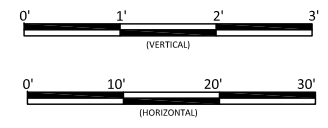
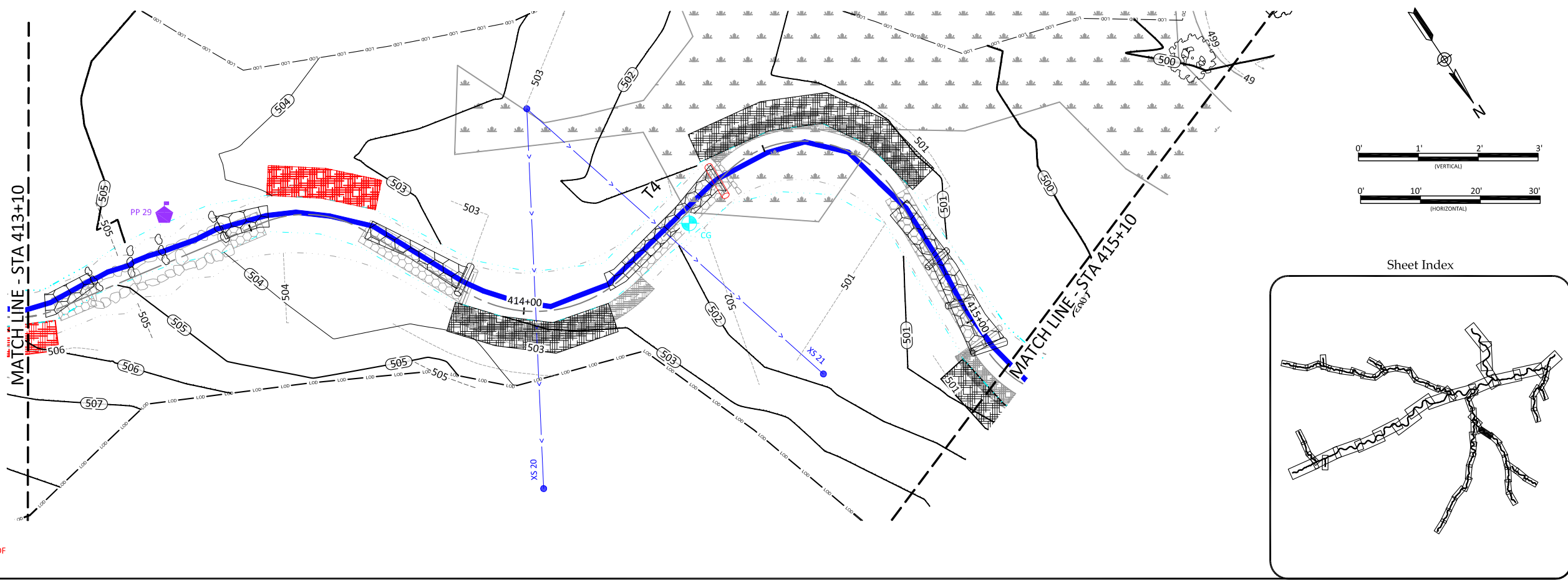
T4
Stream Plan and Profile

Revisions:	

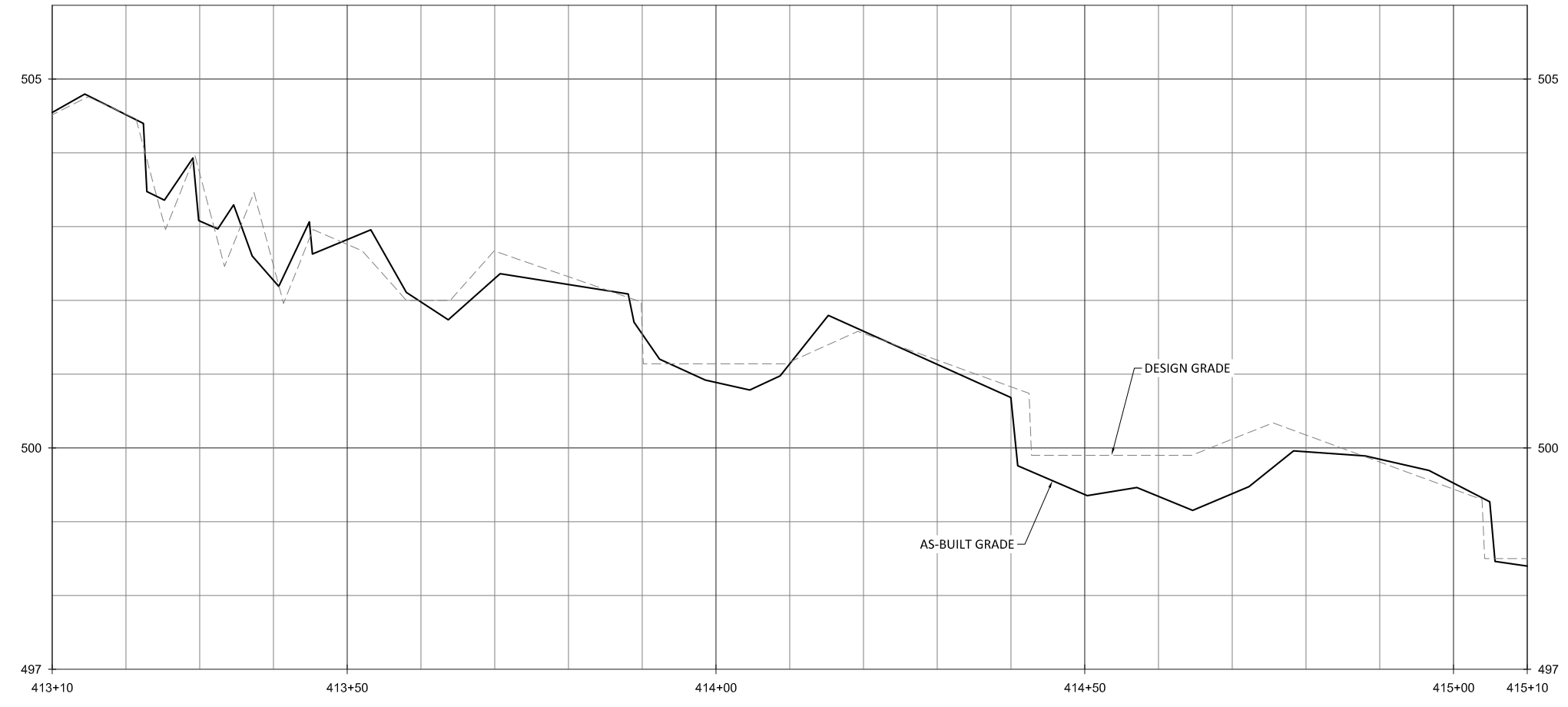
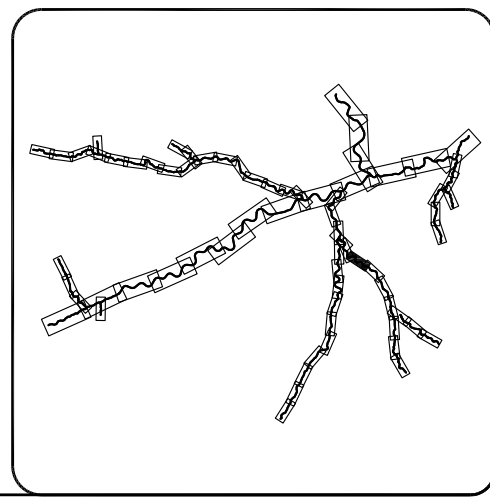
Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

1.35

September 11, 2019
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NOTE:

1. STA 413+75: BRUSH TOE WAS INSTALLED.
2. STA 414+53: LOG SILL INSTALLED INSTEAD OF A BOULDER SILL.

Revisions:

Date	Job Number	Project Engineer	Drawn By	Checked By
07/01/2019	005-02157	NMM	CAW	JTL

1.36

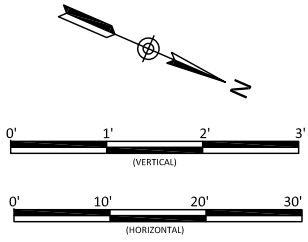
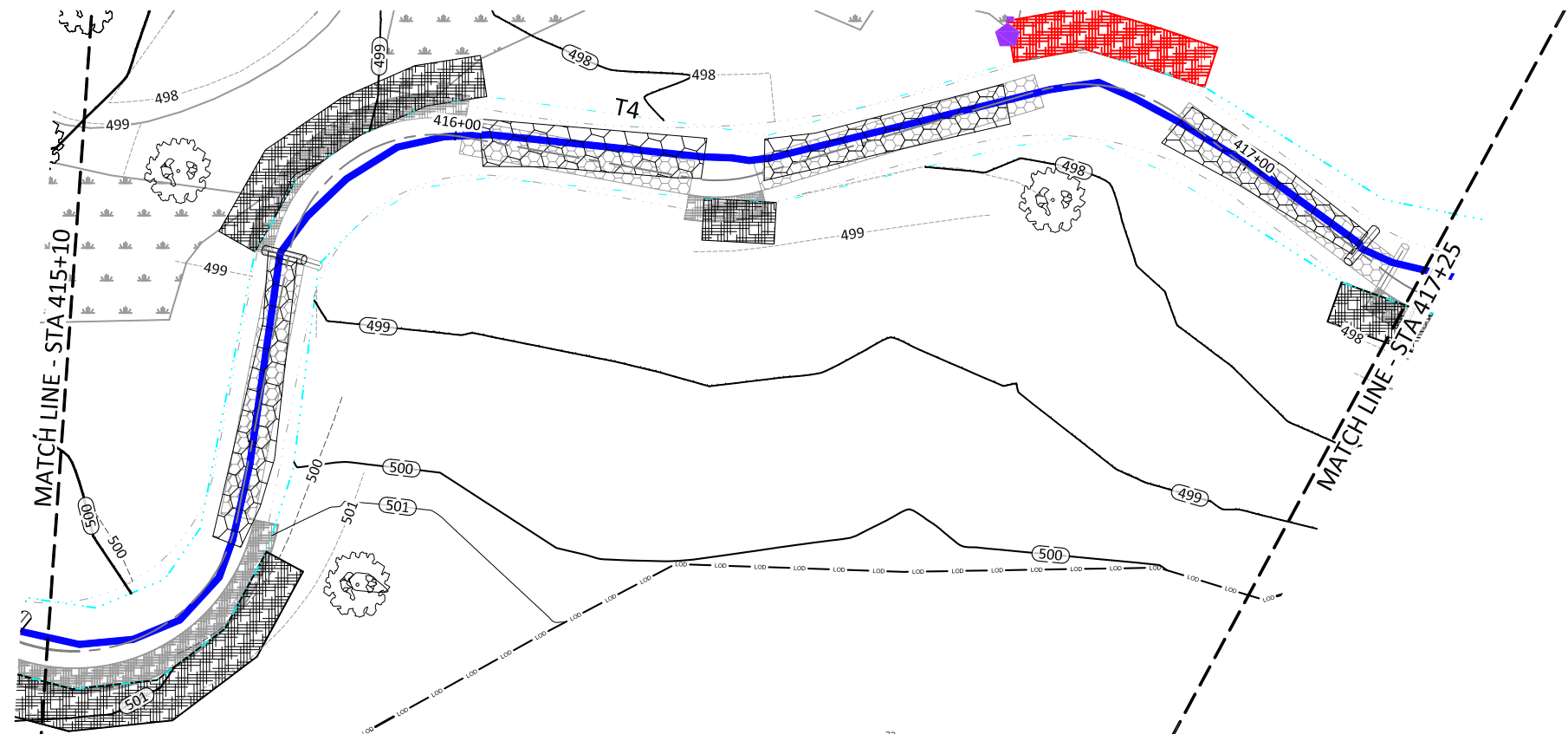
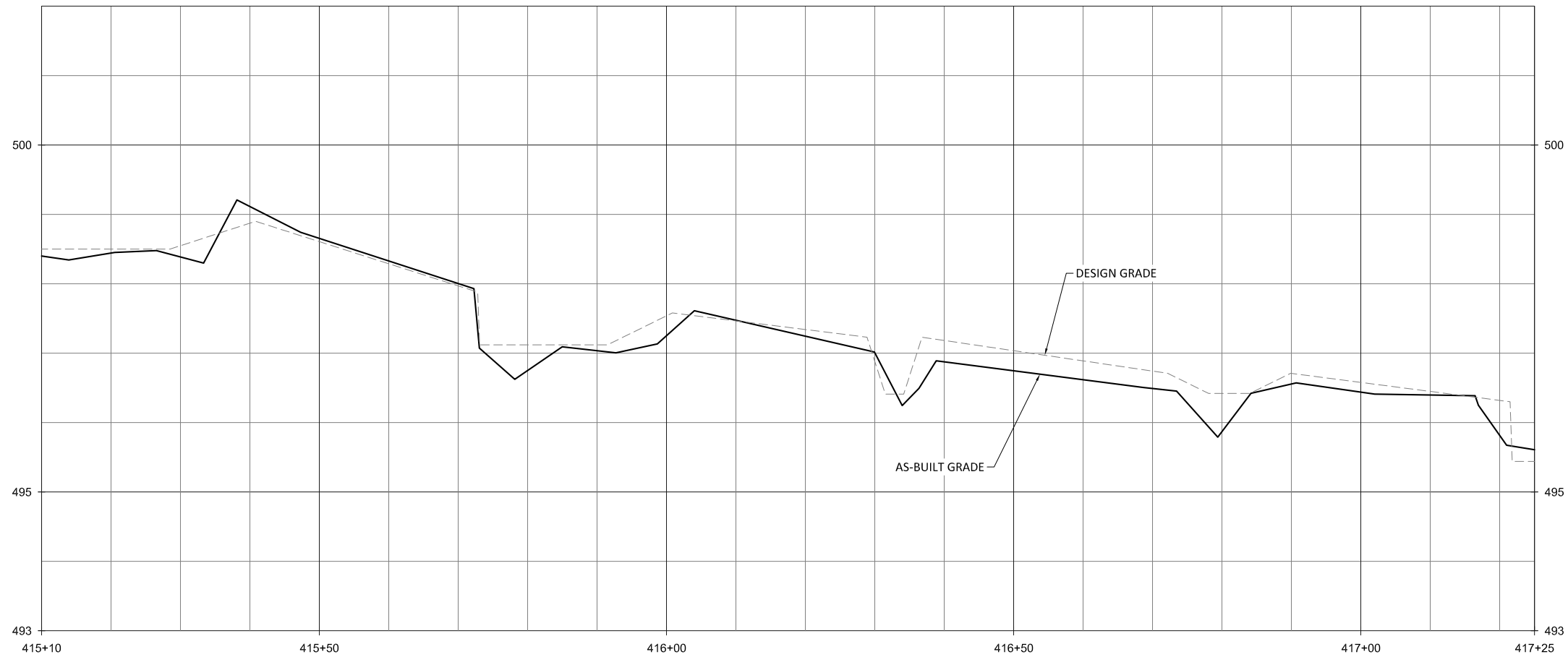
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**Buckwater Mitigation Site
 Orange County, North Carolina**

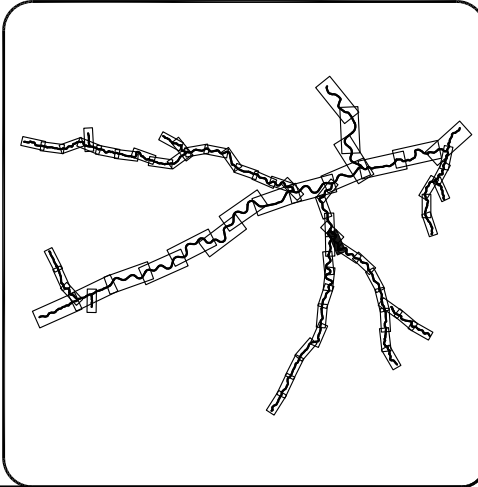
T4
 Stream Plan and Profile



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NOTE:
 1. STA 416+89: BRUSH TOE WAS INSTALLED.

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.37

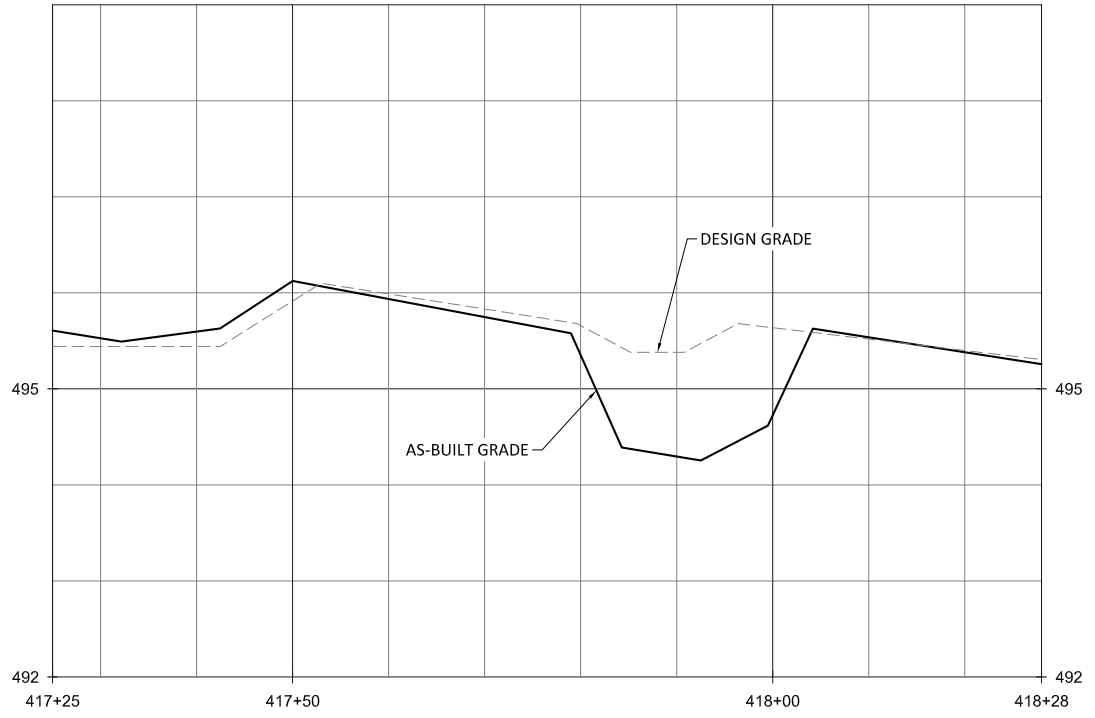
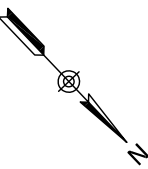
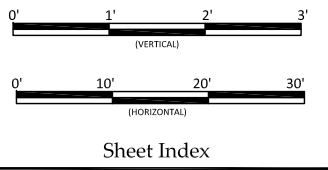
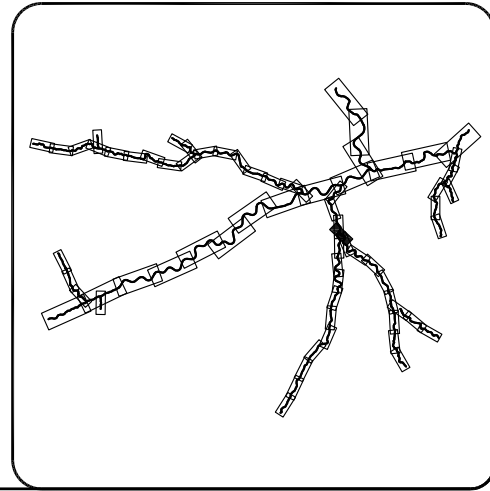
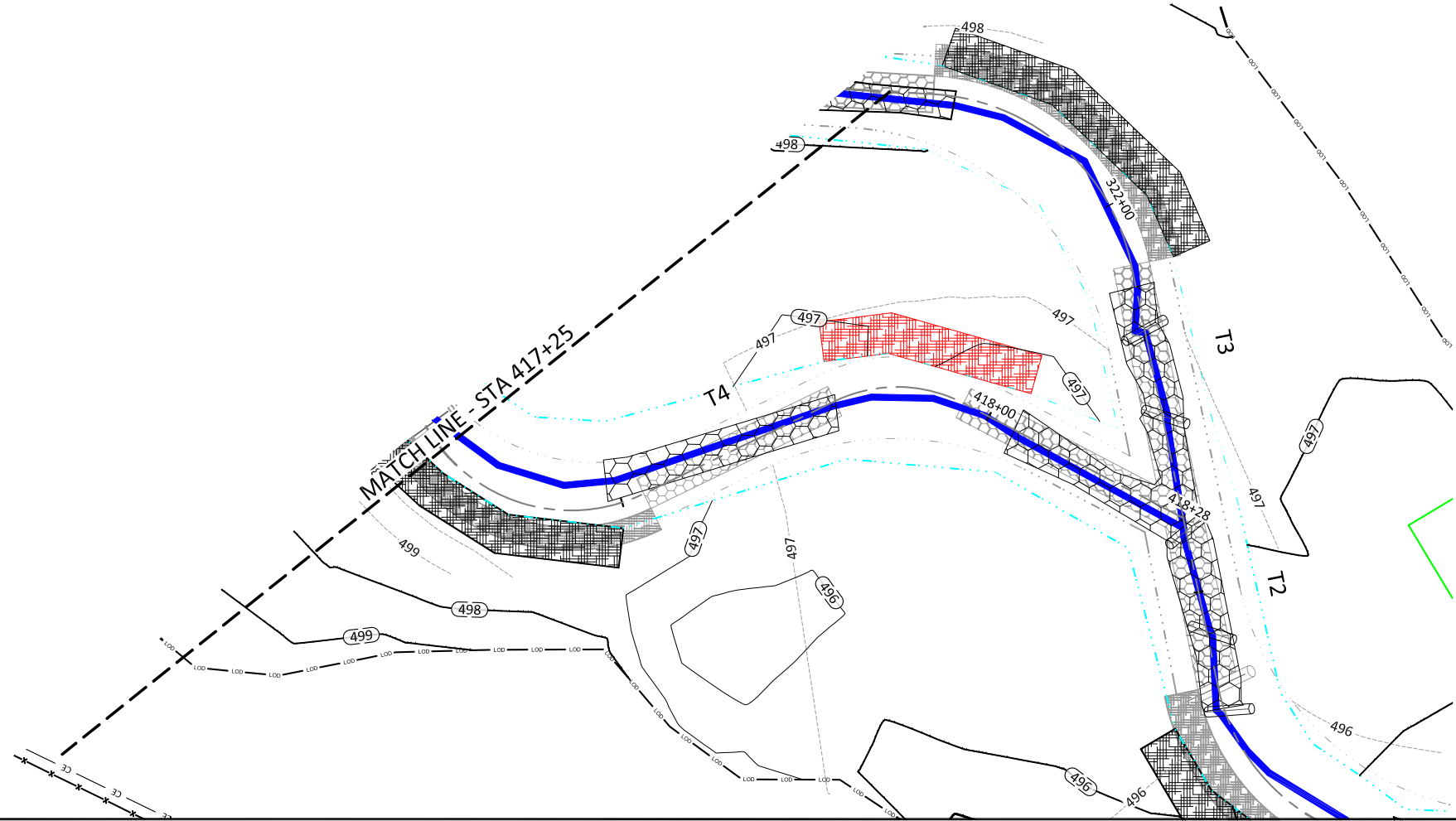
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Buckwater Mitigation Site
 Orange County, North Carolina

T4
 Stream Plan and Profile



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 312 W. Millbrook Road, Ste 225
 Raleigh, NC 27606
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 Fax: 919.852.0997
 Firm License No. F-0831



NOTE:
 1. STA 417+97: BRUSH TOE WAS INSTALLED.

Buckwater Mitigation Site
 Orange County, North Carolina
 T4
 Stream Plan and Profile

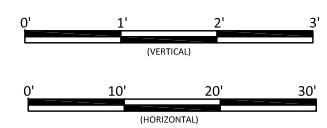
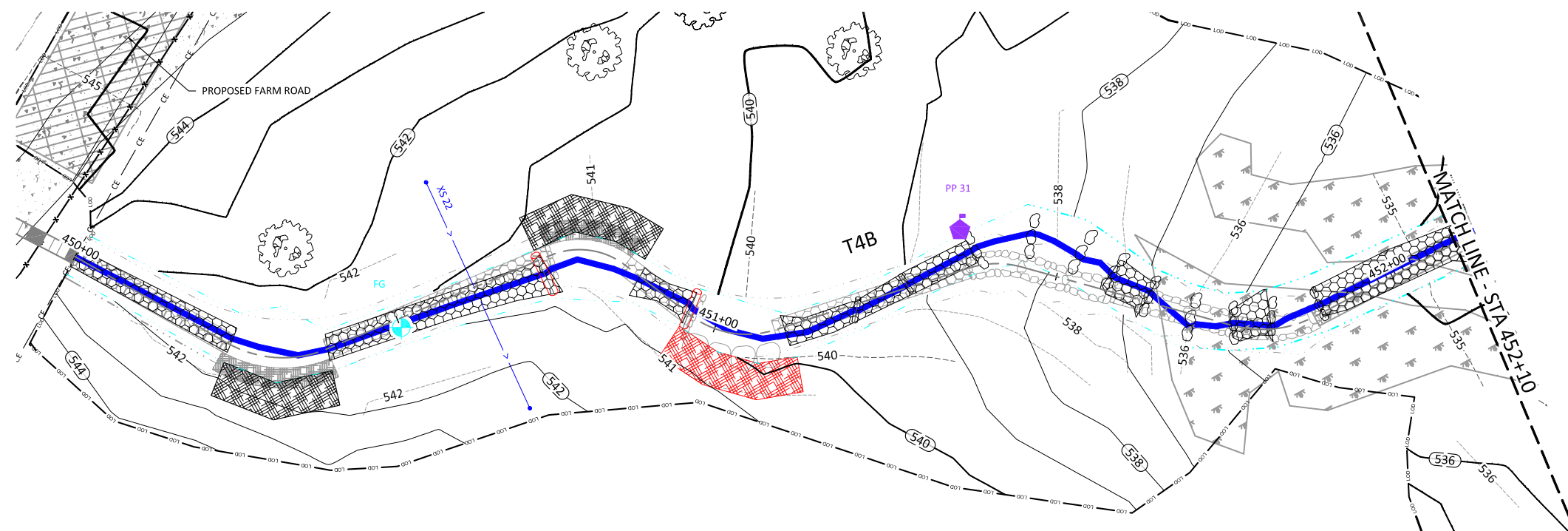
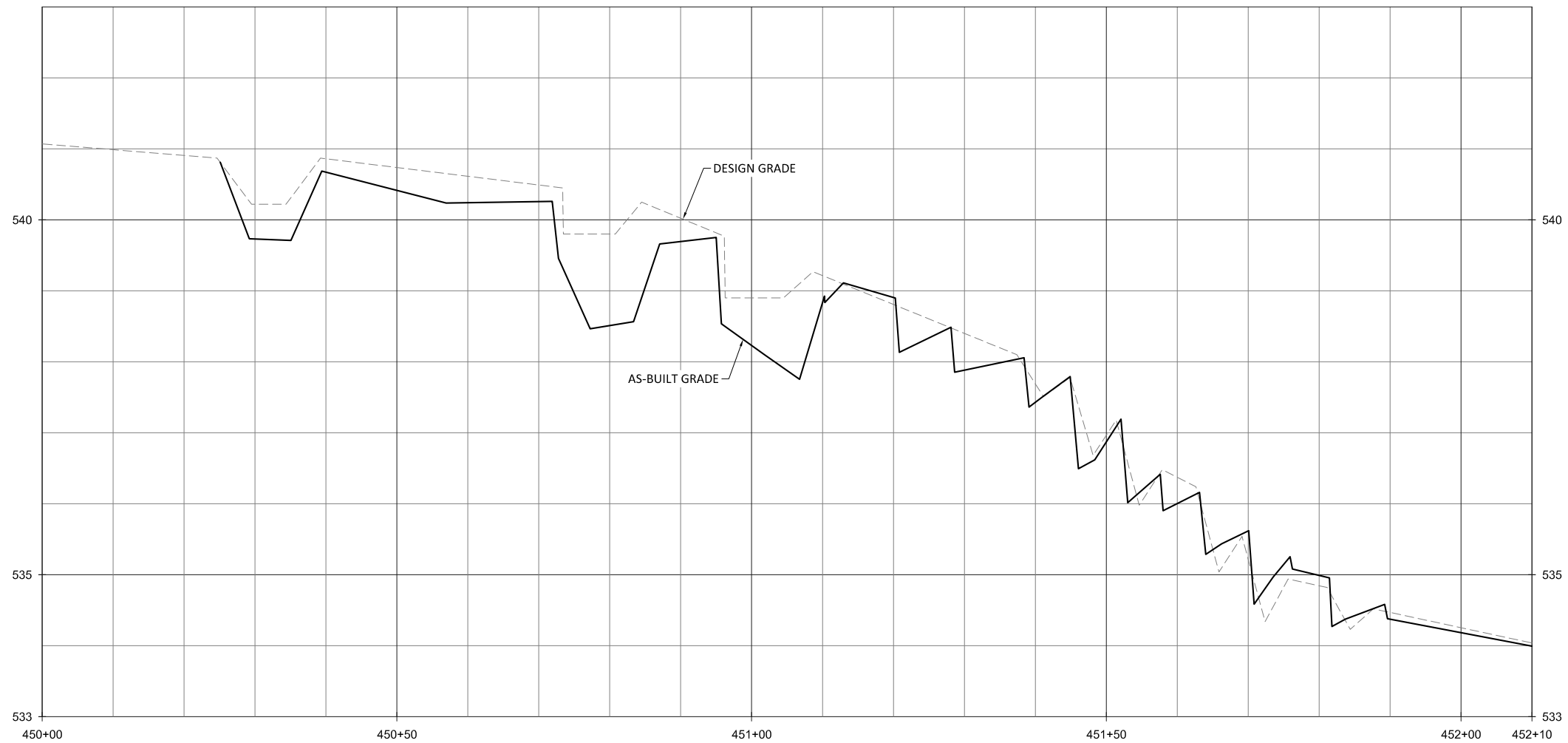
Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.38

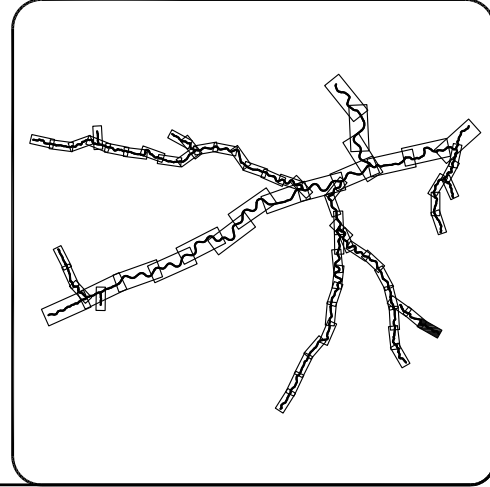
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September 11, 2019
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- NOTE:**
1. STA 450+71: LOG SILL WAS INSTALLED INSTEAD OF BOULDER SILL.
 2. STA 450+94: LOG SILL WAS INSTALLED INSTEAD OF BOULDER SILL.
 3. STA 451+02: BRUSH TOE WAS INSTALLED INSTEAD OF BOULDER TOE.



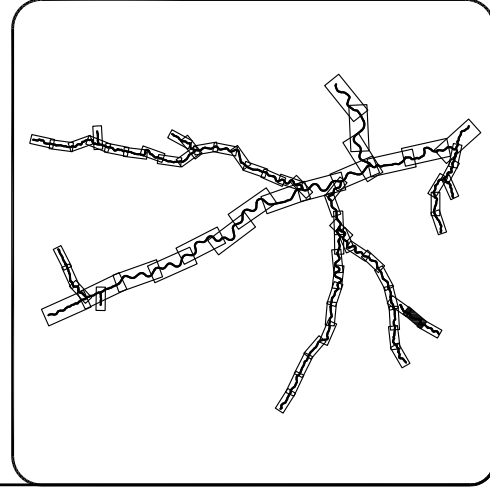
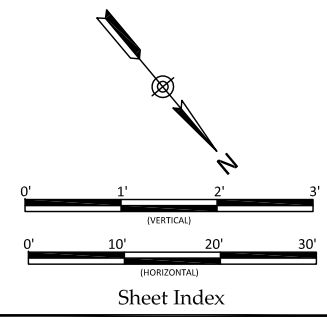
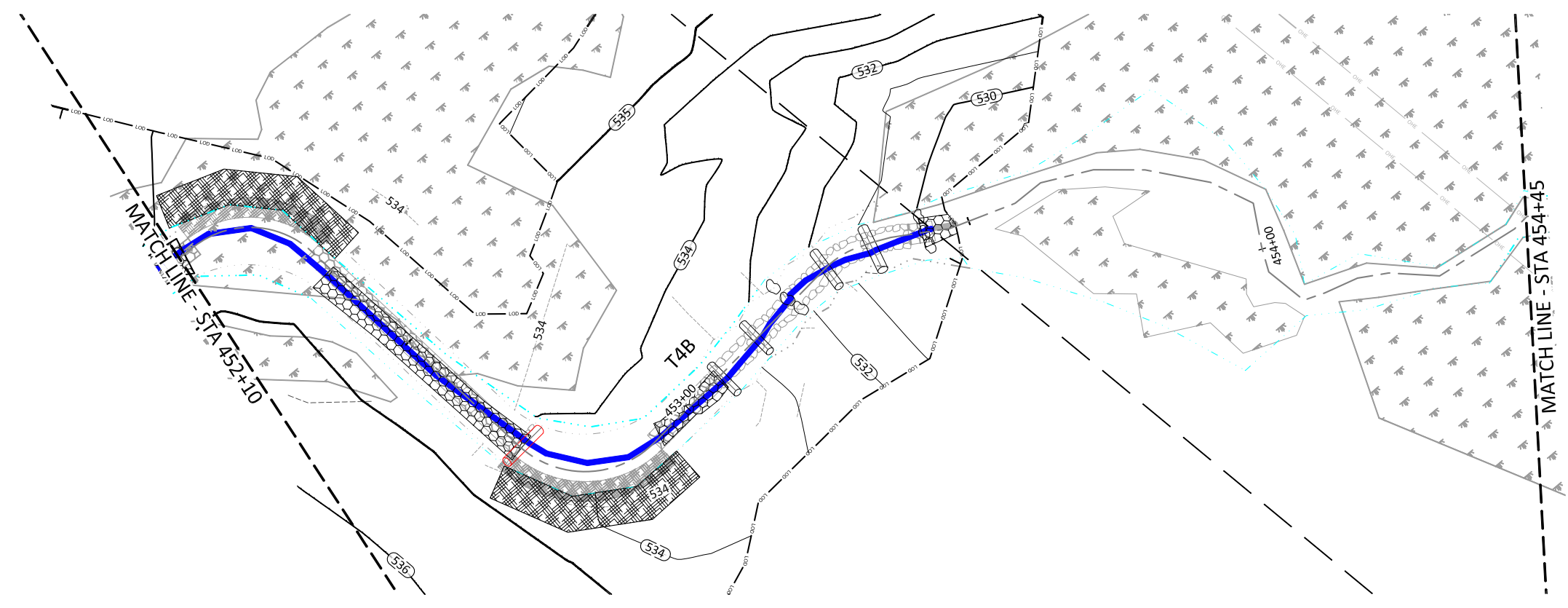
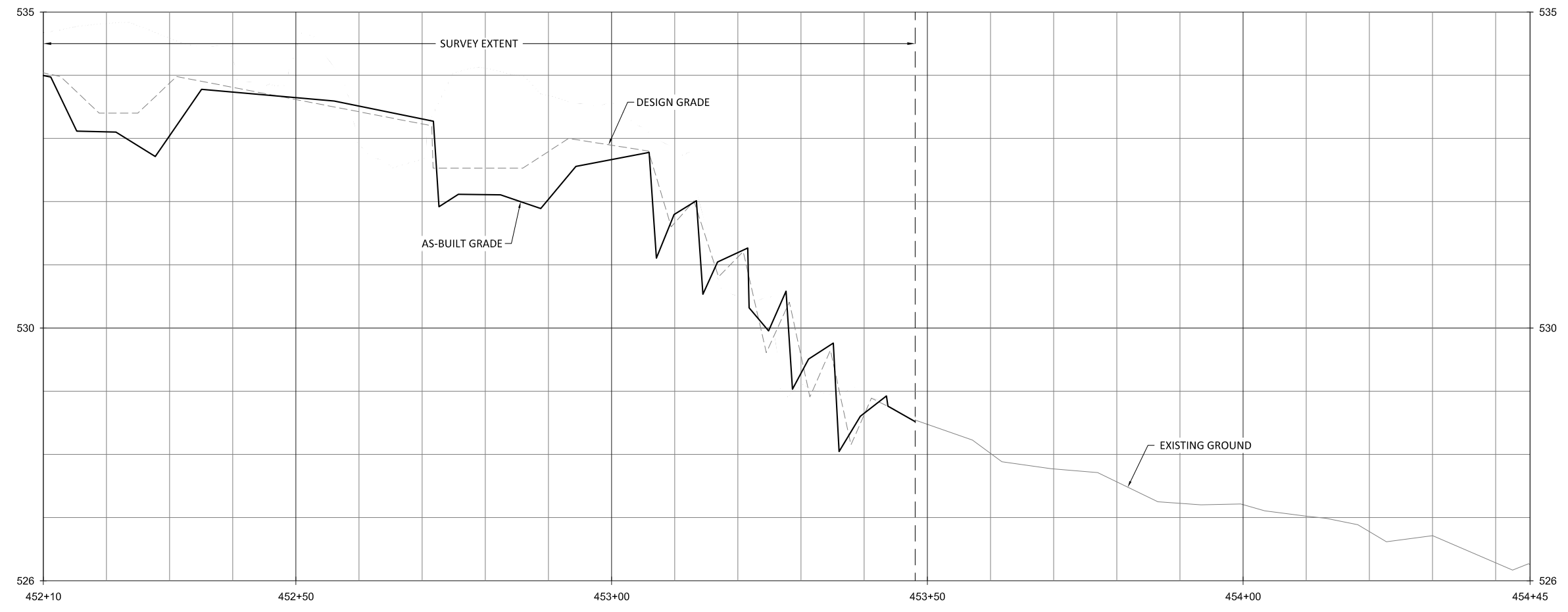
Buckwater Mitigation Site
Orange County, North Carolina
 T4B Reach 1
 Stream Plan and Profile

Revisions:

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAV
 Checked By: JTL

1.39

Sheet



NOTE:
 1. STA 452+75: LOG SILL WAS INSTALLED INSTEAD OF BOULDER SILL.

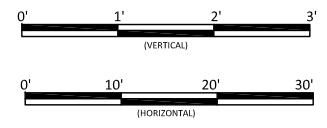
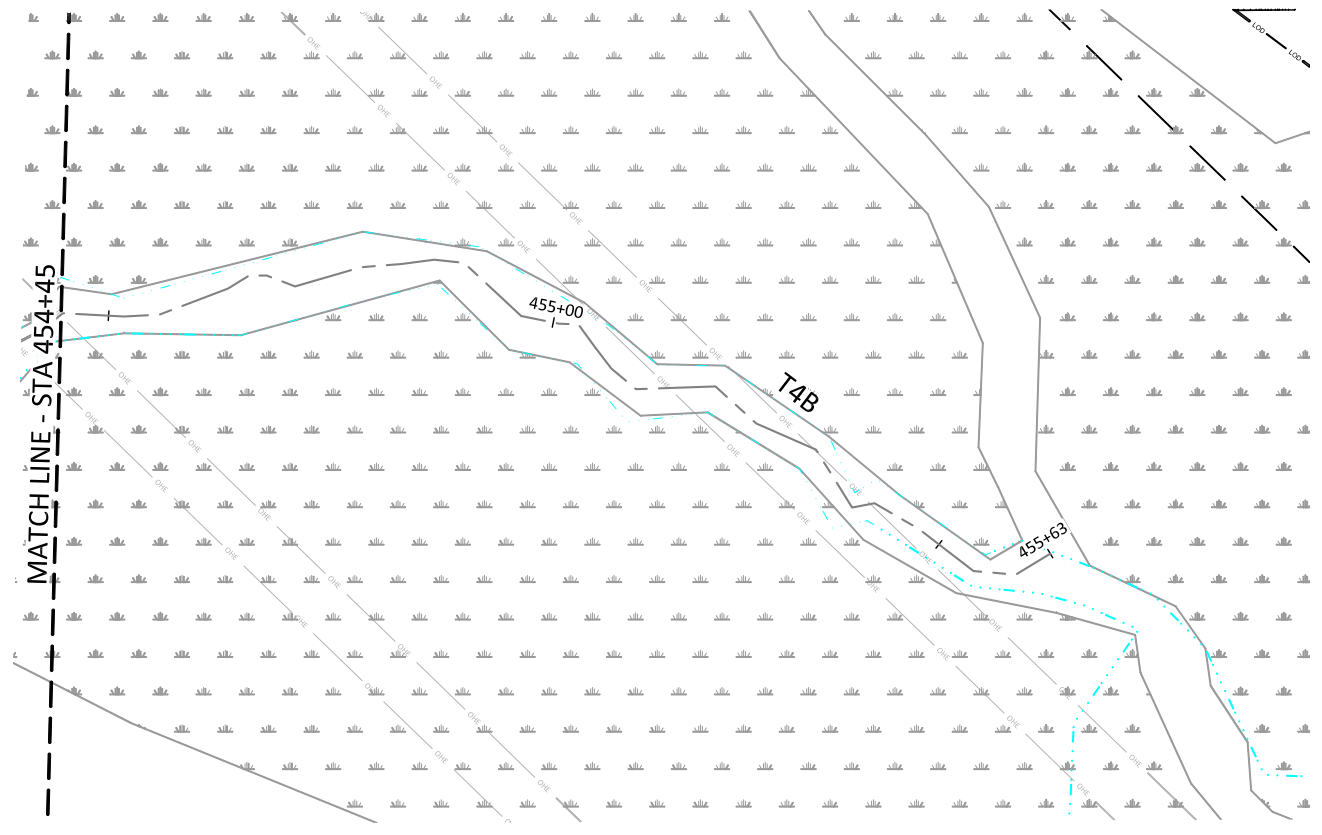


Buckwater Mitigation Site
Orange County, North Carolina
 T4B Reaches 1 & 2
 Stream Plan and Profile

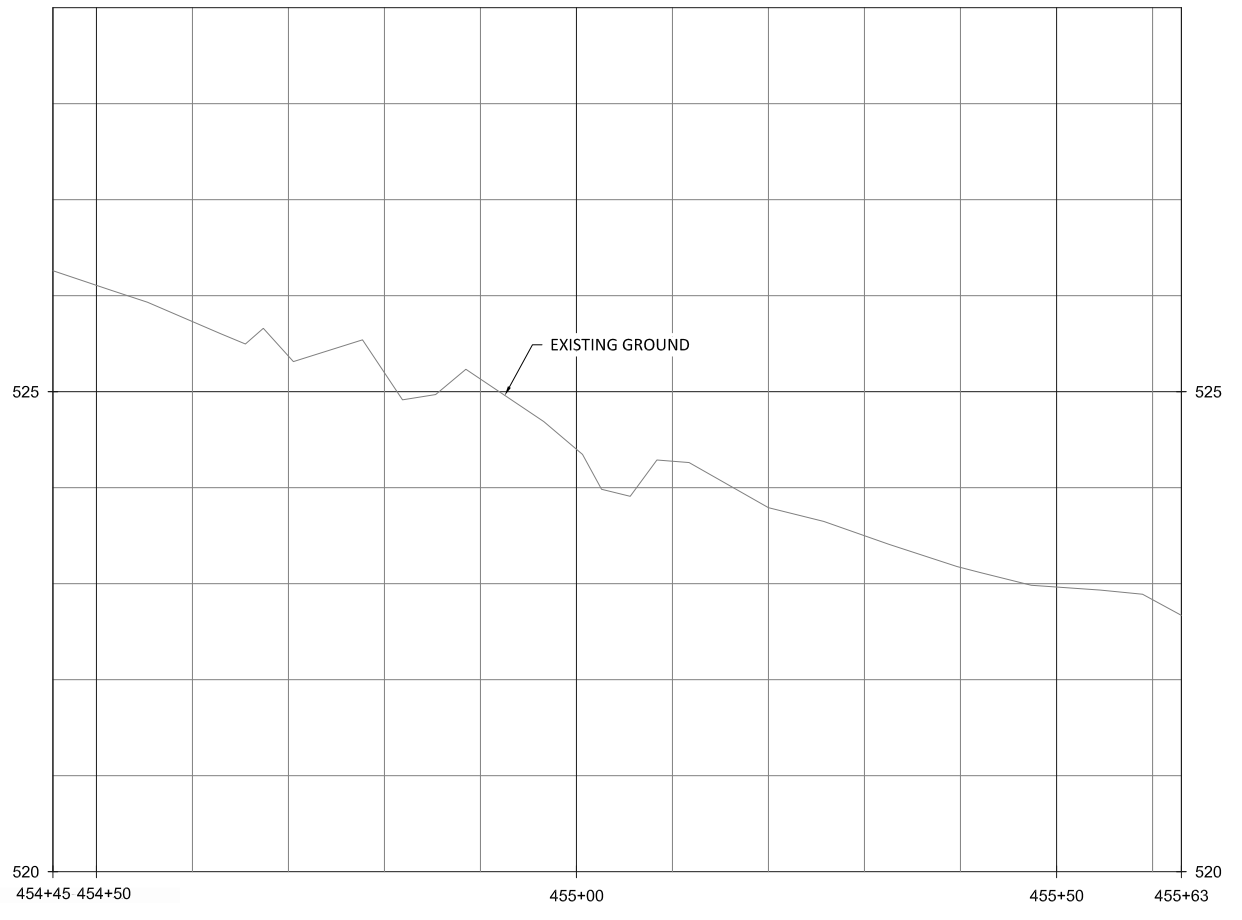
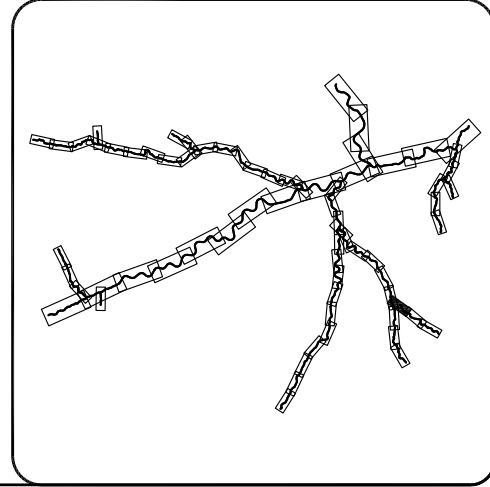
Revisions:

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

1.40



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Revisions:

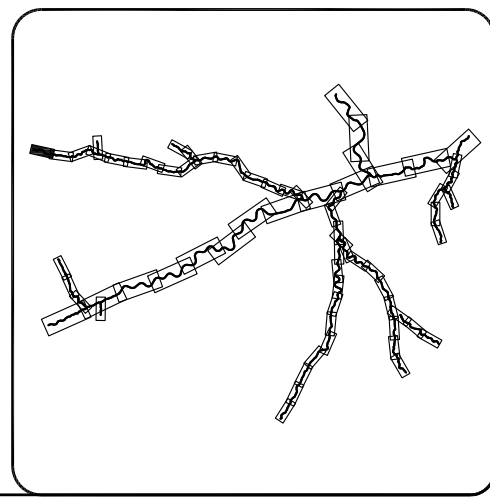
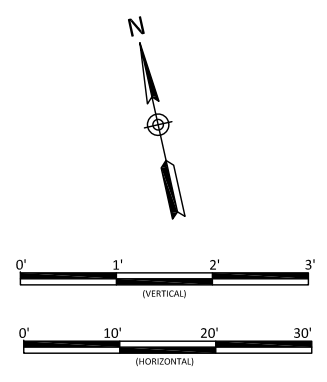
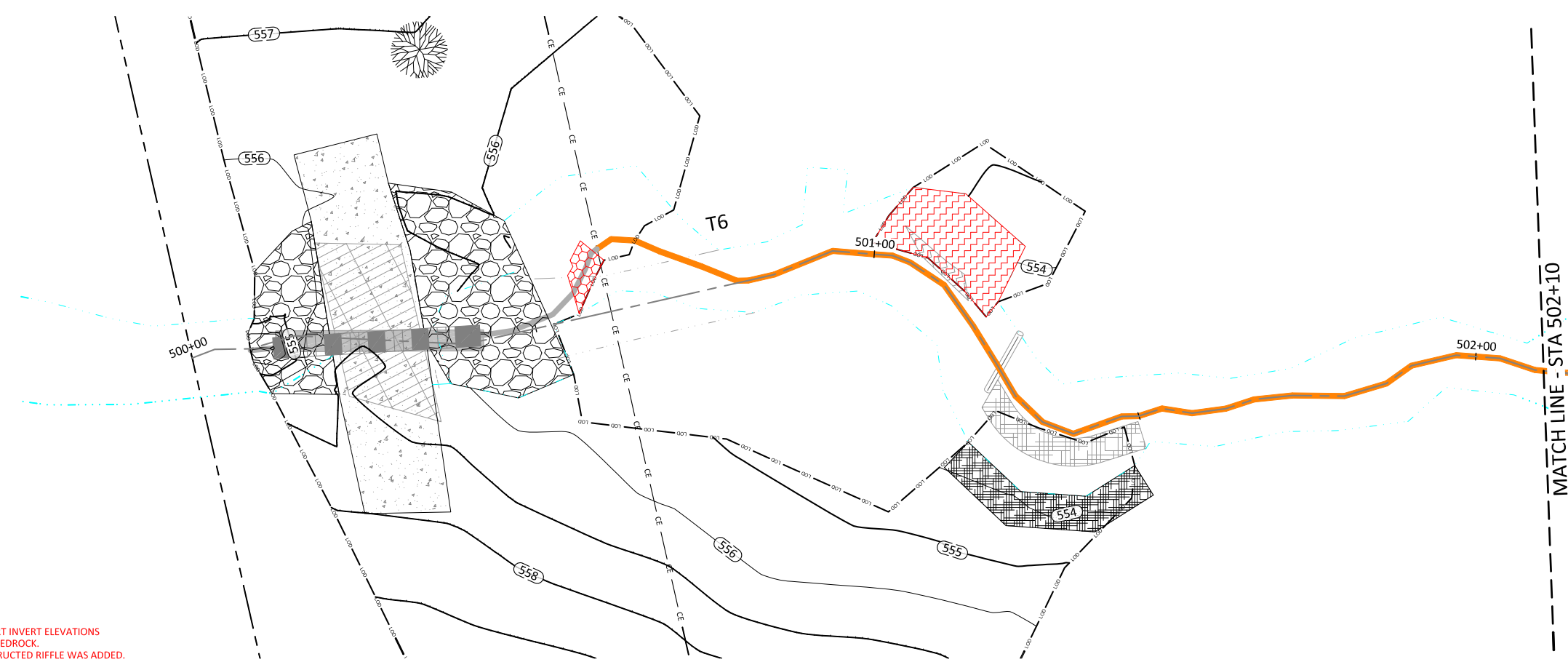
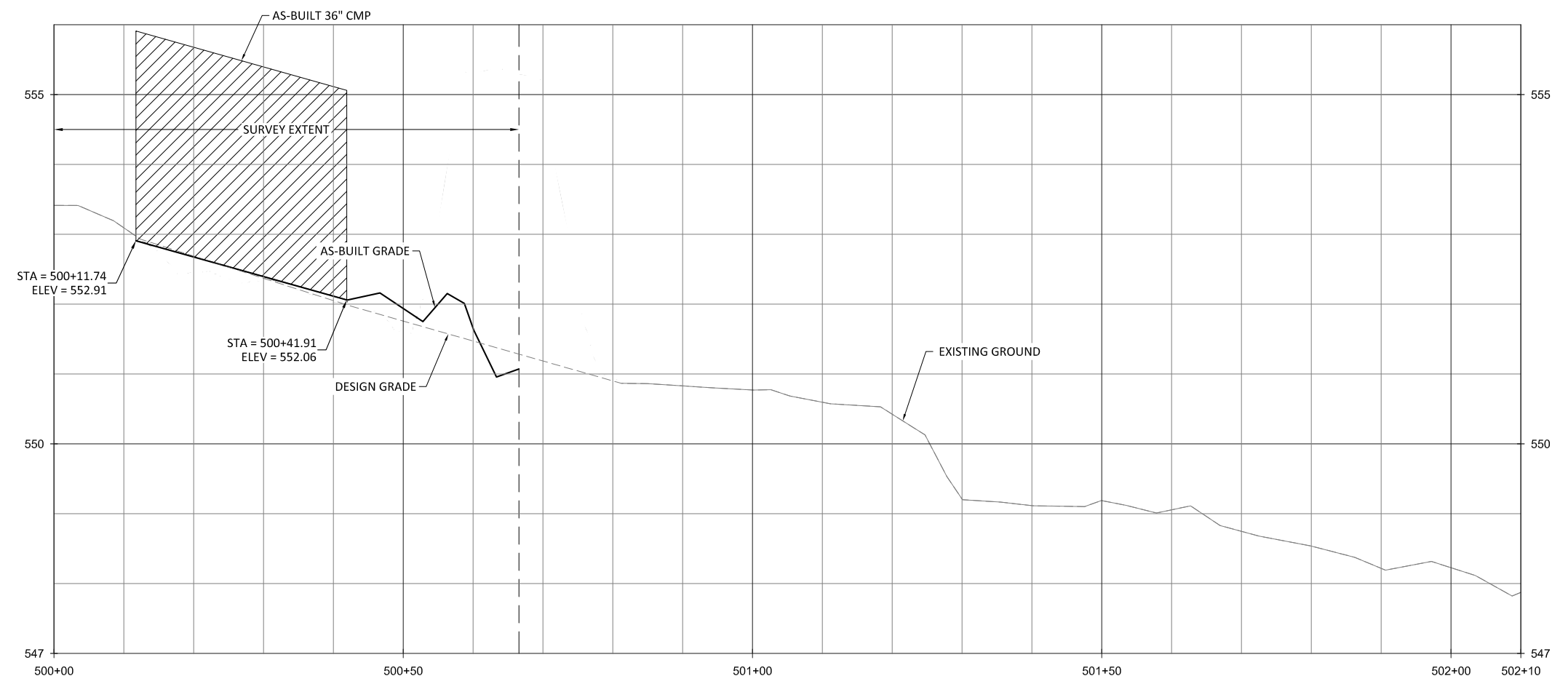
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Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.41

Sheet

Buckwater Mitigation Site
 Orange County, North Carolina
 T4B Reach 2
 Stream Plan and Profile





- NOTE:**
1. STA 500+27: CULVERT INVERT ELEVATIONS ADJUSTED DUE TO BEDROCK.
 2. STA 500+59: CONSTRUCTED RIFFLE WAS ADDED.
 3. STA 501+25: LOG SILL NOT INSTALLED DUE TO BEDROCK.



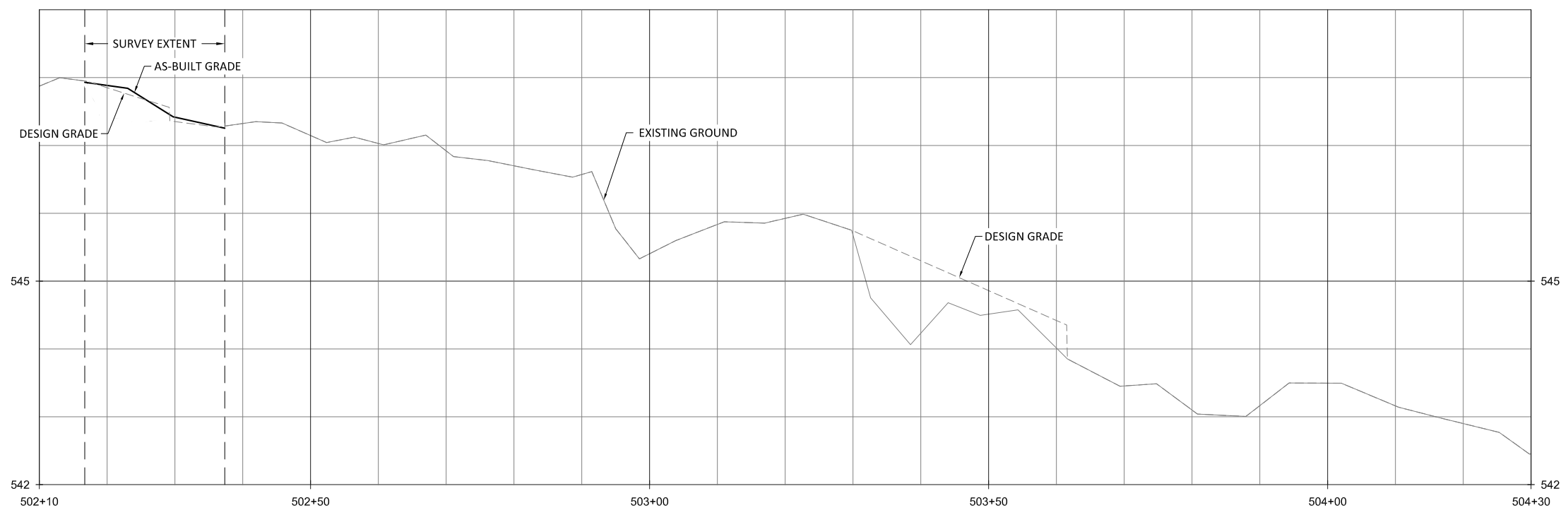
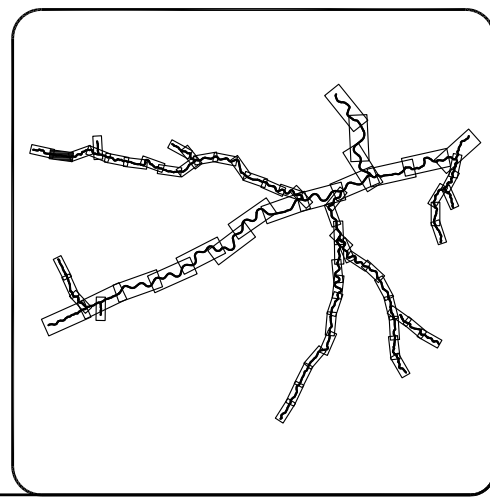
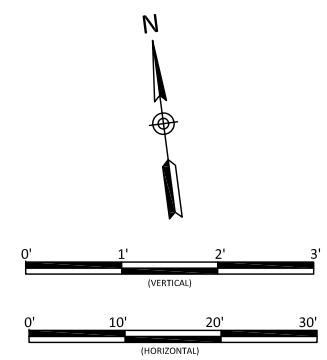
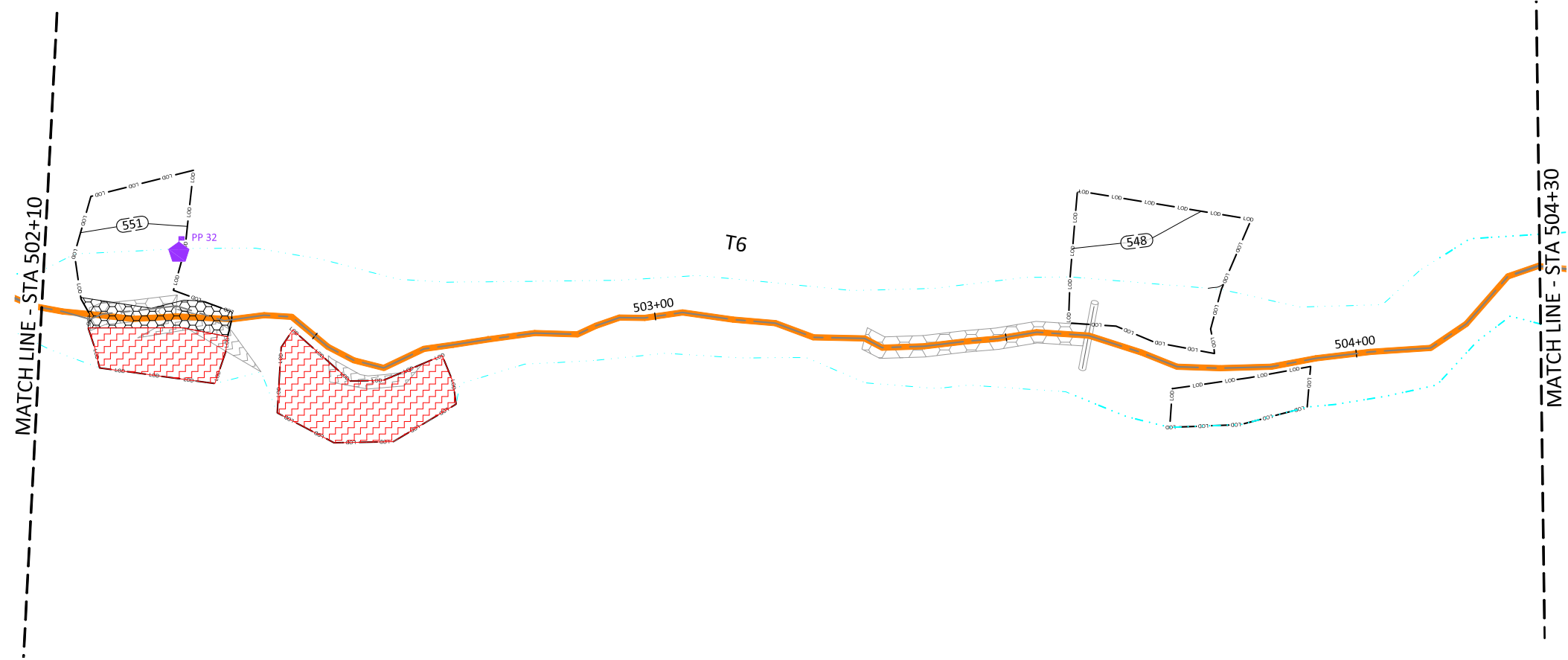
Buckwater Mitigation Site
Orange County, North Carolina
T6 Reach 1
Stream Plan and Profile

Revisions:

Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

1.42

September 12, 2019
 F:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\02157-As-Built-Profiles-4B and 4C.dwg



NOTE:
 1. STA 503+44: RIFFLE AND LOG SILL NOT INSTALLED DUE TO BEDROCK.

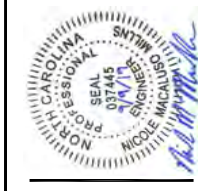
Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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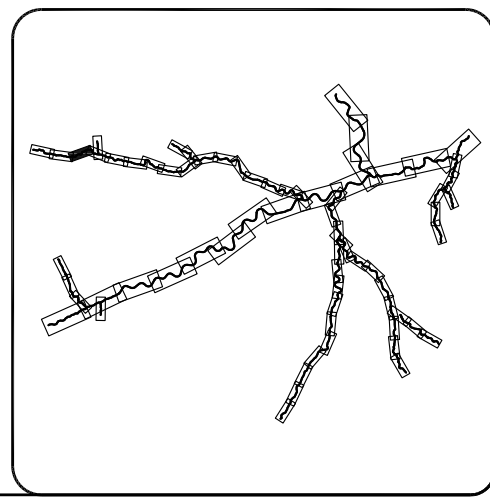
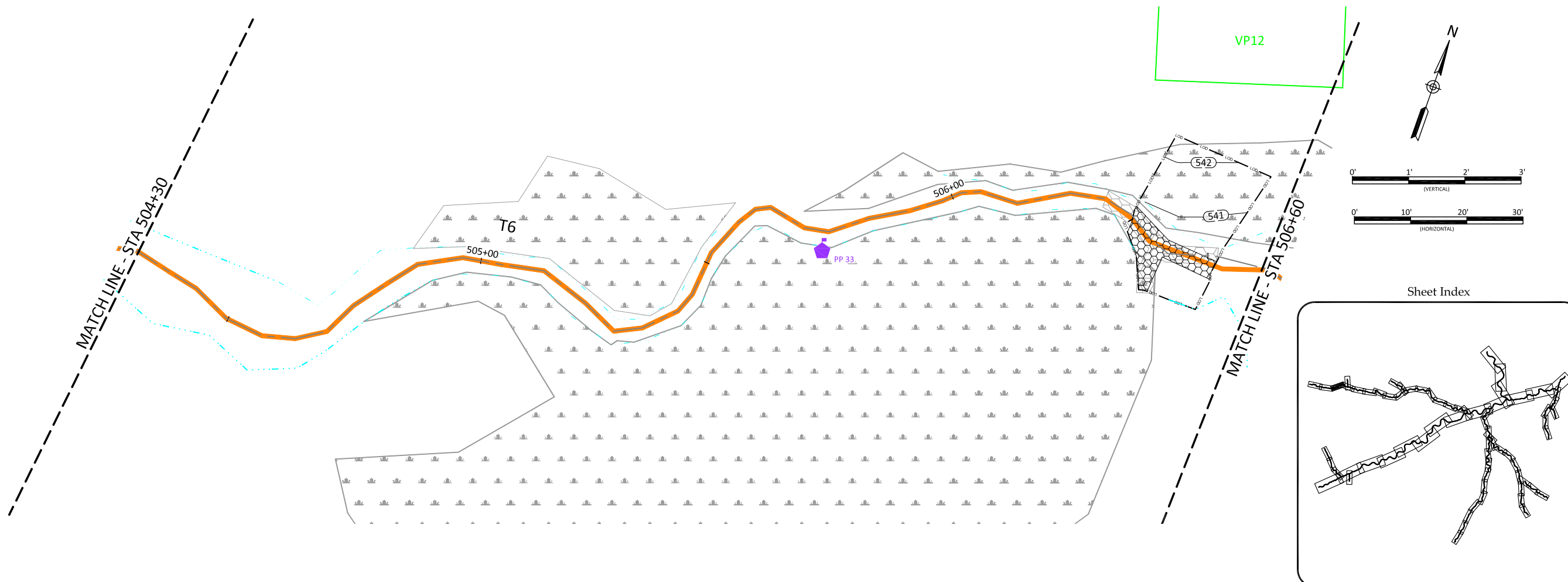
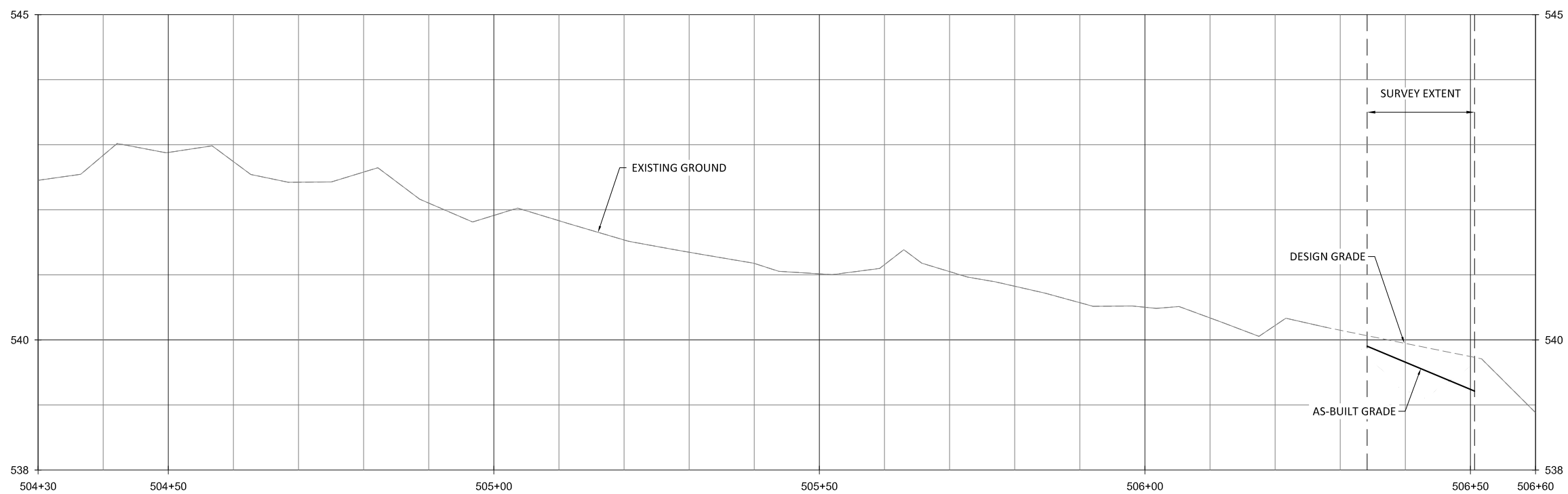
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Revisions:

Buckwater Mitigation Site
 Orange County, North Carolina
 T6 Reach 1
 Stream Plan and Profile



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Buckwater Mitigation Site
Orange County, North Carolina
T6 Reach 1
Stream Plan and Profile

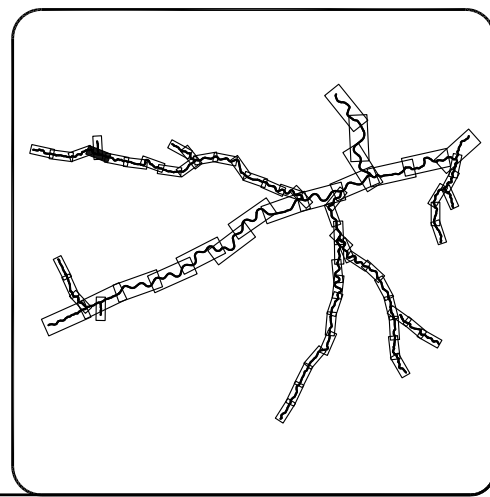
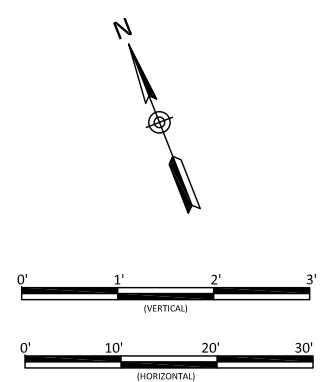
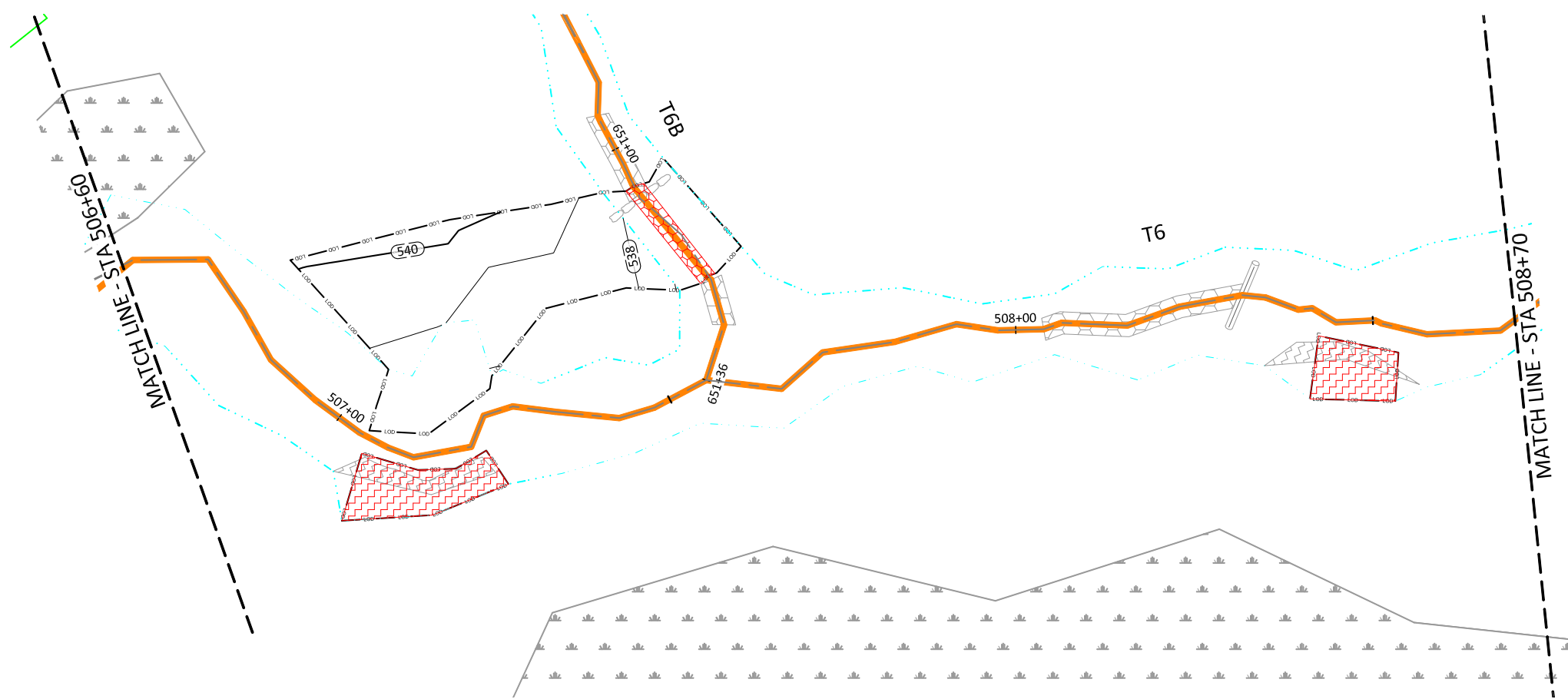
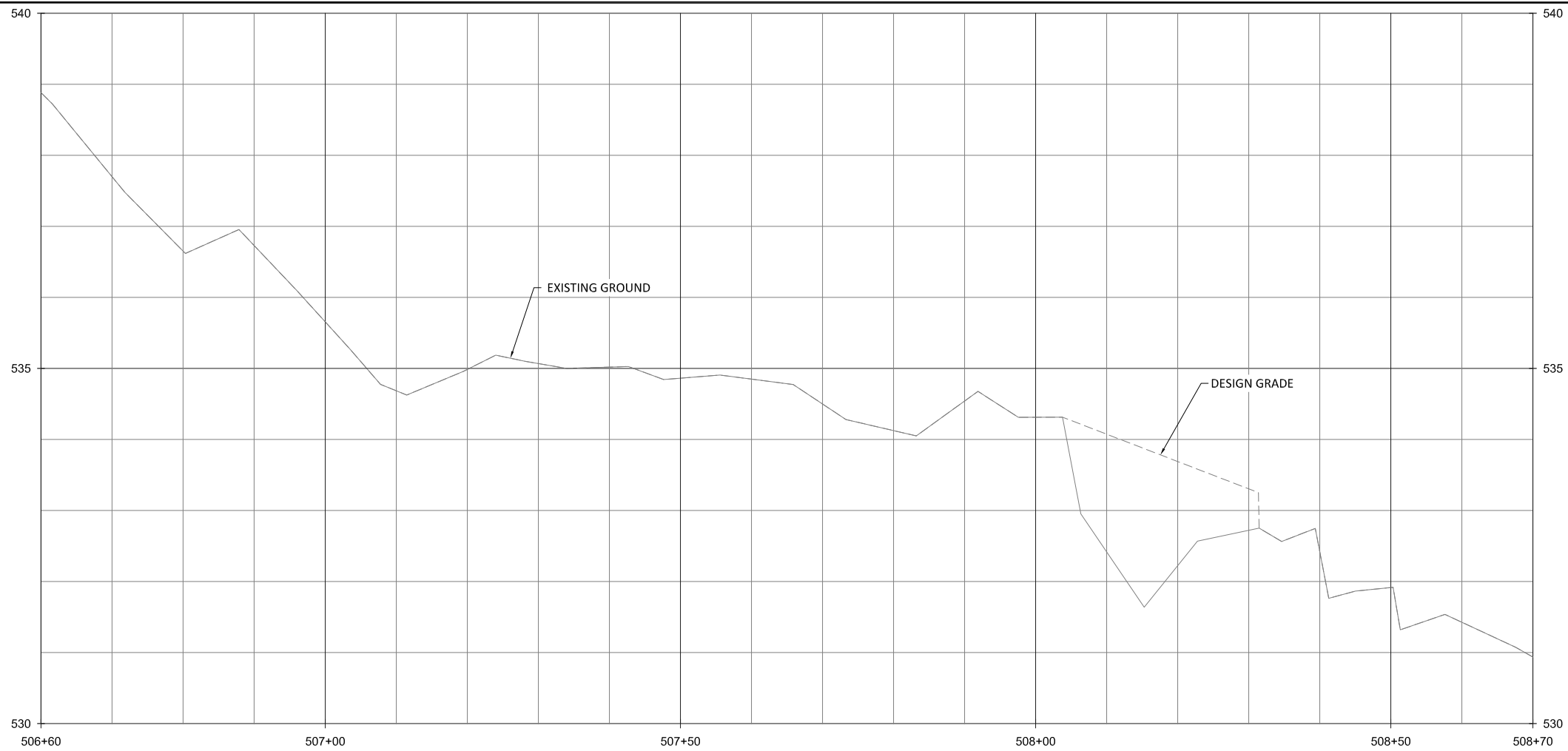
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Date	Job Number	Project Engineer	Drawn By	Checked By
07/01/2019	005-02157	NMM	CAW	JTL

1.44

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NOTE:
 1. STA 508+17: RIFFLE AND LOG SILL NOT INSTALLED DUE TO BEDROCK.

E:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\02157-As-Built-Profiles-L&P-and-T&S.dwg

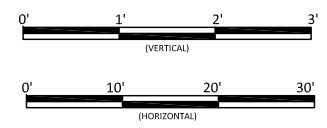
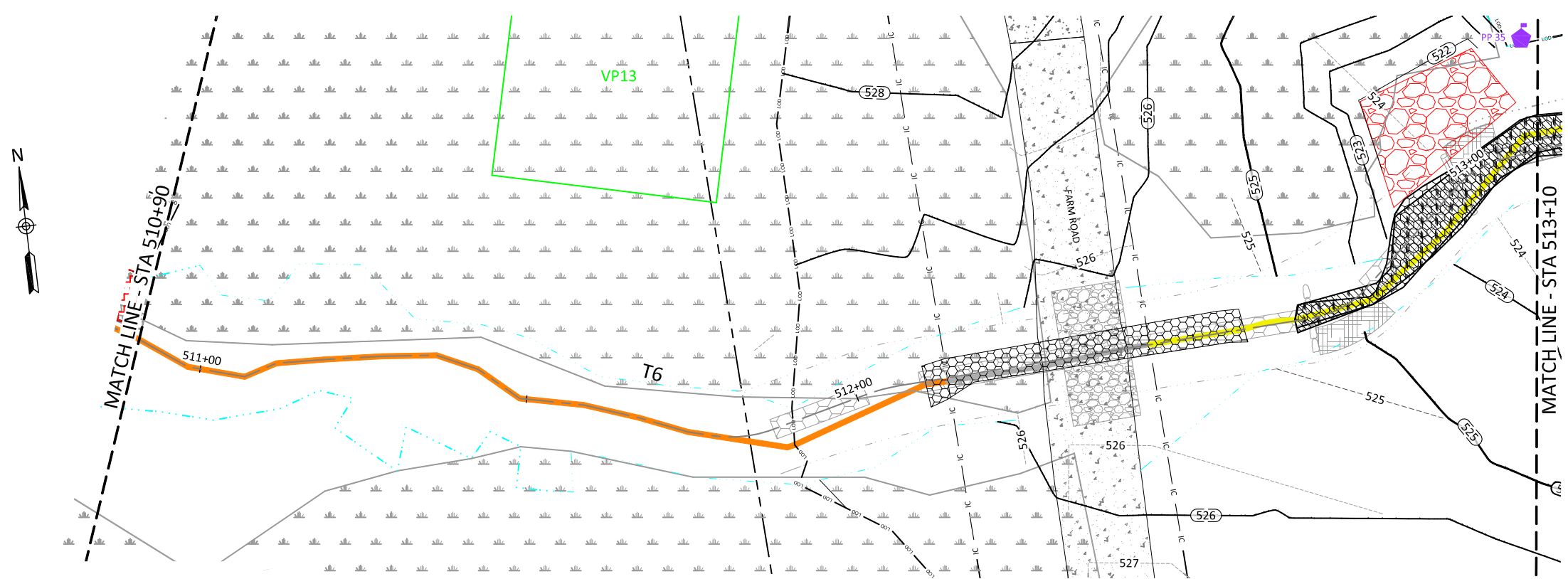
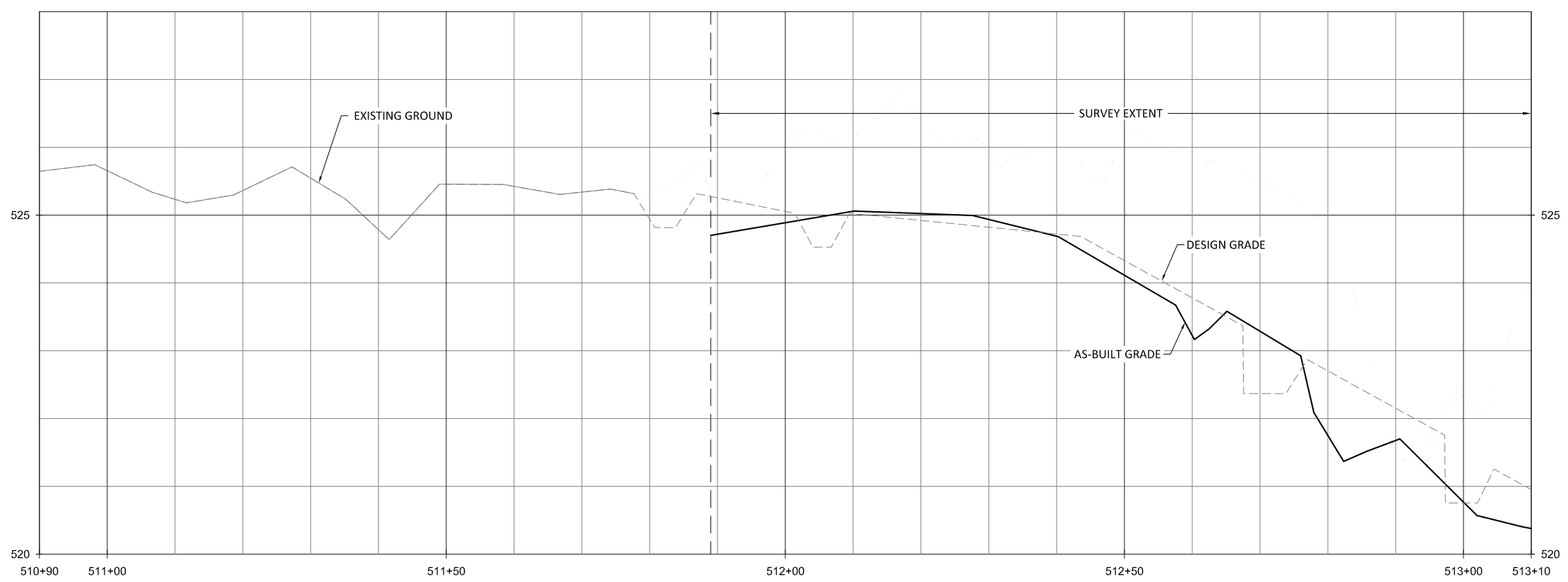


Buckwater Mitigation Site
Orange County, North Carolina
 T6 Reaches 1 & 2
 Stream Plan and Profile

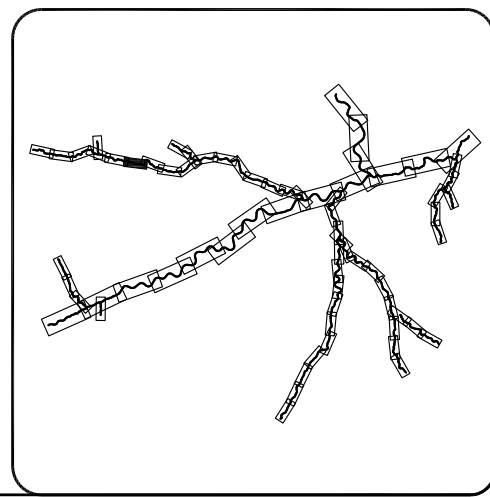
Revisions:

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

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- NOTE:**
1. STA 511+94: RIFLE WAS NOT INSTALLED DUE TO FIELD CONDITIONS.
 2. STA 512+72: BOULDER SILL AND BRUSH TOE WERE NOT ADDED DUE TO BEDROCK.
 3. STA 512+97: LOG SILL NOT ADDED DUE TO BEDROCK.
 4. STA 513+00: RIPRAP ADDED.

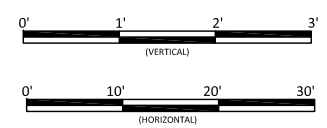
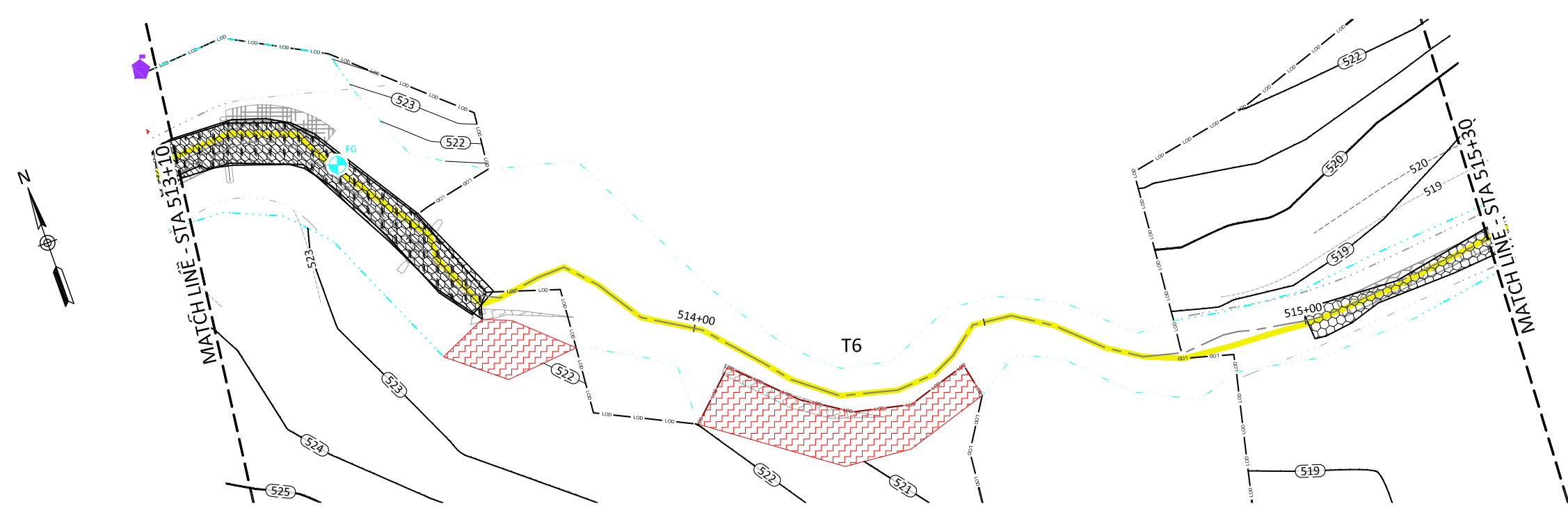
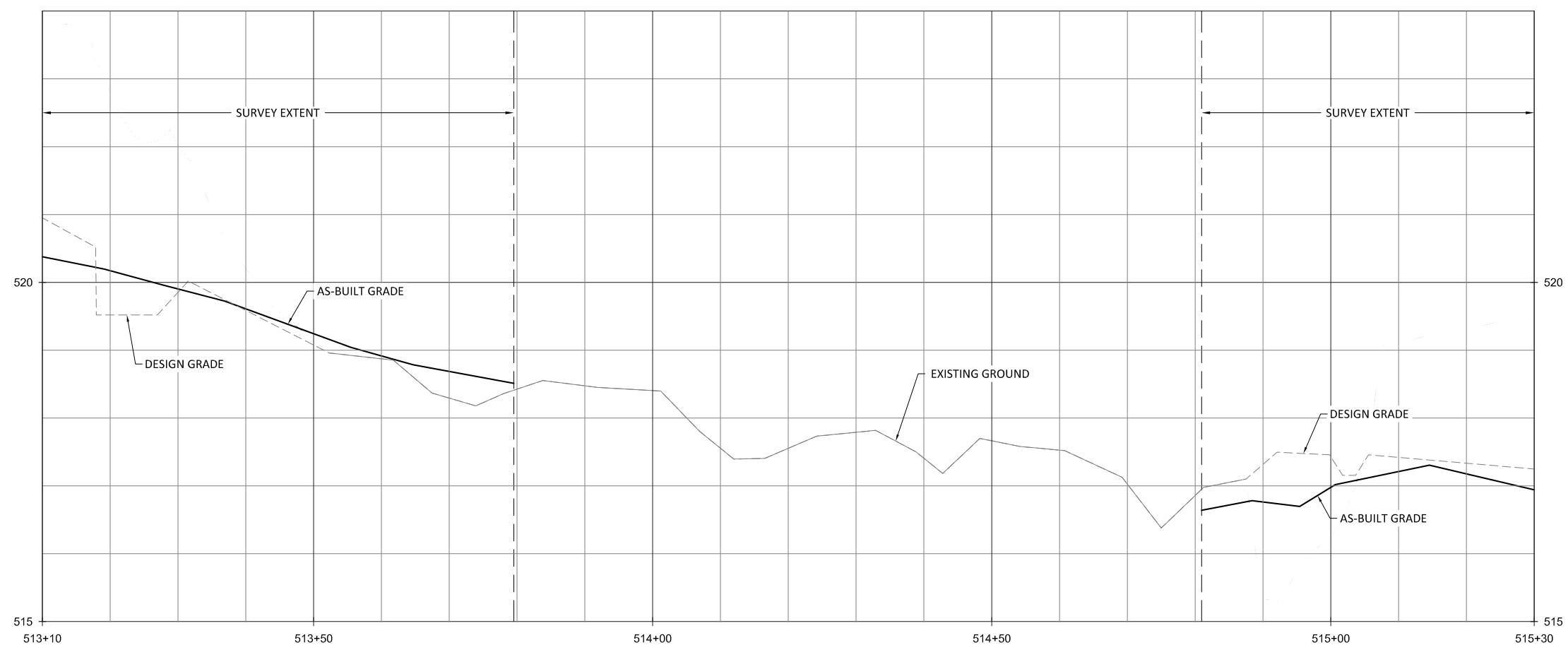


Buckwater Mitigation Site
Orange County, North Carolina
T6 Reaches 2 & 3
Stream Plan and Profile

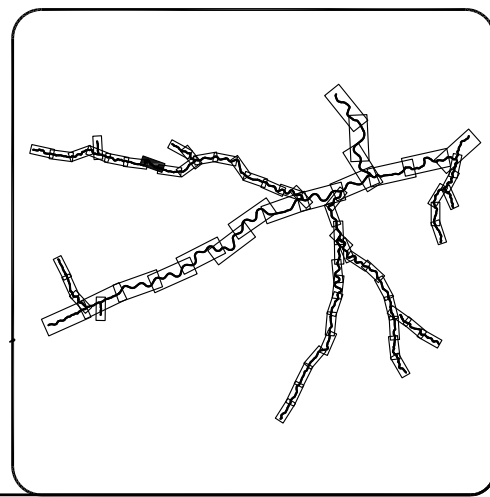
Revisions:

Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

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- NOTE:**
1. STA 513+18: LOG SILL NOT INSTALLED DUE TO BEDROCK.
 2. STA 513+26: BRUSH TOE NOT INSTALLED DUE TO BEDROCK.
 3. STA 513+52: BOULDER SILL NOT INSTALLED DUE TO BEDROCK.



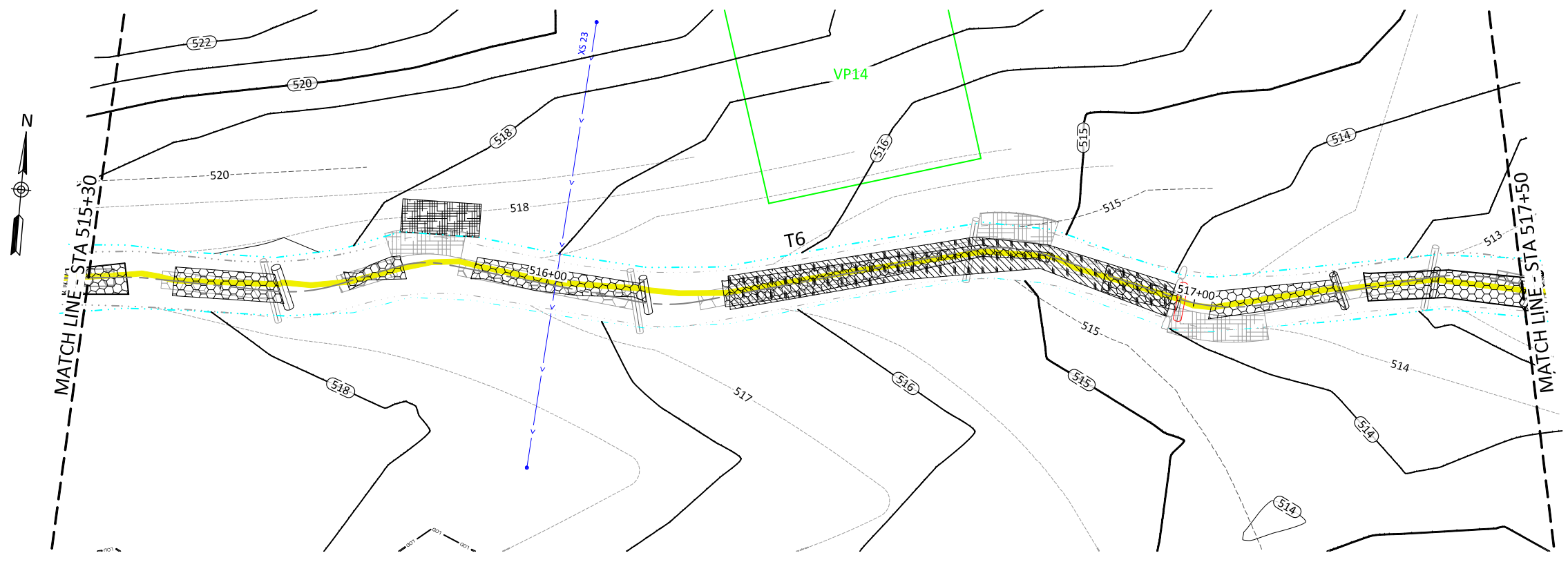
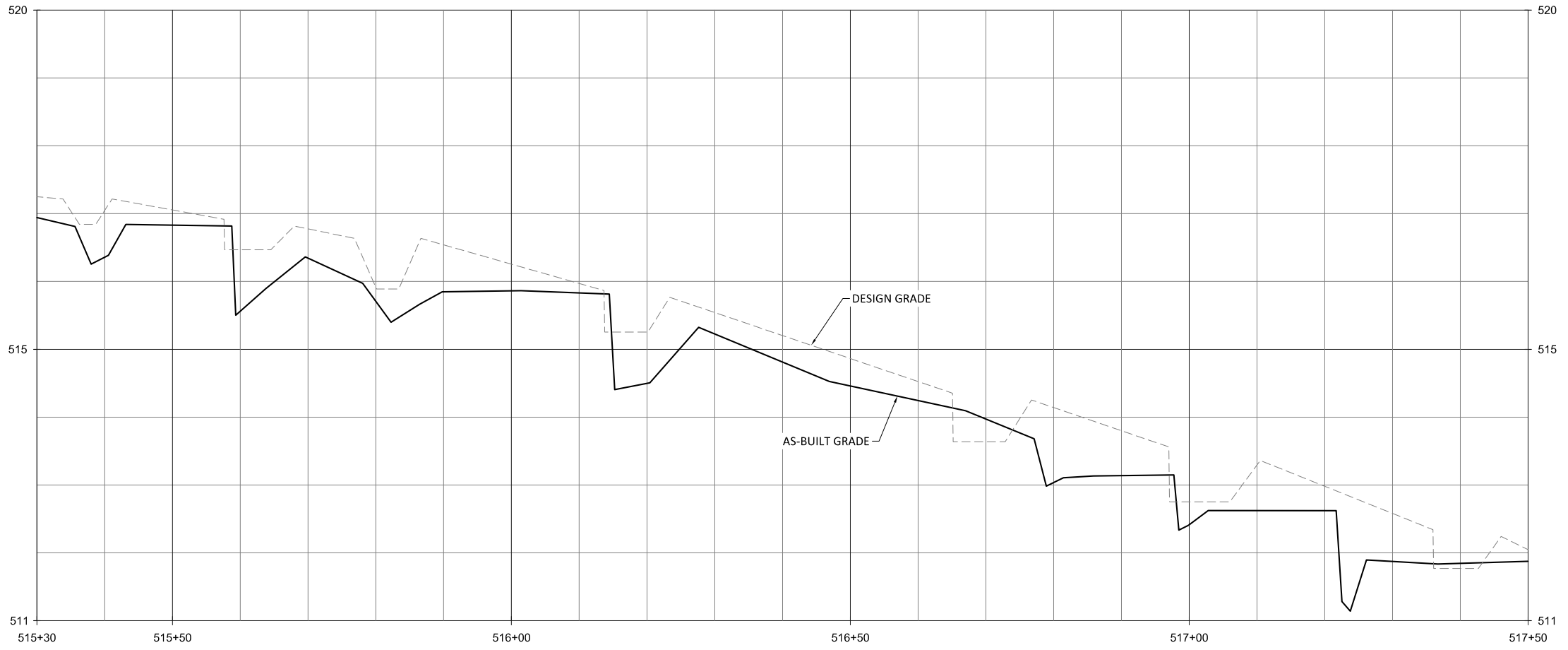
Buckwater Mitigation Site
Orange County, North Carolina
T6 Reach 3
Stream Plan and Profile

Revisions:

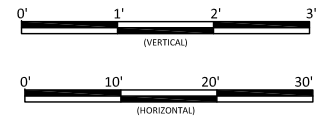
Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

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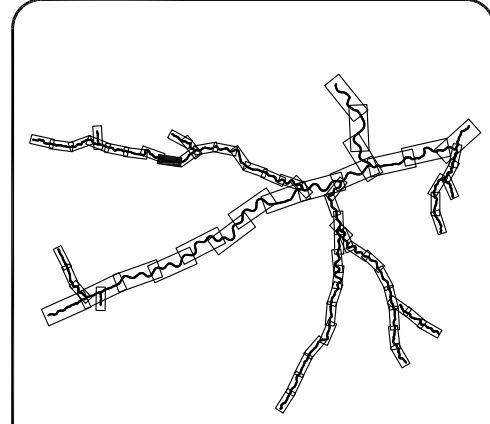
September 11, 2019
 F:\Projects\005-02157 Buckwater\Cadd\Plans\As-Built\Profiles\T6 and T6-15.dwg



- NOTE:**
1. STA 516+65: LOG SILL NOT INSTALLED DUE TO BEDROCK.
 2. STA 516+72: BRUSH TOE NOT INSTALLED DUE TO BEDROCK.
 3. STA 516+98: A LOG SILL WAS INSTALLED INSTEAD OF A BOULDER SILL.
 1. STA 517+04: BRUSH TOE NOT INSTALLED DUE TO BEDROCK.



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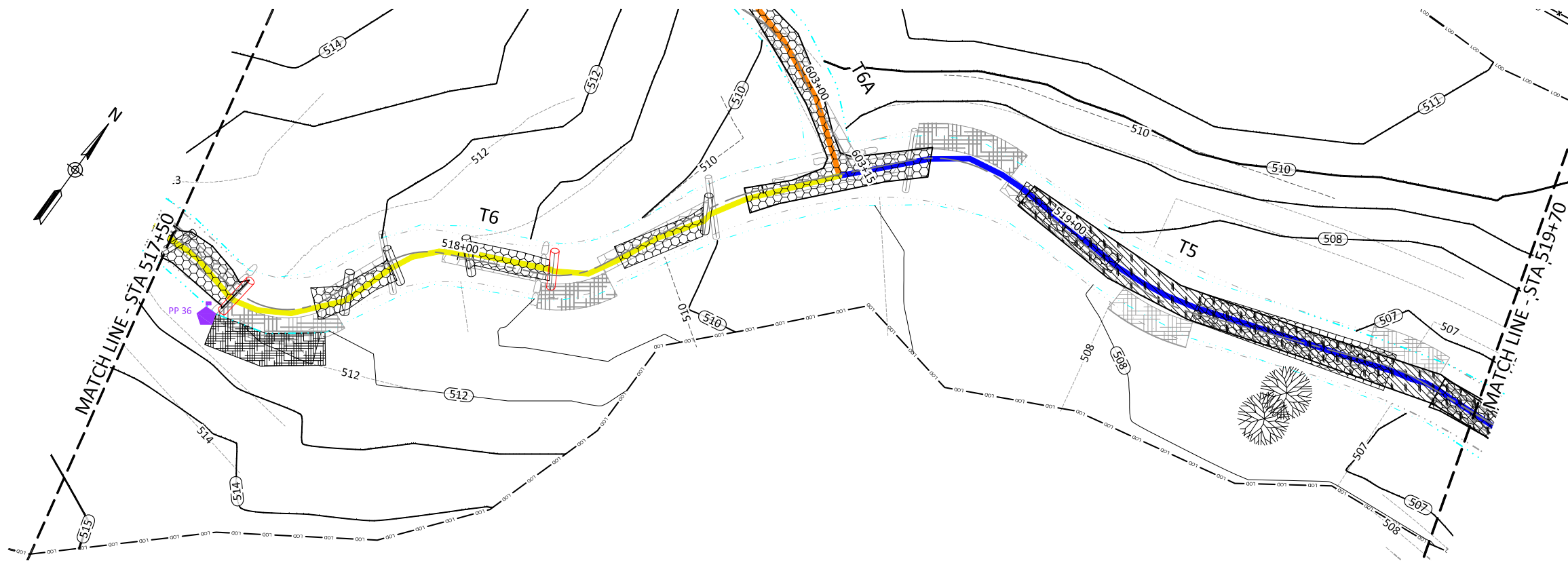
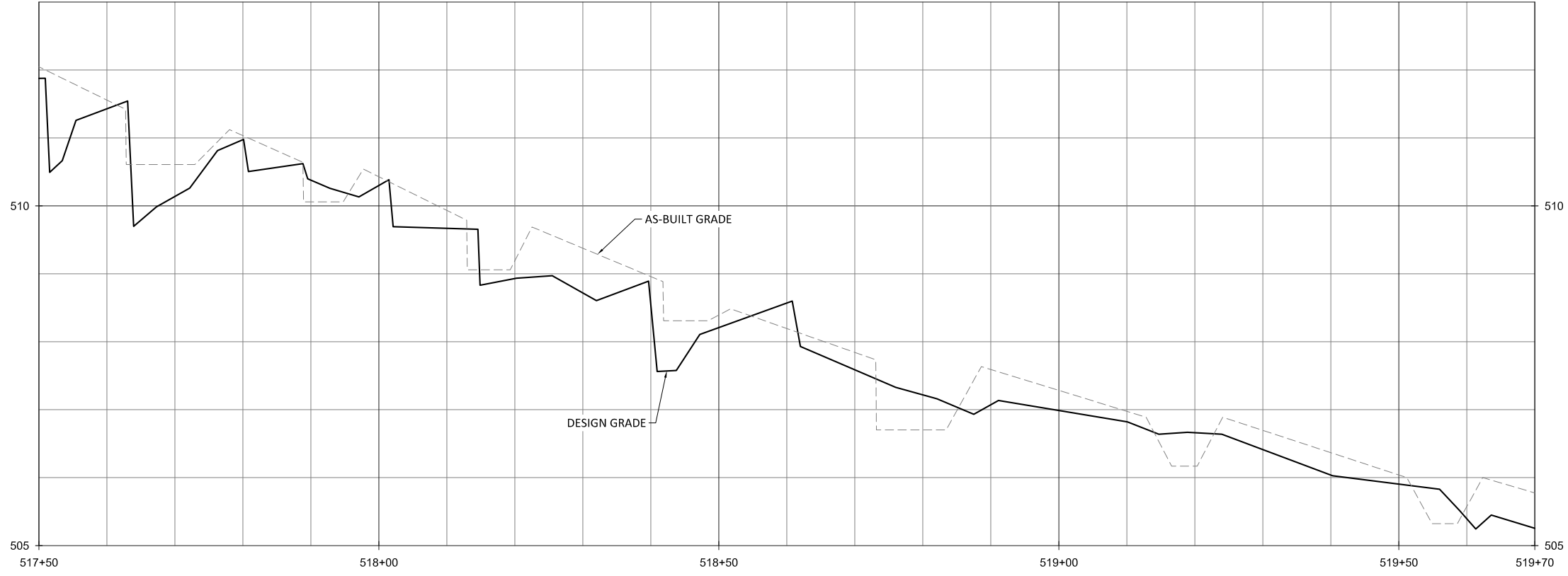
Buckwater Mitigation Site
 Orange County, North Carolina
 T6 Reach 3
 Stream Plan and Profile



Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL
Revisions:	

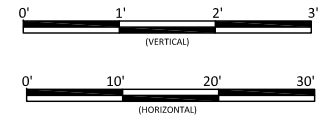
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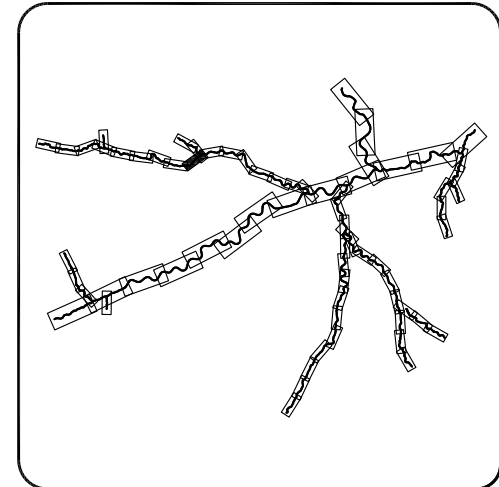


NOTE:

1. STA 517+73: A LOG SILL WAS INSTALLED INSTEAD OF A BOULDER SILL.
2. STA 518+15: A LOG SILL WAS INSTALLED INSTEAD OF A BOULDER SILL.
3. STA 518+18: BRUSH TOE WAS NOT INSTALLED DUE TO BEDROCK.
4. STA 518+73: LOG SILL WAS NOT INSTALLED DUE TO BEDROCK.
5. STA 518+82: BRUSH TOE WAS NOT INSTALLED DUE TO BEDROCK.
6. STA 519+18: BRUSH TOE WAS NOT INSTALLED DUE TO BEDROCK.
7. STA 519+57: BRUSH TOE WAS NOT INSTALLED DUE TO BEDROCK.



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Revisions:

No.	Date	Description

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

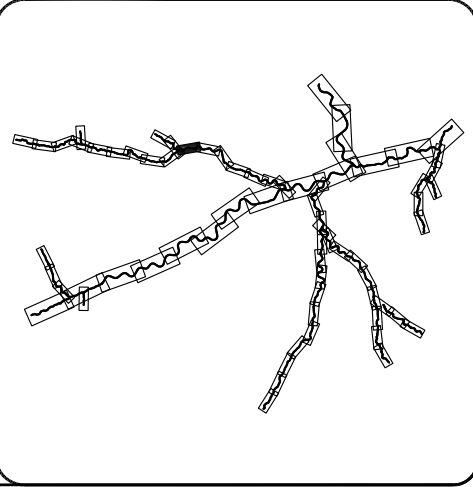
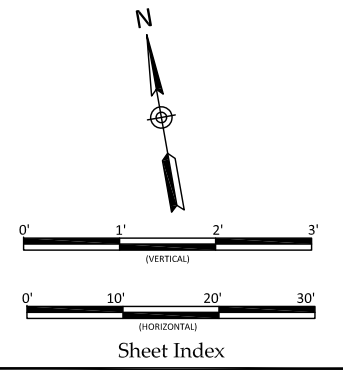
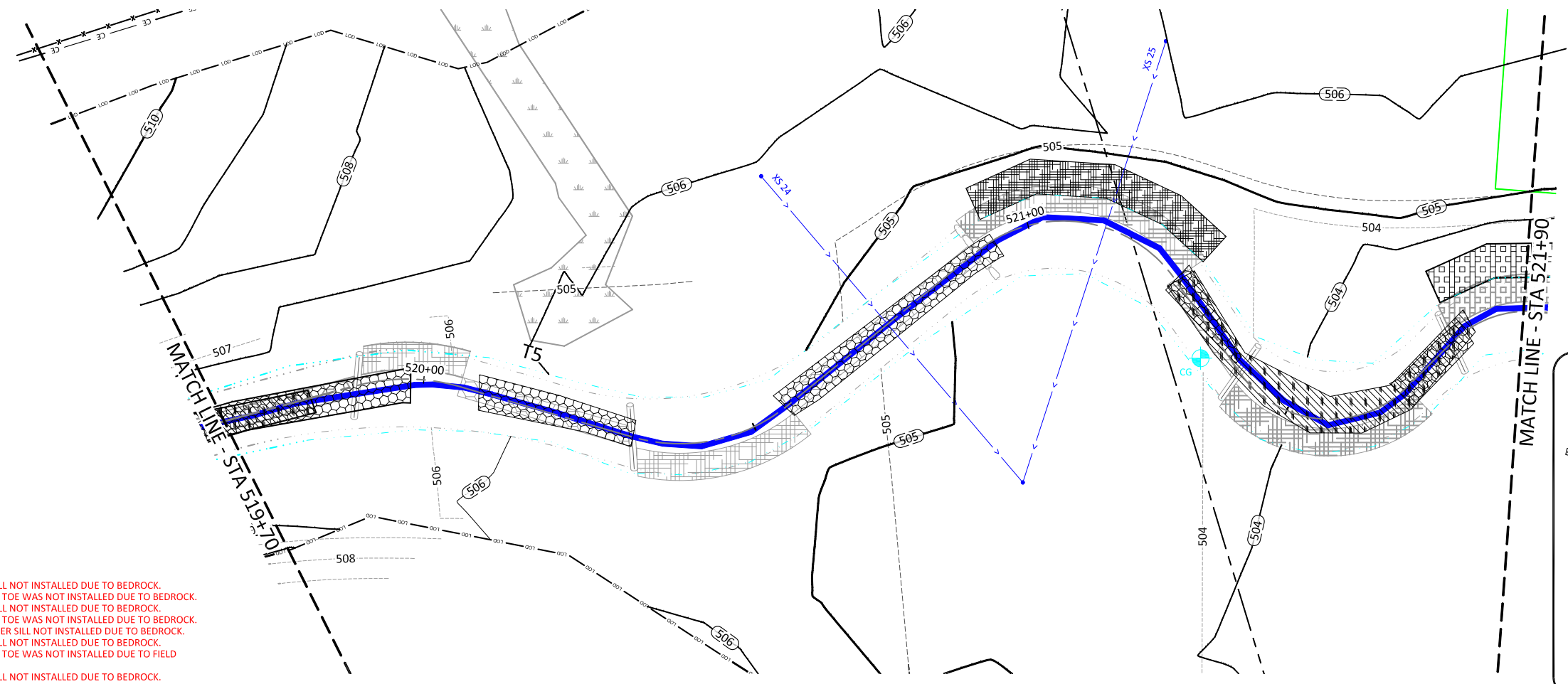
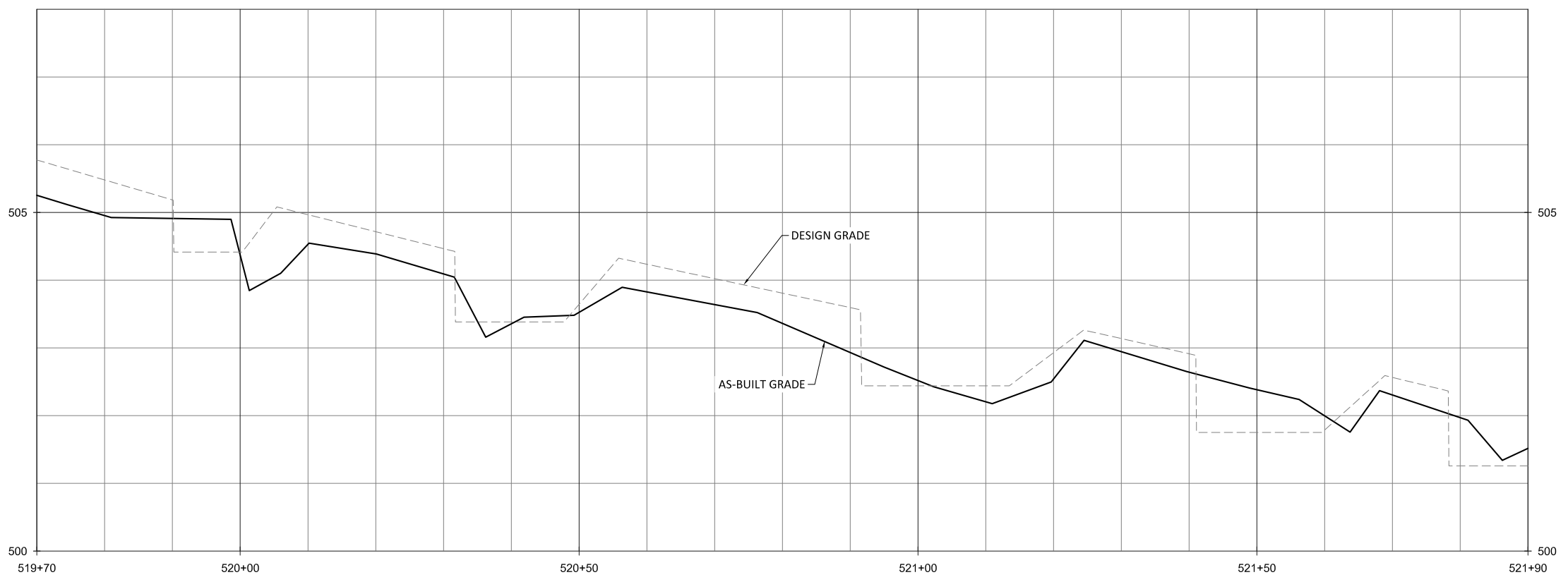
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Sheet

Buckwater Mitigation Site
Orange County, North Carolina

T6 Reach 3 & T5
Stream Plan and Profile





- NOTE:**
1. STA 519+90: LOG SILL NOT INSTALLED DUE TO BEDROCK.
 2. STA 519+99: BRUSH TOE WAS NOT INSTALLED DUE TO BEDROCK.
 3. STA 520+32: LOG SILL NOT INSTALLED DUE TO BEDROCK.
 4. STA 520+44: BRUSH TOE WAS NOT INSTALLED DUE TO BEDROCK.
 5. STA 520+92: BOULDER SILL NOT INSTALLED DUE TO BEDROCK.
 6. STA 521+41: LOG SILL NOT INSTALLED DUE TO BEDROCK.
 7. STA 521+56: BRUSH TOE WAS NOT INSTALLED DUE TO FIELD CONDITIONS.
 8. STA 521+78: LOG SILL NOT INSTALLED DUE TO BEDROCK.



Buckwater Mitigation Site
Orange County, North Carolina
T5
Stream Plan and Profile

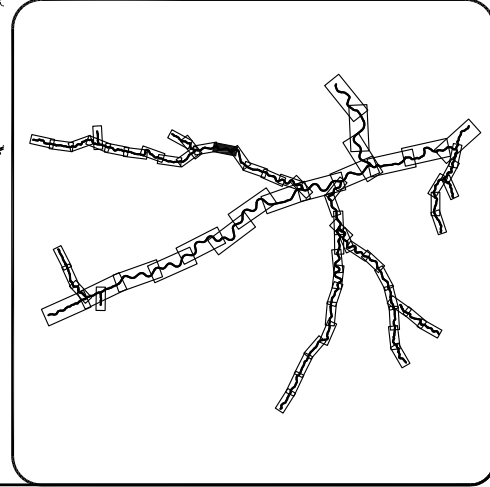
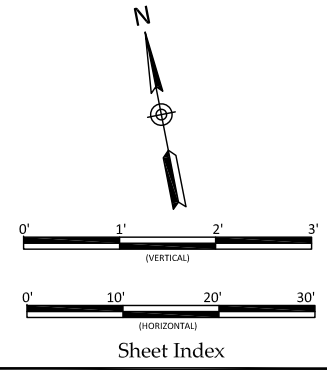
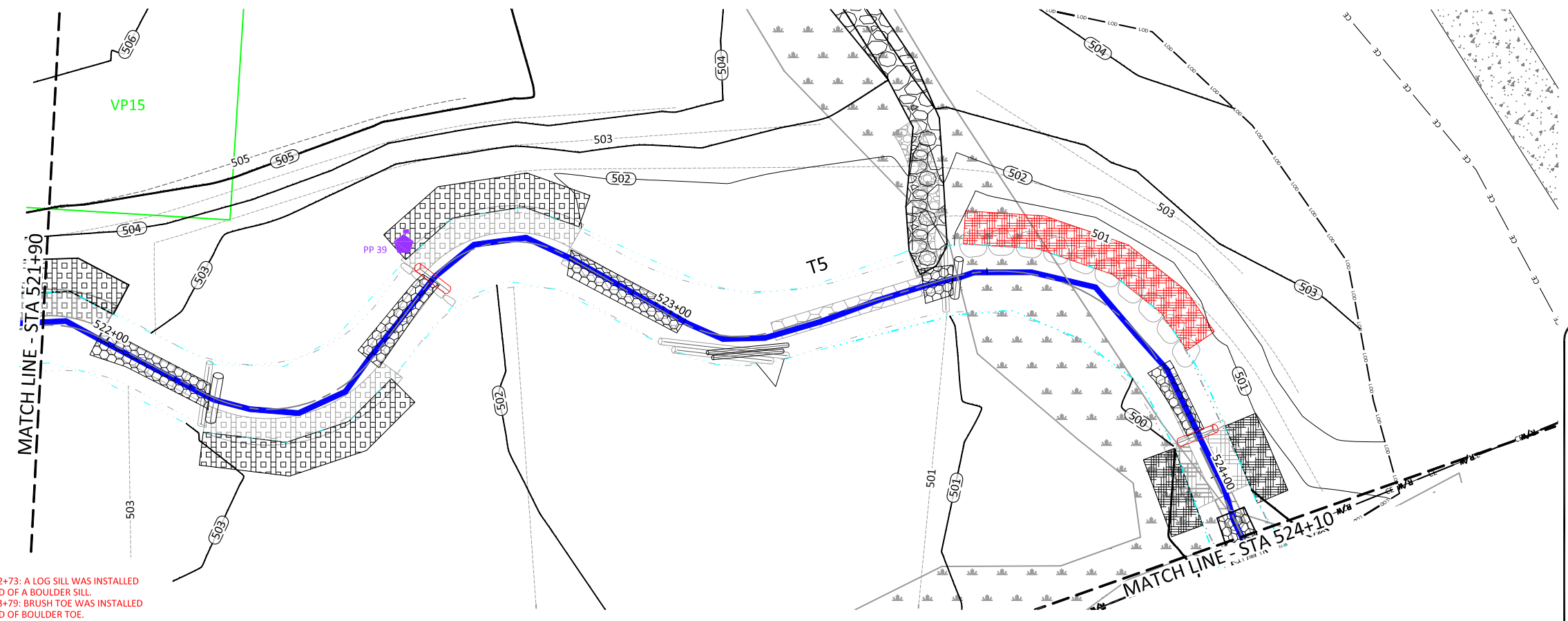
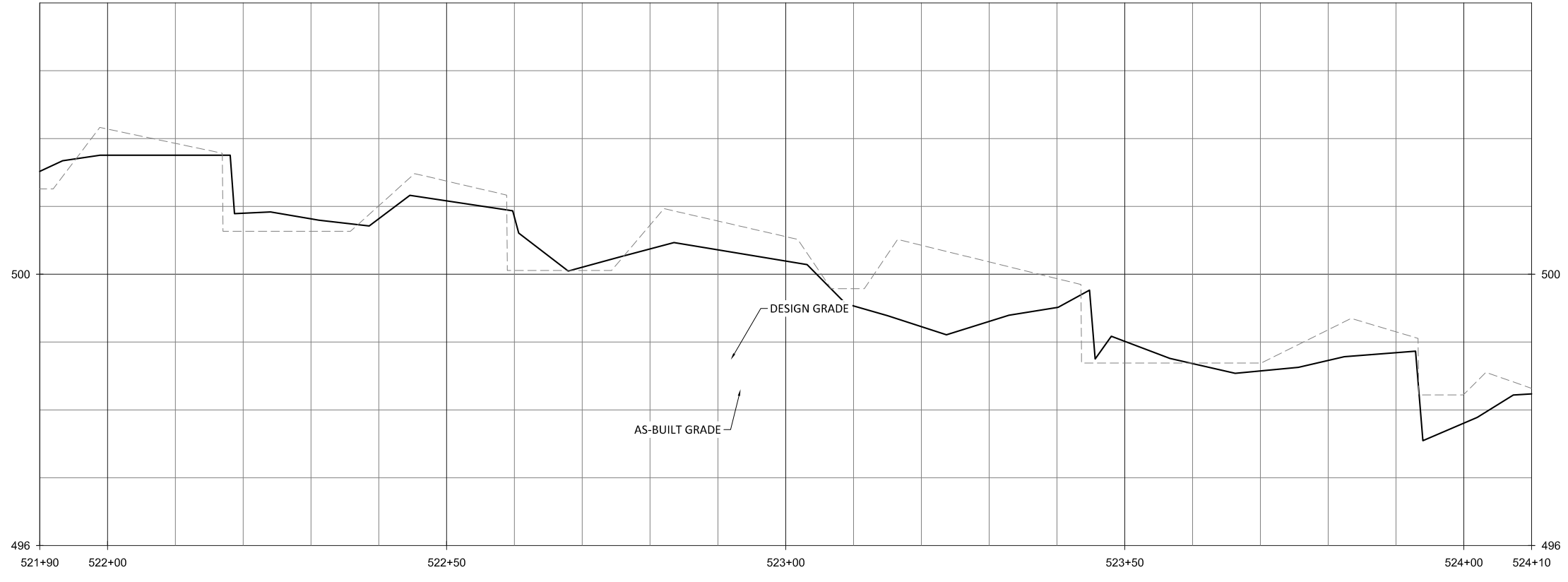
Revisions:	

Date:	07/01/2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.51

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September 11, 2019
 E:\Projects\005-02157 Buckwater Creek\1 Plans\As-Built\02157 As-Built Profiles 4B and T5.dwg



- NOTE:**
1. STA 522+73: A LOG SILL WAS INSTALLED INSTEAD OF A BOULDER SILL.
 2. STA 523+79: BRUSH TOE WAS INSTALLED INSTEAD OF BOULDER TOE.
 3. STA 524+08: A LOG SILL WAS INSTALLED INSTEAD OF A BOULDER SILL.

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Buckwater Mitigation Site
 Orange County, North Carolina

T5
 Stream Plan and Profile

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

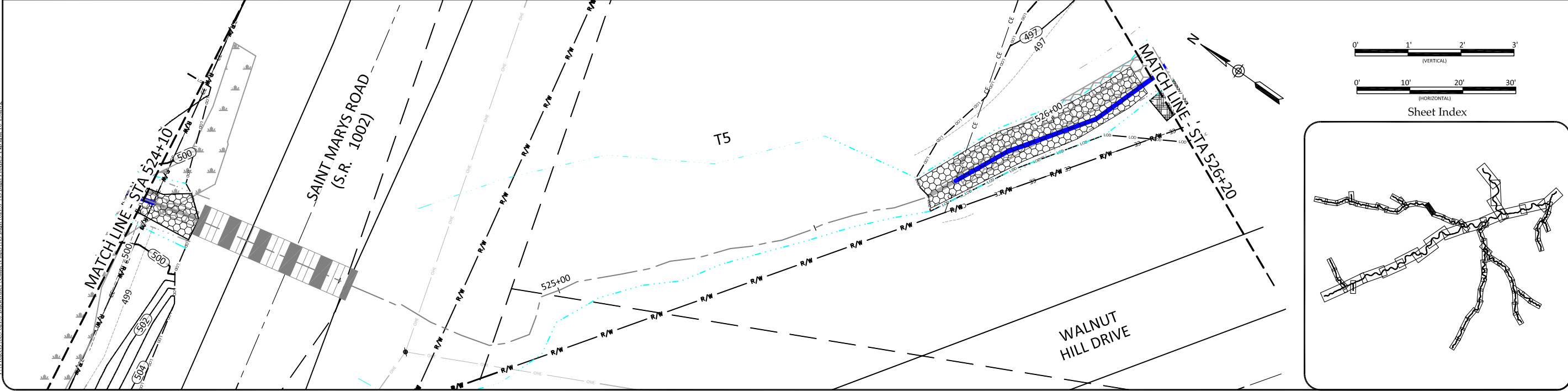
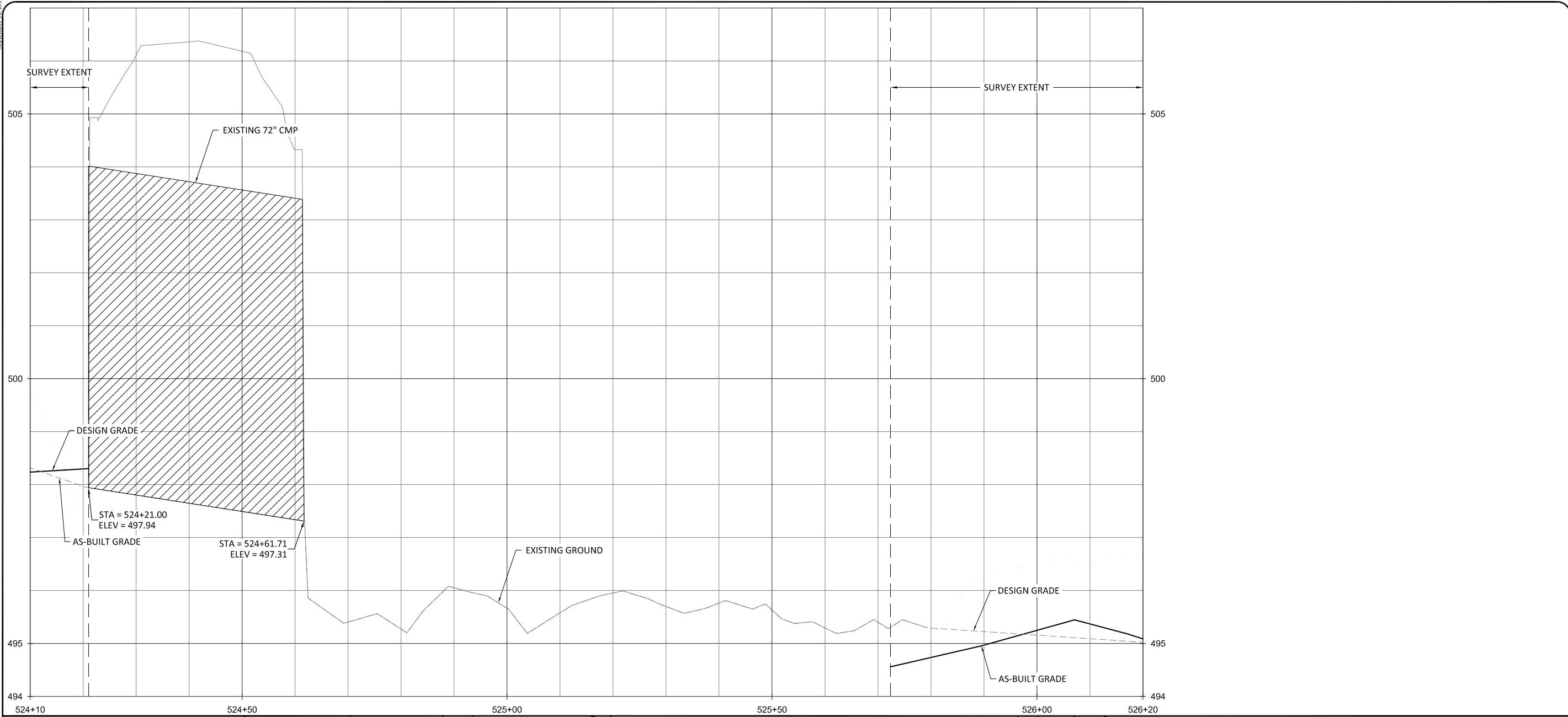
Revisions:

No.	Description

1.52

Sheet

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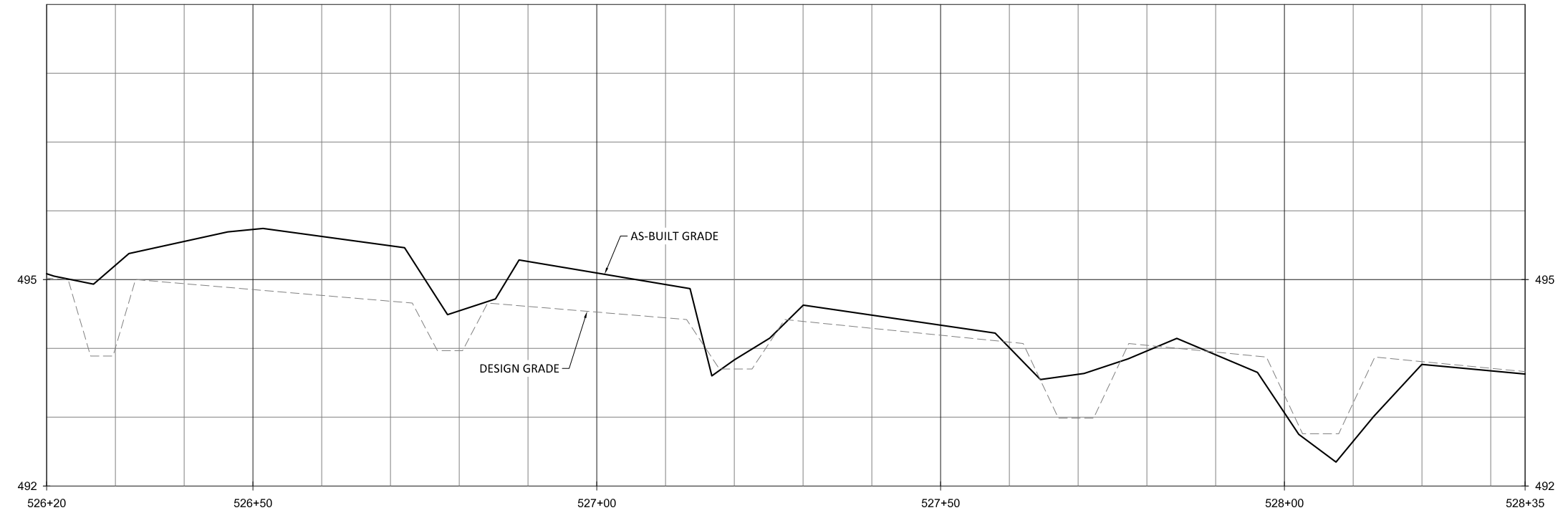
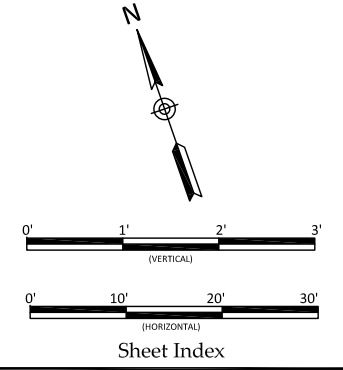
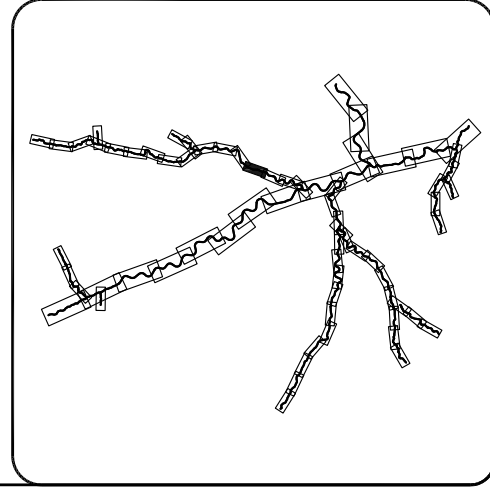
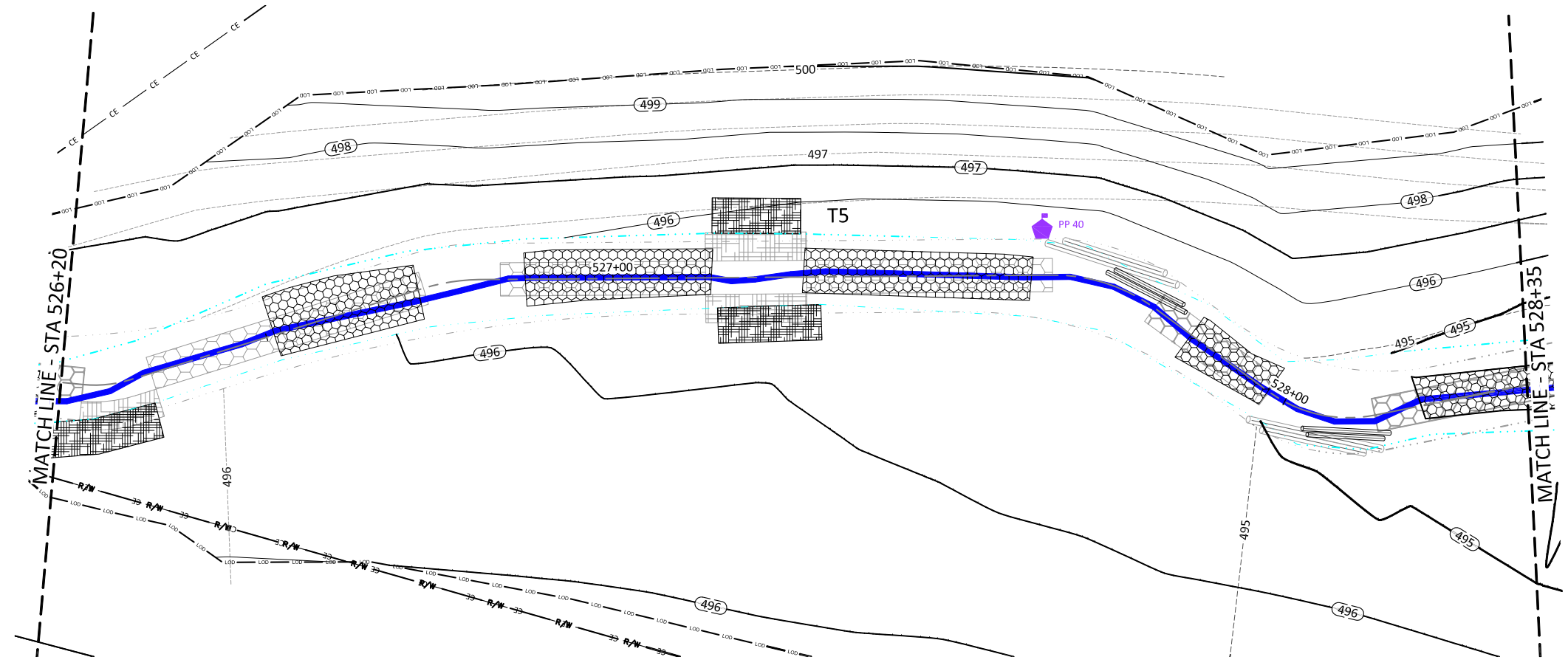
Buckwater Mitigation Site
Orange County, North Carolina

T5
Stream Plan and Profile

Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

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1.53
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Buckwater Mitigation Site
Orange County, North Carolina

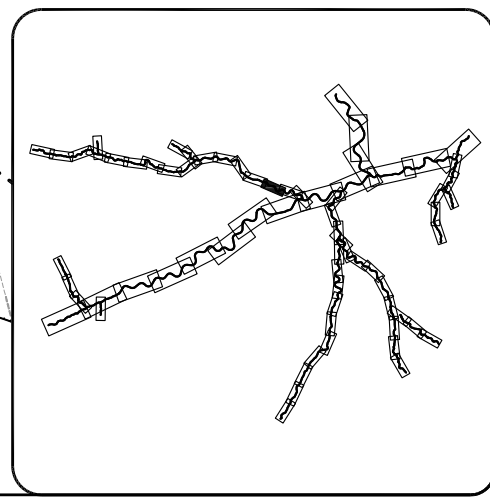
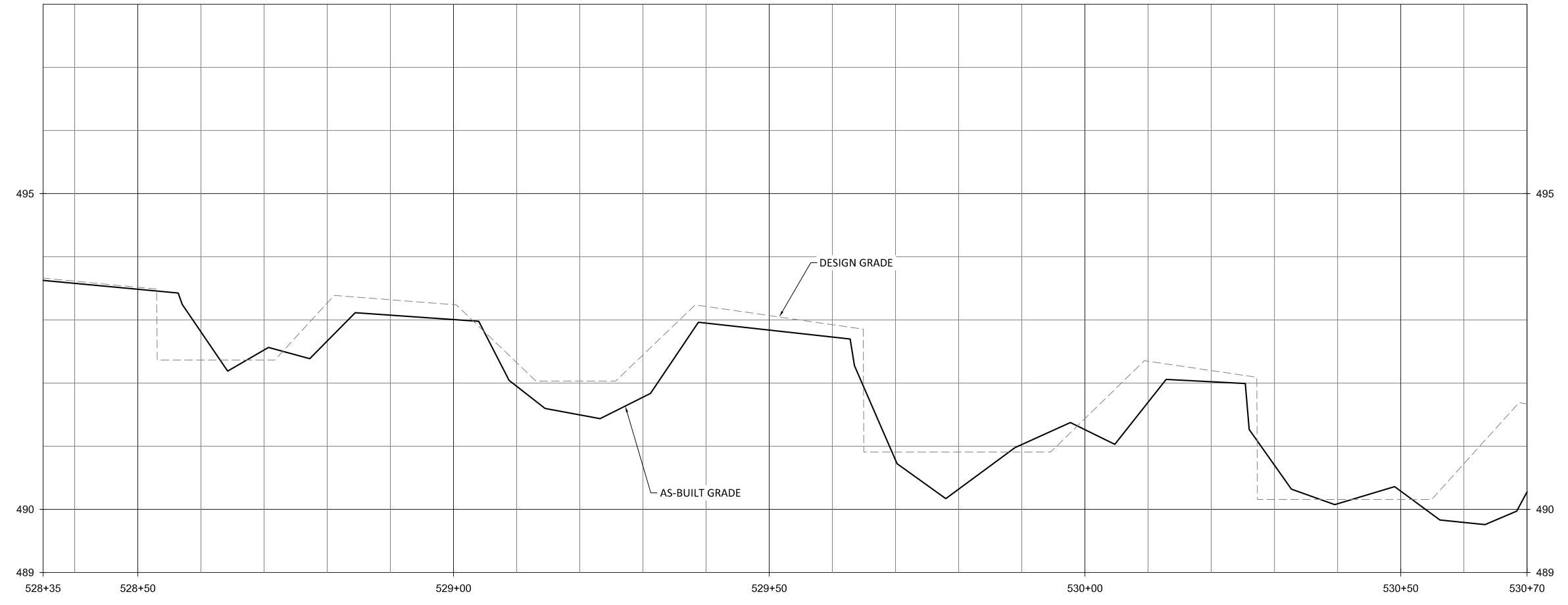
T5
Stream Plan and Profile

Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL


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Sheet






- NOTE:**
1. STA 529+46: BRUSH TOE WAS INSTALLED INSTEAD OF SOD MAT.
 2. STA 530+76: BRUSH TOE WAS INSTALLED INSTEAD OF SOD MAT.



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Buckwater Mitigation Site
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T5
Stream Plan and Profile

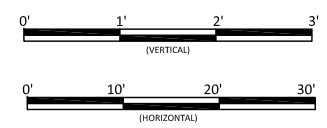
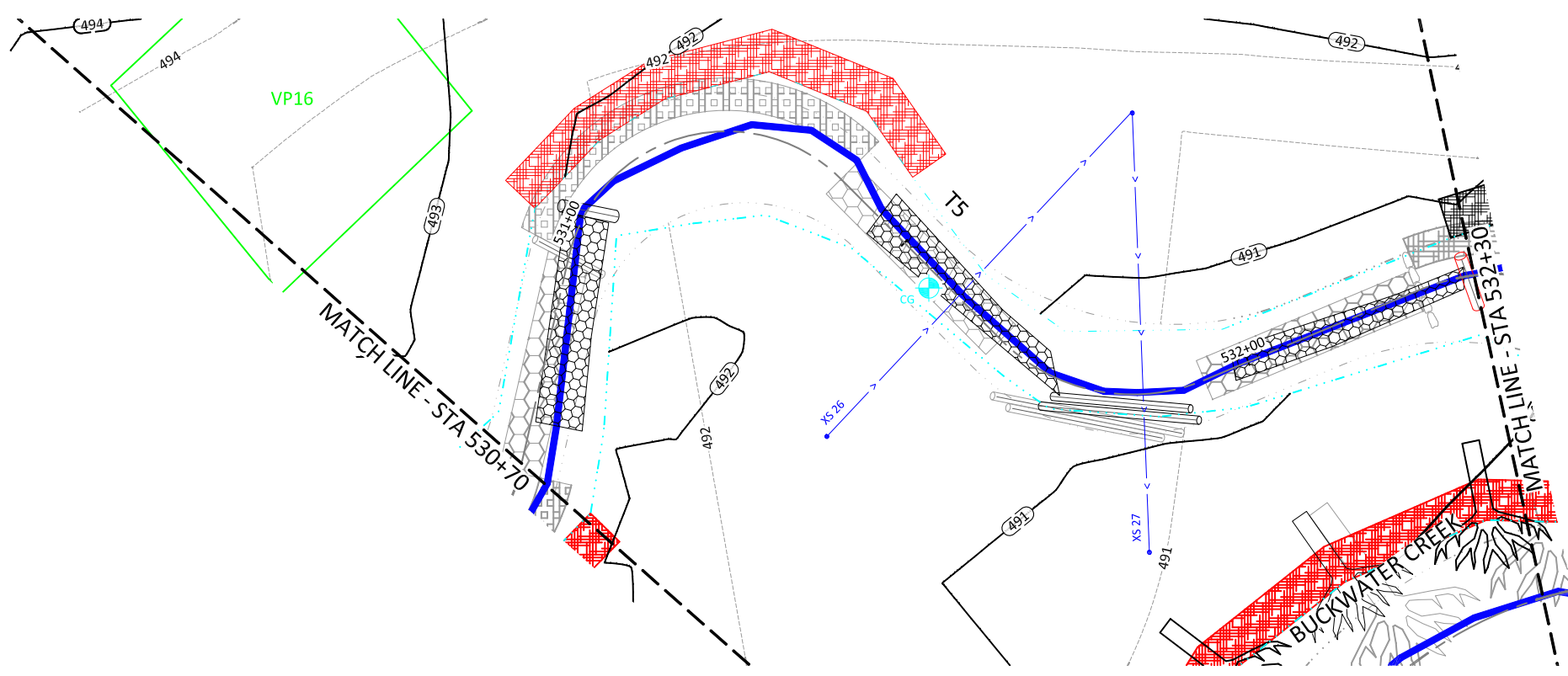
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Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

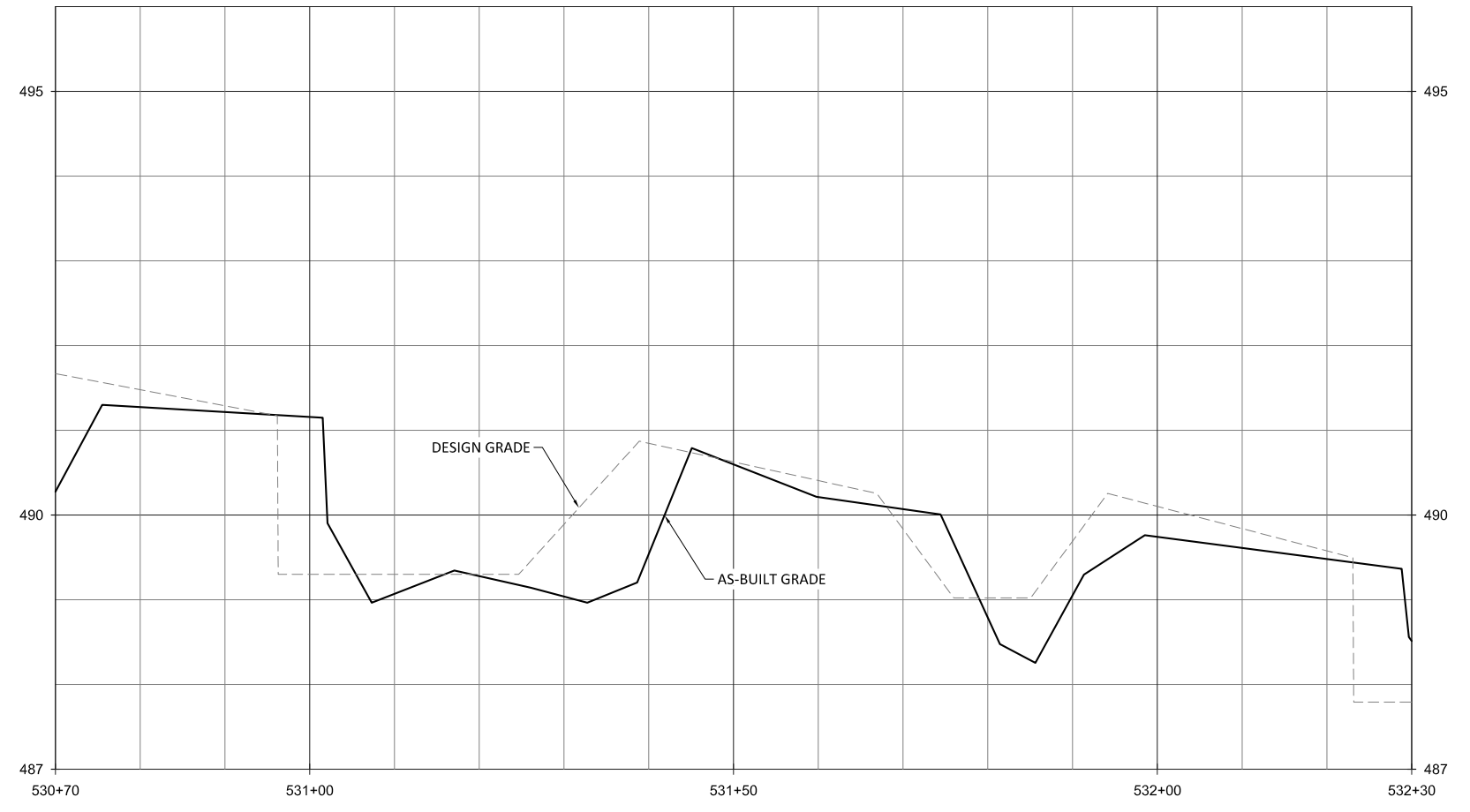
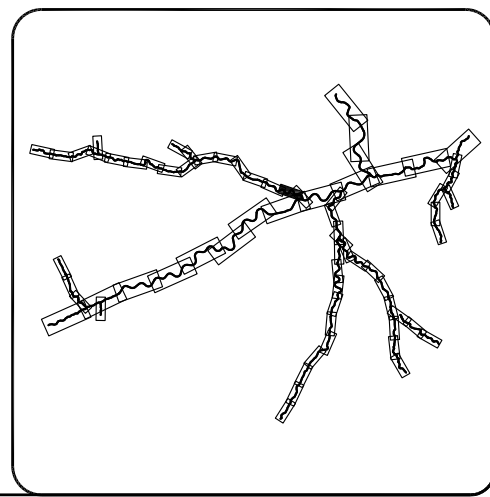
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 E:\Projects\005-02157-Buckwater-Creek\1-Plans\As-Built\02157-As-Built-Profiles-LR and LR-T5.dwg



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- NOTE:**
1. STA 531+51: BRUSH TOE WAS INSTALLED INSTEAD OF SOD MAT.
 2. STA 532+59: LOG SILL WAS INSTALLED INSTEAD OF BOULDER SILL.

Buckwater Mitigation Site
 Orange County, North Carolina

T5
 Stream Plan and Profile

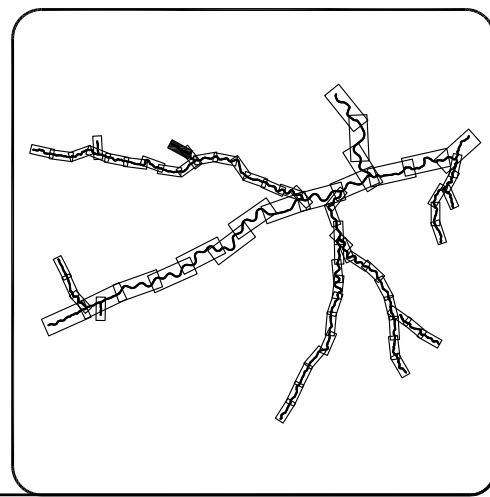
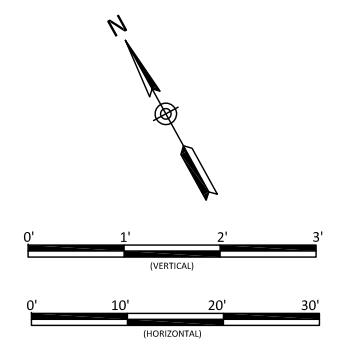
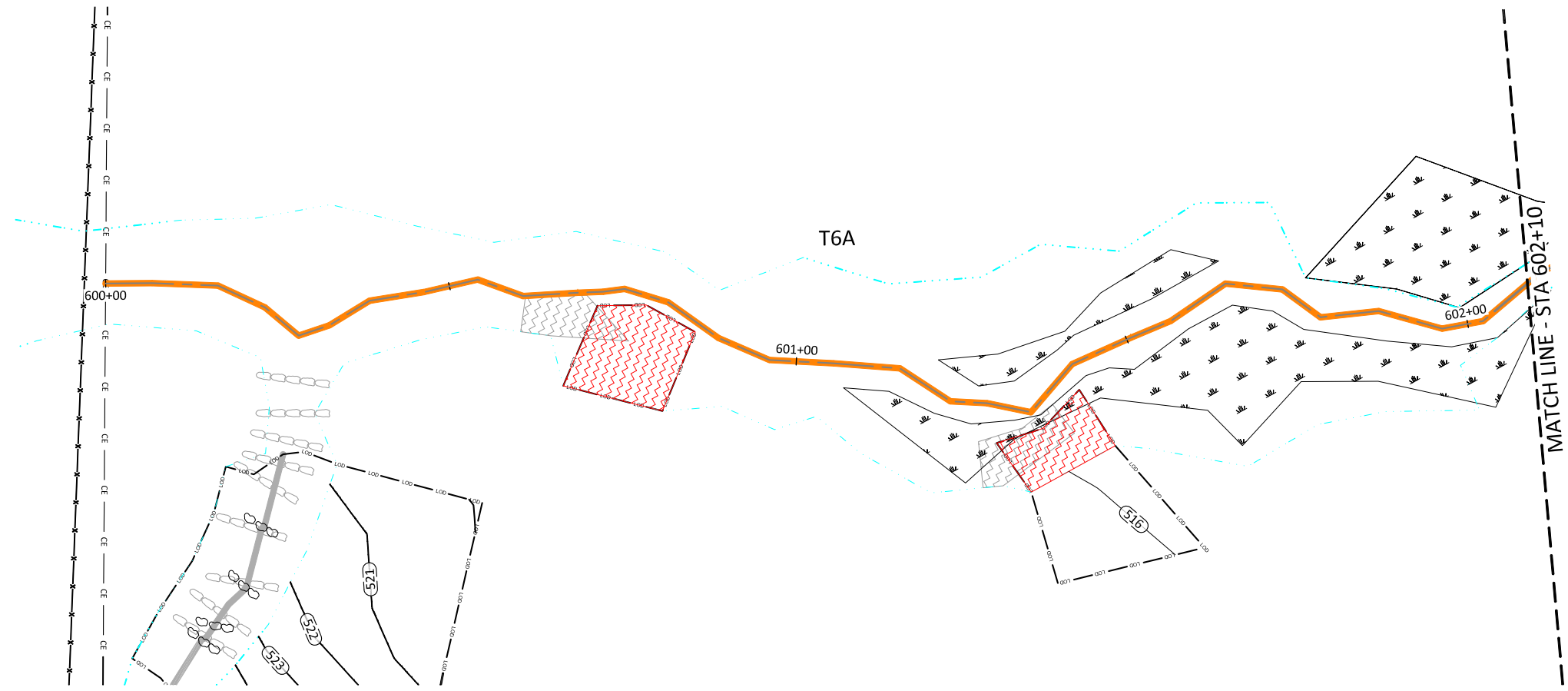
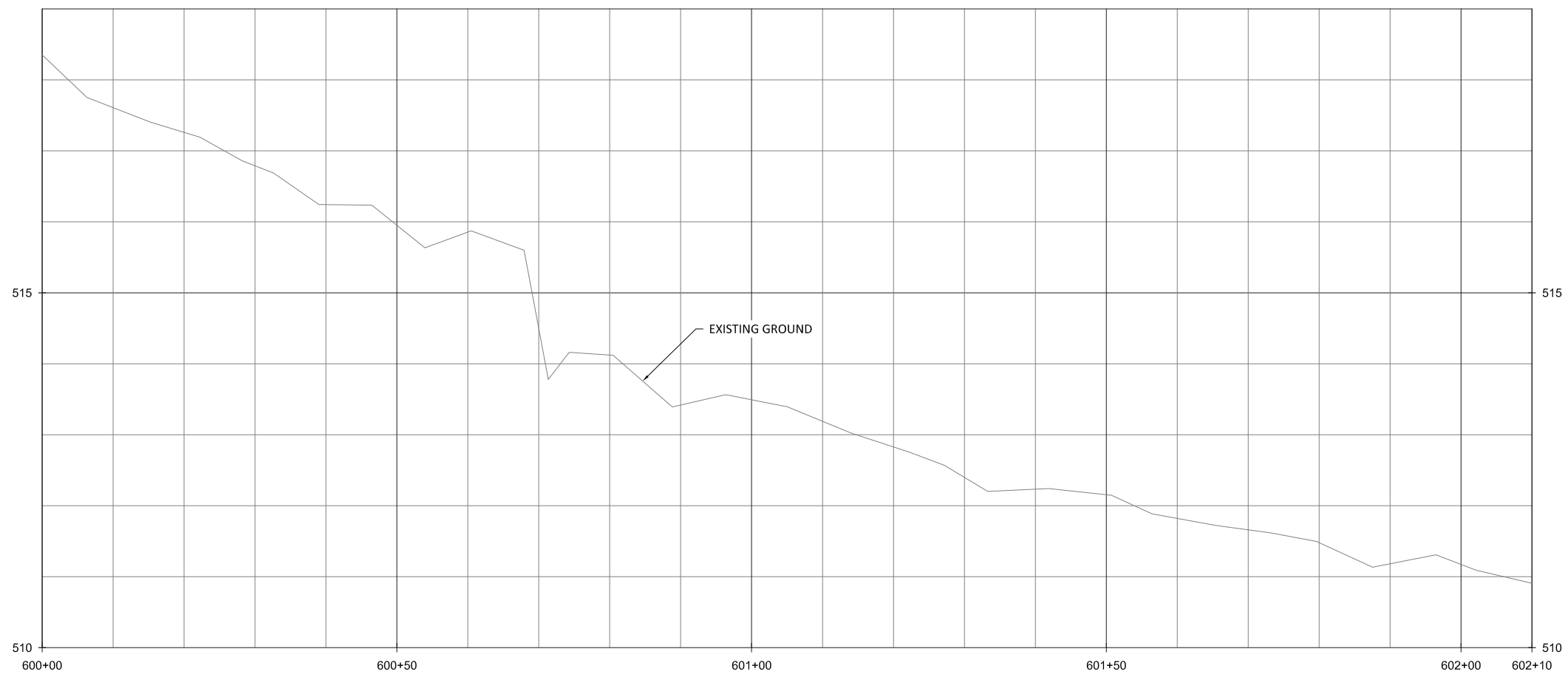
Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

1.56

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NOTE:
 1. STA 600+28: ALONG THIS SWALE, DOWNSTREAM STRUCTURES WERE NOT INSTALLED DUE TO BEDROCK.

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Buckwater Mitigation Site
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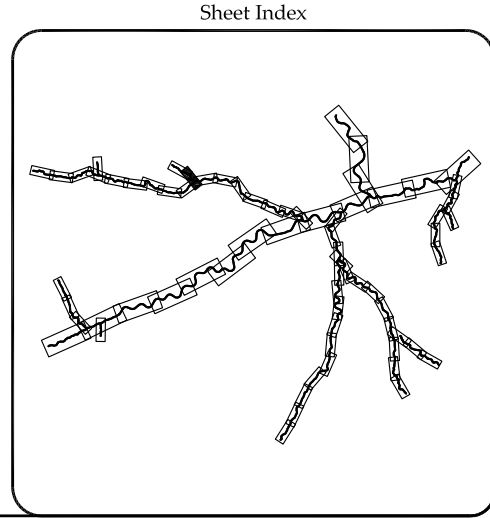
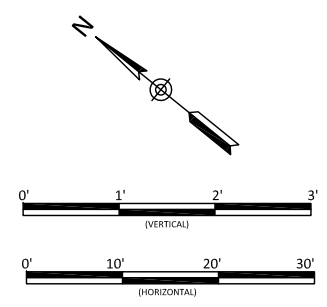
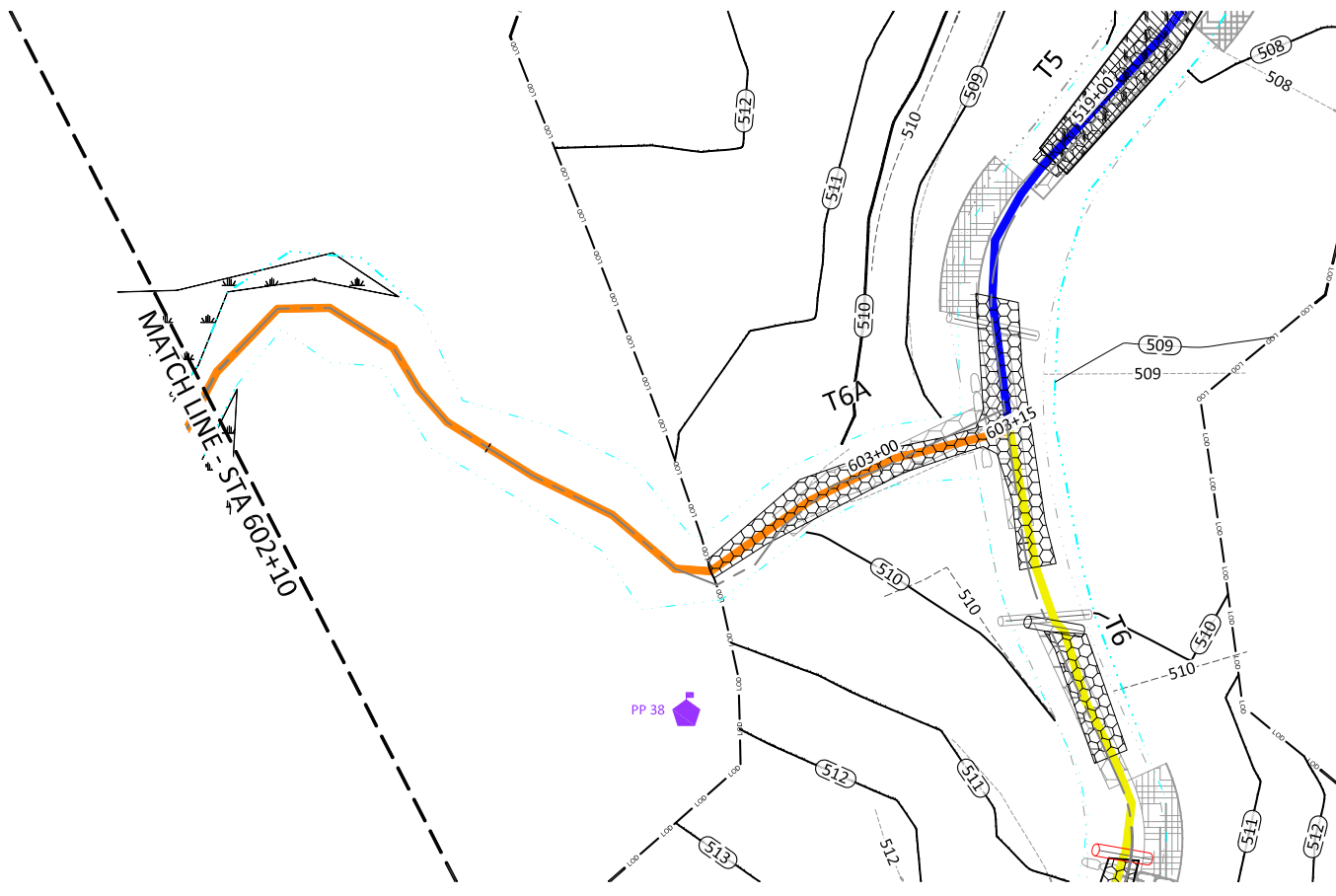
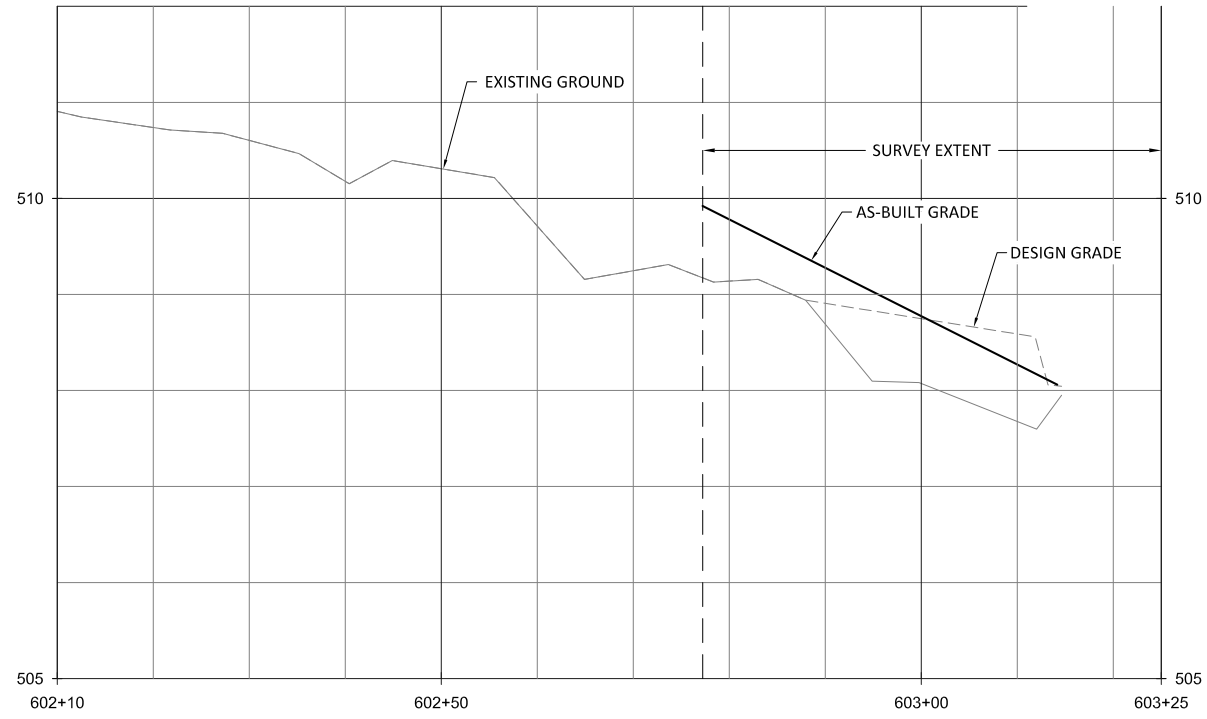
T6A
 Stream Plan and Profile

Date	Job Number	Project Engineer	Drawn By	Checked By	Revisions
07/01/2019	005-02157	NMM	CAW	JTL	

1.58

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 E:\Projects\005-02157 Buckwater Creek\1 Plans\As-Built\02157-As-Built Profiles\T6A, T6B, T7, T7A, T8 AND T9.dwg



NOTE:
 1. STA 603+12: BOULDER SILL NOT INSTALLED DUE TO BEDROCK.

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Orange County, North Carolina

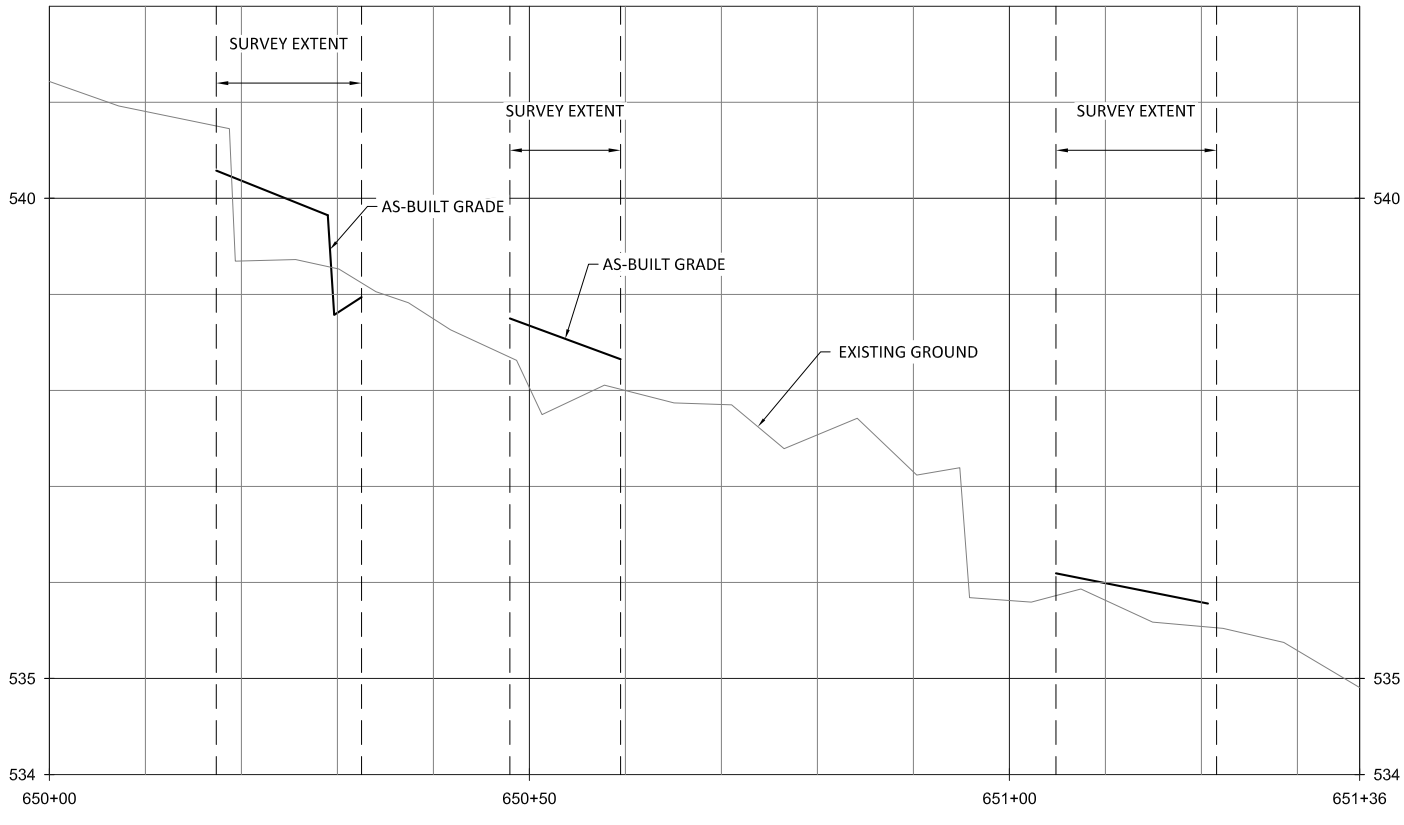
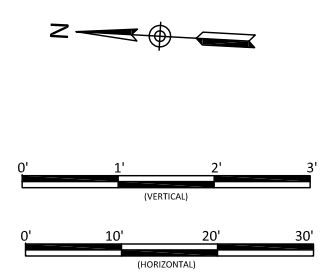
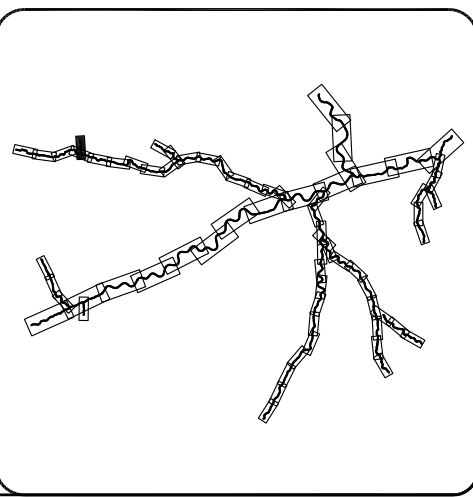
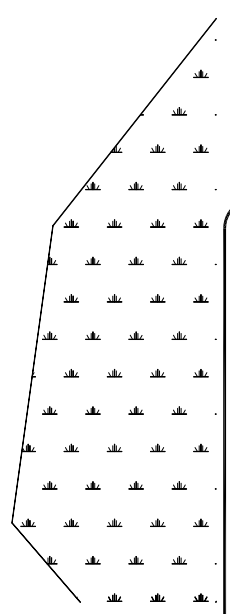
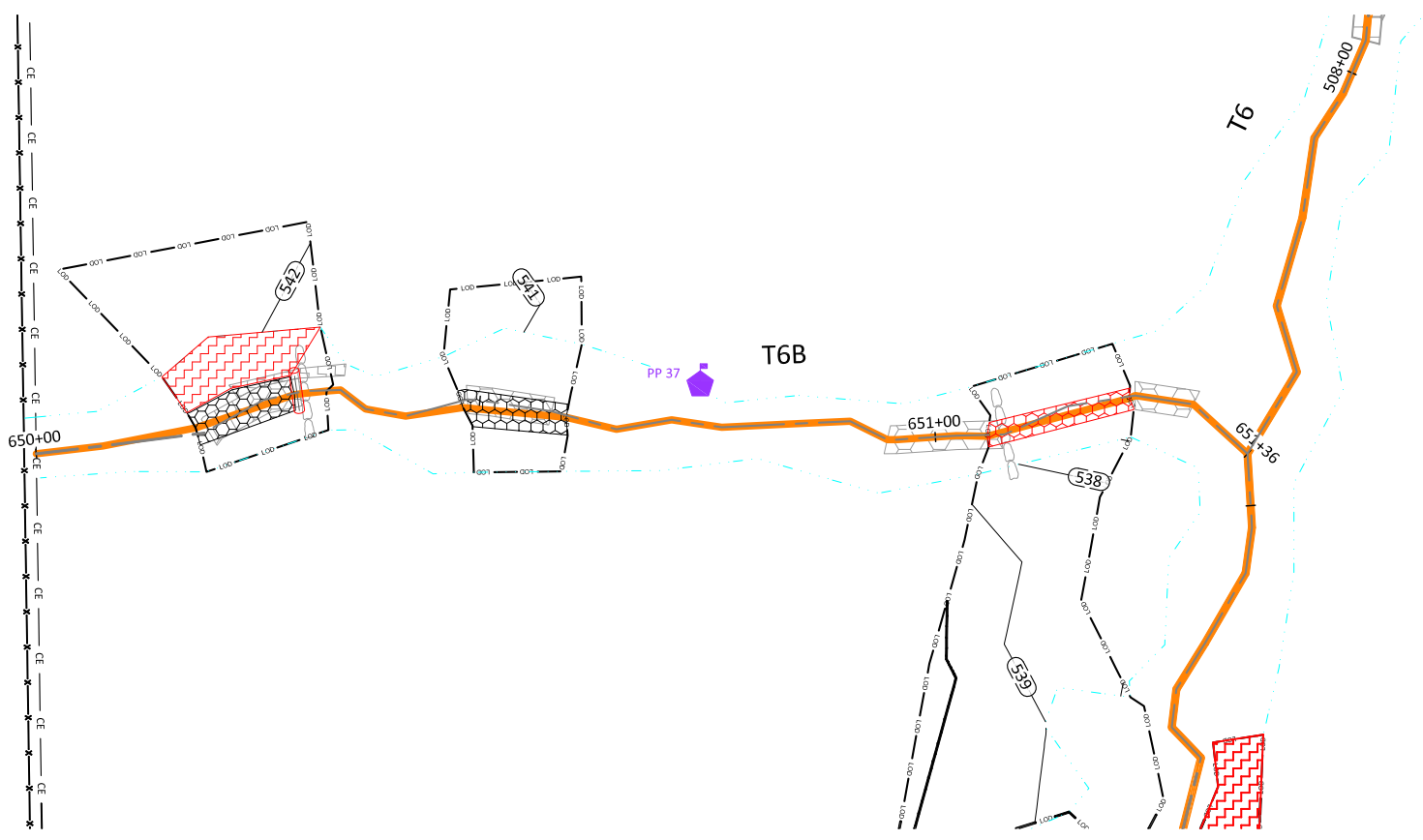
T6A
 Stream Plan and Profile

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:

1.59

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- NOTE:**
1. STA 650+29: LOG SILL WAS INSTALLED INSTEAD OF BOULDER SILL.
 2. STA 651+05: BOULDER SILL WAS NOT INSTALLED DUE TO FIELD CONDITIONS.
 3. STA 651+13: DUE TO FIELD CONDITIONS, ONE RIFFLE WAS INSTALLED INSTEAD OF TWO.

Buckwater Mitigation Site
Orange County, North Carolina

T6B
Stream Plan and Profile

Revisions:

Date: 07.01.2019
Job Number: 005-02157
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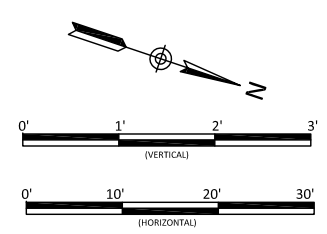
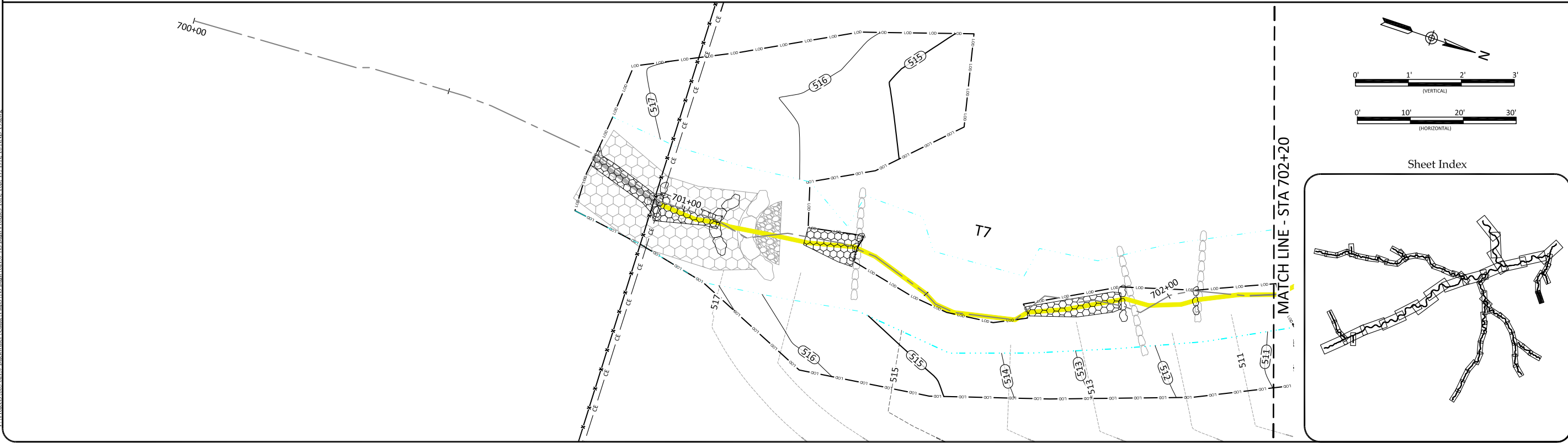
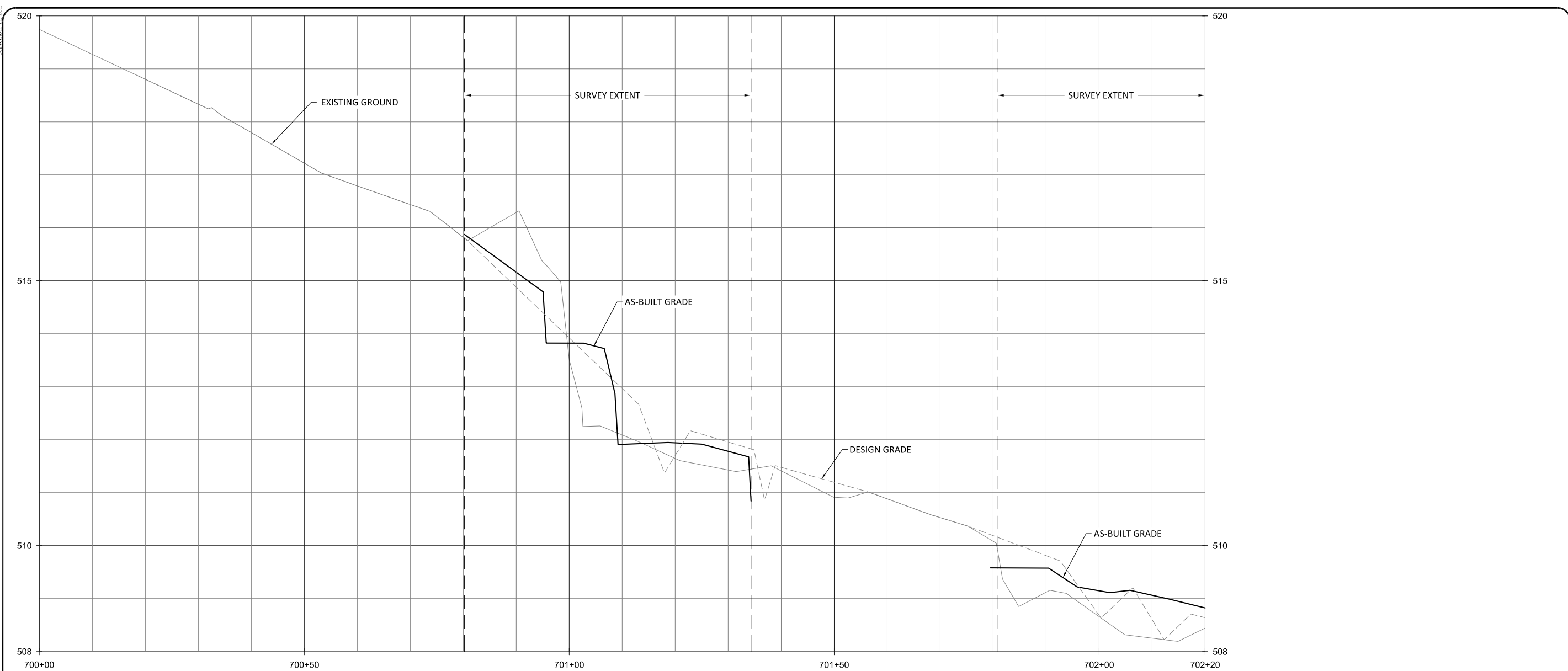
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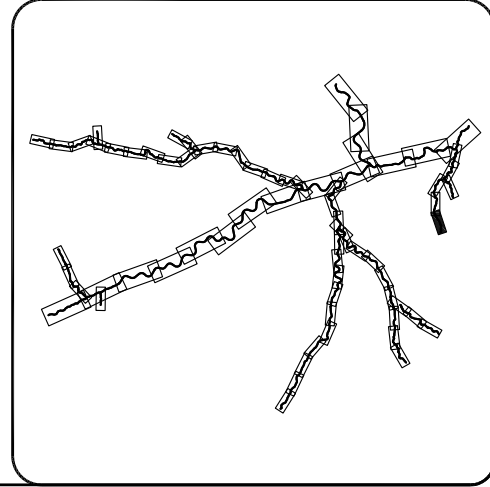


September 11, 2019

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Buckwater Mitigation Site
Orange County, North Carolina

T7 Reach 1
Stream Plan and Profile

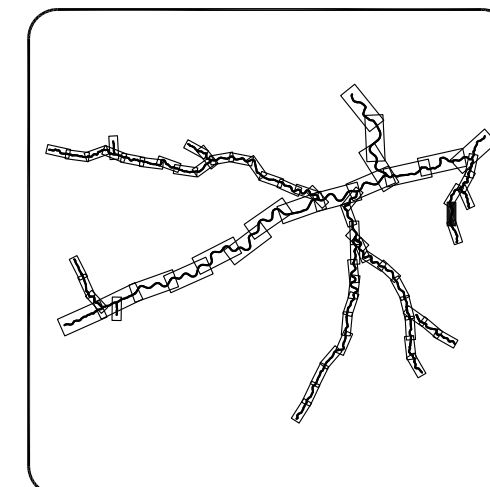
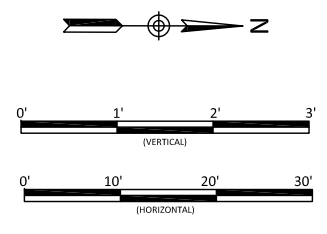
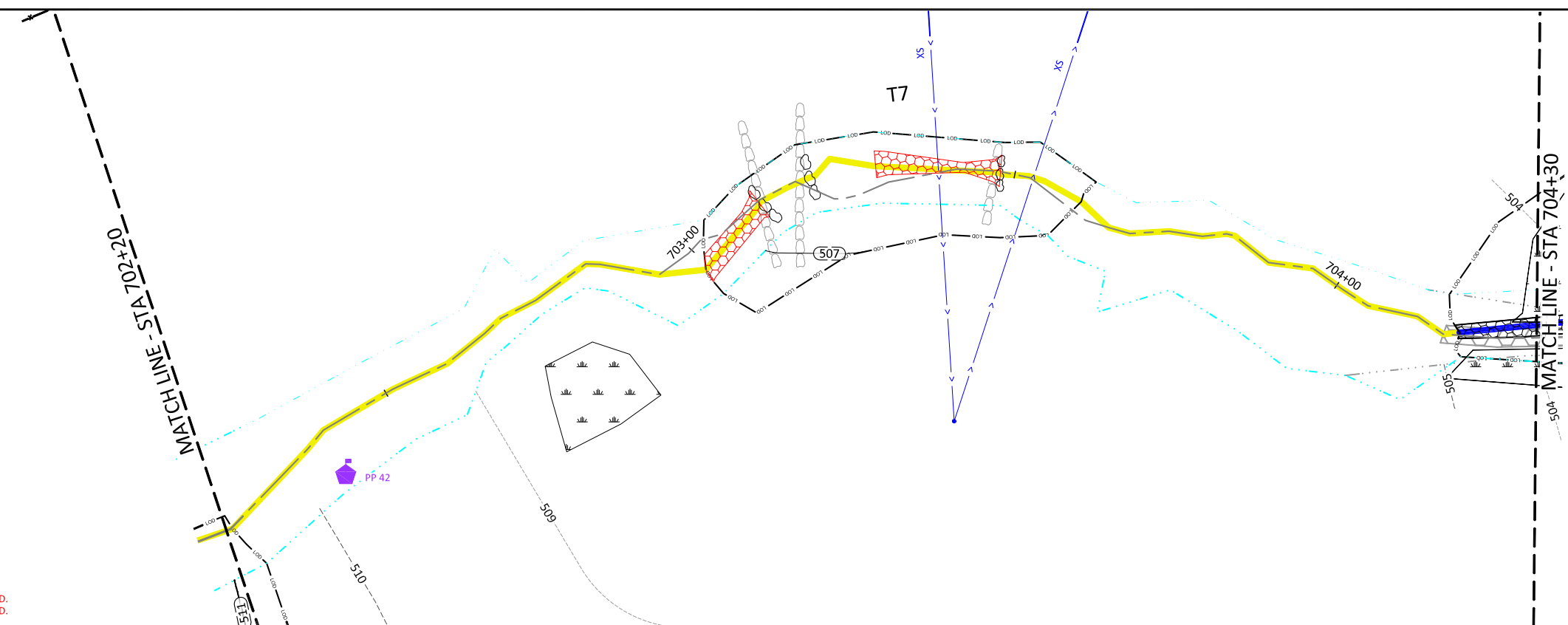
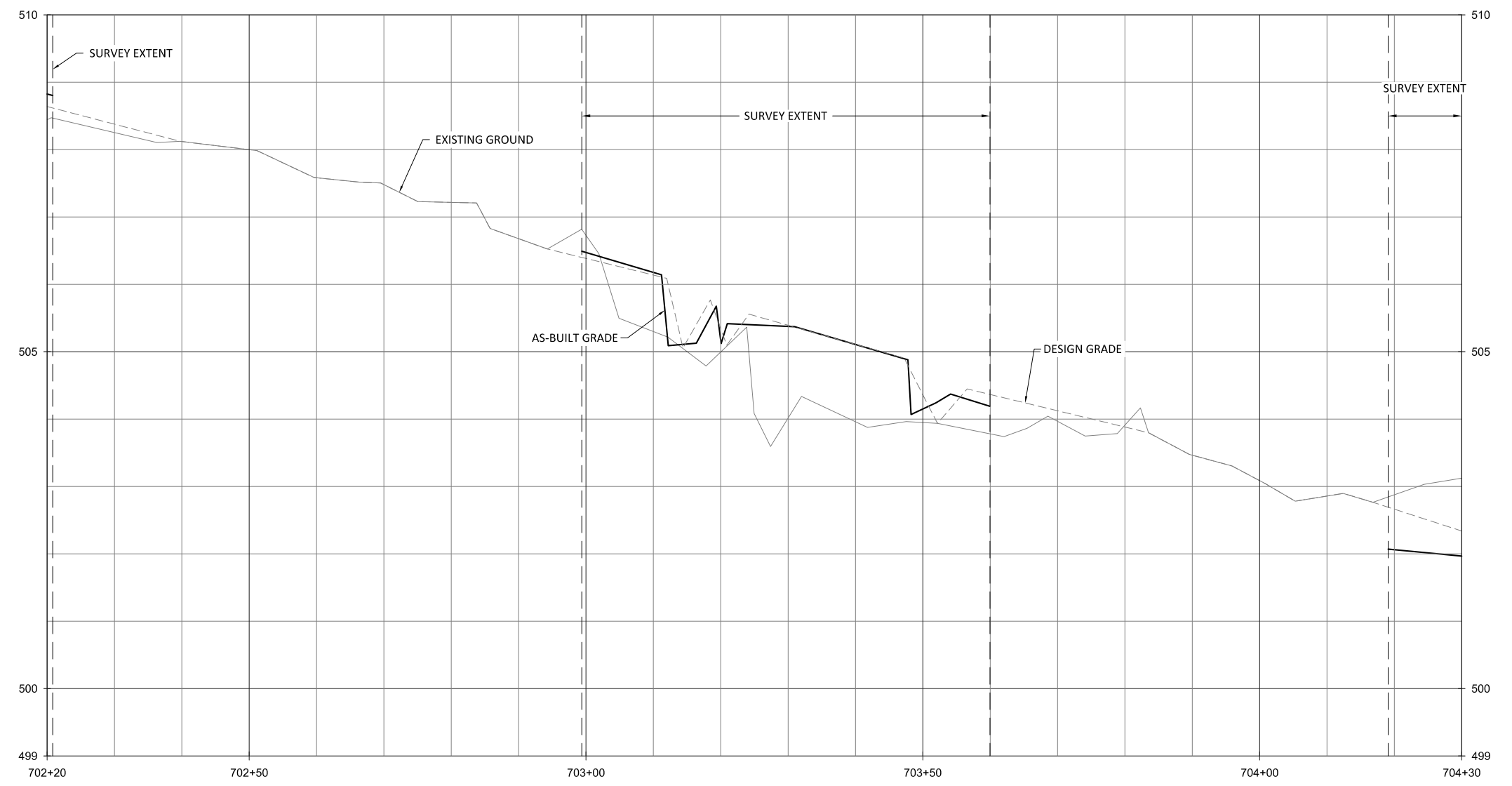
Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

Revisions:

No.	Description

1.61

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NOTE:
 1. STA 703+04: RIFFLE ADDED.
 2. STA 703+38: RIFFLE ADDED.

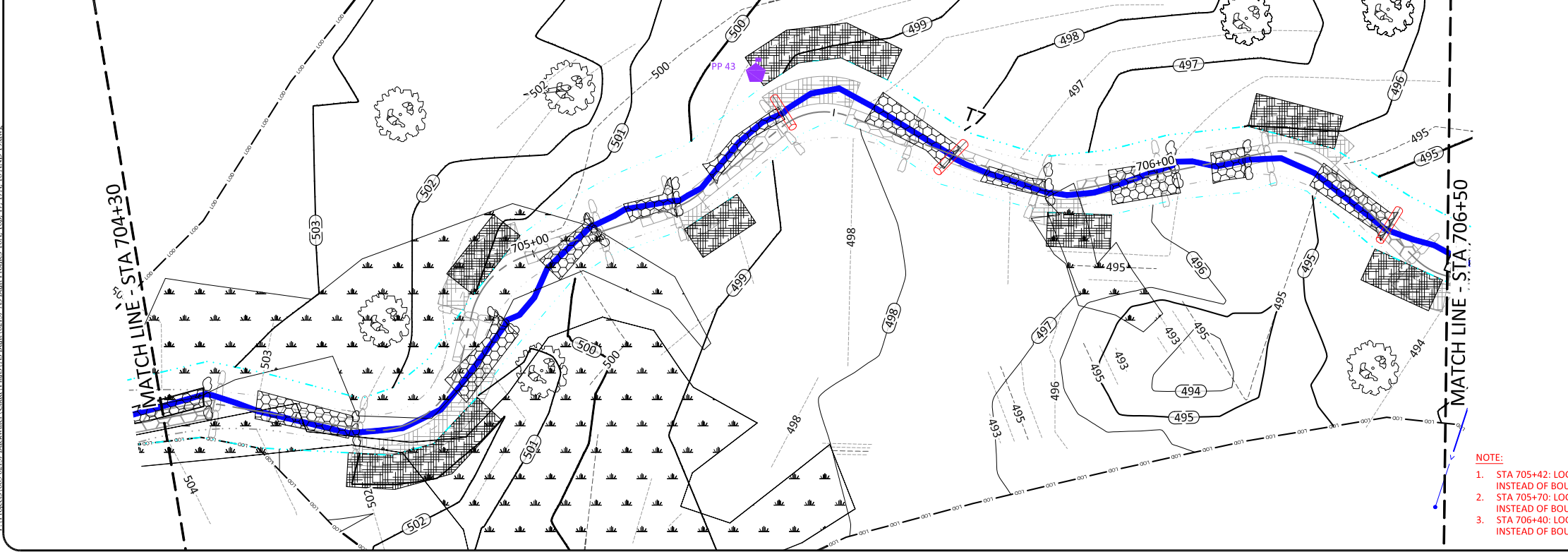
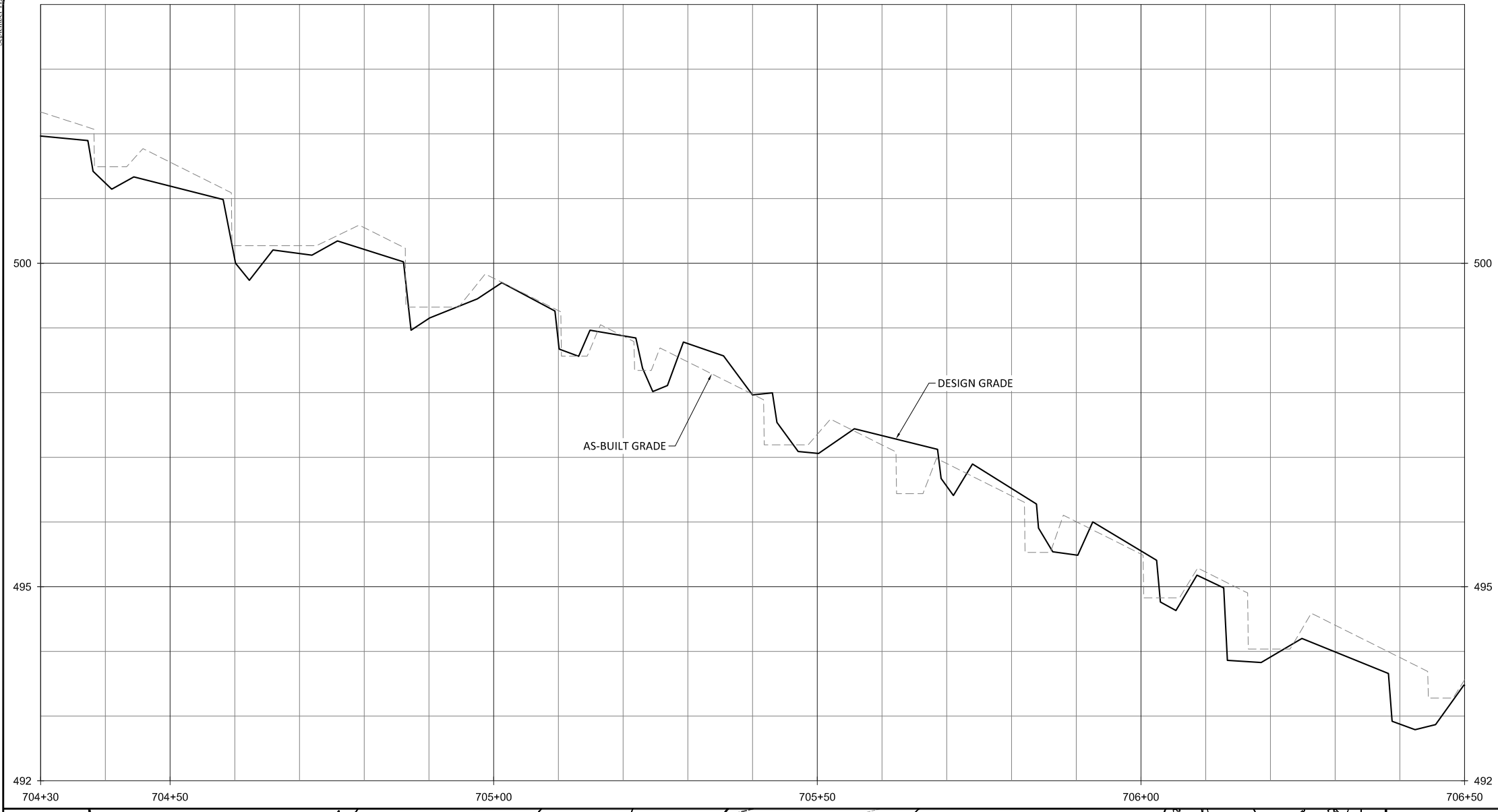


Buckwater Mitigation Site
Orange County, North Carolina
 T7 Reaches 1 & 2
 Stream Plan and Profile

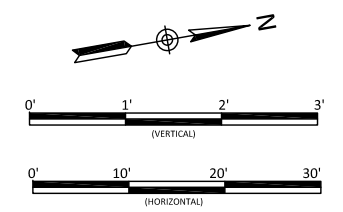
Revisions:

Date: 07.01.2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

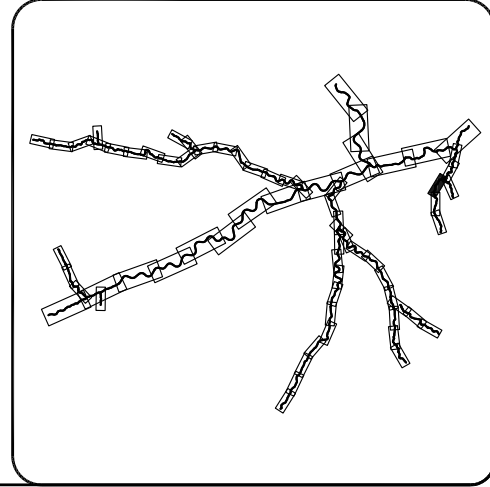
1.62



- NOTE:**
1. STA 705+42: LOG SILL INSTALLED INSTEAD OF BOULDER SILL.
 2. STA 705+70: LOG SILL INSTALLED INSTEAD OF BOULDER SILL.
 3. STA 706+40: LOG SILL INSTALLED INSTEAD OF BOULDER SILL.

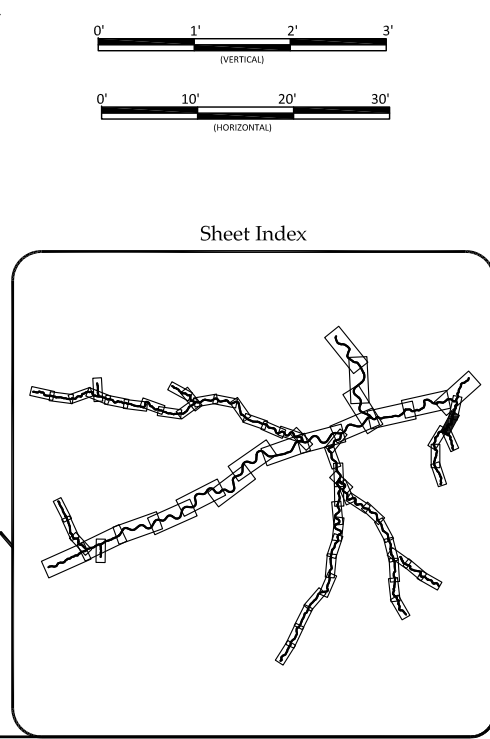
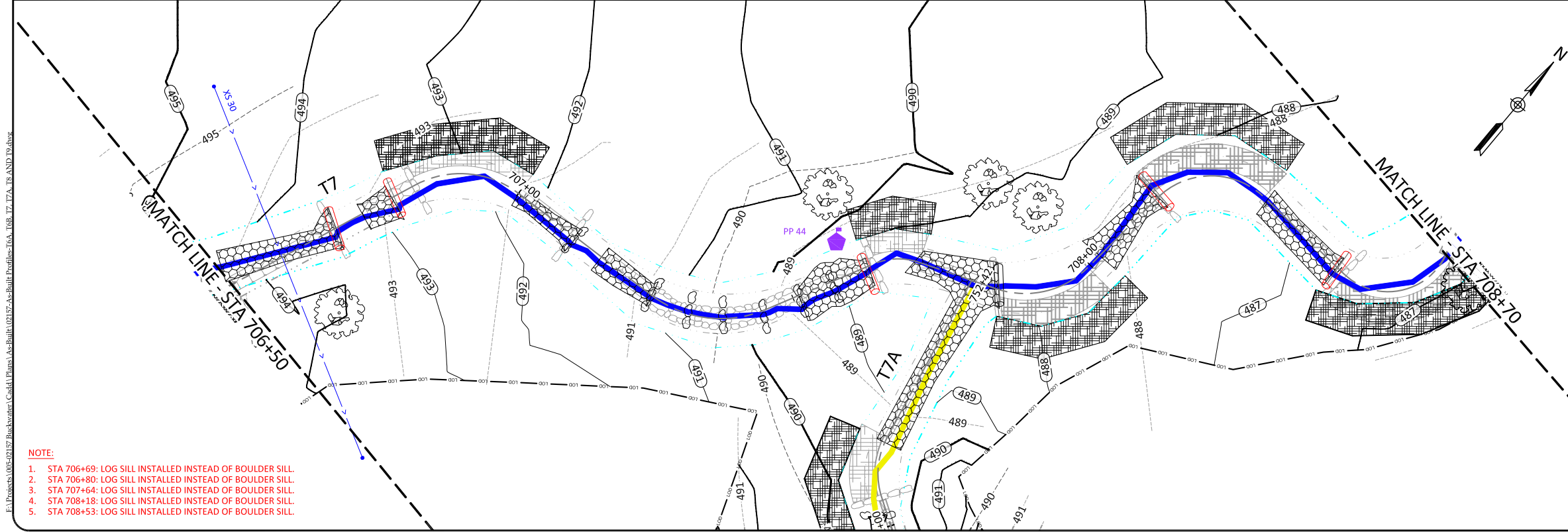
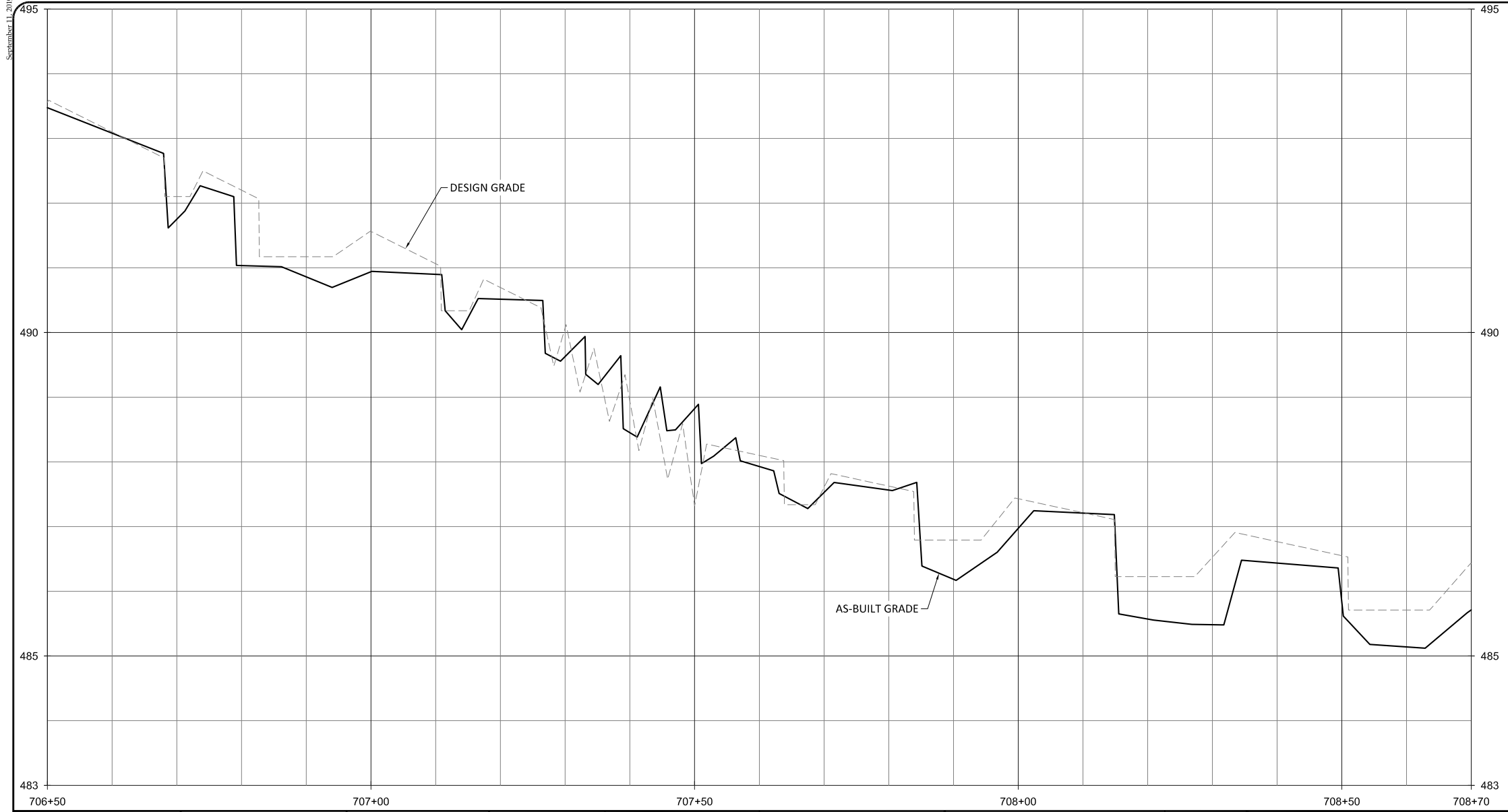


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Buckwater Mitigation Site
Orange County, North Carolina
T7 Reach 2
Stream Plan and Profile


Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL
Revisions:	



- NOTE:**
1. STA 706+69: LOG SILL INSTALLED INSTEAD OF BOULDER SILL
 2. STA 706+80: LOG SILL INSTALLED INSTEAD OF BOULDER SILL
 3. STA 707+64: LOG SILL INSTALLED INSTEAD OF BOULDER SILL
 4. STA 708+18: LOG SILL INSTALLED INSTEAD OF BOULDER SILL
 5. STA 708+53: LOG SILL INSTALLED INSTEAD OF BOULDER SILL



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Raleigh, NC 27606
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Buckwater Mitigation Site
Orange County, North Carolina

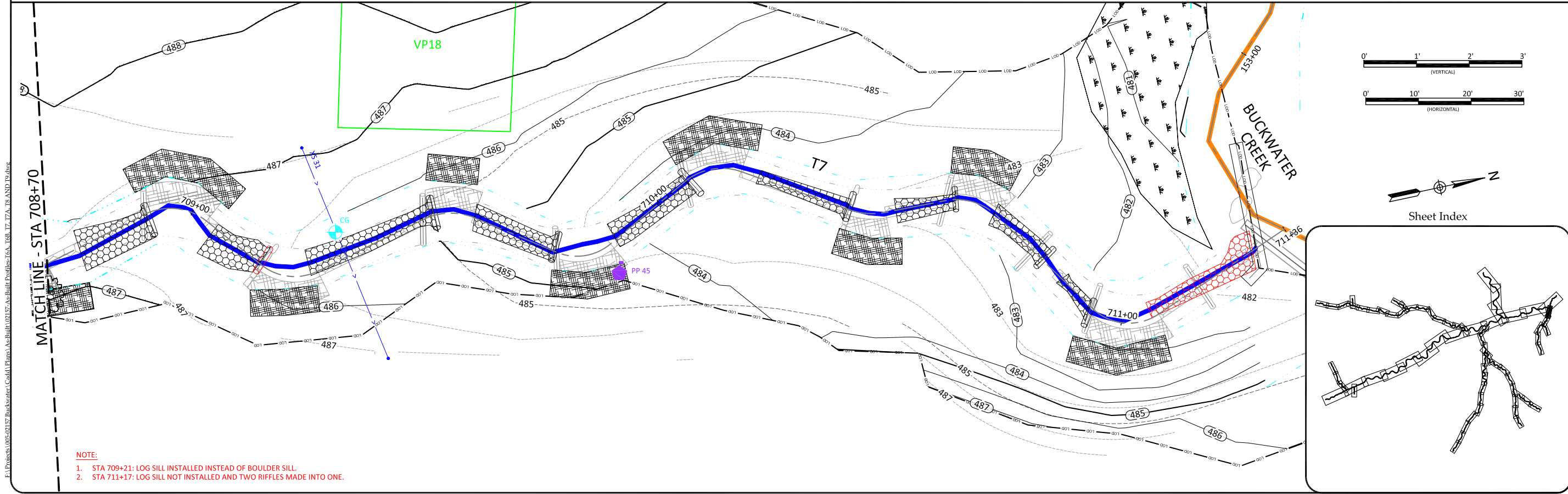
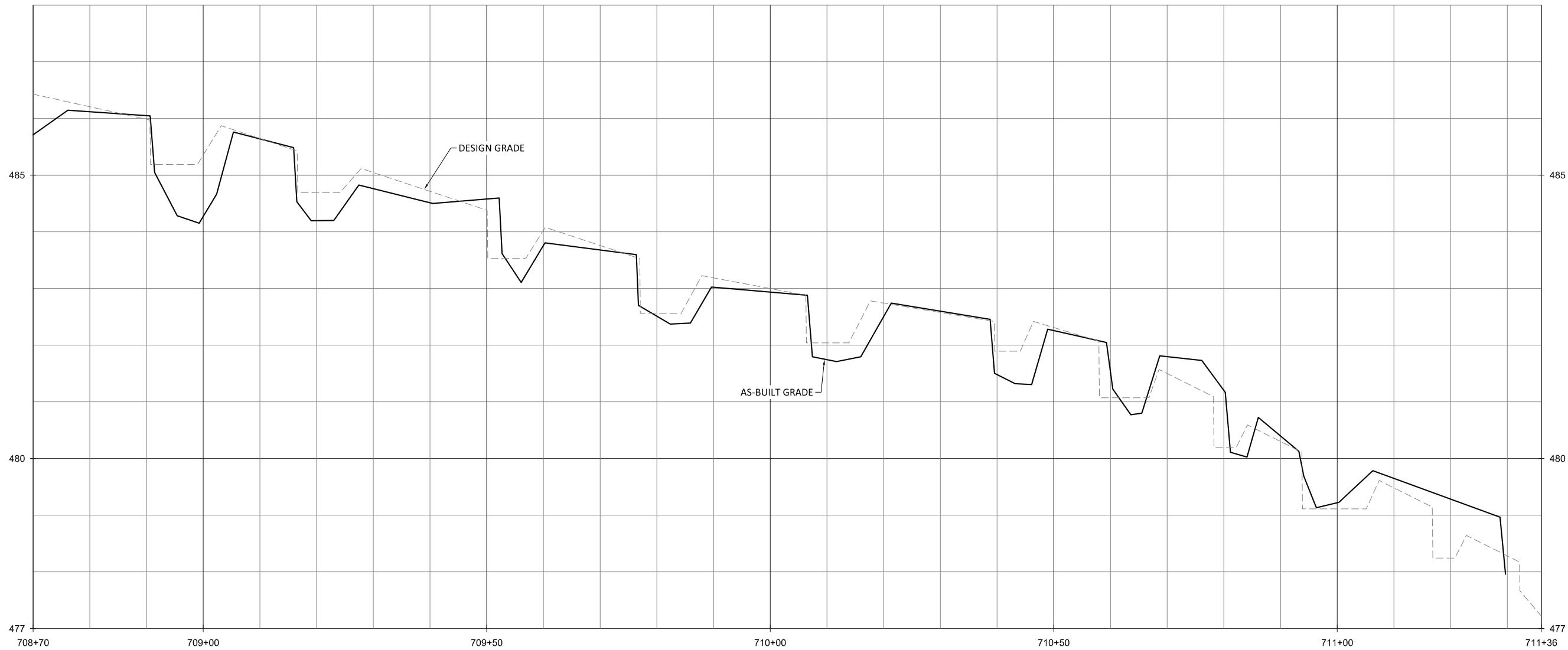
T7 Reaches 2 & 3
Stream Plan and Profile

Revisions:


Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

1.64


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- NOTE:**
1. STA 709+21: LOG SILL INSTALLED INSTEAD OF BOULDER SILL.
 2. STA 711+17: LOG SILL NOT INSTALLED AND TWO RIFFLES MADE INTO ONE.



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Buckwater Mitigation Site
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T7 Reach 3
Stream Plan and Profile

Date: 07/01/2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

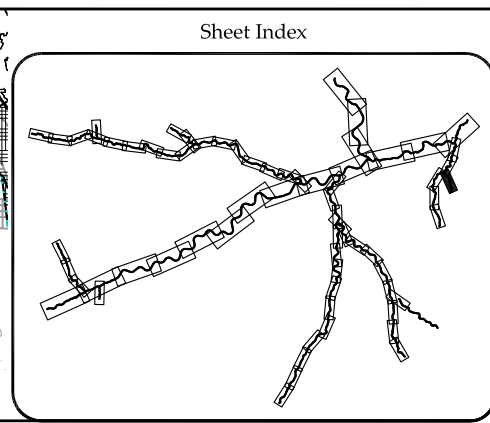
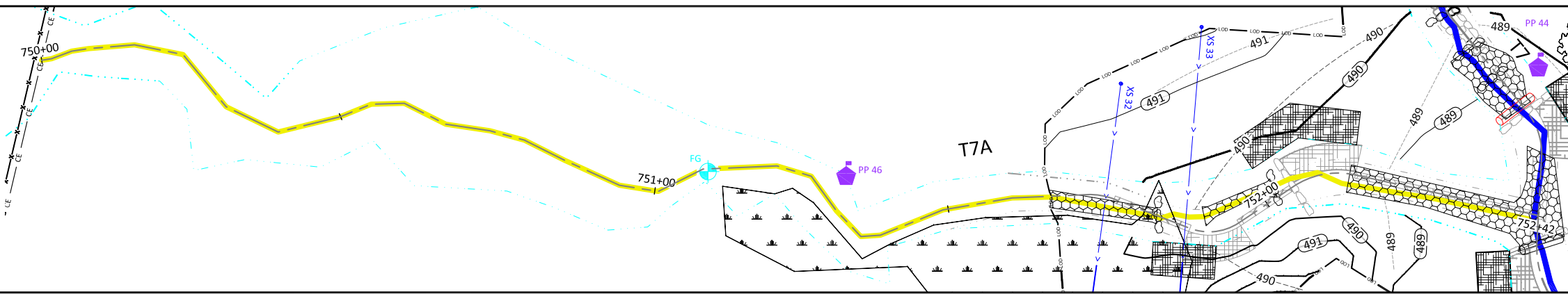
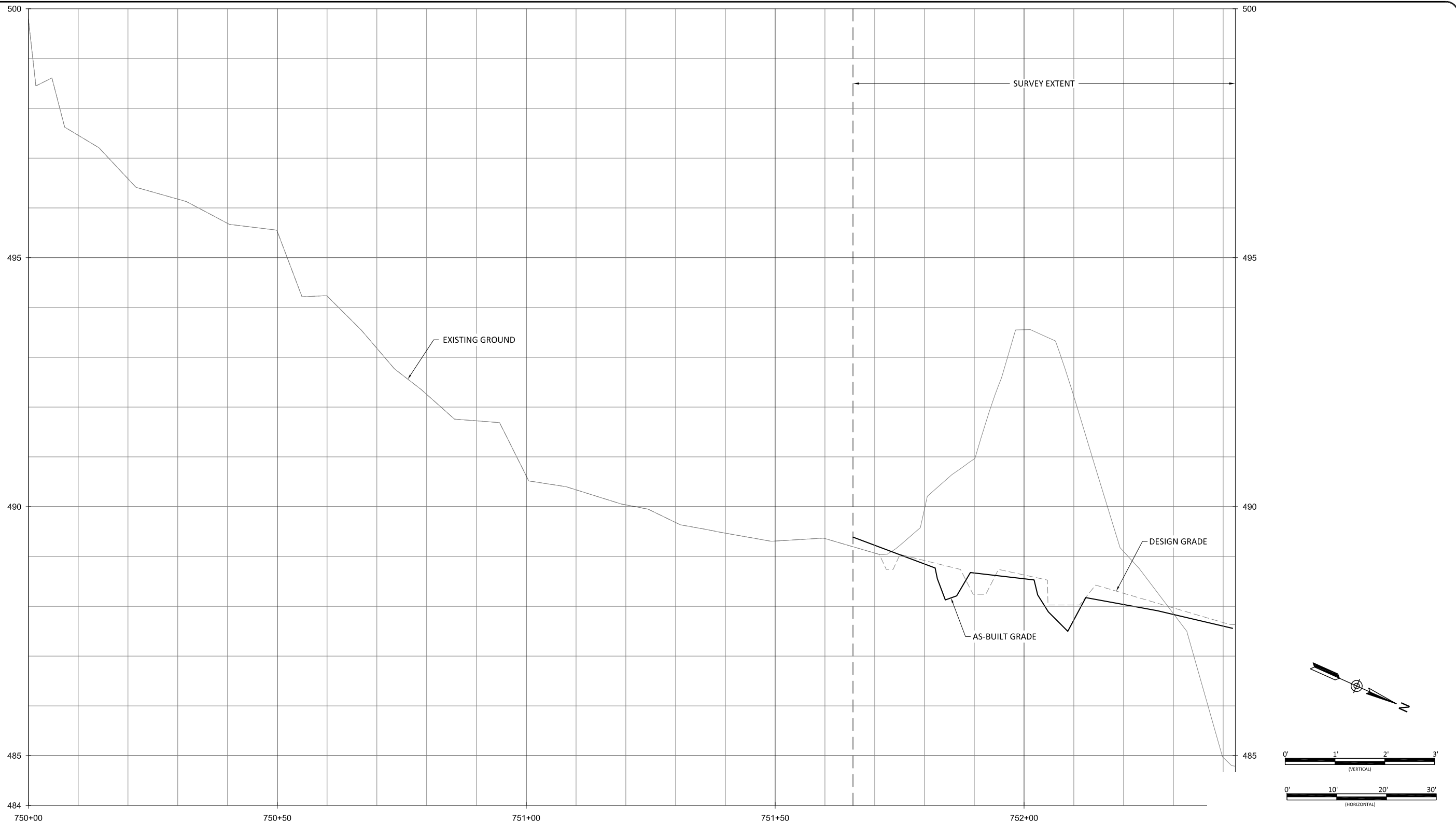
Revisions:

No.	Description

1.65

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Buckwater Mitigation Site
Orange County, North Carolina

T7A
 Stream Plan and Profile

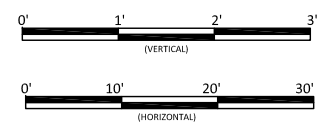
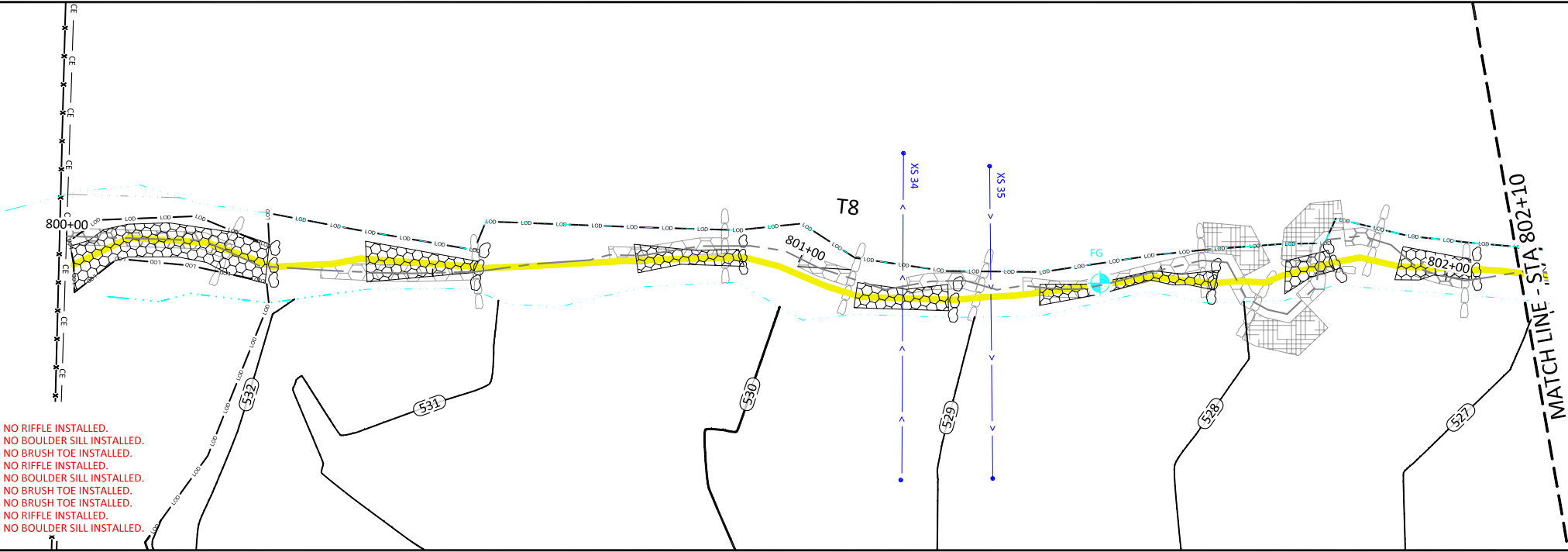
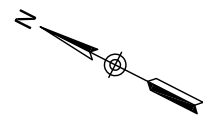
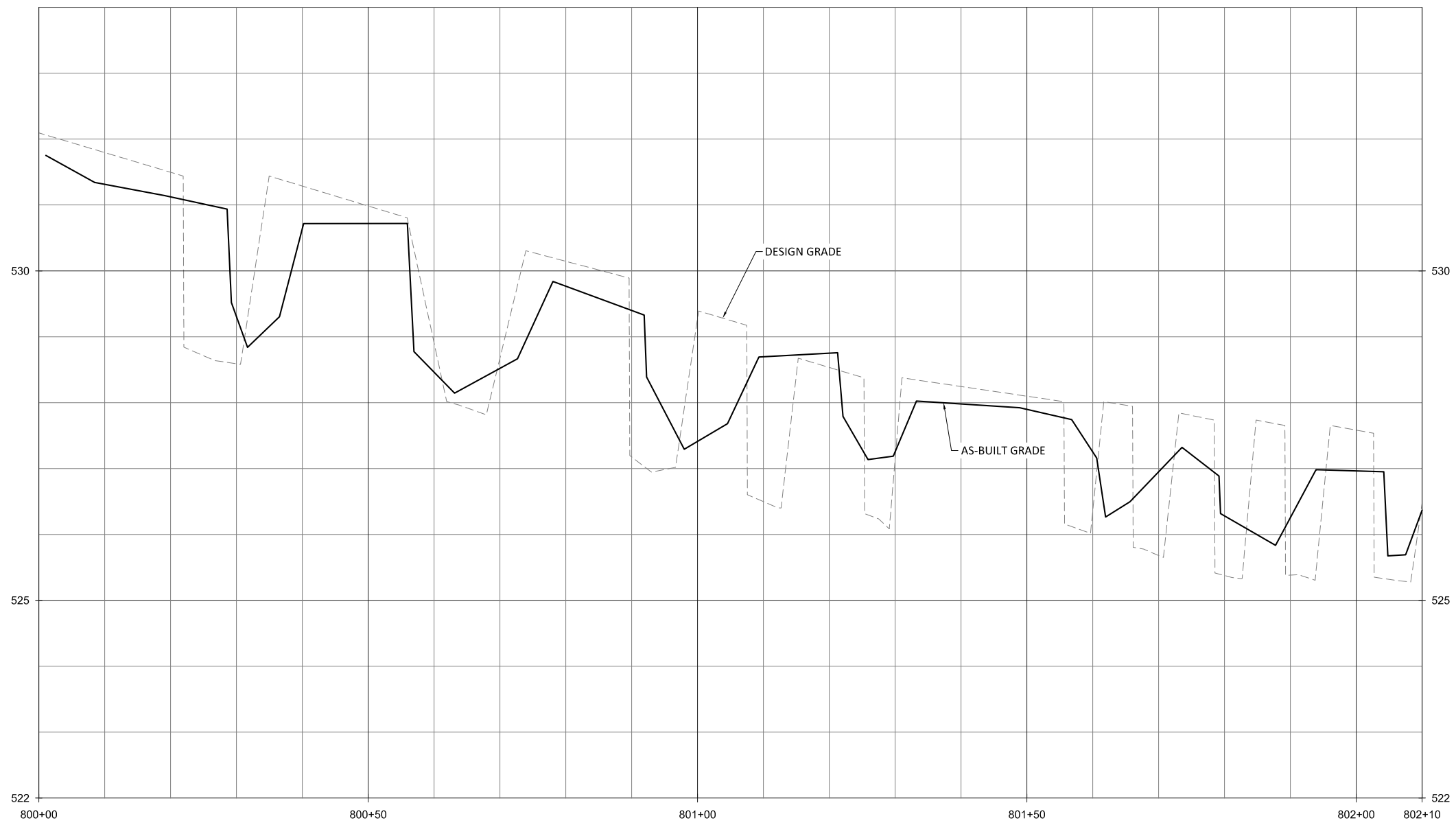
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 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:

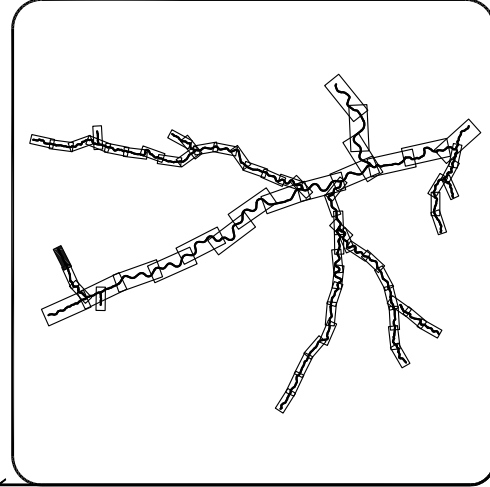
No.	Description

1.66

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- NOTE:**
1. STA 801+04: DUE TO SITE CONDITIONS NO RIFFLE INSTALLED.
 2. STA 801+07: DUE TO SITE CONDITIONS NO BOULDER SILL INSTALLED.
 3. STA 801+75: DUE TO SITE CONDITIONS NO BRUSH TOE INSTALLED.
 4. STA 801+63: DUE TO SITE CONDITIONS NO RIFFLE INSTALLED.
 5. STA 801+66: DUE TO SITE CONDITIONS NO BOULDER SILL INSTALLED.
 6. STA 801+70: DUE TO SITE CONDITIONS NO BRUSH TOE INSTALLED.
 7. STA 801+82: DUE TO SITE CONDITIONS NO BRUSH TOE INSTALLED.
 8. STA 801+87: DUE TO SITE CONDITIONS NO RIFFLE INSTALLED.
 9. STA 801+89: DUE TO SITE CONDITIONS NO BOULDER SILL INSTALLED.

Revisions:

Date	Job Number	Project Engineer	Drawn By	Checked By
07.01.2019	005-02157	NMM	CAW	JTL

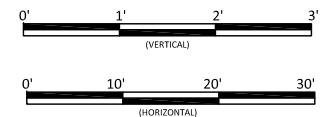
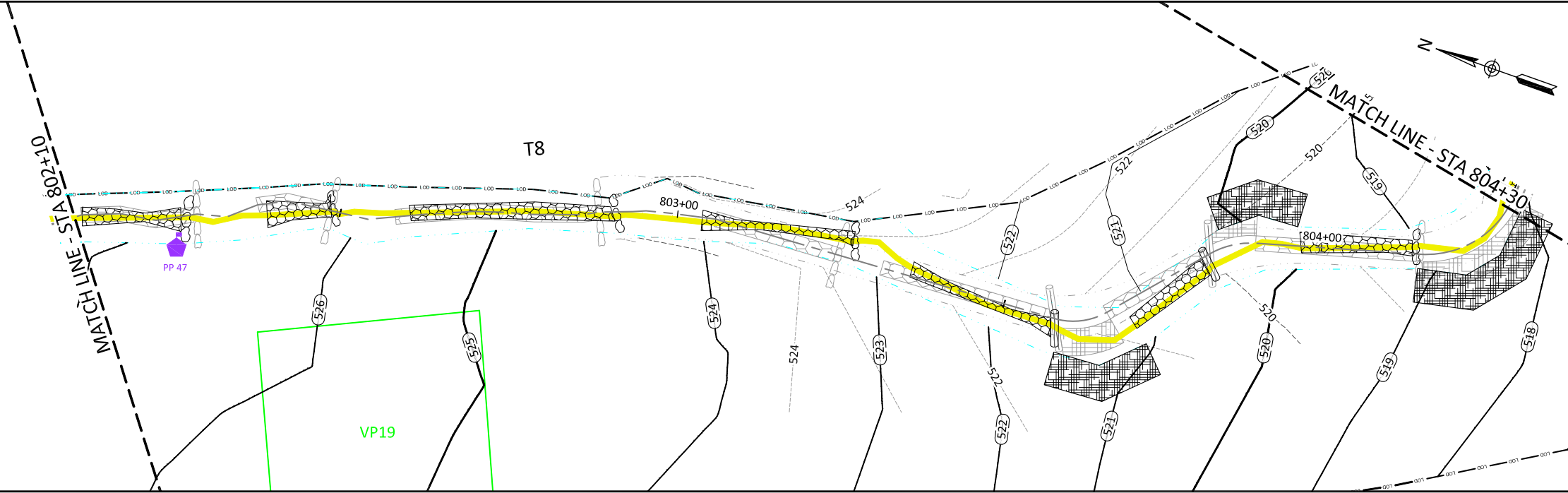
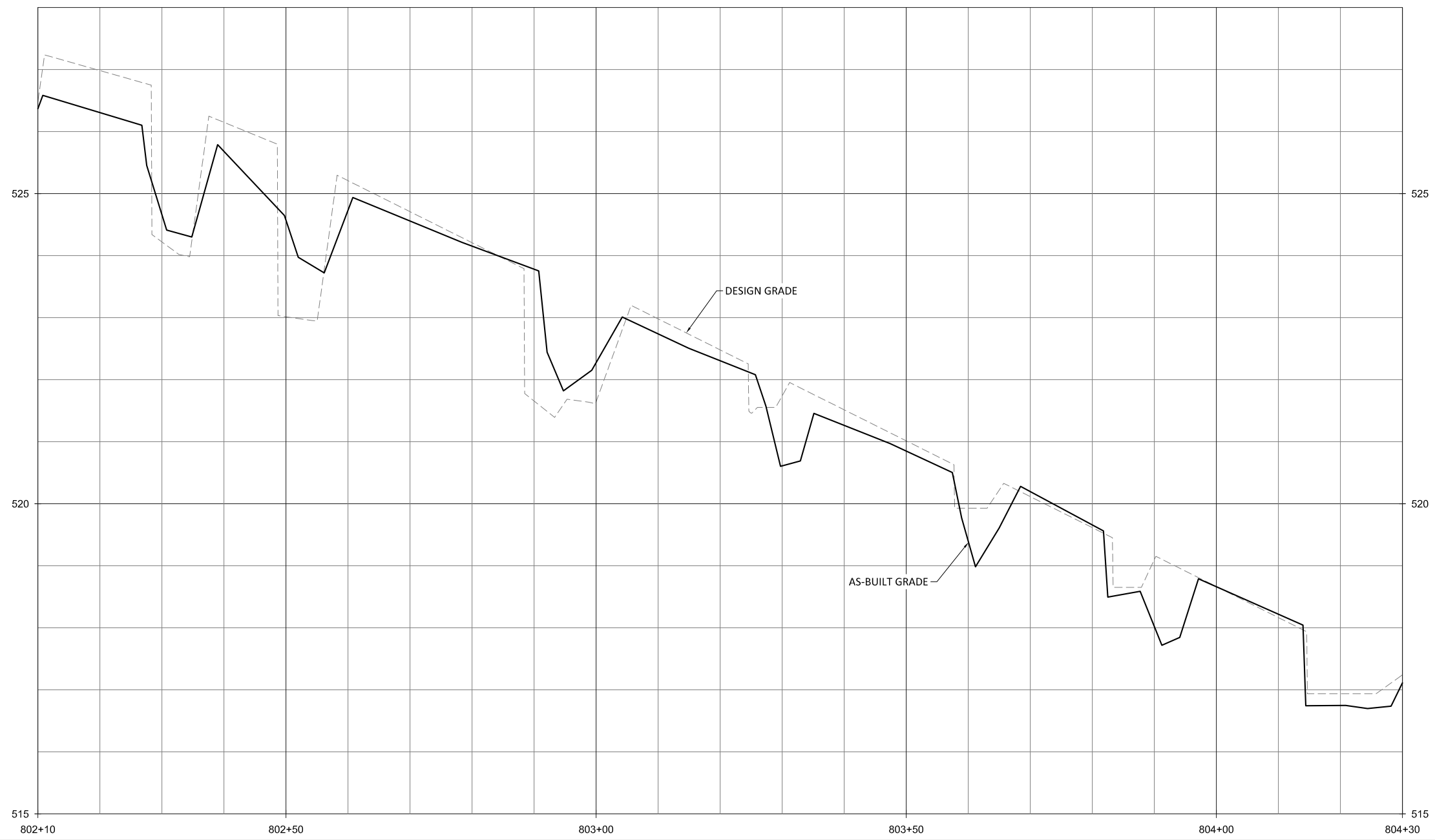
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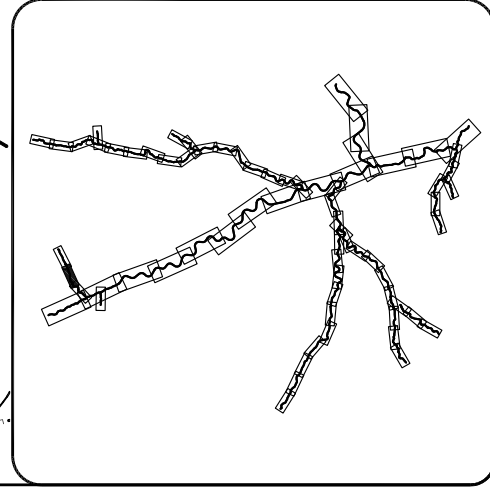
Buckwater Mitigation Site
Orange County, North Carolina

T8
Stream Plan and Profile





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Buckwater Mitigation Site
Orange County, North Carolina

T8
Stream Plan and Profile

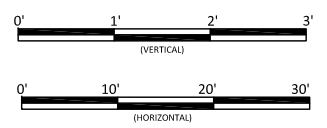
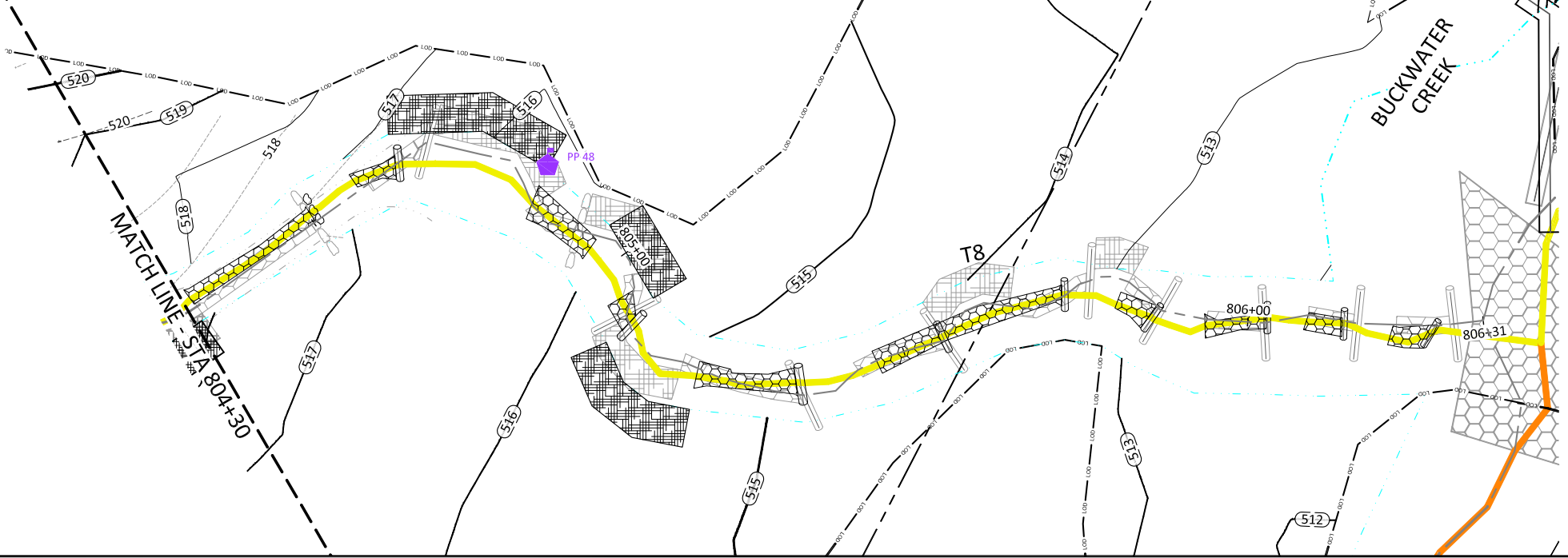
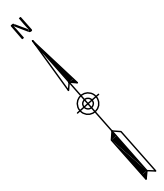
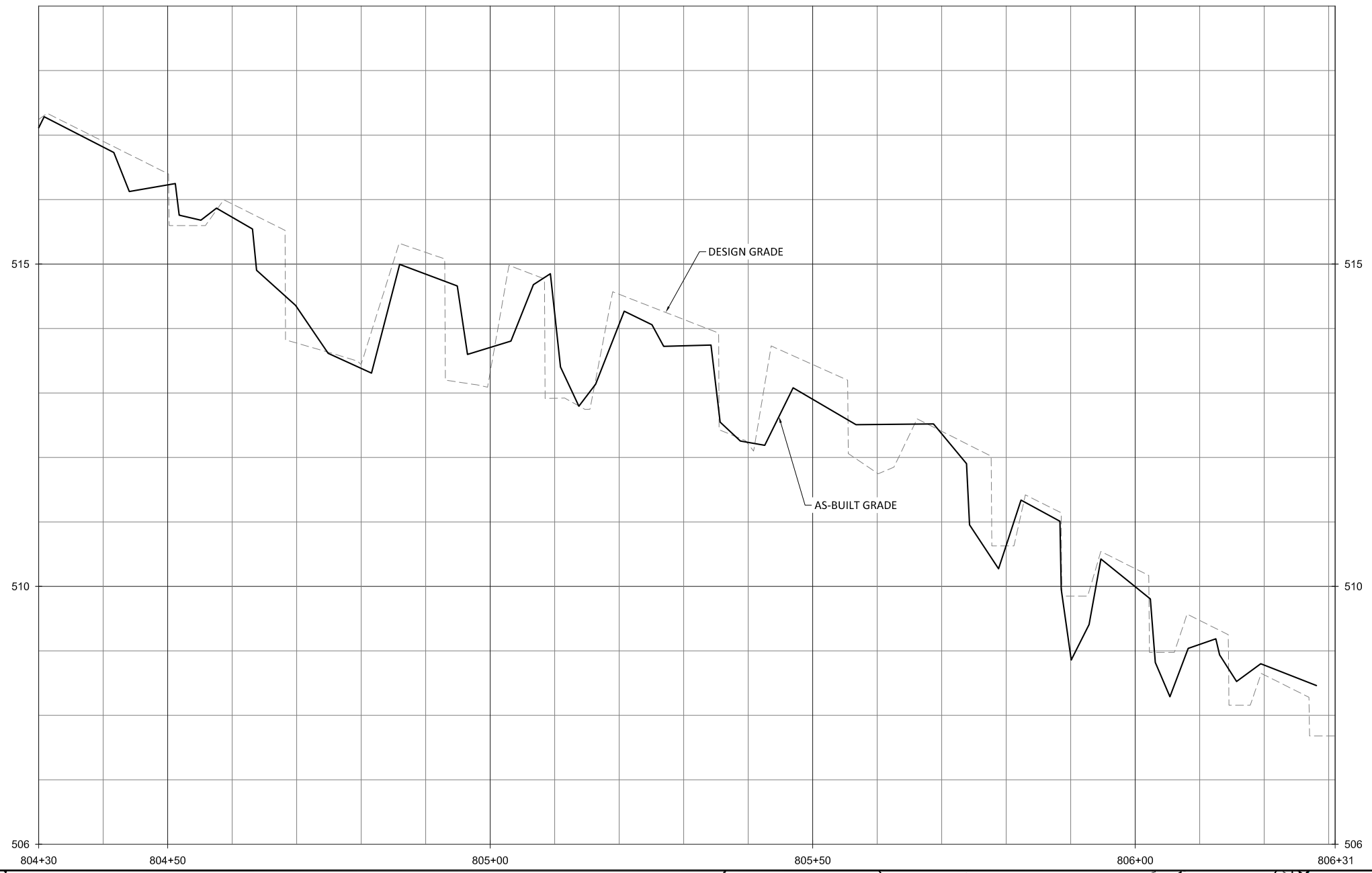
Revisions:

Date: 07.01.2019
Job Number: 005-02157
Project Engineer: NMM
Drawn By: CAW
Checked By: JTL

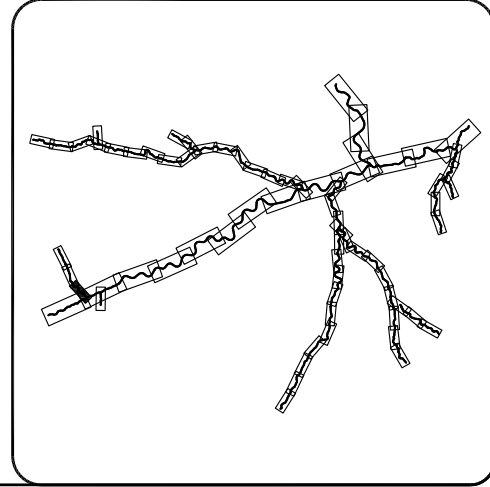
1.68

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- NOTE:**
1. STA 804+93: NO BOULDER SILL INSTALLED.
 2. STA 805+62: BRUSH TOE WAS NOT INSTALLED TO AVOID IMPACTING EXISTING VEGETATION.
 3. STA 805+81: BRUSH TOE WAS NOT INSTALLED TO AVOID IMPACTING EXISTING VEGETATION.



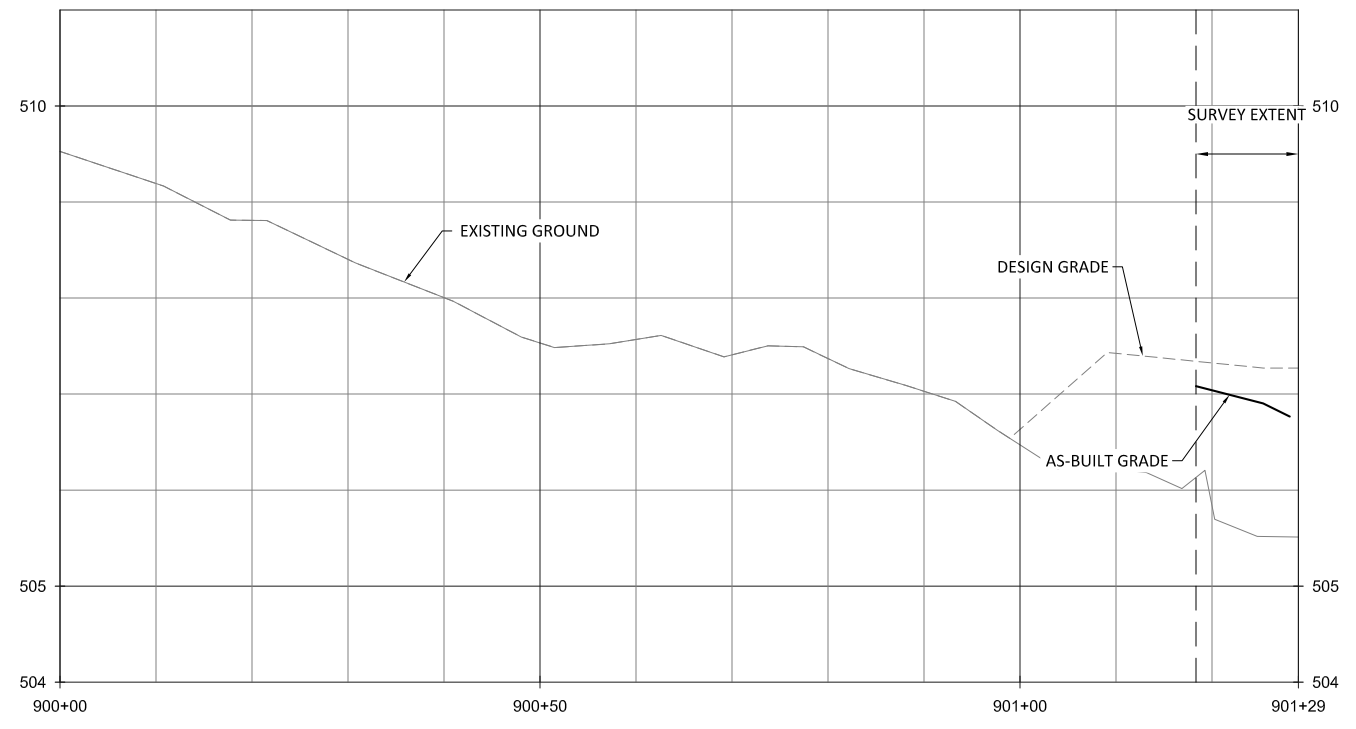
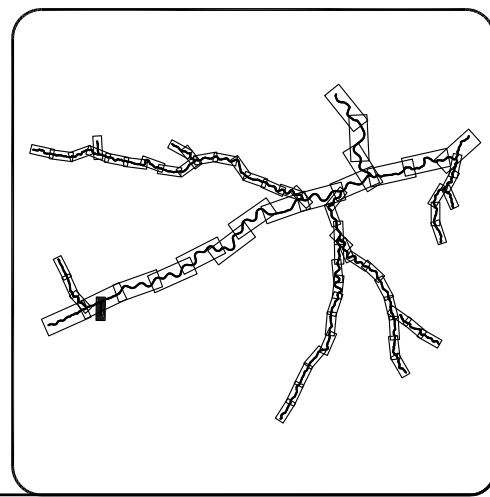
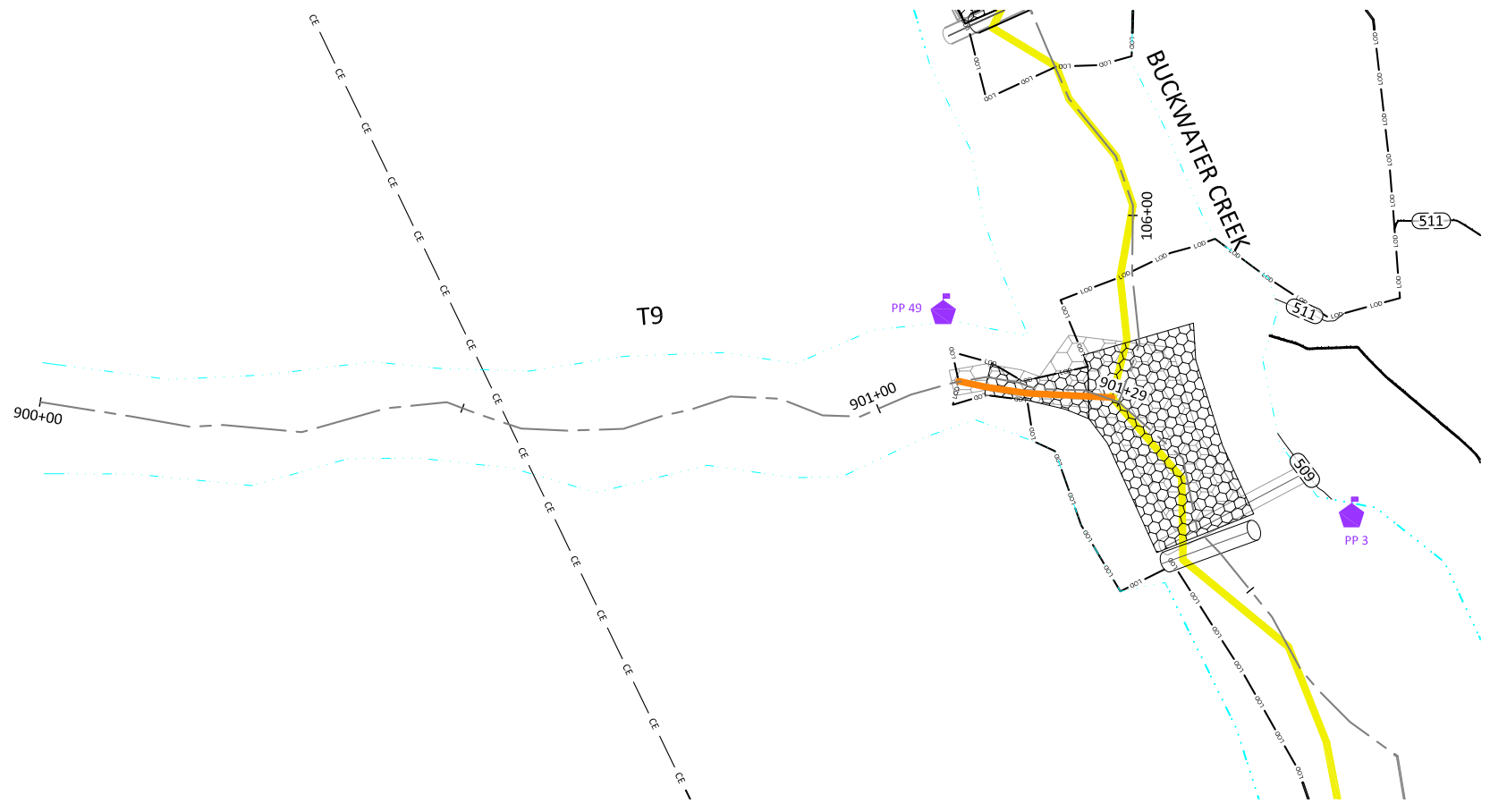
Buckwater Mitigation Site
Orange County, North Carolina
T8
Stream Plan and Profile

Revisions:	

Date:	07.01.2019
Job Number:	005-02157
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	JTL

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Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

Revisions:

Buckwater Mitigation Site
Orange County, North Carolina
 T9
 Stream Plan and Profile





Zone 1 - Streambank Planting Zone
(See Detail 3, Sheet 5.6)



Zone 2 - Buffer Planting Zone
(See Detail 4, Sheet 5.6)



Zone 3 - Overhead Electric Utility Easement Planting Zone

Streambank Planting Zone					
Live Stakes					
Species	Common Name	Indiv. Spacing	Min. Size	Stratum	% of Stems
<i>Salix nigra</i>	Black Willow	3-6 ft.	0.5"-1.5" cal.	Shrub	15%
<i>Cornus amomum</i>	Silky Dogwood	3-6 ft.	0.5"-1.5" cal.	Shrub	45%
<i>Salix sericea</i>	Silky Willow	3-6 ft.	0.5"-1.5" cal.	Shrub	40%
					100%
Herbaceous Plugs					
<i>Juncus effusus</i>	Common Rush	4 ft.	1.0"-2.0" plug	Herb	40%
<i>Carex alata</i>	Broadwing Sedge	4 ft.	1.0"-2.0" plug	Herb	40%
<i>Panicum virgatum</i>	Switchgrass	4 ft.	1.0"-2.0" plug	Herb	20%
					100%



Buffer Planting Zone - 23.6 Acres						
Bare Root						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Quercus phellos</i>	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	10%
<i>Platanus occidentalis</i>	Sycamore	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20%
<i>Betula nigra</i>	River Birch	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	10%
<i>Liriodendron tulipifera</i>	Tulip Poplar	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus alba</i>	White Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	5%
<i>Quercus shumardii</i>	Shumard Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	5%
<i>Fraxinus pennsylvanica</i>	Green Ash	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	17%
<i>Viburnum nudum</i>	Possumhaw Viburnum	24 ft.	12-24 ft.	0.25"-1.0"	Understory	1%
<i>Amelanchier laevis</i>	Allegheny Serviceberry	24 ft.	12-24 ft.	0.25"-1.0"	Understory	1%
<i>Aesculus pavia</i>	Red Buckeye	24 ft.	12-24 ft.	0.25"-1.0"	Understory	1%
						100%



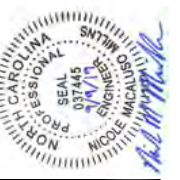
Overhead Electric Utility Easement Planting Zone					
Live Stakes					
Species	Common Name	Indiv. Spacing	Min. Size	Stratum	% of Stems
<i>Cornus amomum</i>	Silky Dogwood	6-12 ft.	0.5"-1.5" cal.	Shrub	50%
<i>Salix sericea</i>	Silky Willow	6-12 ft.	0.5"-1.5" cal.	Shrub	50%
					100%

Zones 1, 2 and 3

Permanent Riparian Seeding						
Pure Live Seed (20 lbs / acre)						
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)	pH	Percentage
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	1.5	5.0-7.5	5%
All Year	<i>Agrostis hyemalis</i>	Winter Bentgrass	Herb	3.0	5.0-7.5	15%
All Year	<i>Chasmanthium latifolium</i>	River Oats	Herb	2.0	5.0-7.0	10%
All Year	<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	1.0	6.0-7.0	5%
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	1.0	6.0-7.0	5%
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	4.0	6.8-8.9	20%
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	3.4	4.0-7.5	24%
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	3.0	5.0-7.4	15%
All Year	<i>Asclepias syriaca</i>	Common Milkweed	Herb	0.2	5.5-7.3	1%
						100%

Permanent Seeding Outside Easement					
Approved Date	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%




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



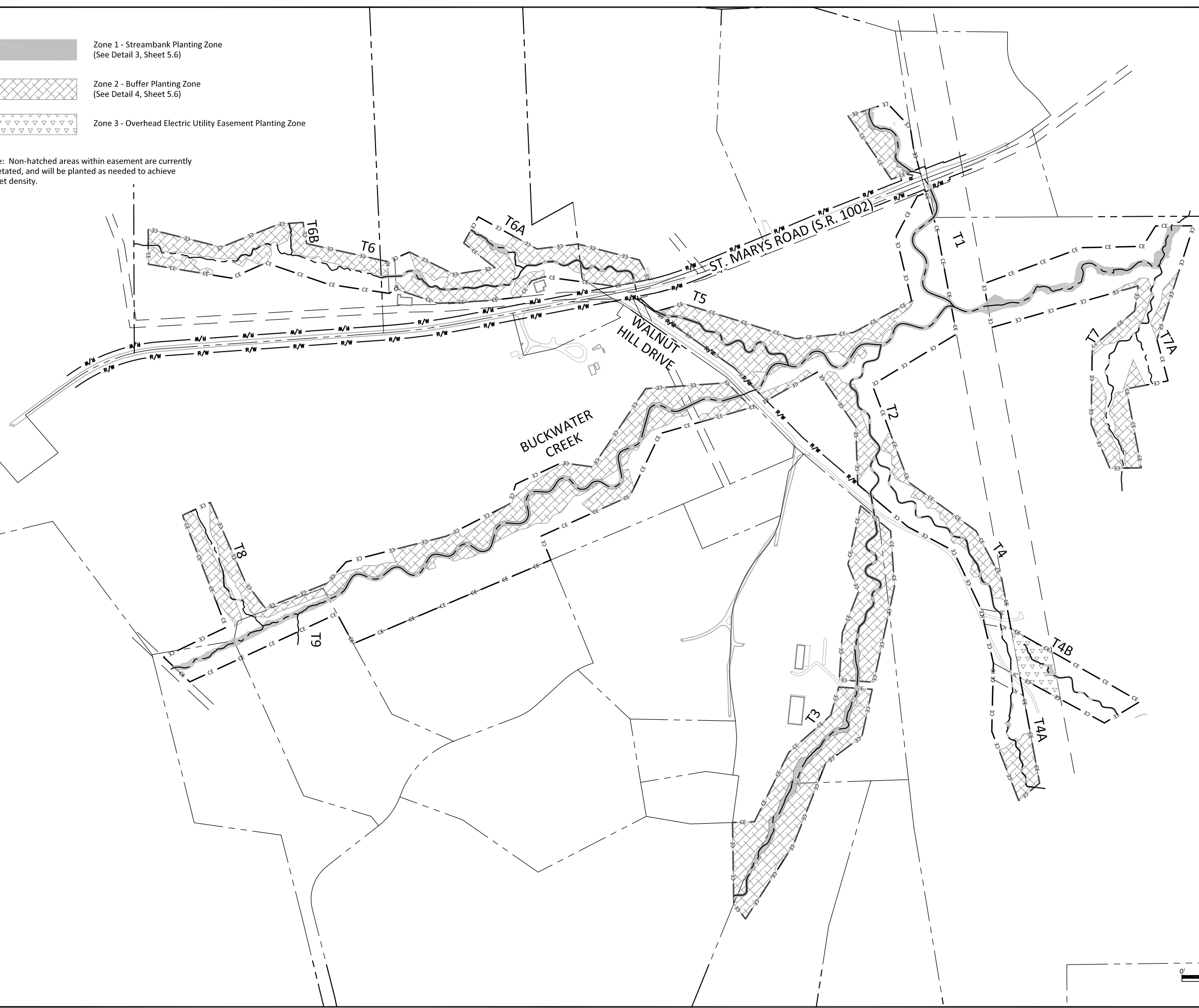
Buckwater Mitigation Site
Orange County, North Carolina
Planting Tables

Revisions:

September 11, 2019
E:\Projects\005-02157\Buckwater\Cadd\Plans\As-Built\Planting_Plans.dwg

-  Zone 1 - Streambank Planting Zone
(See Detail 3, Sheet 5.6)
-  Zone 2 - Buffer Planting Zone
(See Detail 4, Sheet 5.6)
-  Zone 3 - Overhead Electric Utility Easement Planting Zone

Note: Non-hatched areas within easement are currently vegetated, and will be planted as needed to achieve target density.



Buckwater Mitigation Site
Orange County, North Carolina
 Planting Plan

Revisions:

Date: 07/01/2019
 Job Number: 005-02157
 Project Engineer: NMM
 Drawn By: CAW
 Checked By: JTL

2.1

Sheet