

# Key Mill Mitigation Site - Record Drawings

Surry County, North Carolina  
Yadkin River Basin HUC 03040101

for  
NCDEQ

Division of Mitigation Services

Surry County, NC



Vicinity Map  
Not to Scale



Record Drawings  
August 27, 2020

**CERTIFICATE OF SURVEY AND ACCURACY**

I, PHILLIP B. KEE, CERTIFY THAT THE GROUND TOPOGRAPHIC SURVEY PORTION OF THIS PROJECT WAS COMPLETED UNDER MY DIRECT SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY DIRECT SUPERVISION; THAT THE RECORD DRAWINGS WERE PREPARED BY WILDLANDS ENGINEERING, INC. FROM DIGITAL FILES PROVIDED BY KEE MAPPING AND SURVEYING, PA AS SHOWN ON AN AS-BUILT SURVEY FOR "KEY MILL MITIGATION SITE AREA A-WEST & AREA B-EAST". JOB #190870-AB, DATED 01/31/20 (AREA A-WEST) & 07/23/20 (AREA B-EAST); THAT THIS SURVEY WAS PERFORMED AT THE 95% CONFIDENCE LEVEL TO MEET THE FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS AND TO MEET THE REQUIREMENTS OF A TOPOGRAPHIC SURVEY TO THE ACCURACY OF CLASS A HORIZONTAL AND CLASS C VERTICAL WHERE APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAINED BETWEEN THE DATES OF 09/30/19-10/18/19 (AREA A-WEST) & 04/28/20-06/04/20 (AREA B-EAST); THAT THE CONTOURS SHOWN AS BROKEN LINES MAY NOT MEET THE STATED STANDARD AND ALL COORDINATES ARE BASED ON NAD 83 (NSRS 2011) AND ALL ELEVATIONS ARE BASED ON NAVD 88; THAT THIS MAP MEETS THE SPECIFICATIONS FOR TOPOGRAPHIC SURVEYS AS STATED IN TITLE 21, CHAPTER 56, SECTION .1606; THAT THIS MAP WAS NOT PREPARED IN ACCORDANCE WITH G.S. 47-30, AS AMENDED AND DOES NOT REPRESENT AN OFFICIAL BOUNDARY SURVEY.

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 6TH DAY OF OCTOBER, 2020, A.D.



DocuSigned by:  
Phillip B. Kee  
D985004A7892407...  
PHILLIP B. KEE, PLS L-4647

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Title Sheet	0.1
General Notes and Legend	0.2
Project Overview	0.3
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Planting and Fencing Plan	2.1-2.9

**Project Directory**

**Engineering:**  
Wildlands Engineering, Inc  
License No. F-0831  
1430 S. Mint St., Ste. 104  
Charlotte, NC 28203  
Aaron Earley, PE, CFM  
704-332-7754

**Surveying:**  
Kee Mapping & Surveying  
Box P.O. 2566  
Asheville, NC 28802  
Phillip B. Kee, PLS  
828-575-9021

**Owner:**  
NCDEQ  
Division of Mitigation Services  
5 Ravenscroft Drive, Ste 102  
Asheville, NC 28801  
Matthew Reid  
919-707-8976

DMS Project no. 100025  
Yadkin River Basin HUC 03040101  
USACE Action ID: SAW-2017-01504



Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina

Title Sheet

Revisions:

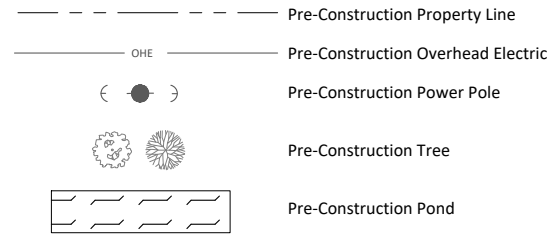
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Date: August 27, 2020

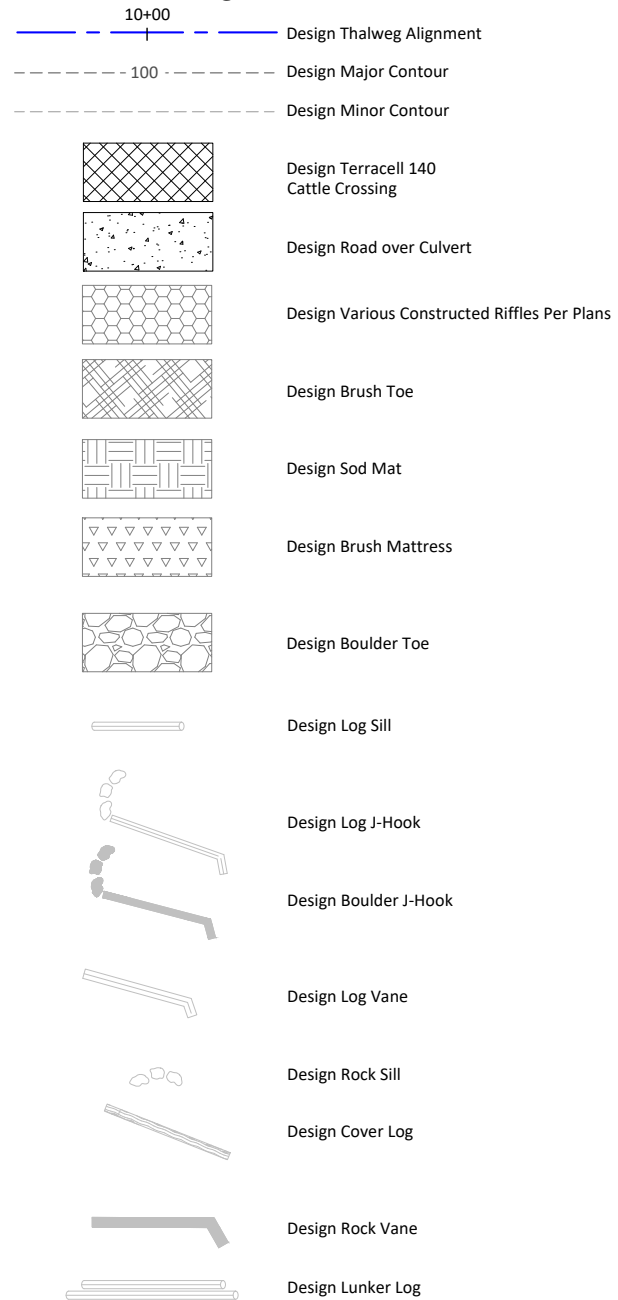
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Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

0.1

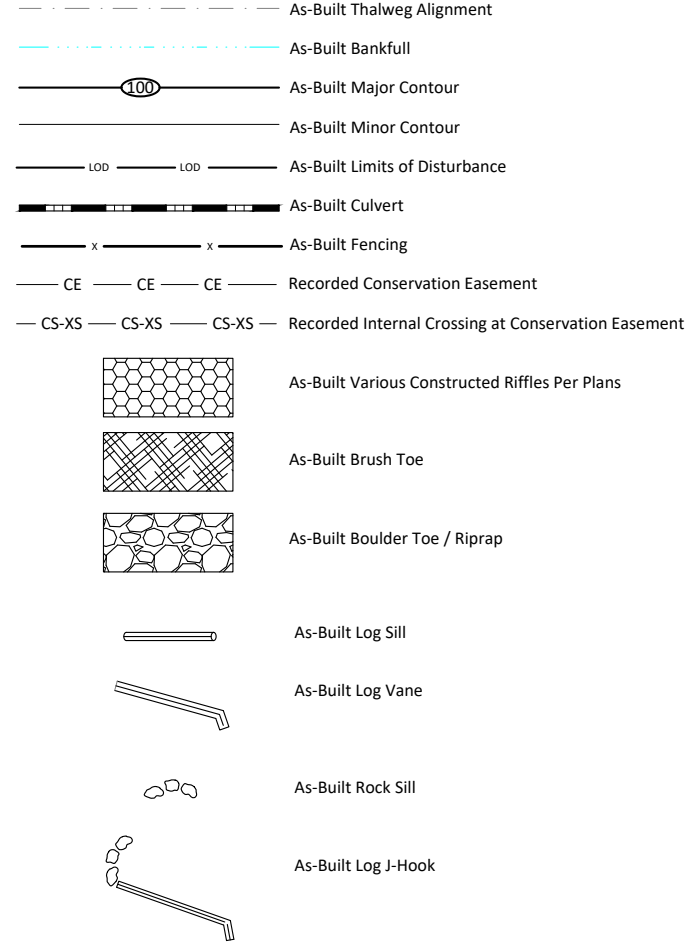
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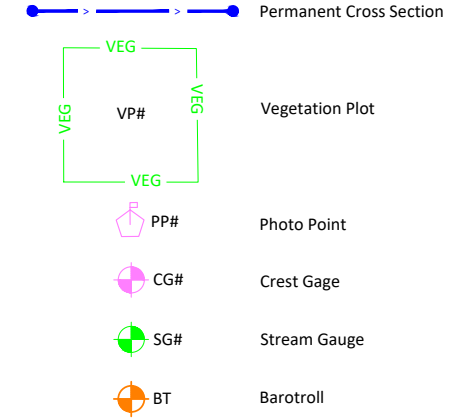
### Design Features



### As-Built Features



### Monitoring Features



### Notes:

1. Deviations from Design will be shown in Red.
2. Both the As-Built surveyed thalweg alignment and Design Centerline are depicted in this plan set.
3. The Design Centerline stationing is used for the profiles as well as project credit stationing.
4. Pre-construction topography by Kee Mapping and Surveying March 16, 2018.
5. Boundary survey by Kee Mapping and Surveying June 1, 2018.
6. As-built survey west of Key Road November 1, 2019.
7. As-built survey east of Key Road June 9, 2020.



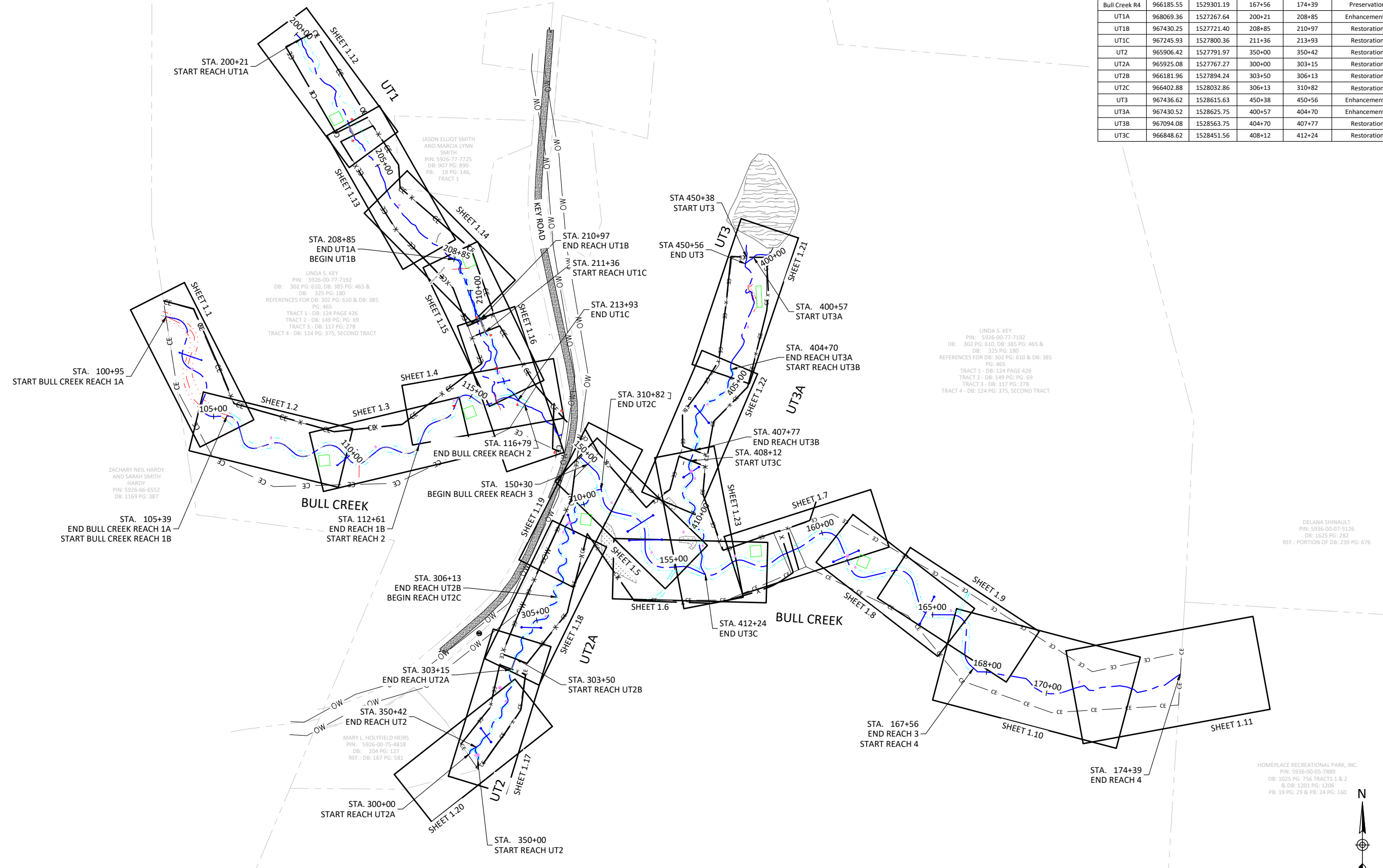
Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 General Notes and Legend

Revisions:


Date: August 27, 2020  
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# 0.2

OCTOBER 6, 2020  
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Reach	Reach Start			End Station	Type of Mitigation
	Northing	Easting	Station		
Bull Creek R1A	967255.23	1526843.10	100+95	105+39	Restoration
Bull Creek R1B	966953.15	1527027.89	105+39	112+61	Restoration
Bull Creek R2	966864.77	1527613.64	112+61	116+79	Restoration
Bull Creek R3	966807.00	1528127.22	150+30	167+56	Restoration
Bull Creek R4	966185.55	1529301.19	167+56	174+39	Preservation
UT1A	968069.36	1527267.64	200+21	208+85	Enhancement II
UT1B	967430.25	1527721.40	208+85	210+97	Restoration
UT1C	967245.93	1527800.36	211+36	213+93	Restoration
UT2	965906.42	1527791.97	350+00	350+42	Restoration
UT2A	965925.08	1527767.27	300+00	303+15	Restoration
UT2B	966181.96	1527894.24	303+50	306+13	Restoration
UT2C	966402.88	1528032.86	306+13	310+82	Restoration
UT3	967436.62	1528615.63	450+38	450+56	Enhancement II
UT3A	967430.52	1528625.75	400+57	404+70	Enhancement II
UT3B	967094.08	1528563.75	404+70	407+77	Restoration
UT3C	966848.62	1528451.56	408+12	412+24	Restoration

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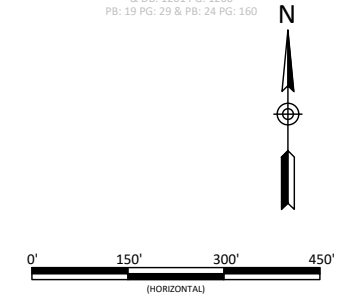


**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
 Project Overview

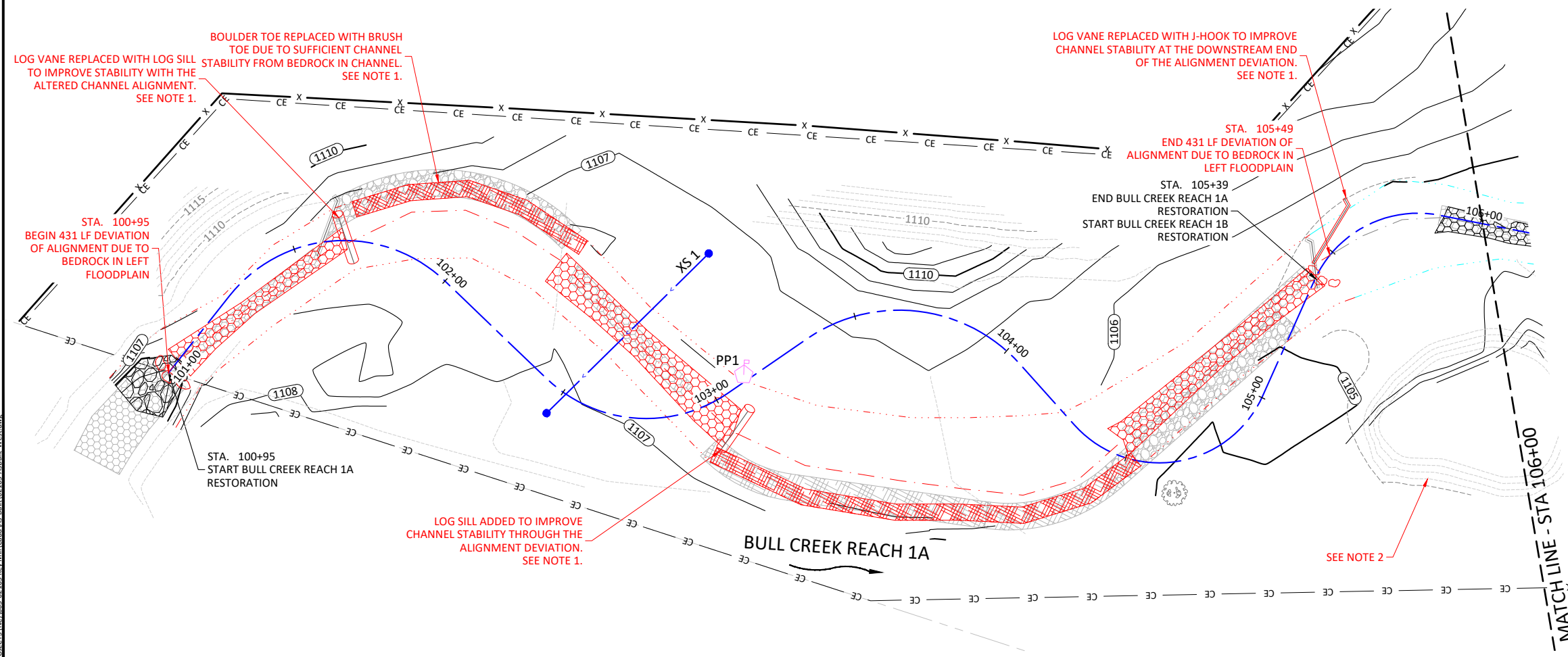
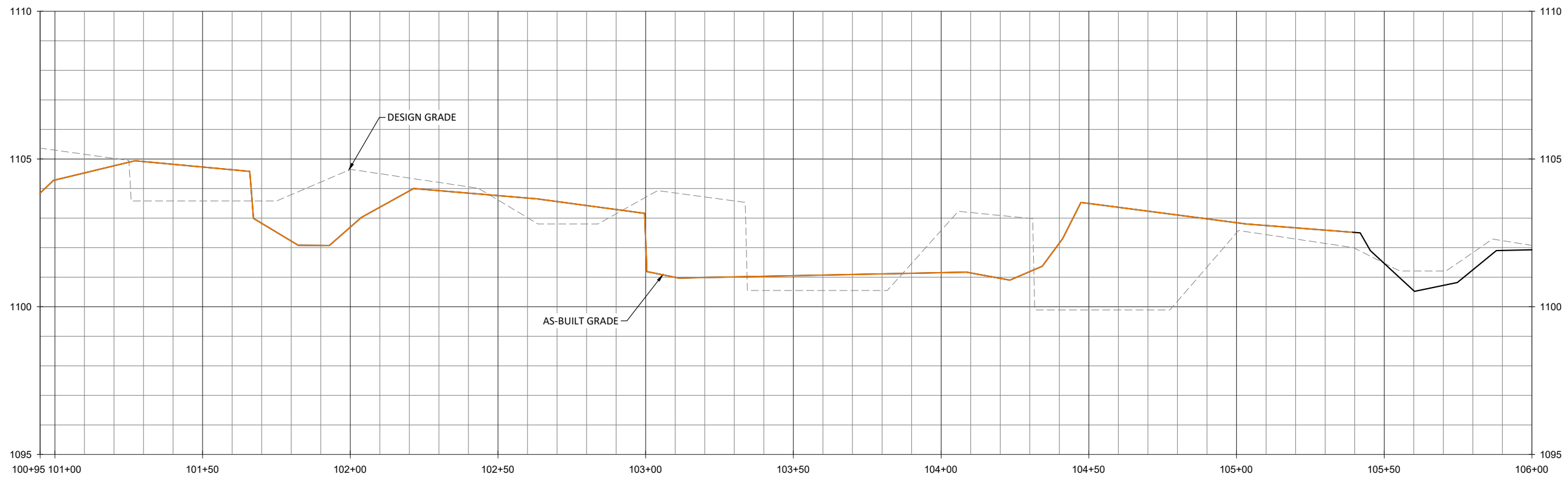
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 Project Engineer: AE  
 Drawn By: ABP/JTC  
 Checked By: JCK

Revisions:  
 09/29/2020

0.3  
 Sheet



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0' 2' 4' 6'

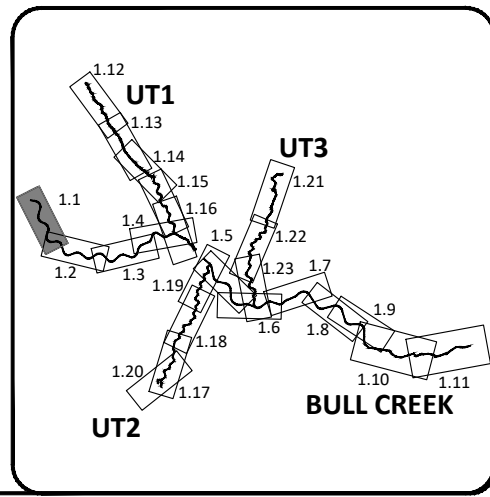
(VERTICAL)

0' 20' 40' 60'

(HORIZONTAL)

**NOTES:**

1. STA. 100+95-105+49: THE CHANNEL DESIGN WAS ALTERED AND REALIGNED DUE TO BEDROCK THAT WAS PRESENT IN THE LEFT FLOODPLAIN WHICH RESULTED IN 431 LF OF CONSTRUCTED CHANNEL, COMPARED TO THE 454 LF IN ORIGINAL DESIGN.
2. STA. 105+75: THE VERNAL POOL AT DEPICTED LOCATION WAS NOT INSTALLED BECAUSE IT WAS NOT NECESSARY TO BALANCE ONSITE EARTHWORK VOLUMES AT THIS LOCATION.



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**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
 Bull Creek Reach 1A  
 Stream Plan and Profile

Revisions:

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Drawn By: ABP/JTC

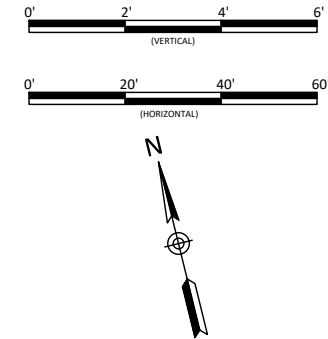
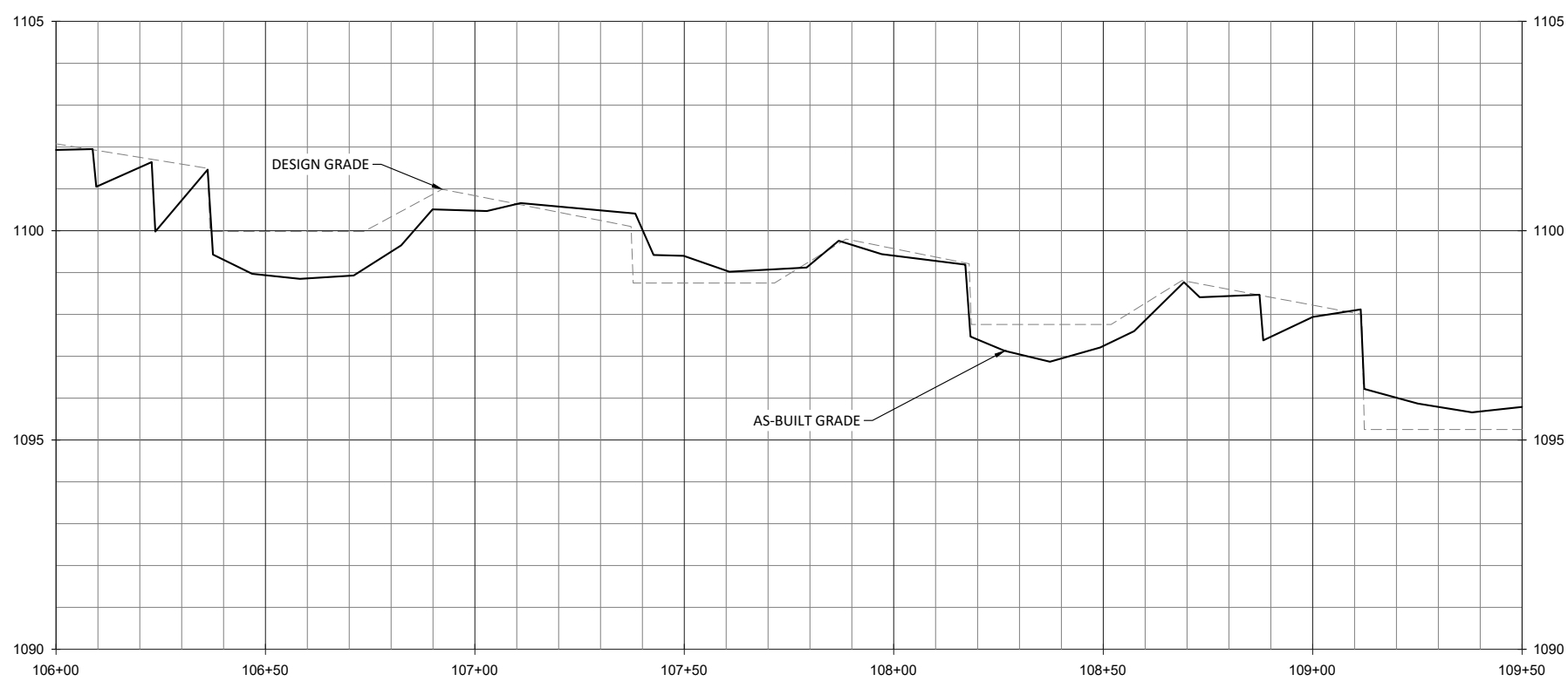
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Sheet

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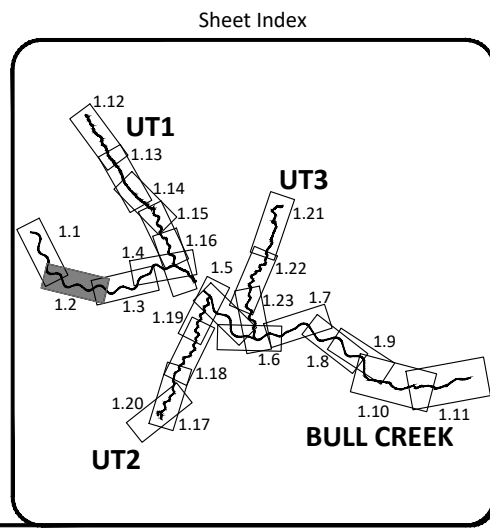
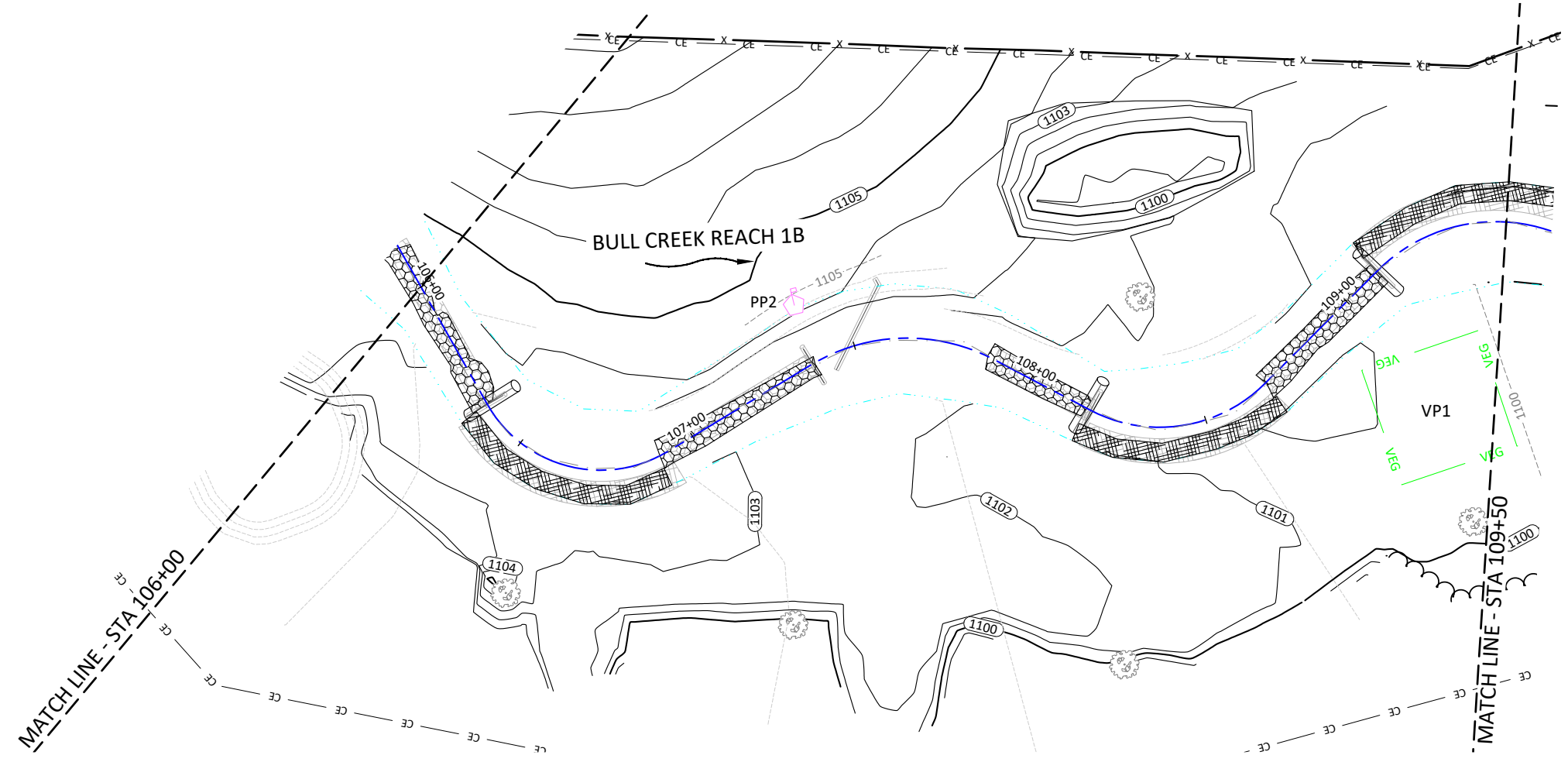


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Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 Bull Creek Reach 1B  
 Stream Plan and Profile

**NOTE:**  
 1. STA. 107+40: THE LOG SILL AND LOG VANE WERE OMITTED DUE TO PRESENCE OF BEDROCK.



Revisions:

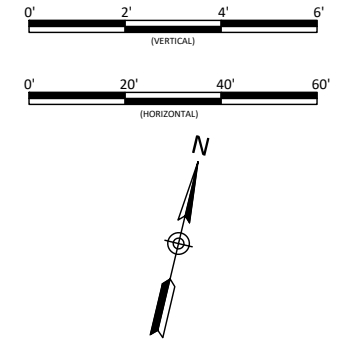
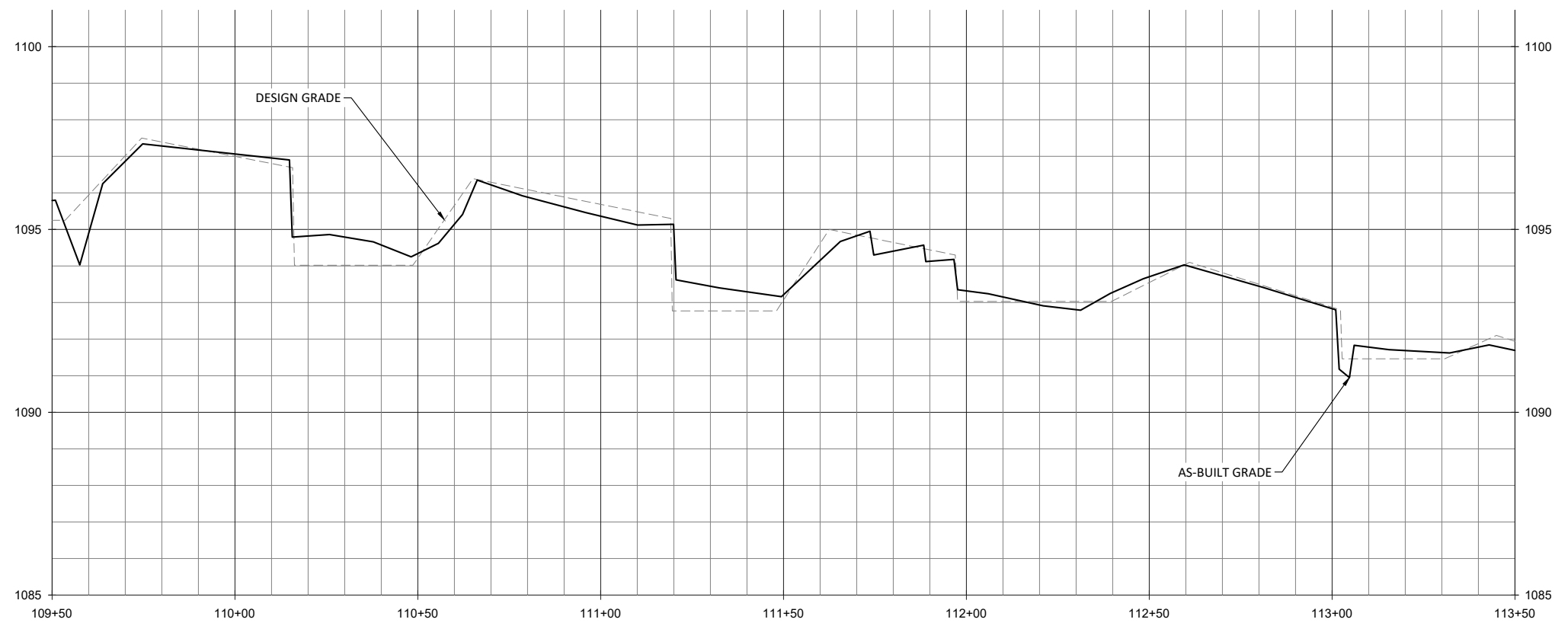
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Sheet

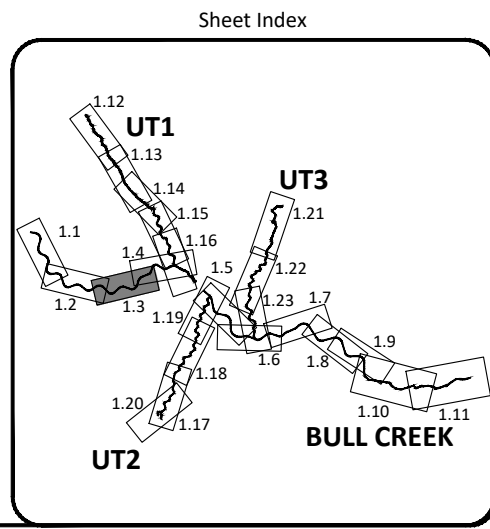
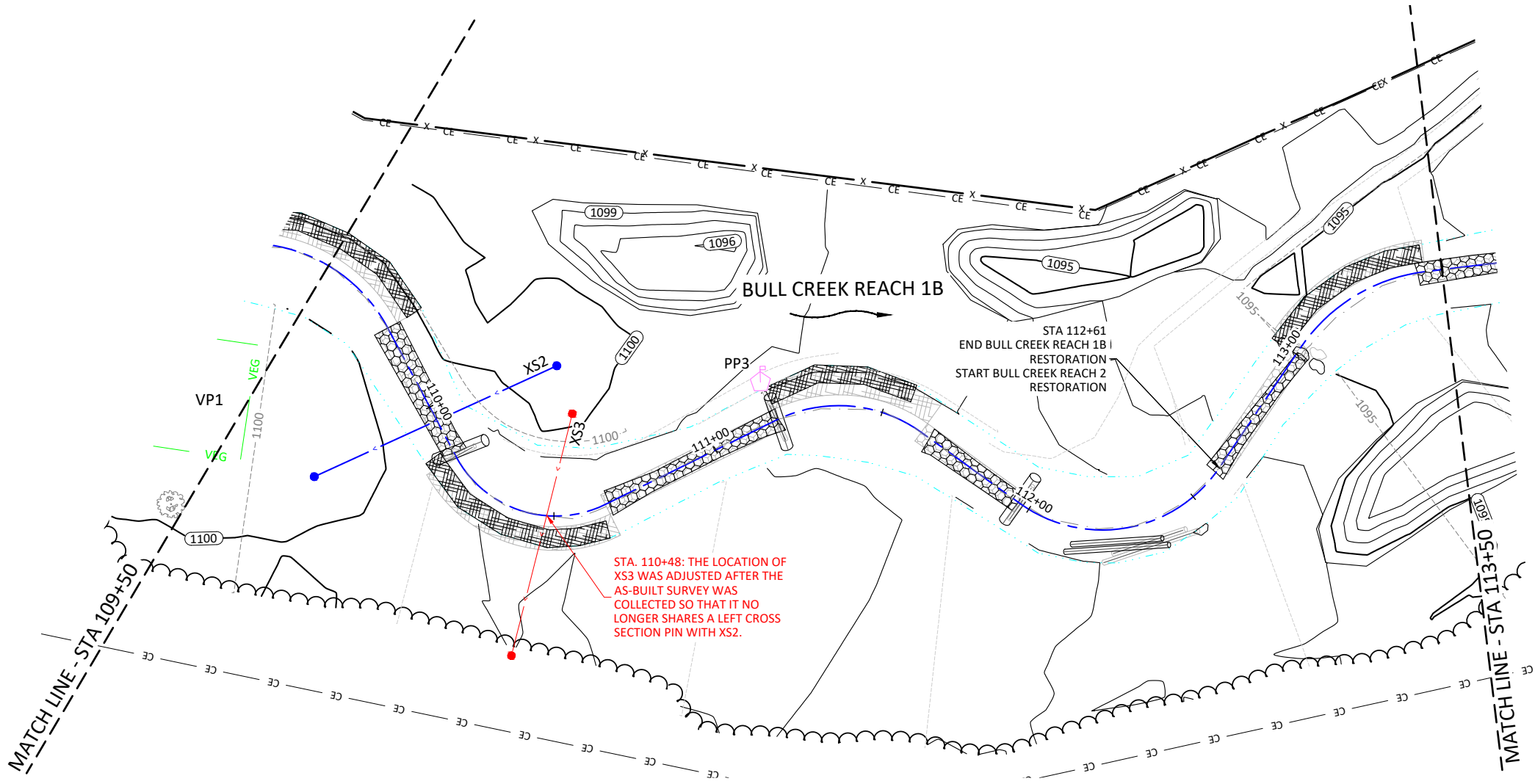
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**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
 Bull Creek Reach 1B  
 Stream Plan and Profile



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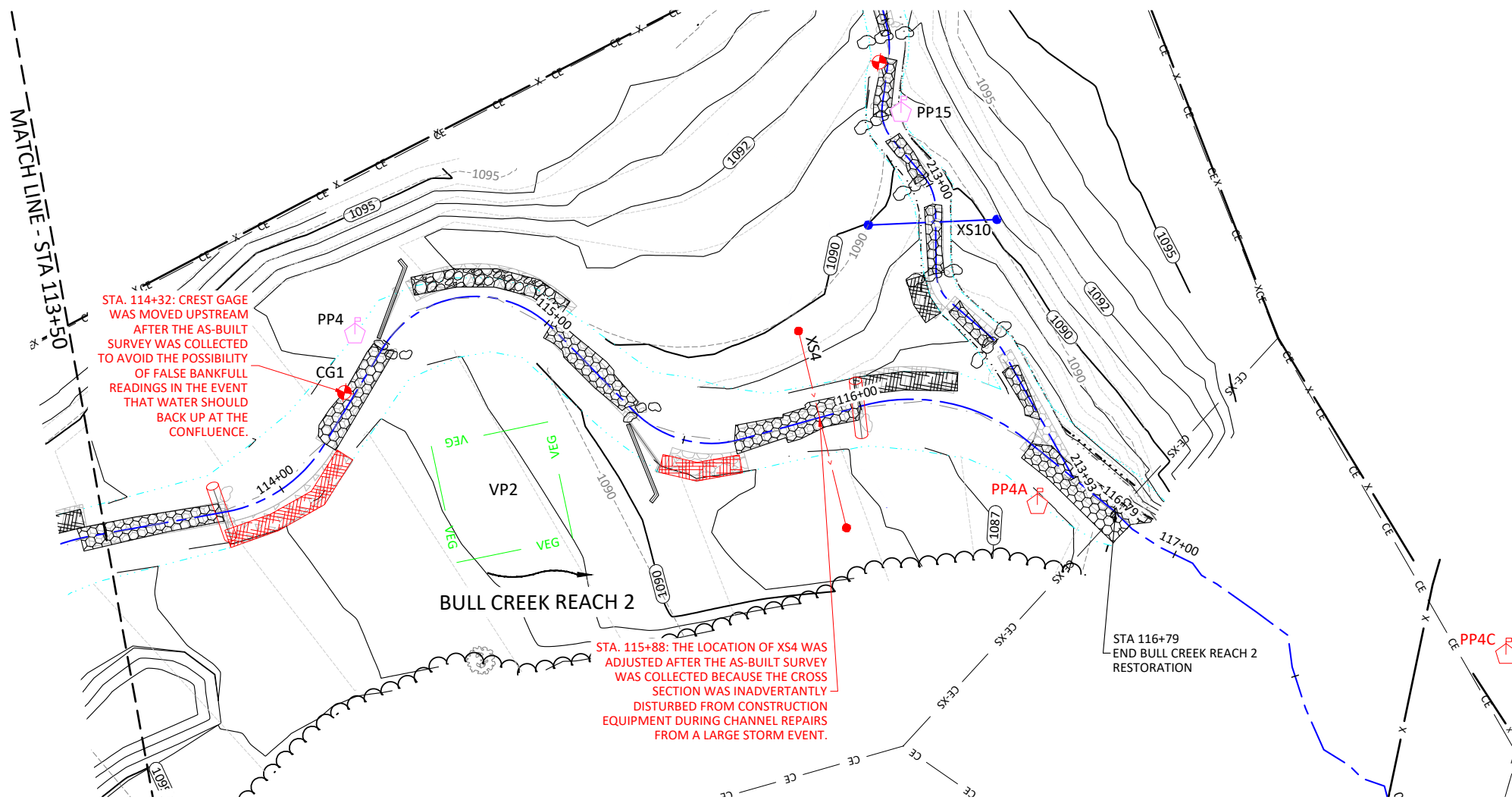
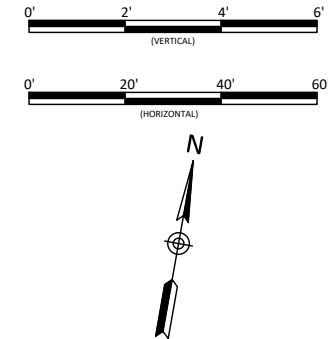
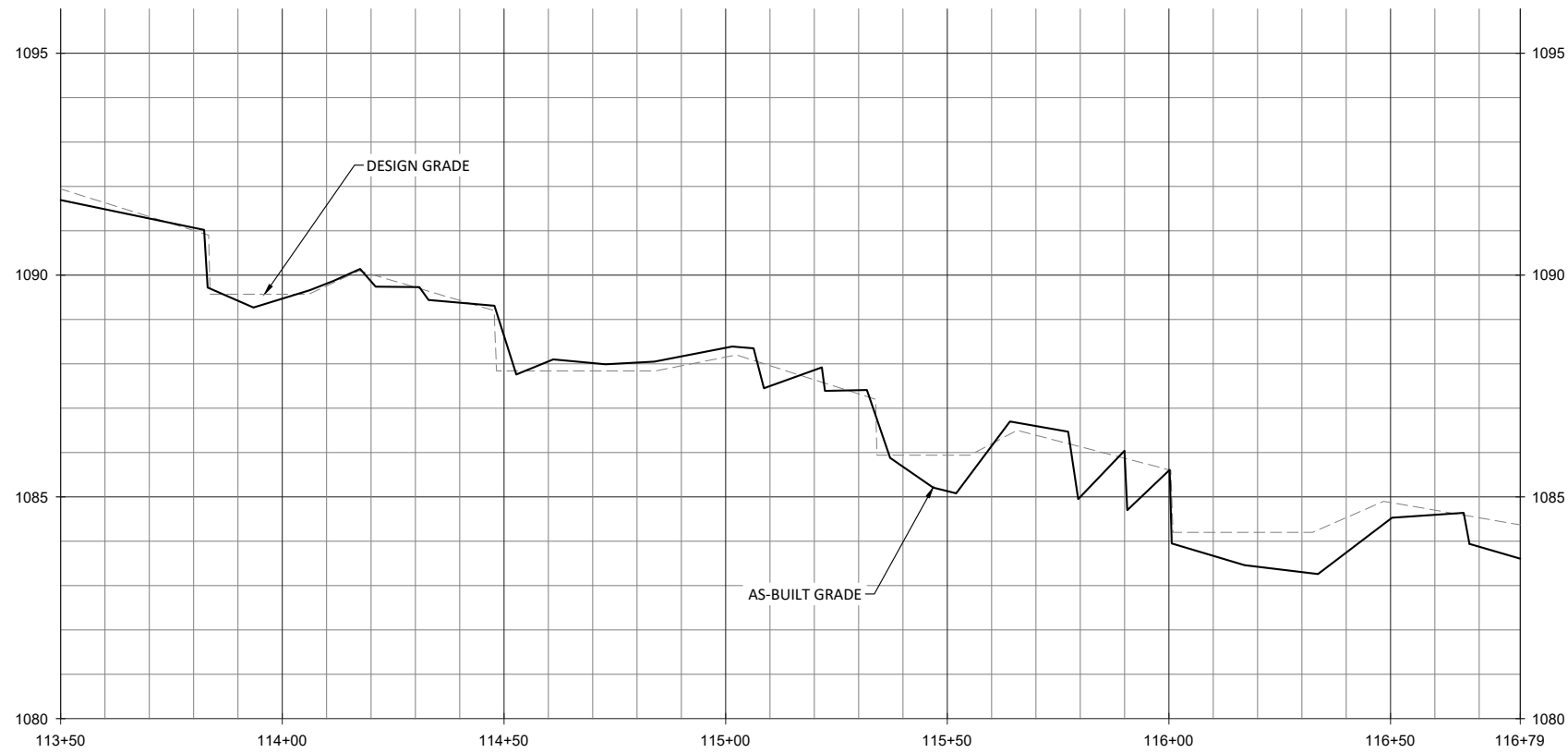
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October 6, 2020

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STA. 114+32: CREST GAGE WAS MOVED UPSTREAM AFTER THE AS-BUILT SURVEY WAS COLLECTED TO AVOID THE POSSIBILITY OF FALSE BANKFULL READINGS IN THE EVENT THAT WATER SHOULD BACK UP AT THE CONFLUENCE.

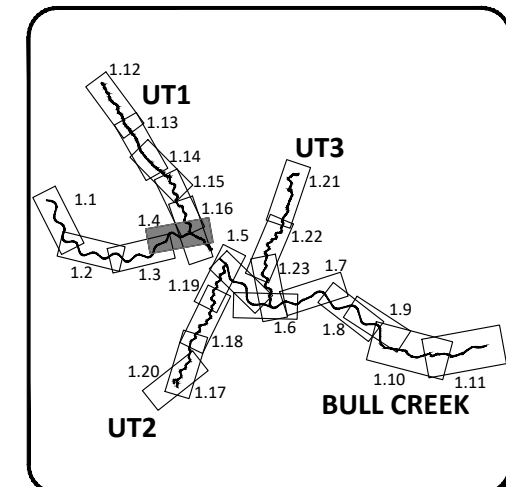
STA. 115+88: THE LOCATION OF XS4 WAS ADJUSTED AFTER THE AS-BUILT SURVEY WAS COLLECTED BECAUSE THE CROSS SECTION WAS INADVERTANTLY DISTURBED FROM CONSTRUCTION EQUIPMENT DURING CHANNEL REPAIRS FROM A LARGE STORM EVENT.

STA 116+79  
END BULL CREEK REACH 2  
RESTORATION

**NOTES:**

1. STA. 113+80: LOG SILL WAS SUBSTITUTED FOR ROCK SILL DUE TO LOCAL MATERIAL AVAILABILITY AND SITE CONDITIONS.
2. STA. 113+85: BRUSH TOE WAS SUBSTITUTED FOR BRUSH MATTRESS DUE TO SUFFICIENT BANK STABILITY FOLLOWING CONSTRUCTION OF THE PROPOSED CHANNEL.
3. STA. 115+45: BRUSH TOE WAS SUBSTITUTED FOR BOULDER TOE DUE TO SUFFICIENT BANK STABILITY FOLLOWING CONSTRUCTION OF THE PROPOSED CHANNEL.
4. STA. 116+00: LOG SILL WAS SUBSTITUTED FOR ROCK SILL DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.
5. STA. 116+62: PHOTO POINT 4A WAS ADDED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE THE CONSERVATION EASEMENT BREAK.

**Sheet Index**



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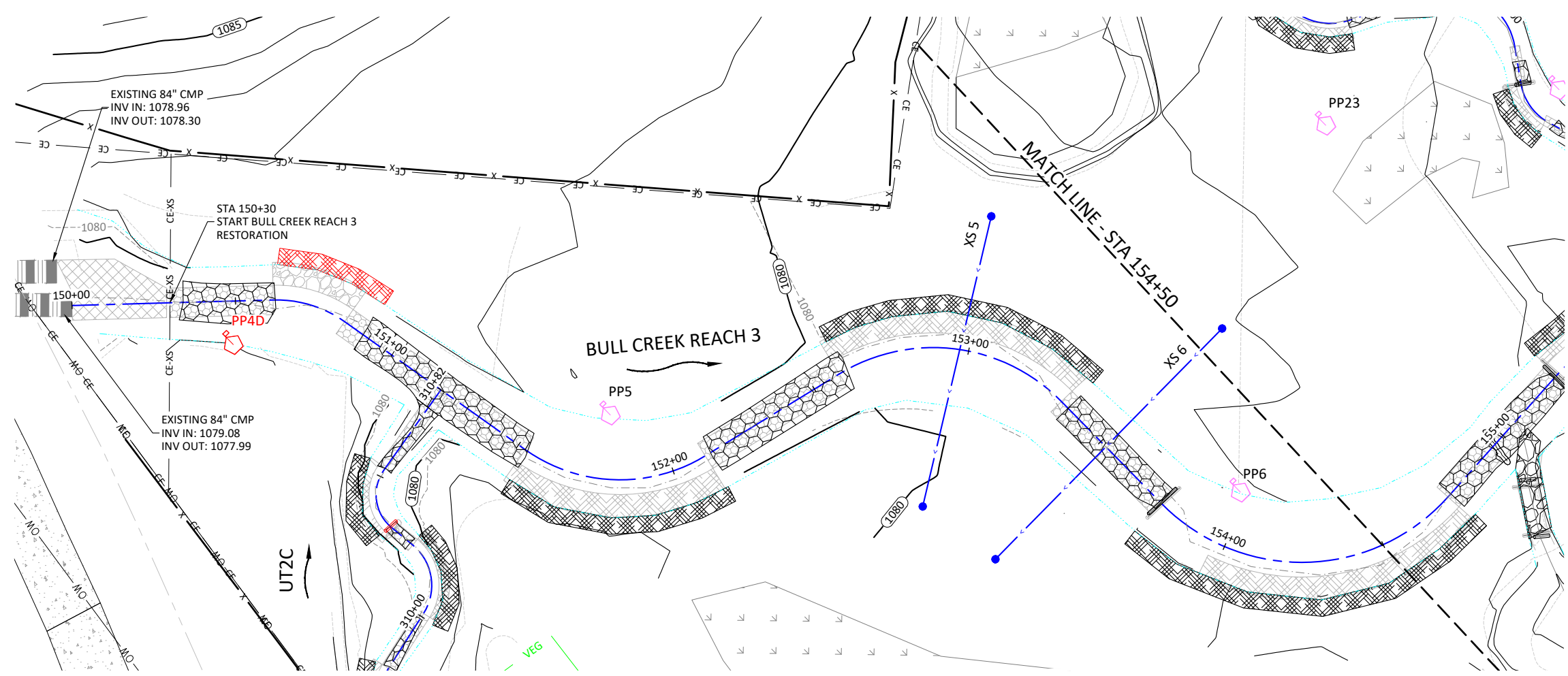
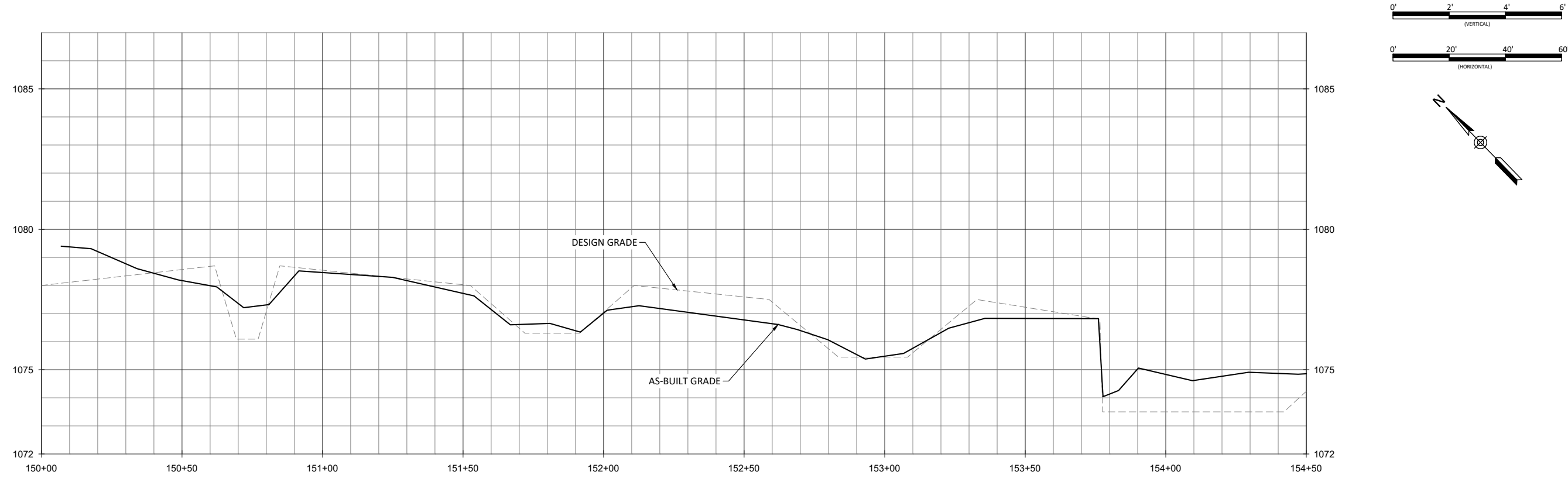
**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
Bull Creek Reach 2  
Stream Plan and Profile

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Project Engineer:	AE
Drawn By:	ABP/JTC
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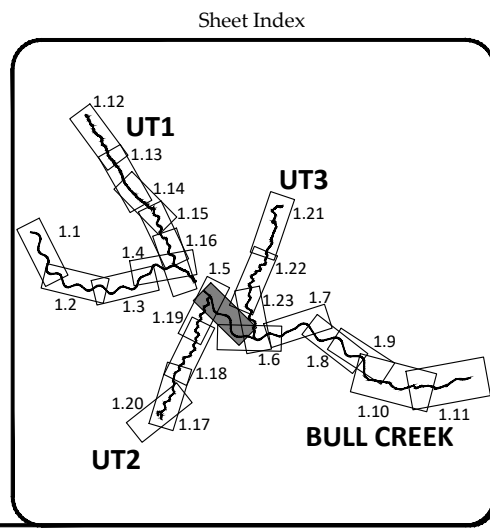
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Sheet

October 6, 2020  
TRAFFIC PROJECTS (NO. 1005-1016) Key Mill Creek, AS-BUILT, UTCS, AS-BUILT, Final.dwg



- NOTE:**
- 1. STA. 150+50: PHOTO POINT 4D WAS ADDED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE THE CONSERVATION EASEMENT BREAK.
  - 2. STA. 150+62: BOULDER TOE REPLACED WITH BRUSH TOE DUE TO LOCAL MATERIAL AVAILABILITY AND TO IMPROVE IN-STREAM HABITAT.



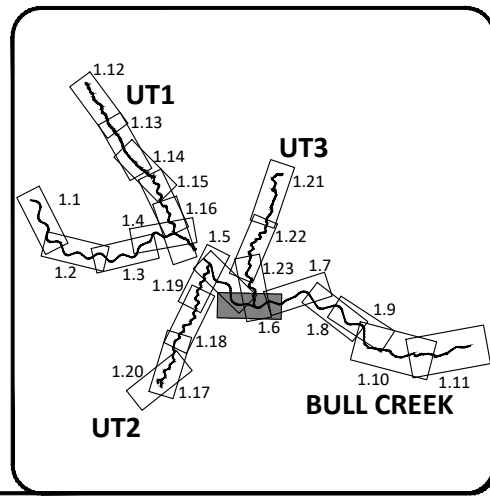
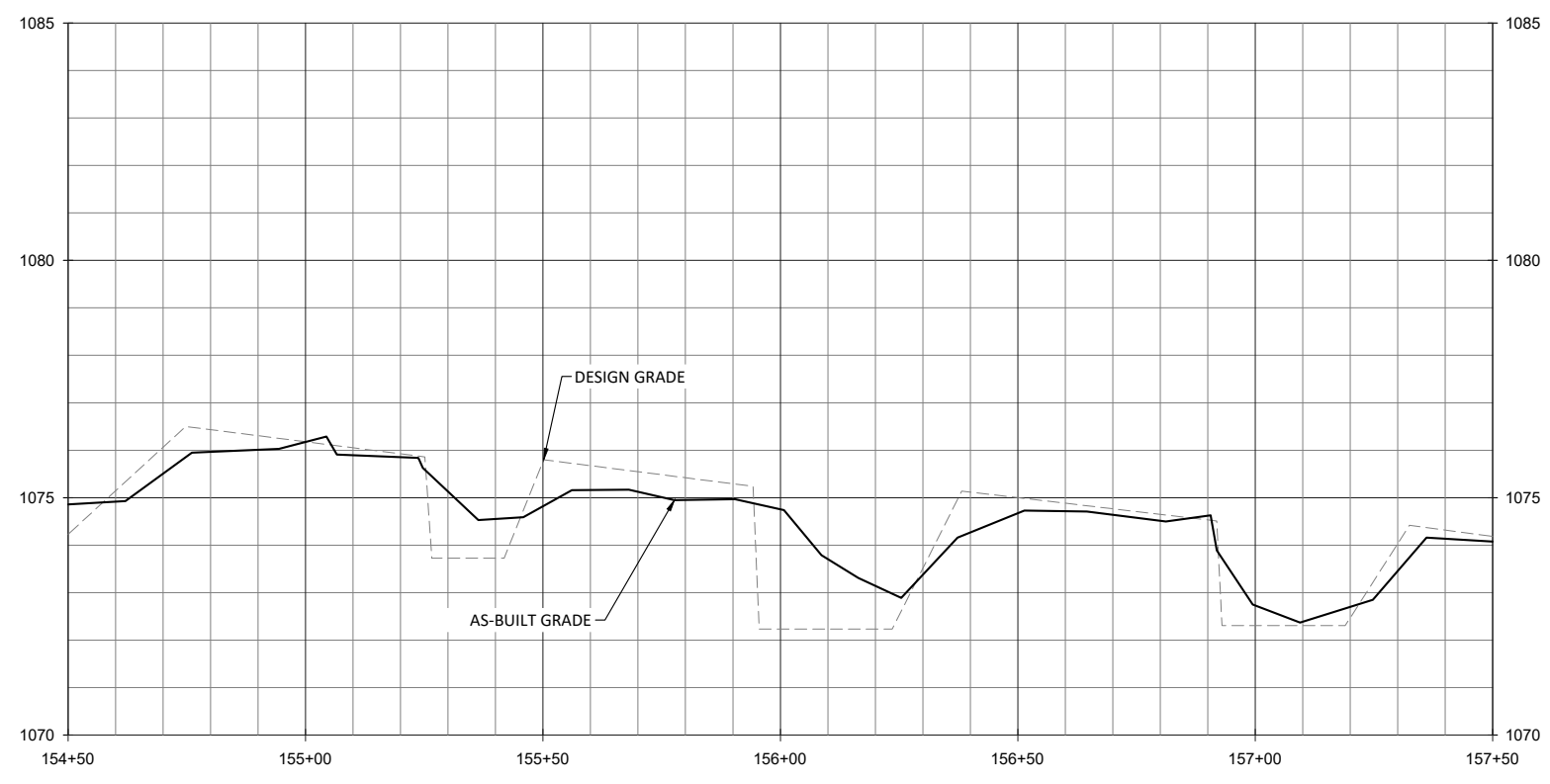
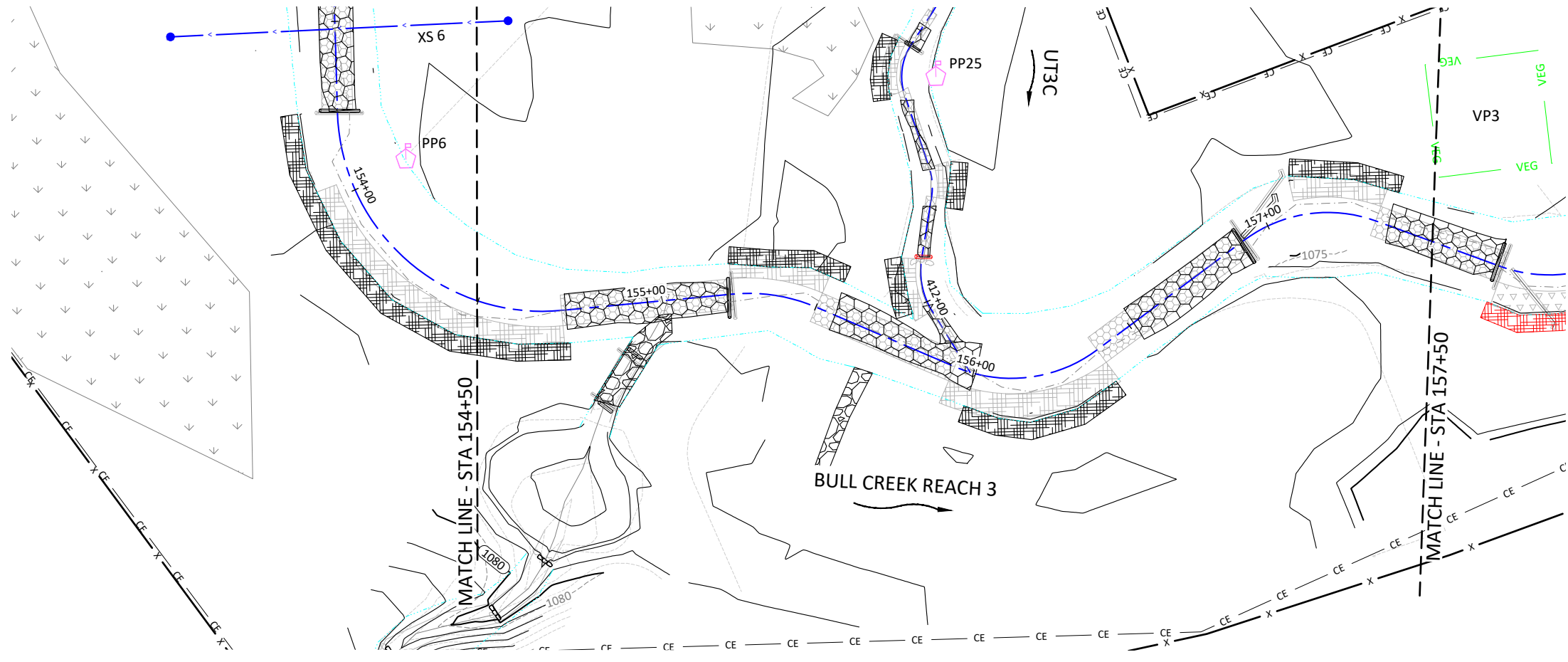
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Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina  
Bull Creek Reach 3  
Stream Plan and Profile





October 6, 2020  
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Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 Bull Creek Reach 3  
 Stream Plan and Profile



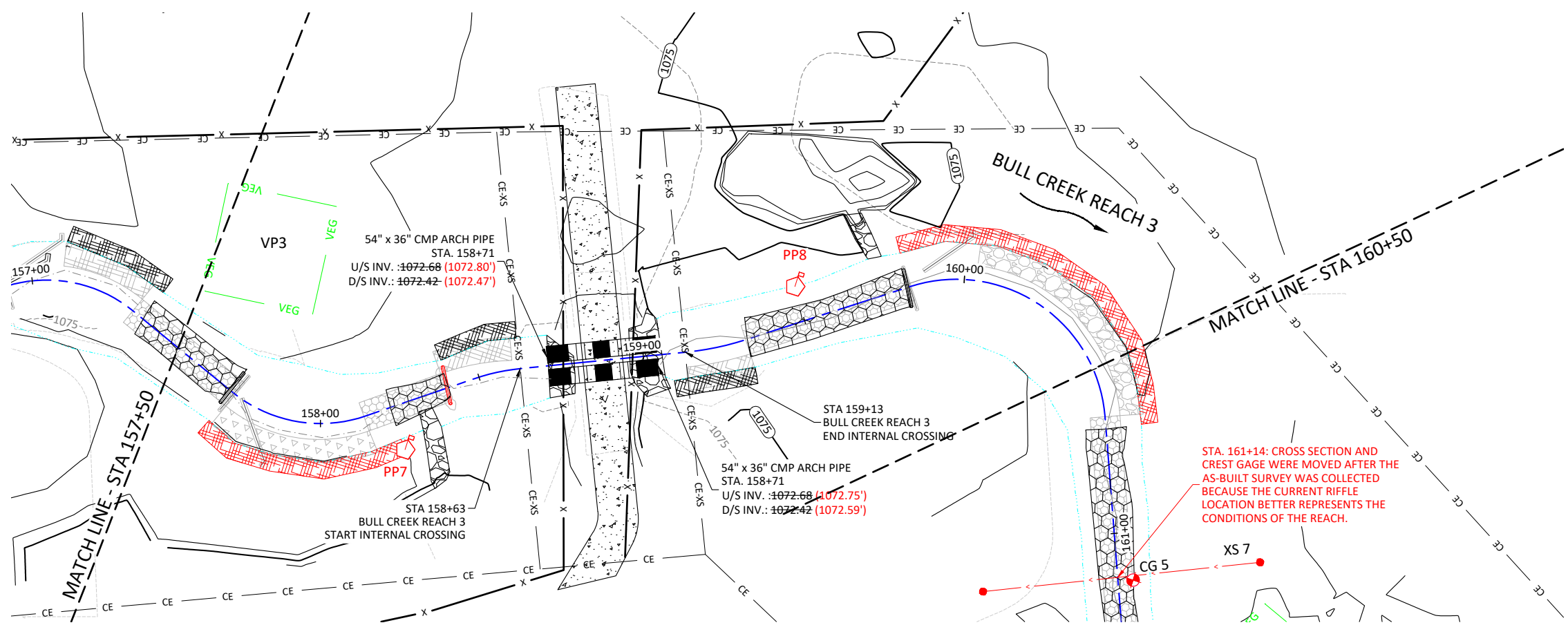
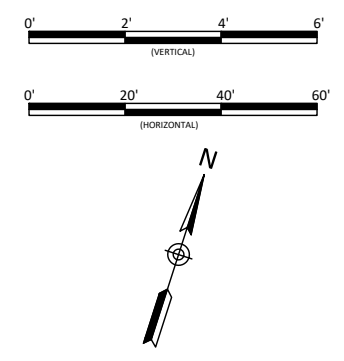
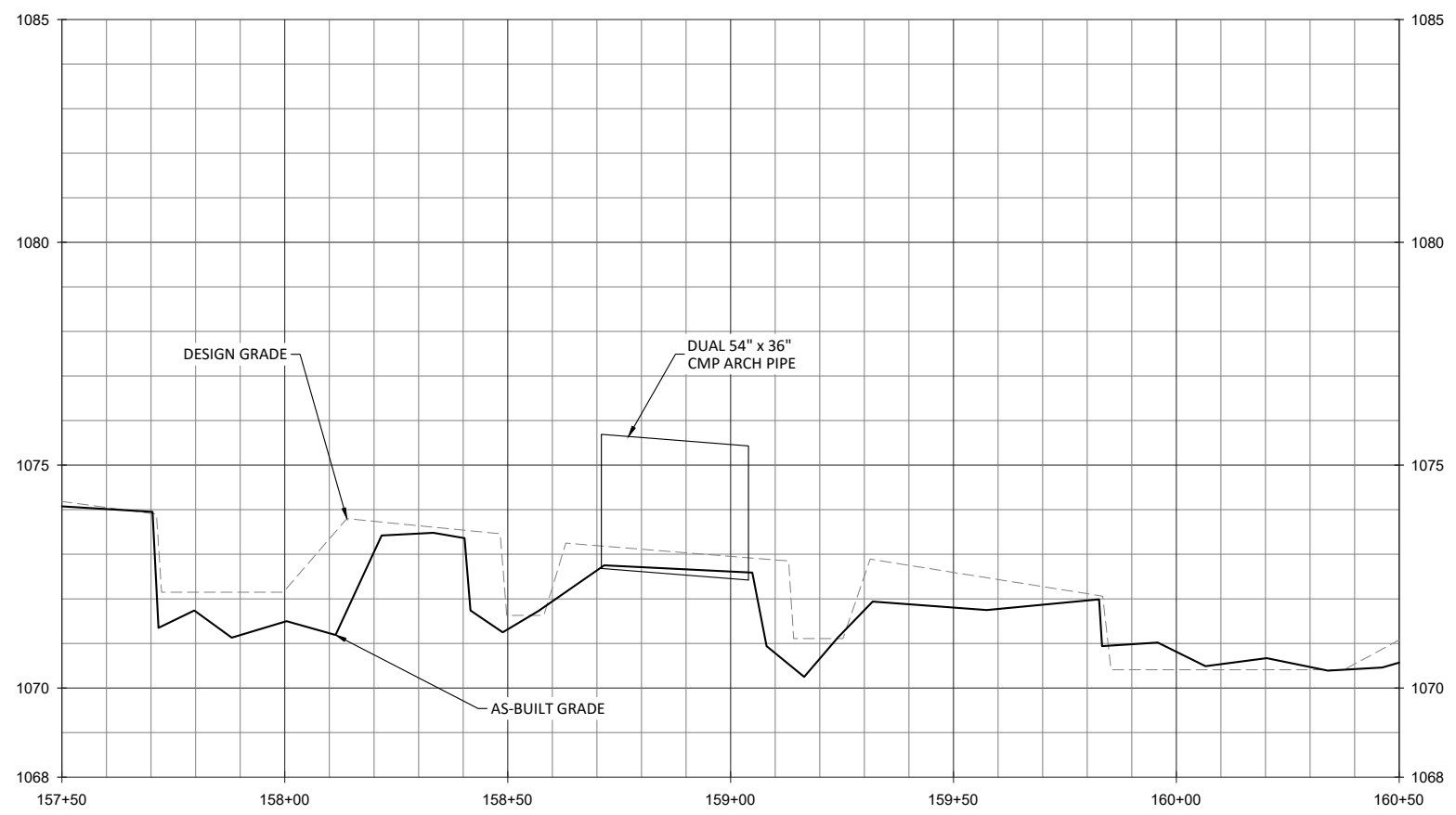
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**1.6**

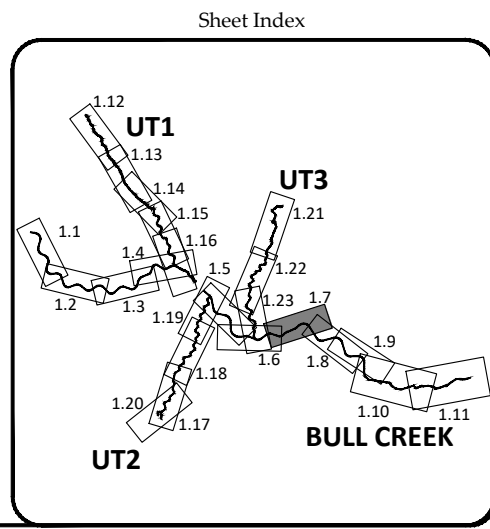
Sheet

October 6, 2020

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- NOTE:**
1. STA. 157+72: BRUSH MATTRESS REPLACED WITH BRUSH TOE DUE TO TIME OF YEAR OF INSTALLATION. LOG VANE REMOVED DUE TO BANK STABILITY AND HABITAT ENHANCEMENT PROVIDED BY BRUSH TOE.
  2. STA. 158+22: PHOTO POINT 7 WAS MOVED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE A DOWNSTREAM VIEW OF THE CULVERT CROSSING.
  3. STA. 158+40: ROCK SILL REPLACED WITH LOG SILL DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.
  4. STA. 159+50: PHOTO POINT 8 WAS MOVED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE AN UPSTREAM VIEW OF THE CULVERT CROSSING.
  5. STA. 159+84: BRUSH TOE WAS SUBSTITUTED FOR BOULDER TOE AND LOG VANE REMOVED DUE TO LOCAL MATERIAL AVAILABILITY AND THE BANK STABILITY AND HABITAT ENHANCEMENT PROVIDED BY BRUSH TOE.



Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina

Bull Creek Reach 3  
Stream Plan and Profile

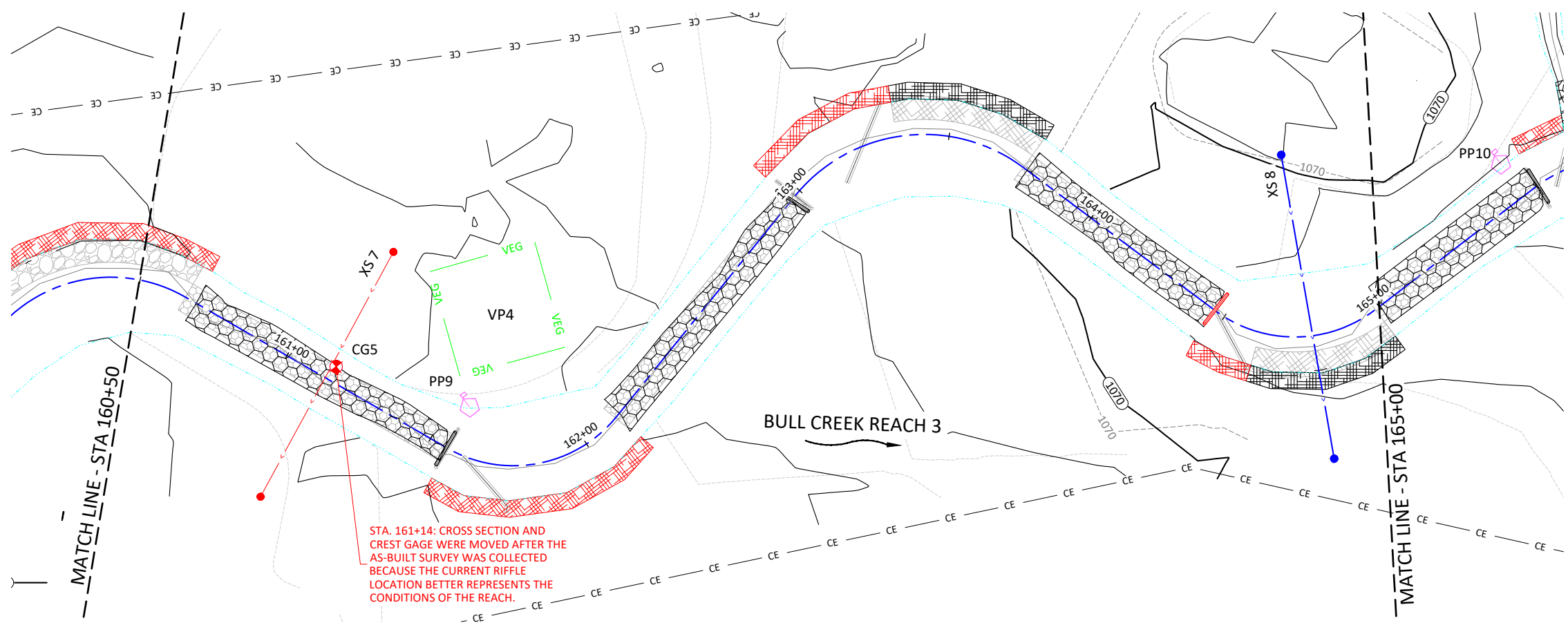
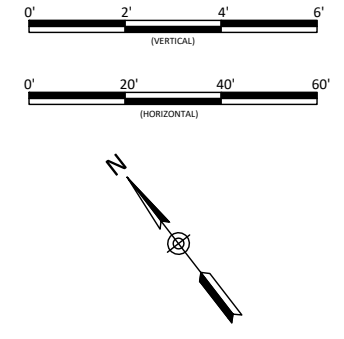
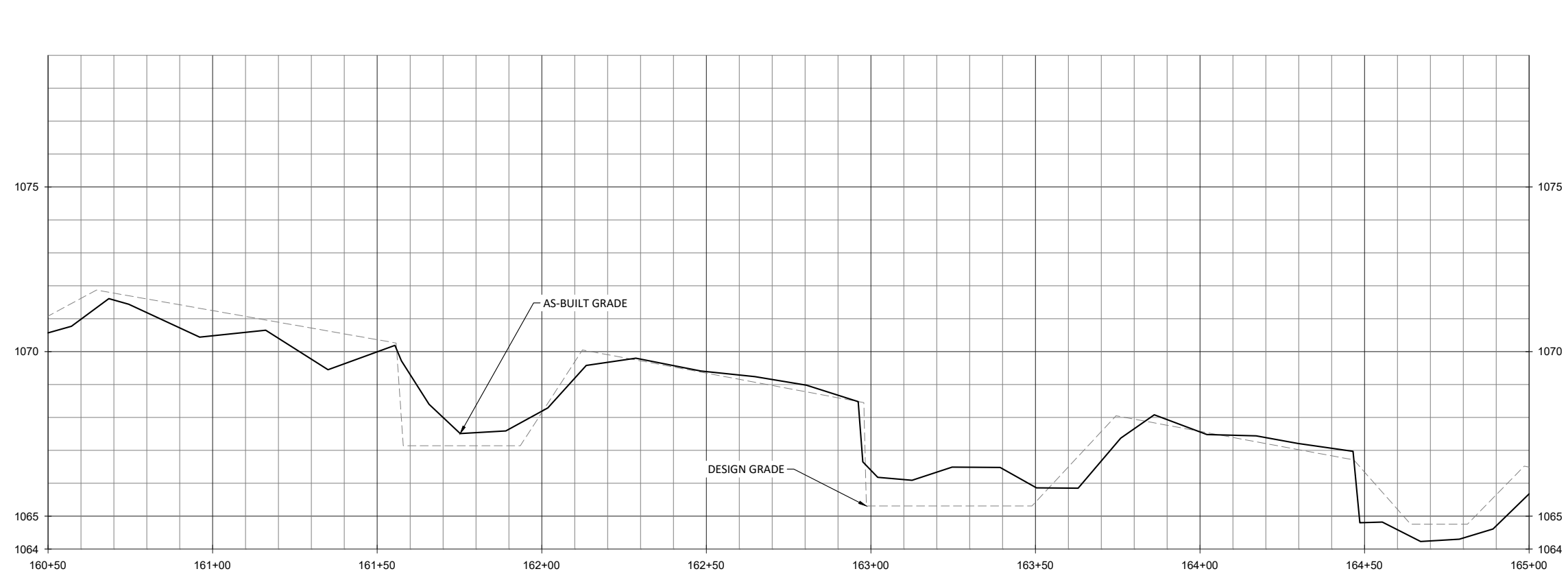
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1.7

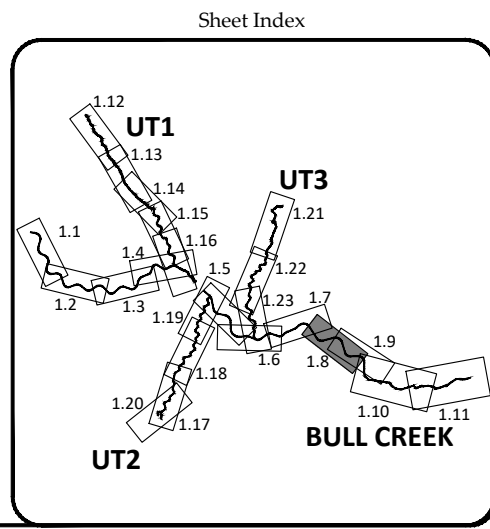
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October 6, 2020  
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- NOTE:**
1. STA. 161+56: LOG VANE REMOVED AND BRUSH TOE ADDED TO OUTSIDE BANK TO IMPROVE STABILITY FOR THE ENTIRE OUTSIDE BANK.
  2. STA. 163+30: LOG VANE REMOVED AND BRUSH TOE EXTENDED DUE TO AVAILABILITY OF MATERIALS AND TO IMPROVE STREAM BANK STABILITY AND HABITAT.
  3. STA. 164+47: LOG VANE REMOVED, LOG SILL ADDED AND BRUSH TOE EXTENDED DUE TO LOCAL AVAILABILITY OF MATERIALS AND TO IMPROVE CHANNEL STABILITY AND HABITAT.


STA. 161+14: CROSS SECTION AND CREST GAGE WERE MOVED AFTER THE AS-BUILT SURVEY WAS COLLECTED BECAUSE THE CURRENT RIFFLE LOCATION BETTER REPRESENTS THE CONDITIONS OF THE REACH.



Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

Bull Creek Reach 3  
 Stream Plan and Profile

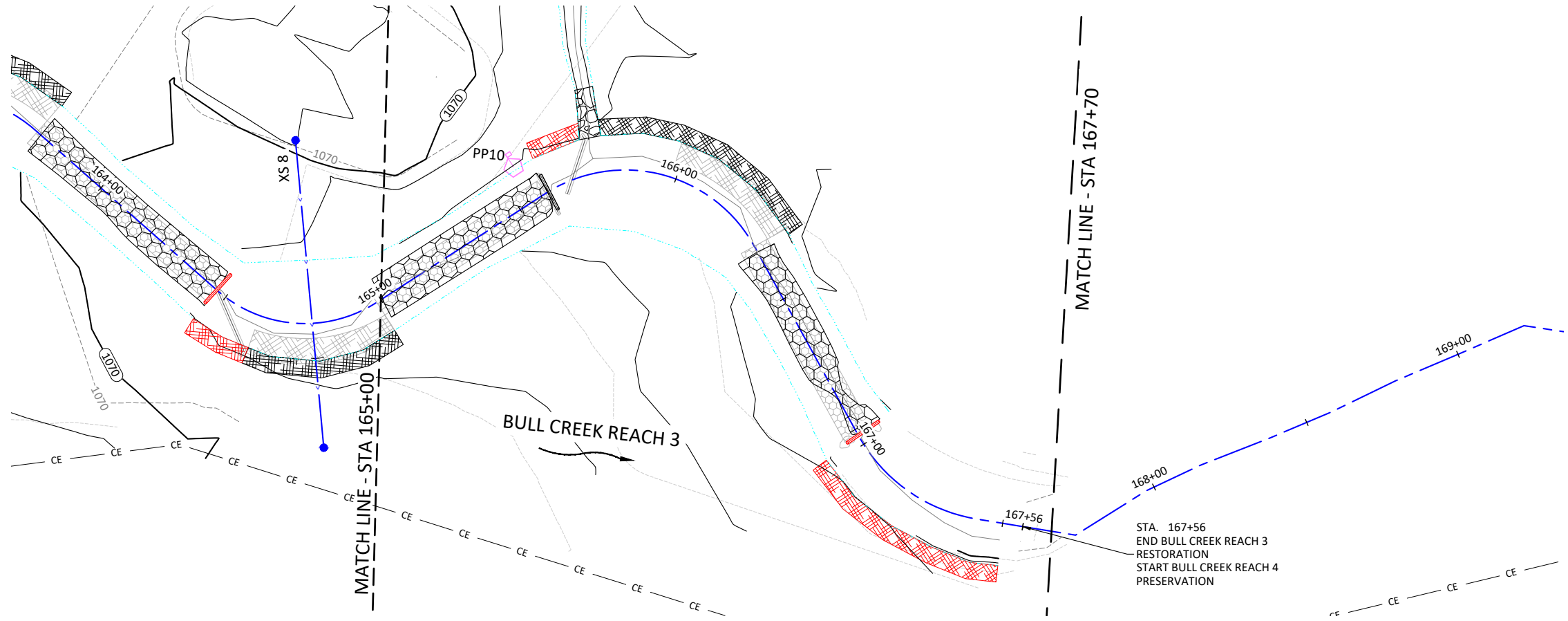
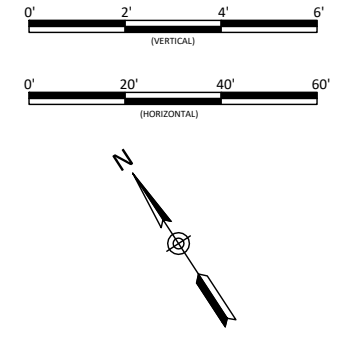
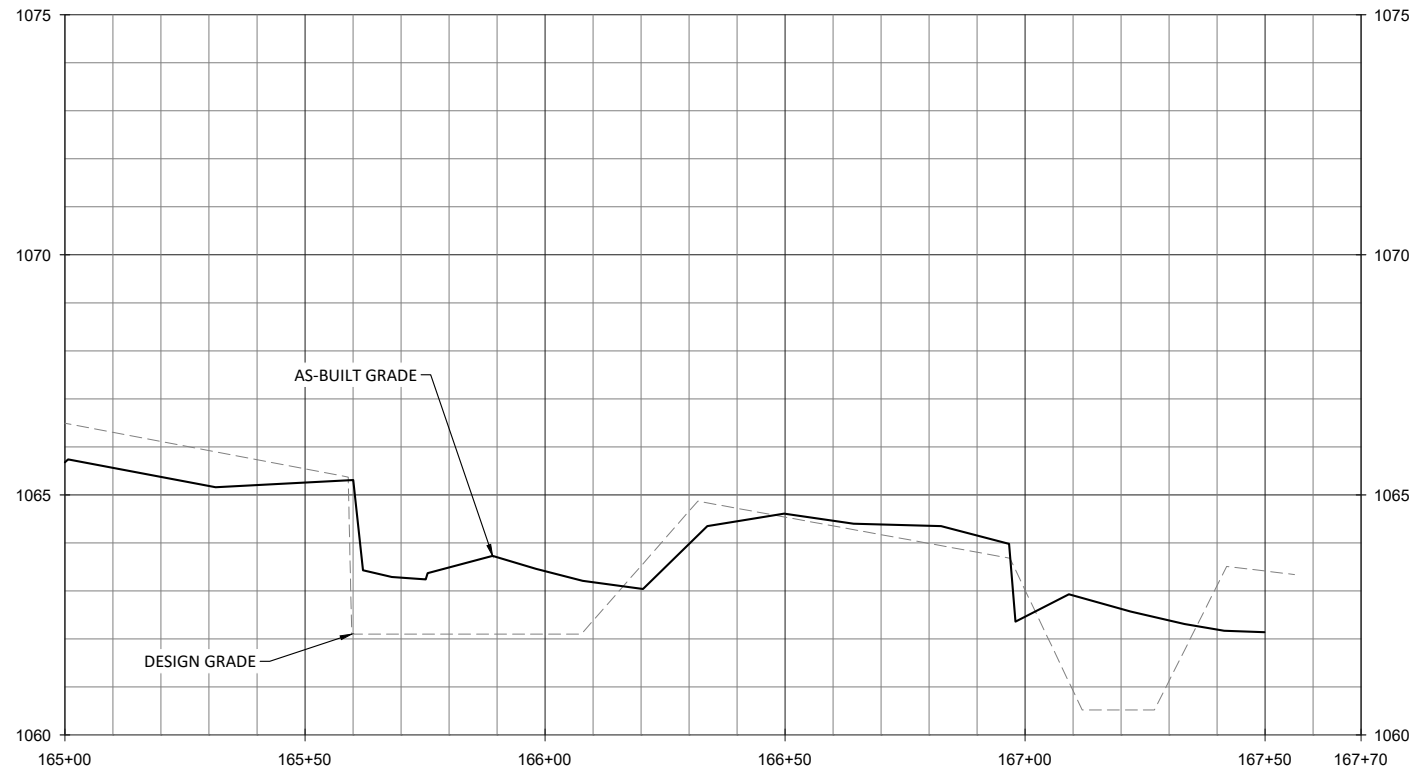
  
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 State of North Carolina  
 8-27-20

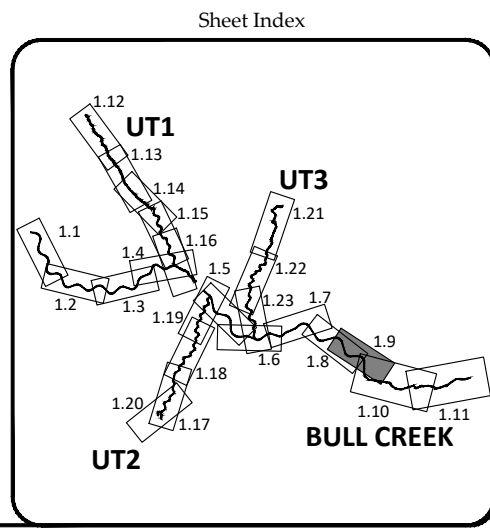
Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK
Revisions:	09/29/2020

**1.8**  
 Sheet

October 6, 2020  
 T:\ACTIVE PROJECTS\INCL005\01065\_Spcr Mill\CD\1\_ArBull\02165\_ArBull\_Est.dwg



- NOTE:**
- STA. 165+75: LOG VANE REMOVED AND BRUSH TOE EXTENDED DUE TO AVAILABILITY OF MATERIALS AND THE IMPROVED HABITAT PROVIDED BY BRUSH TOE.
  - STA. 166+97: LOG SILL WAS SUBSTITUTED FOR ROCK SILL DUE TO LOCAL MATERIAL AVAILABILITY AND SITE CONDITIONS.
  - STA. 167+00: BRUSH TOE WAS ADDED TO IMPROVE BANK STABILITY.



Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

Bull Creek Reach 3  
 Stream Plan and Profile

Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

**1.9**

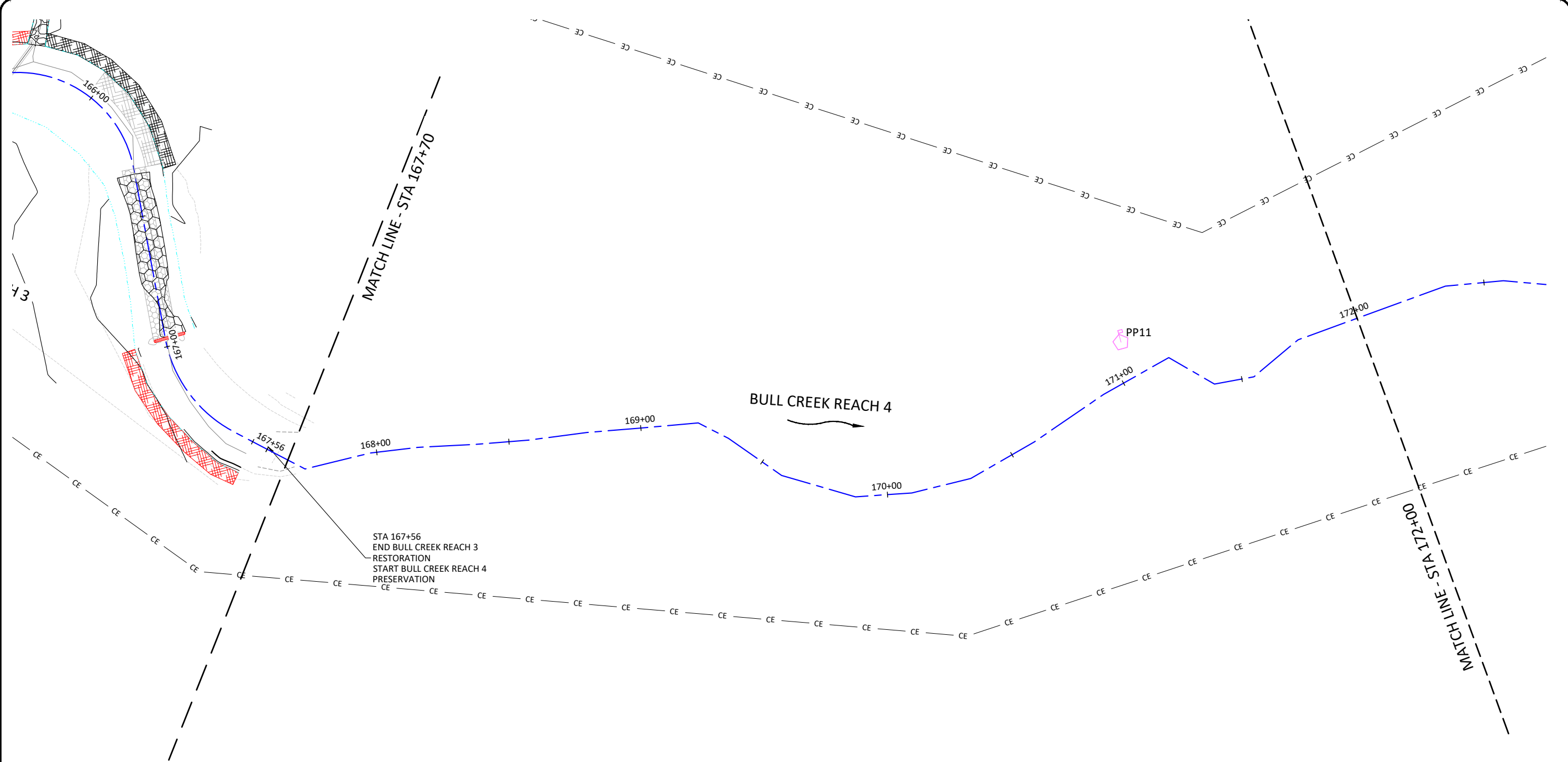
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**WILDLANDS ENGINEERING**  
 1405 BENTLEY CENTER DRIVE, SUITE 104  
 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
 Firm License No. F-0831

PROFESSIONAL SEAL  
 AARON S. SMITH  
 No. 023447  
 State of North Carolina  
 8-27-20

October 6, 2020

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 CHARLOTTE, NC 28203  
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 Fax: 704.332.3306  
 Firm License No. F-0831



**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
 Bull Creek Reach 4  
 Stream Plan

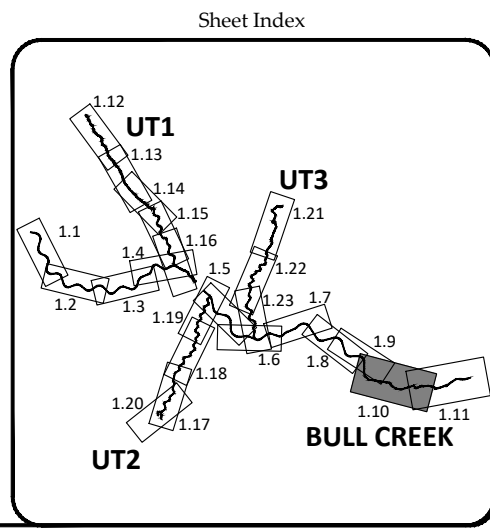
Revisions:

09/29/2020	

Date: August 27, 2020  
 Job Number: 005-02165  
 Project Engineer: AE  
 Drawn By: ABP/JTC  
 Checked By: JCK

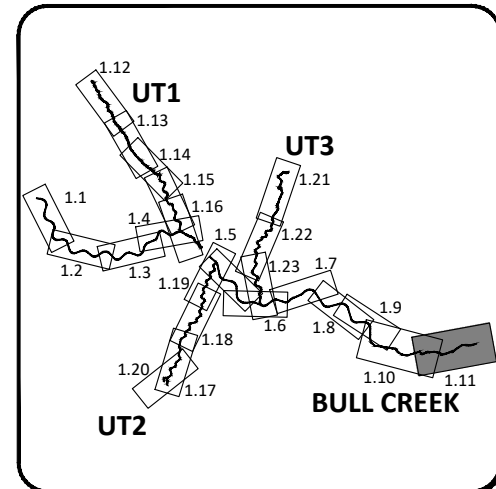
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Revisions:  
09/29/2020

Date: August 27, 2020  
 Job Number: 005-02165  
 Project Engineer: AE  
 Drawn By: ABP/JTC  
 Checked By: JCK

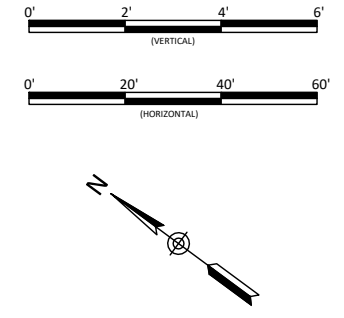
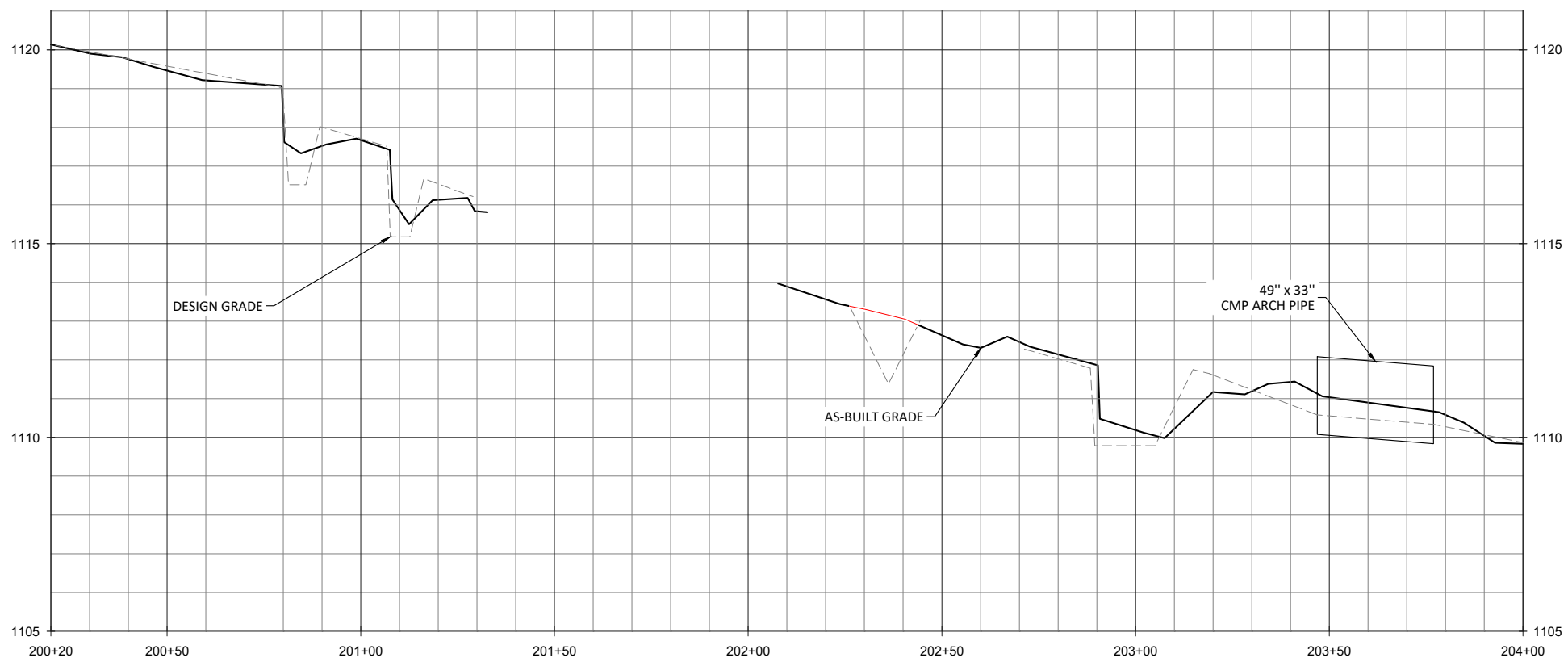
Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 Bull Creek Reach 4  
 Stream Plan

1.11

Sheet



October 6, 2020

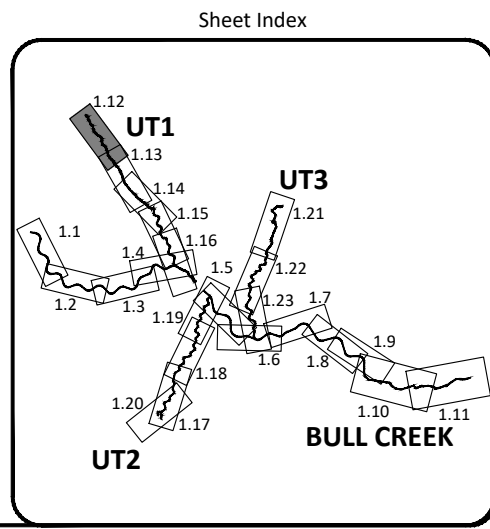
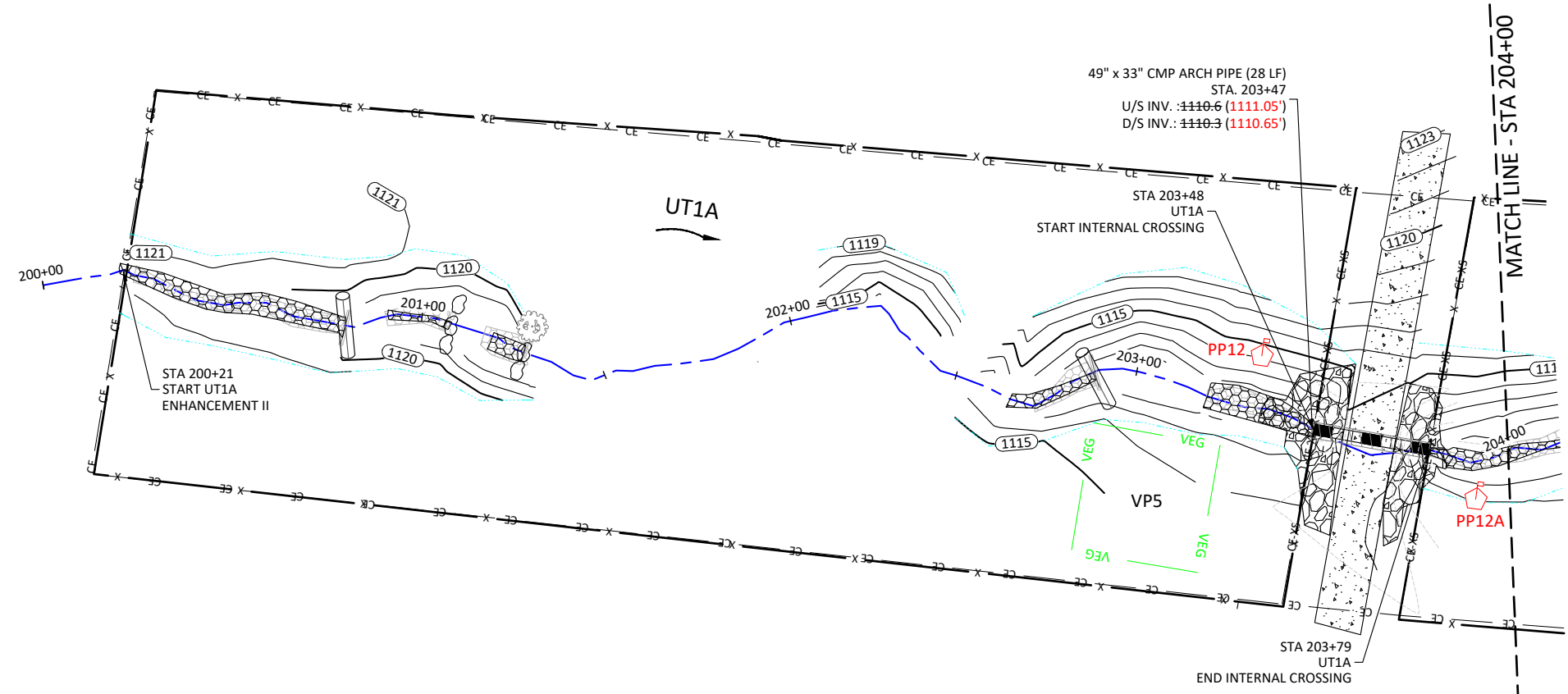


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 CHARLOTTE, NC 28203  
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 Fax: 704.332.3306  
 Firm License No. F-0831



Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 UT1A  
 Stream Plan and Profile

- NOTES:**
1. STA. 202+26: POOL WAS NOT EXCAVATED DUE TO EXISTING PROFILE STABILITY.
  2. STA. 203+32: PHOTO POINT 12 WAS MOVED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE A DOWNSTREAM VIEW OF THE CULVERT CROSSING.
  3. STA. 203+90: PHOTO POINT 12A WAS ADDED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE AN UPSTREAM VIEW OF THE CULVERT CROSSING.



Revisions:

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Date: August 27, 2020  
 Job Number: 005-02165  
 Project Engineer: AE  
 Drawn By: ABP/JTC  
 Checked By: JCK

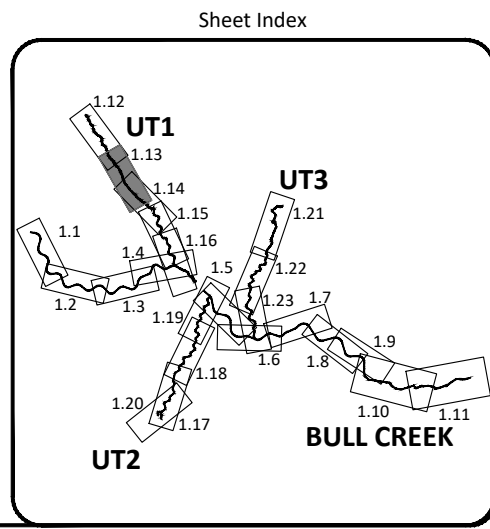
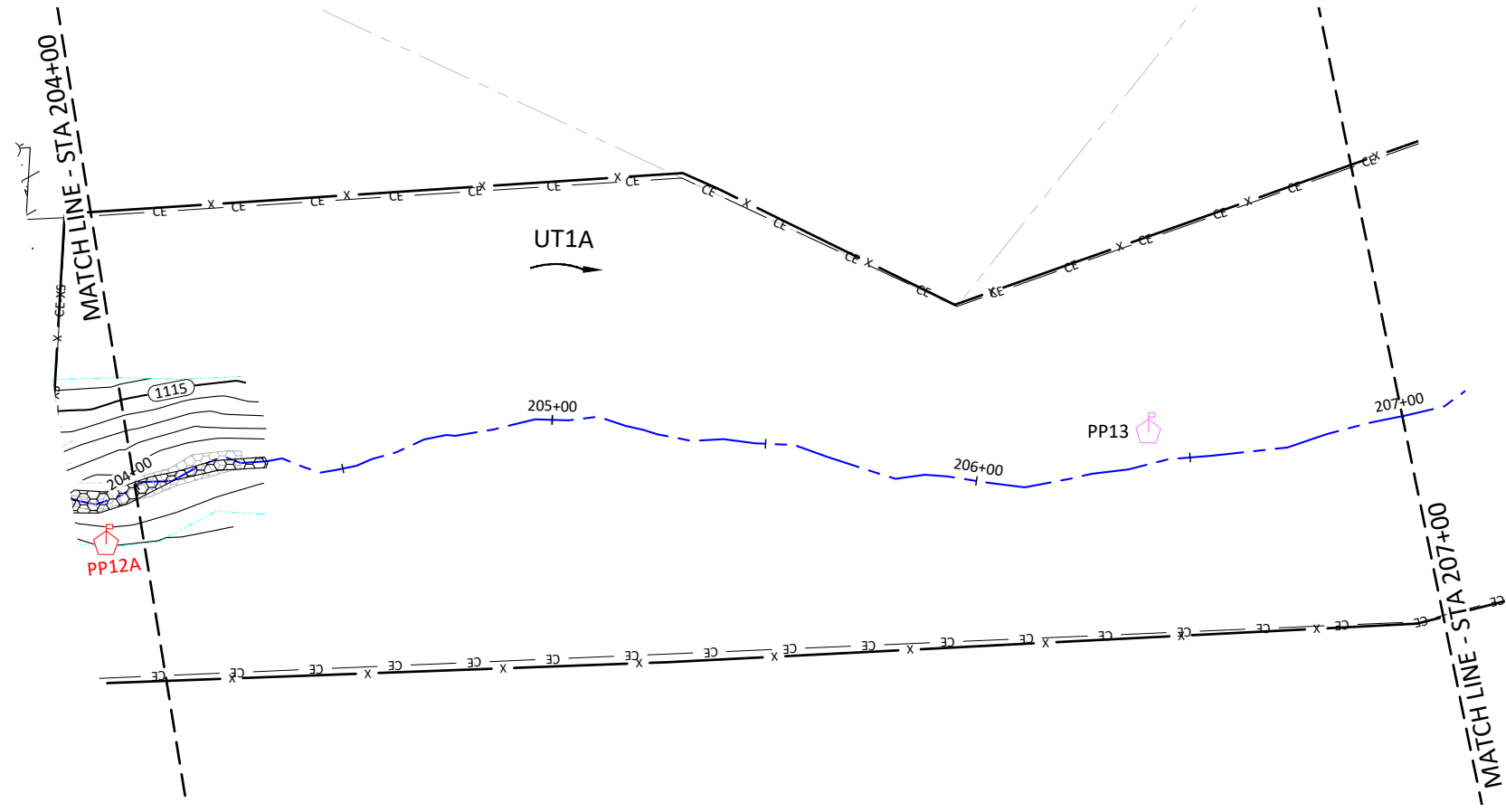
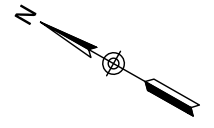
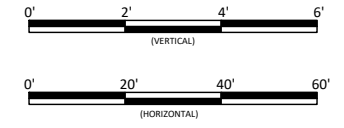
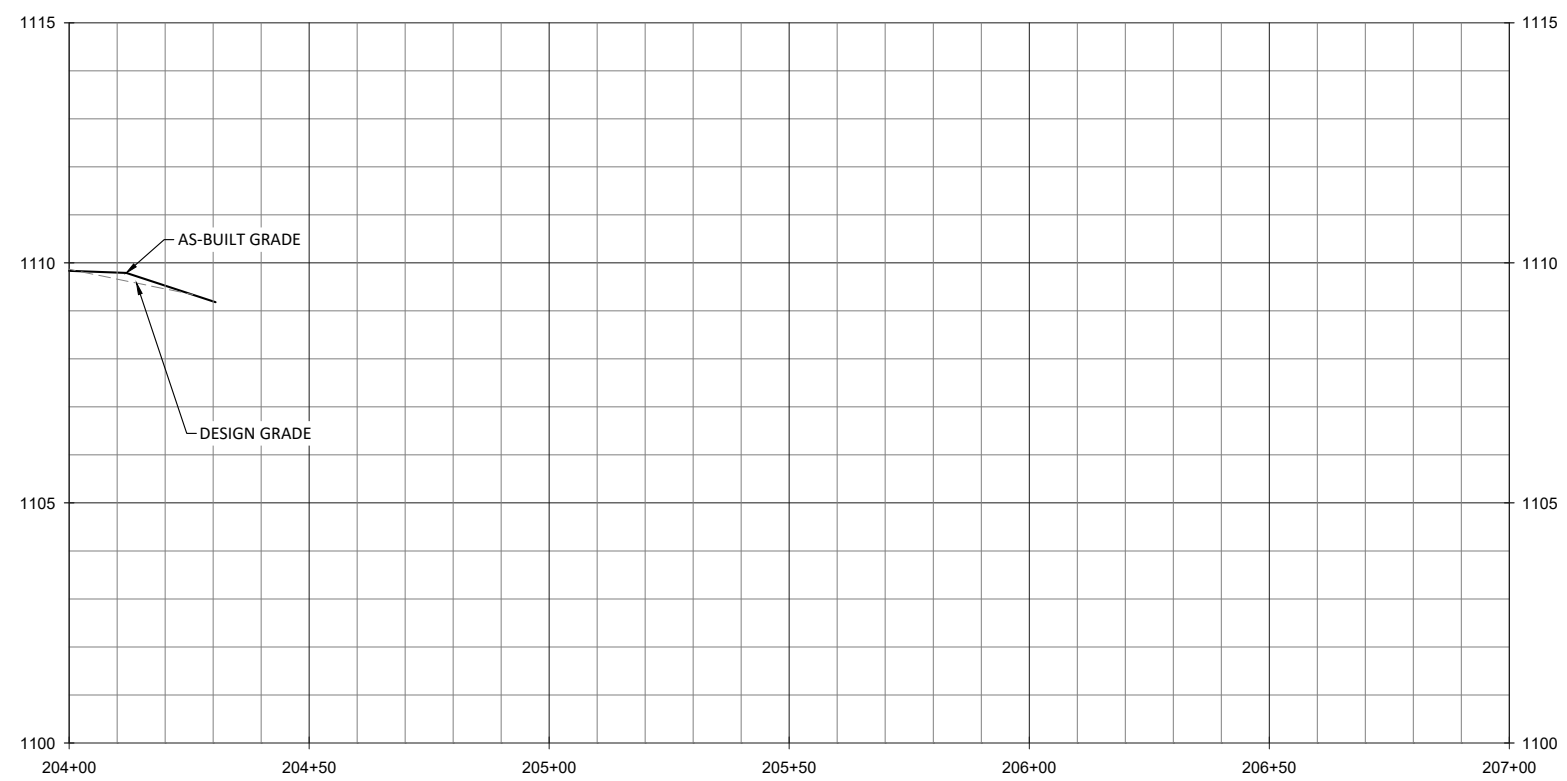
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October 6, 2020

T:\ACTIVE PROJECTS\1605-02-165-New Mill Mill Pond\As-Built\02-165-As-Built-West.dwg



Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina

UT1A  
Stream Plan and Profile

Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

**1.13**

Sheet

Revisions:	09/29/2020

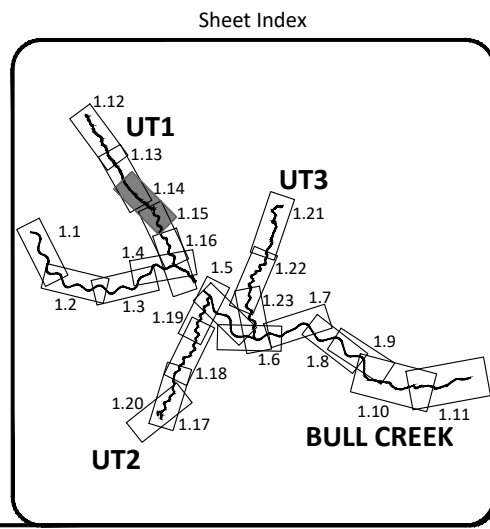
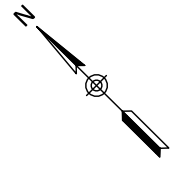
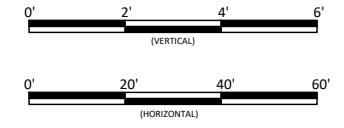
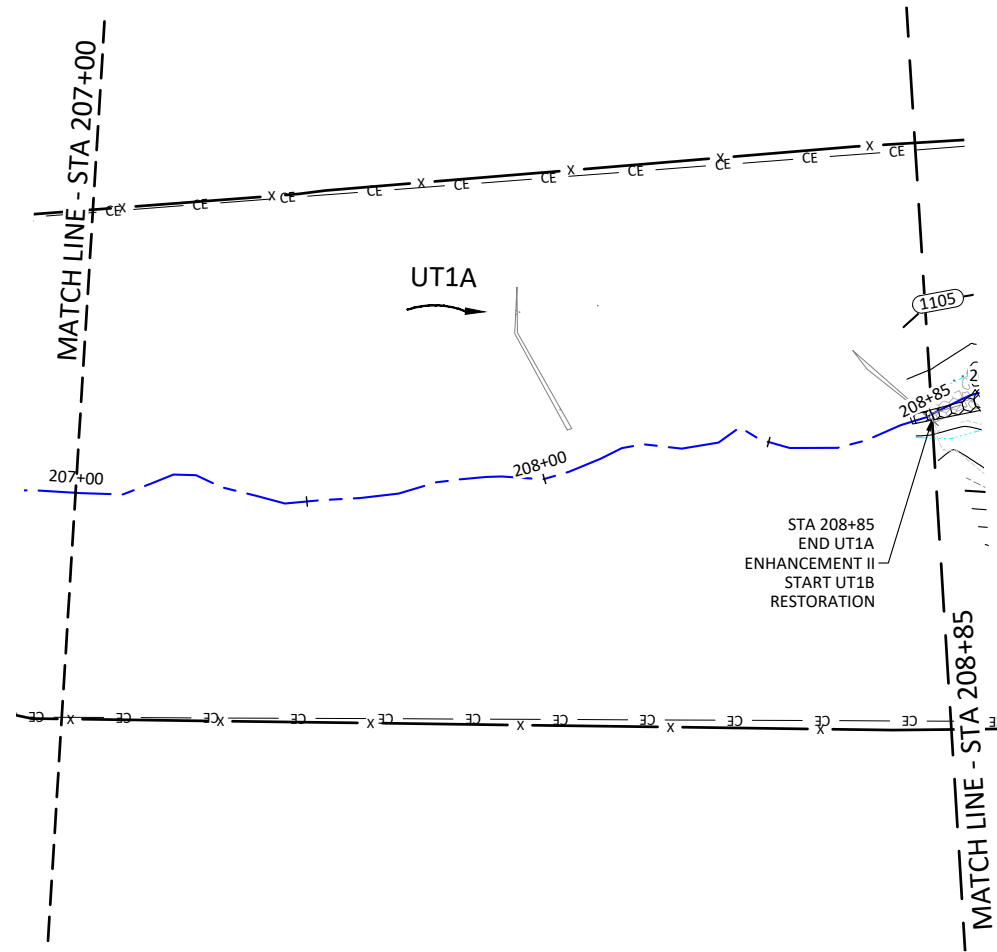
**WILDLANDS**  
ENGINEERING  
1485 N. GREENWAY, 104  
CHARLOTTE, NC 28203  
Tel: 704.332.7754  
Fax: 704.332.3306  
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October 6, 2020

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Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

Revisions:	
09/29/2020	

Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina

UT1A  
Stream Plan and Profile

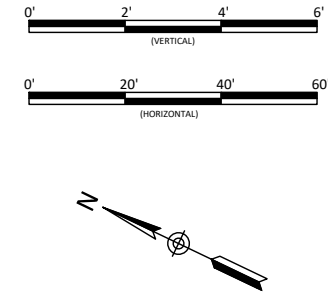
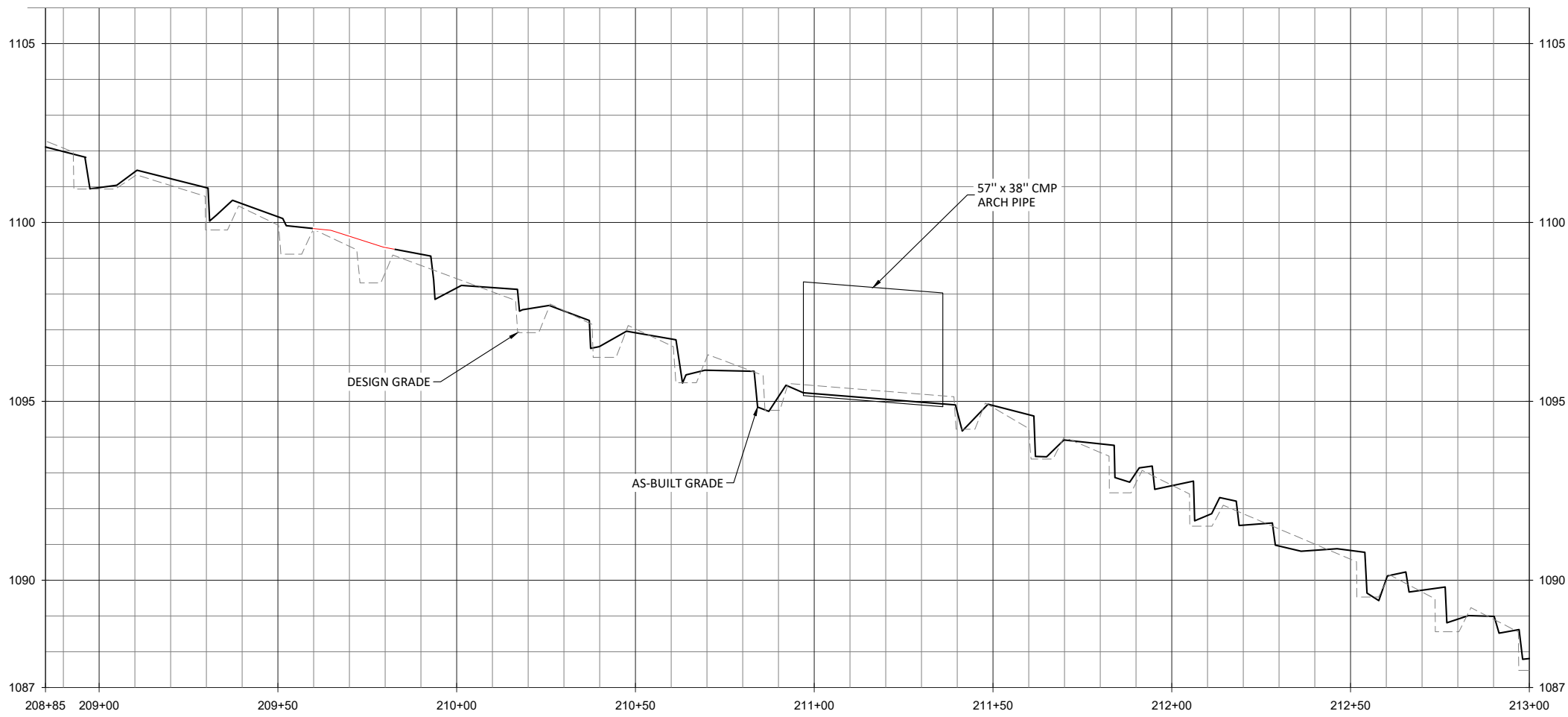
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1405 E. WILSON ROAD  
CHARLOTTE, NC 28203  
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Fax: 704.332.3306  
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October 6, 2020

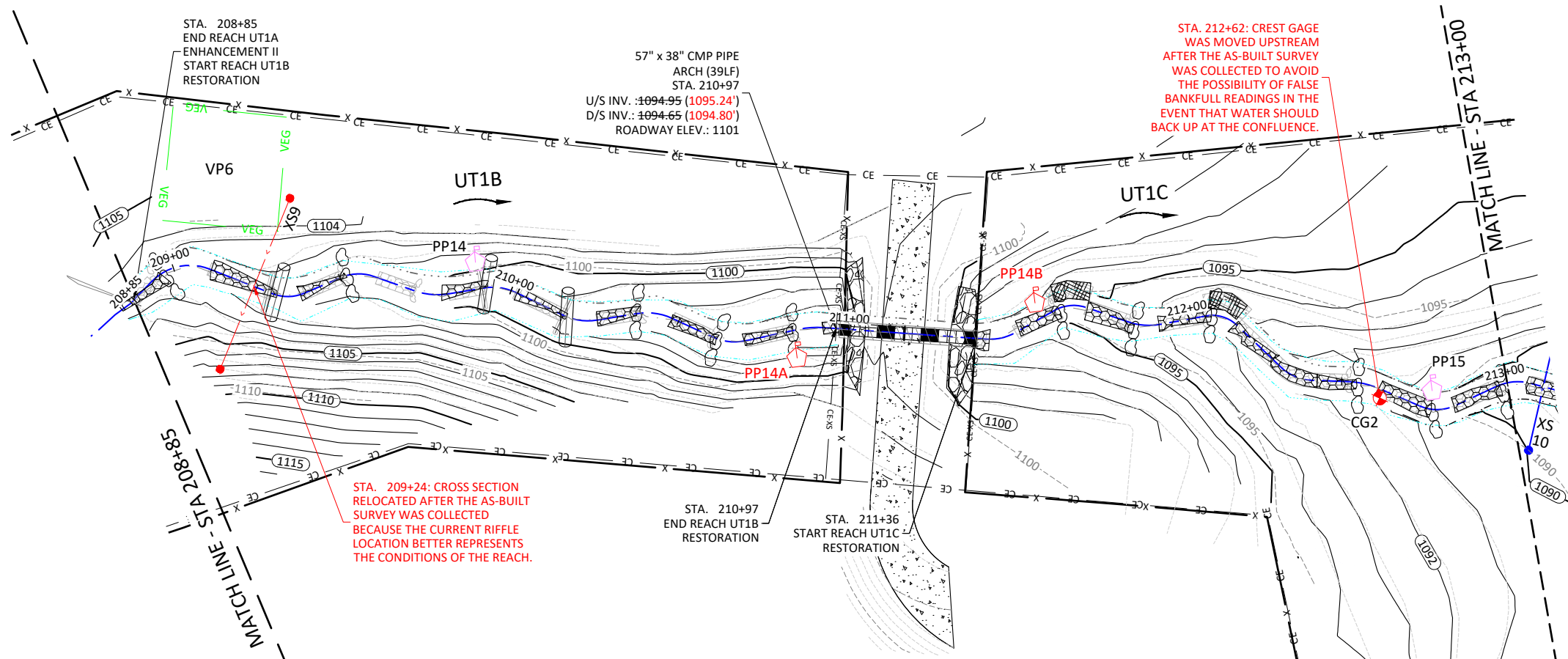


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 ENGINEERING  
 1405 W. GARDNER STREET, SUITE 104  
 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
 Firm License No. F-0831

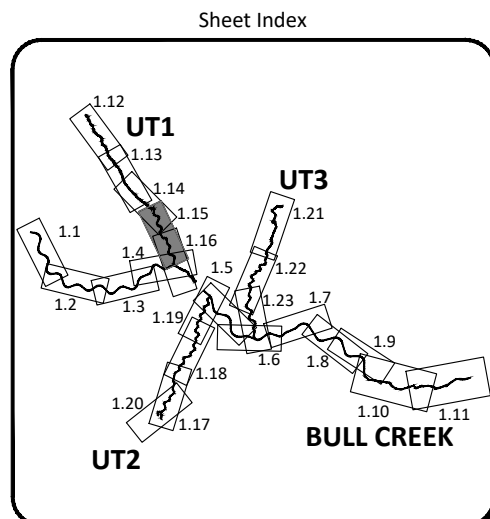


**Key Mill Mitigation Site - Record Drawings**  
 Surry County, North Carolina

UT1B  
 Stream Plan and Profile



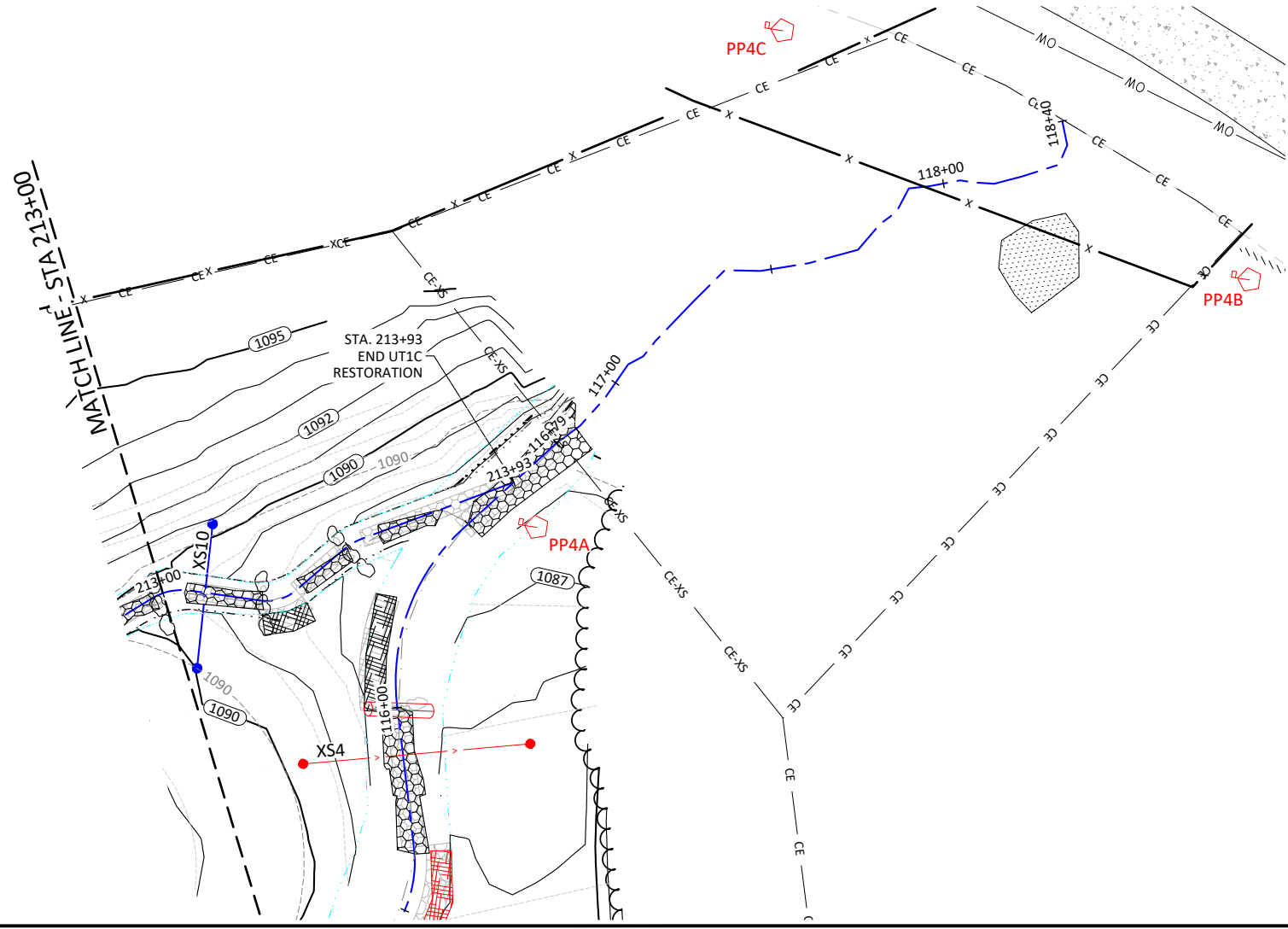
- NOTE:**
1. STA. 209+65: RIFFLE, ROCK SILL AND POOL WERE OMITTED DUE TO SUFFICIENT STABILITY AND SLOPE ON THE REACH.
  2. STA. 210+83: PHOTO POINT 14A WAS ADDED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE A DOWNSTREAM VIEW OF THE CULVERT CROSSING.
  3. STA. 211+57: PHOTO POINT 14B WAS ADDED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE AN UPSTREAM VIEW OF THE CULVERT CROSSING.
  4. STA. 212+35: UPSTREAM ROCK AND ROLL RIFFLE BOULDER SILL WAS OMITTED AND RIFFLE WAS EXTENDED TO CONNECT TO DOWNSTREAM ROCK AND ROLL RIFFLE.



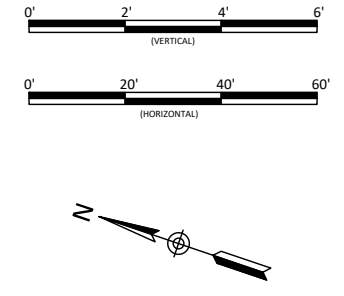
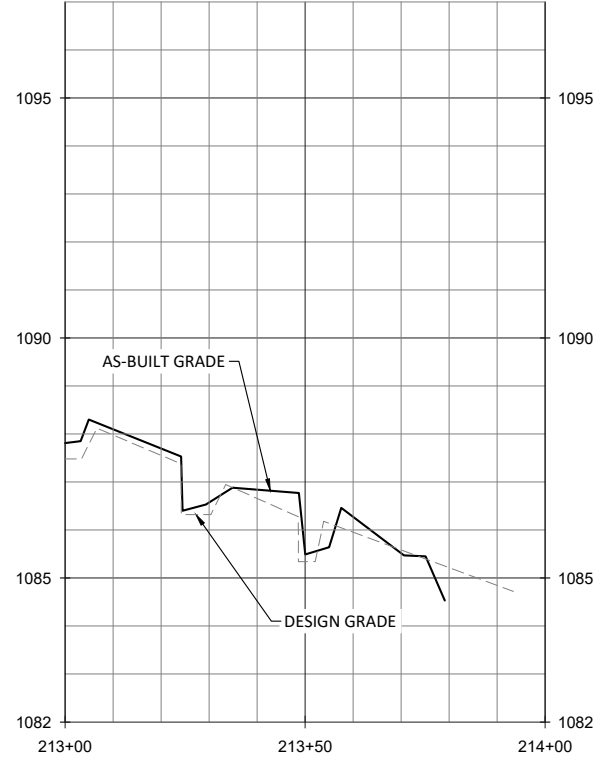
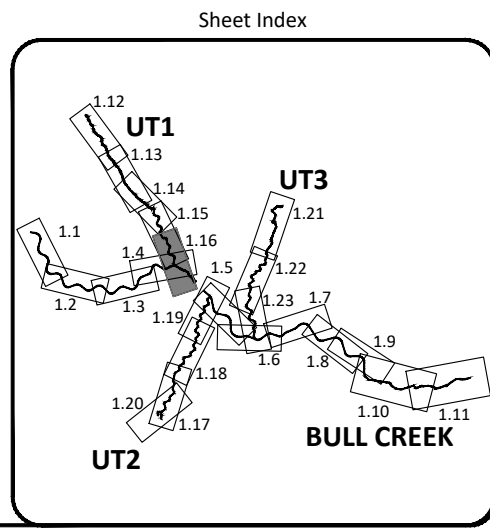
Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK
Revisions:	09/29/2020
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October 6, 2020  
 T:\ACTIVE PROJECTS\1605-02165 Key Mill\Grid\As-Built\02165-As-Built-West.dwg



**NOTE:**  
 1. STA. 118+30: PHOTO POINT 4B AND 4C WERE ADDED AFTER THE SURVEY WAS COMPLETE AT THE REQUEST OF DMS TO CAPTURE VIEWS ACROSS THE CATTLE CROSSING.



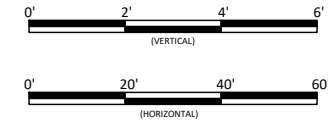
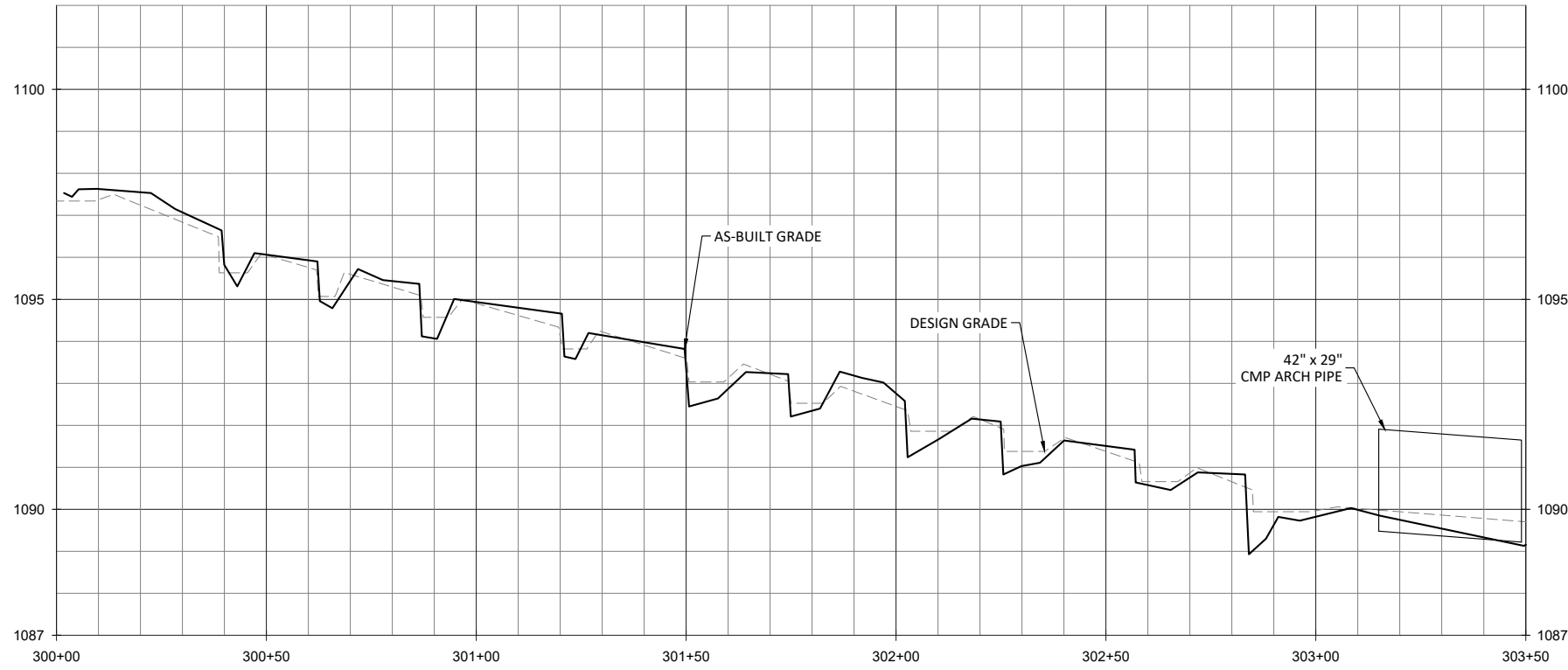
**Key Mill Mitigation Site**  
**Surry County, North Carolina**  
 UT1C  
 As-Built Plan & Profile

Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

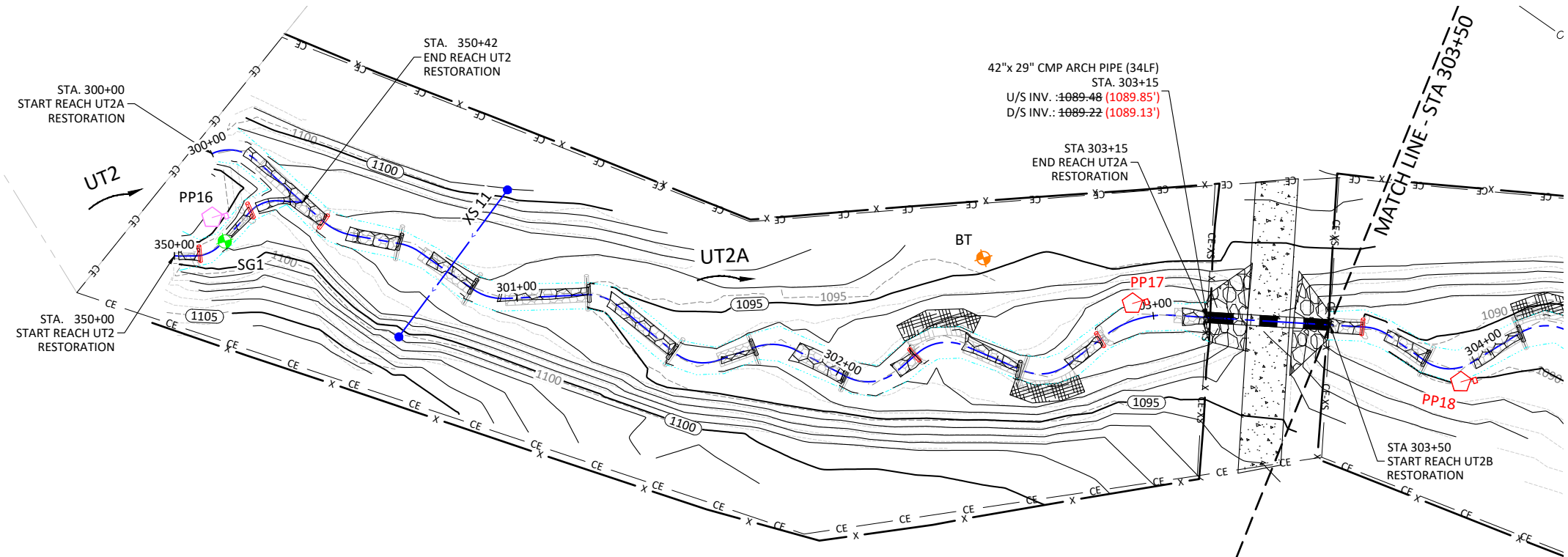
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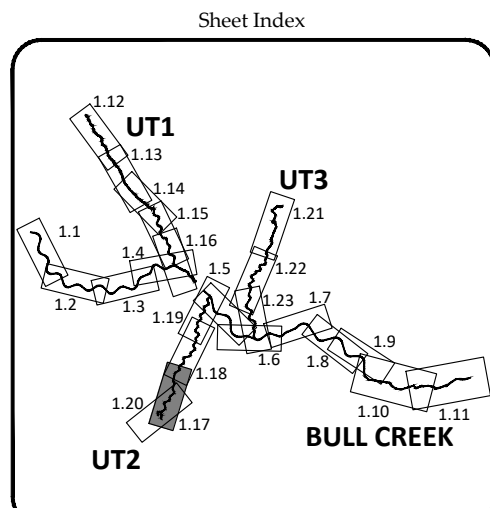
**WILDLANDS**  
 ENGINEERING  
 1485 W. GARDNER ST., 104  
 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
 Firm License No. F-0831



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 CHARLOTTE, NC 28203  
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 Fax: 704.332.3306  
 Firm License No. F-0831



- NOTE:**
- STA. 300+40, 302+25, & 302+83: ROCK SILLS REPLACED WITH LOG SILLS DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.
  - STA. 302+95: PHOTO POINT 17 WAS MOVED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE A DOWNSTREAM VIEW OF THE CULVERT CROSSING.



Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

UT2A  
 Stream Plan and Profile

Revisions:

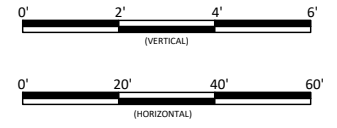
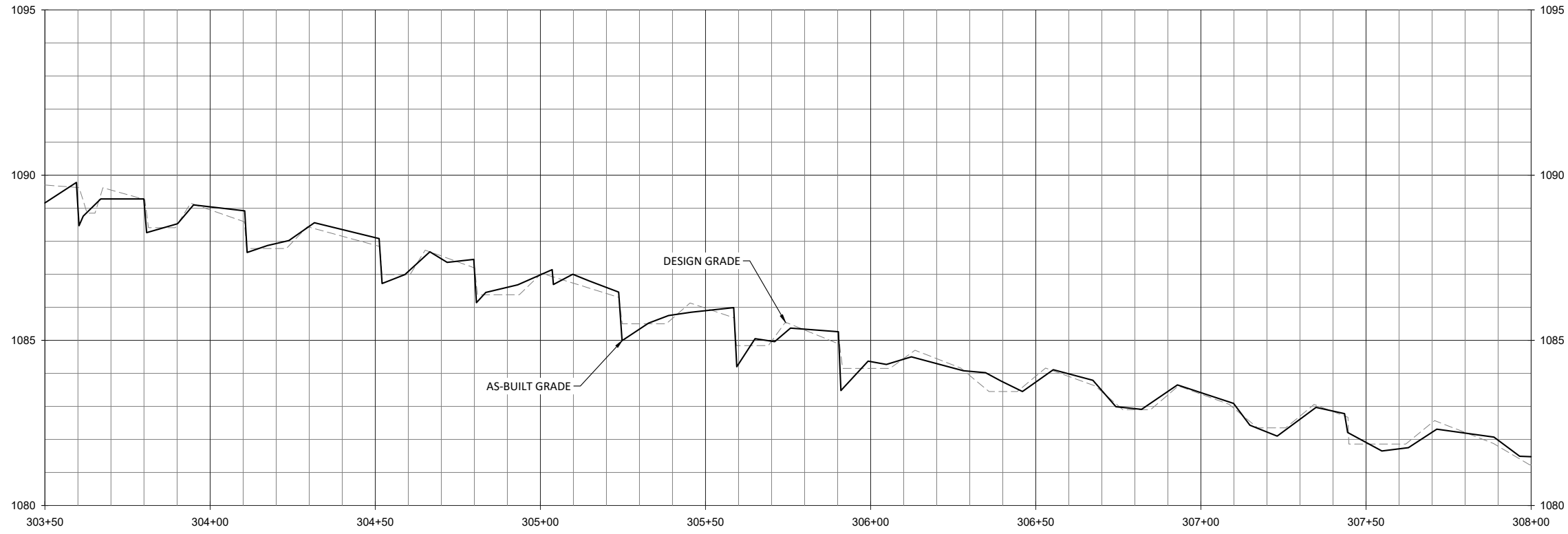
09/29/2020	

Date: August 27, 2020  
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 Project Engineer: AE  
 Drawn By: ABP/JTC  
 Checked By: JCK

**1.17**

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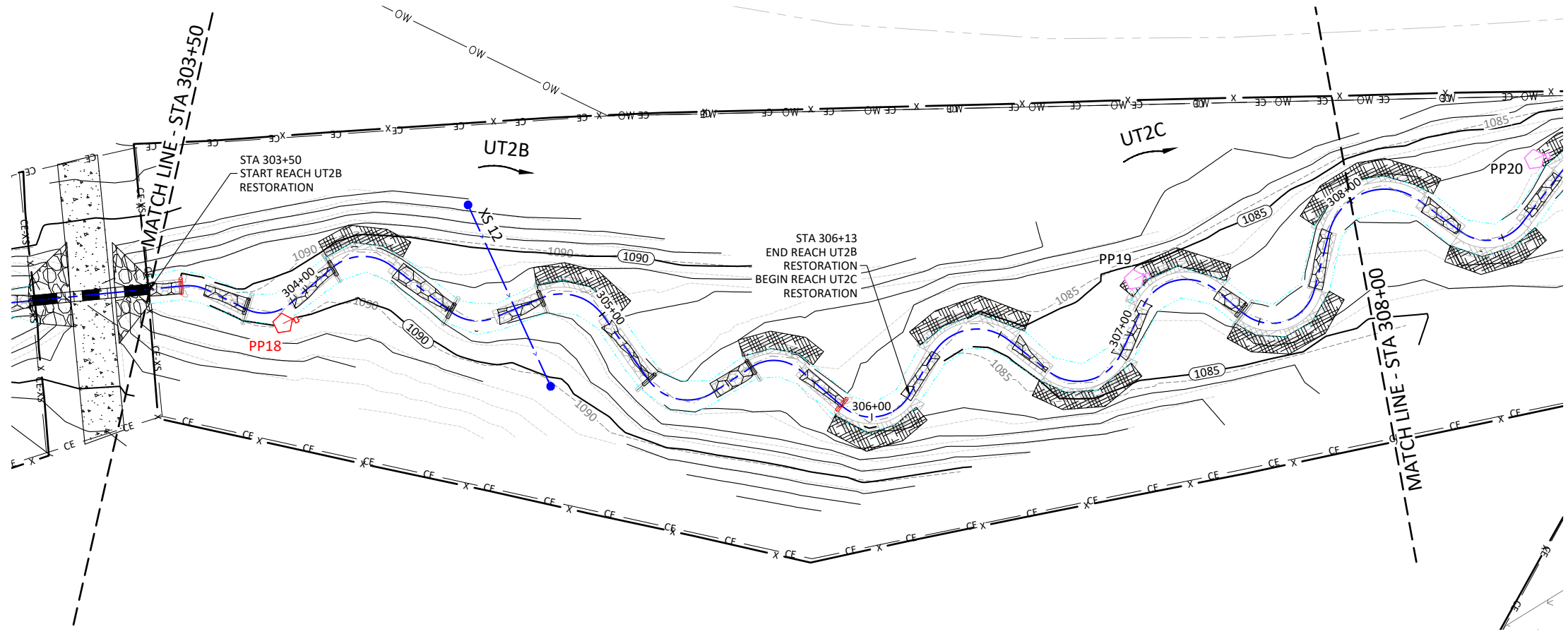


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 CHARLOTTE, NC 28203  
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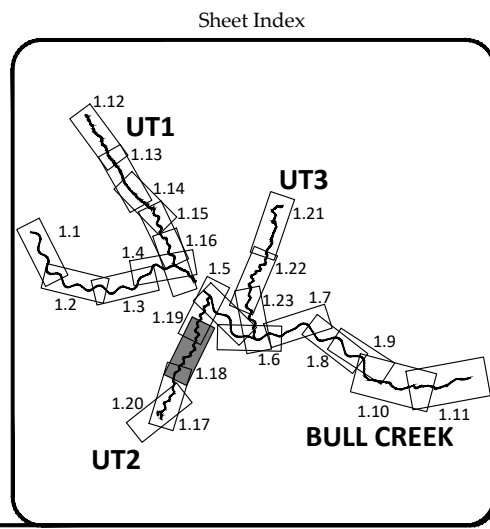


**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**

UT2B  
 Stream Plan and Profile



- NOTE:**
1. STA. 303+59 & 305+90: ROCK SILLS REPLACED WITH LOG SILLS DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.
  2. STA. 303+90: PHOTO POINT 18 WAS MOVED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE AN UPSTREAM VIEW OF THE CULVERT CROSSING.



Revisions:

09/29/2020	

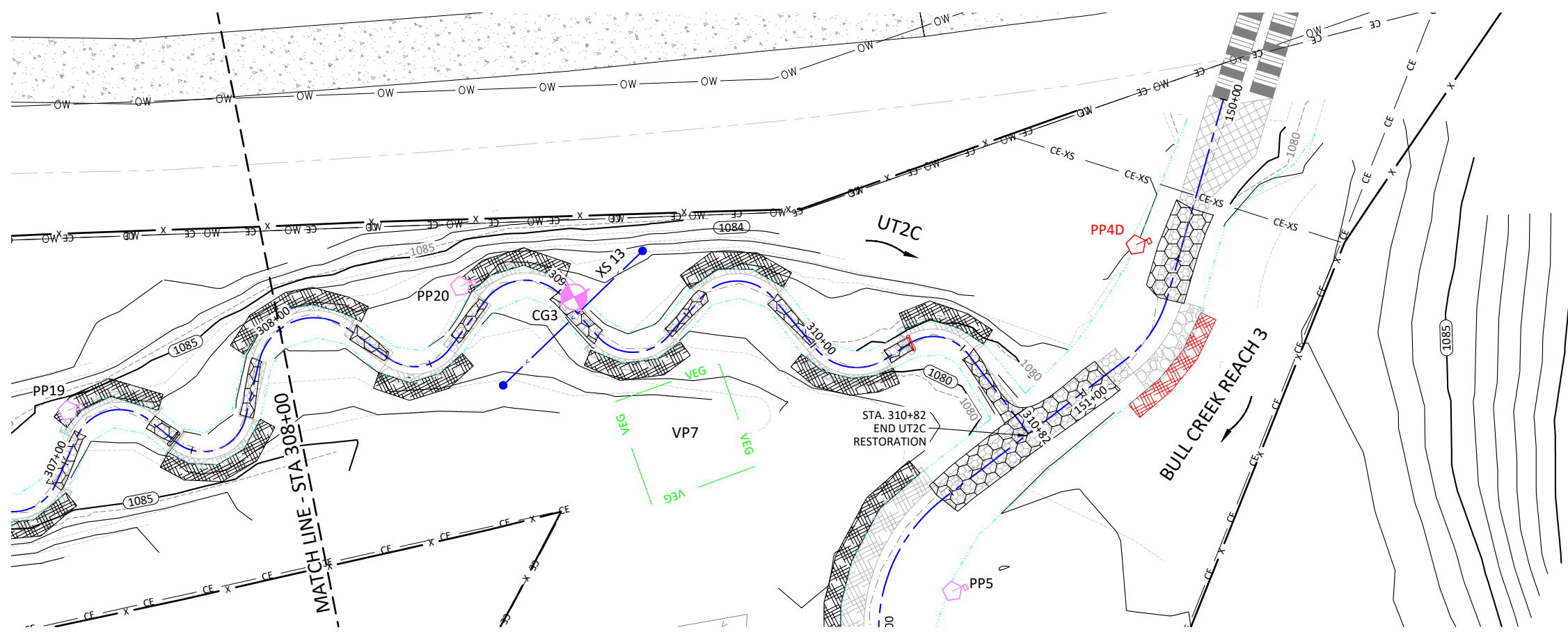
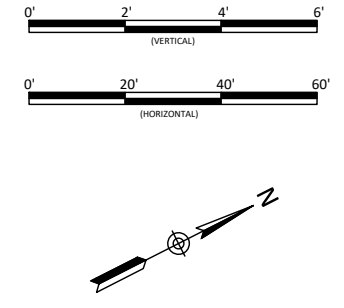
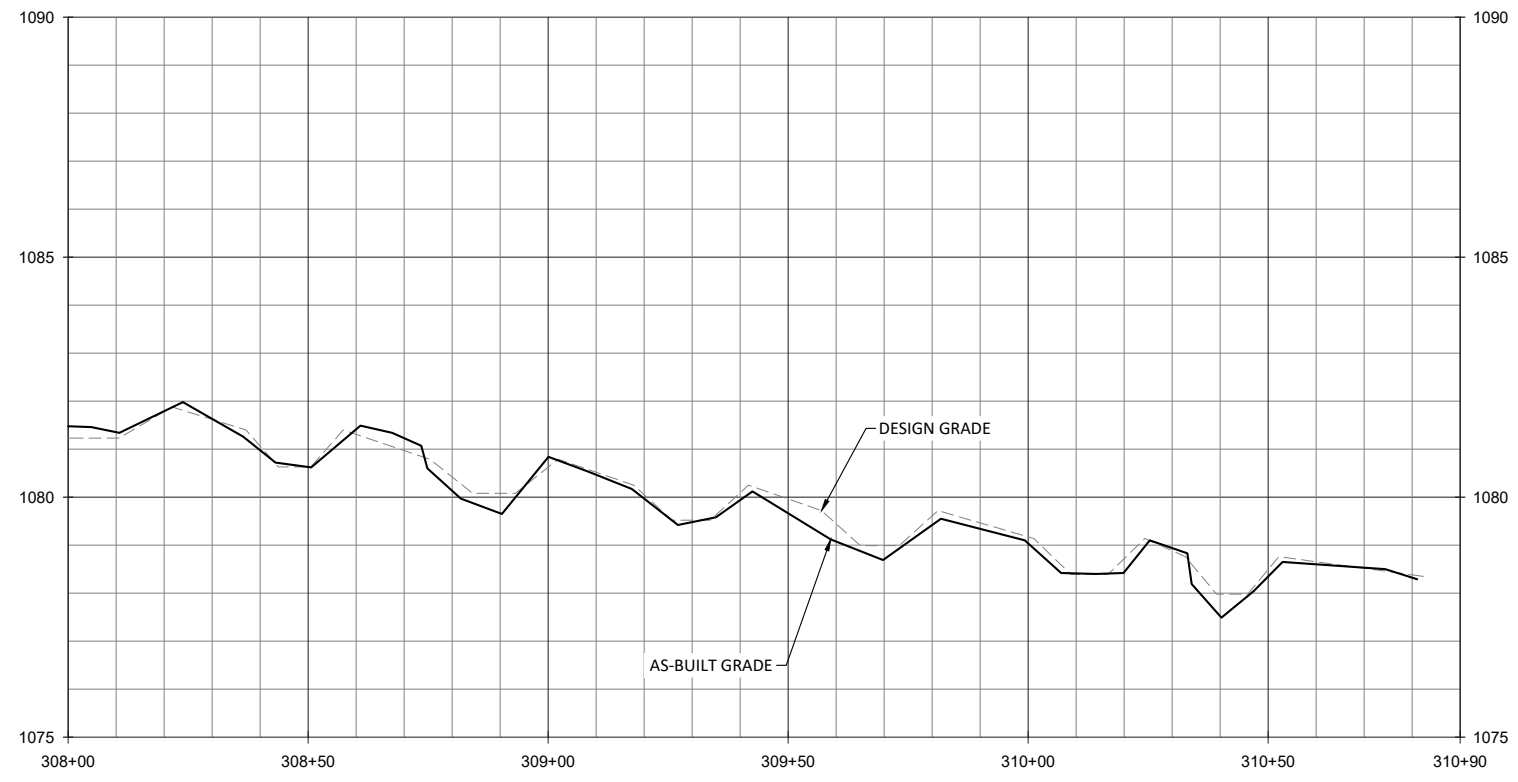
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 Project Engineer: AE  
 Drawn By: ABP/JTC  
 Checked By: JCK

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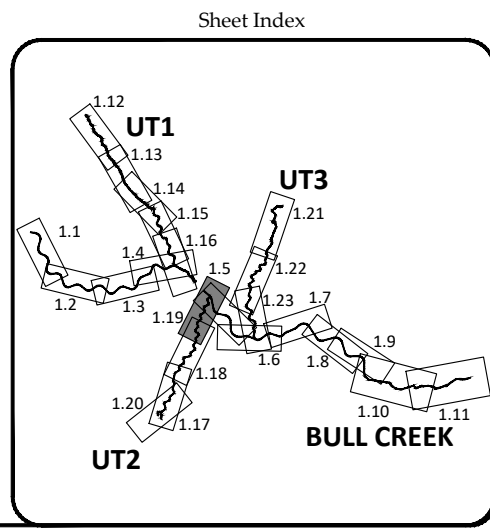
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TRAFFIC PROJECTS (INC) 1005-0166 Key Mill Creek, A-B, Hill, UT2B, UT2C, A-B, Hill, UT2B, UT2C

October 6, 2020  
 T:\ACTIVE PROJECTS\1005\1005\_Keys Mill\CD\1. As-Built\1005-As-Built-Plan.dwg



**NOTE:**  
 1. STA. 310+33: ROCK SILL REPLACED WITH LOG SILL DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.



Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

UT2C  
 Stream Plan and Profile

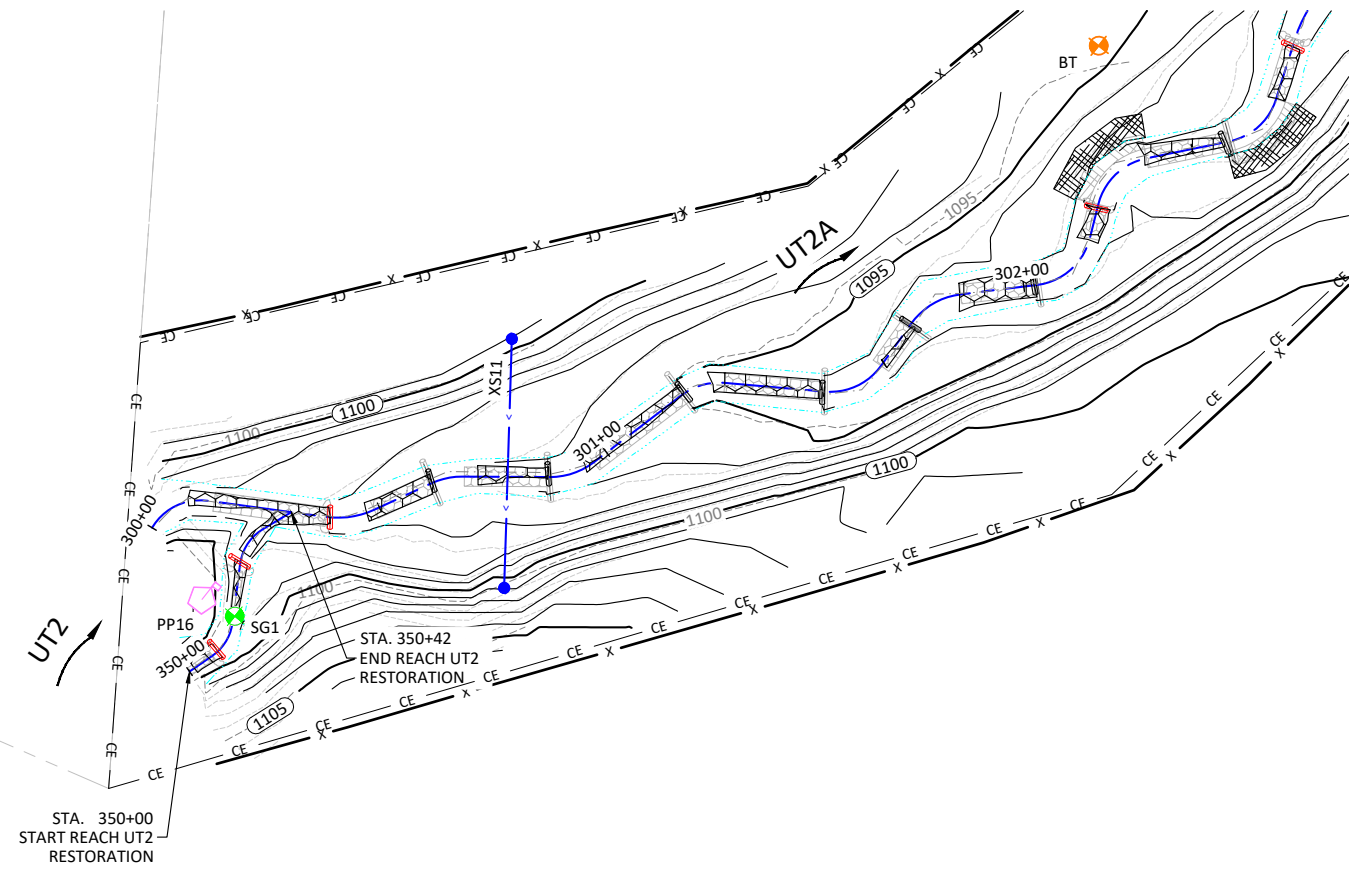
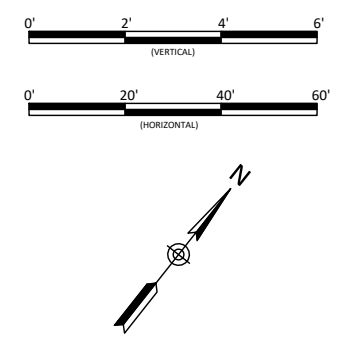
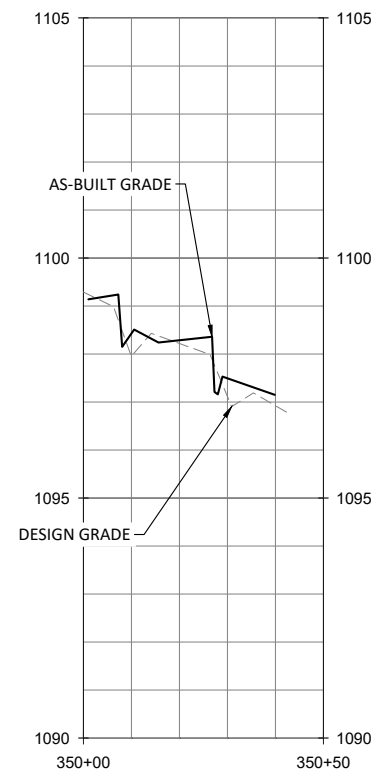
Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

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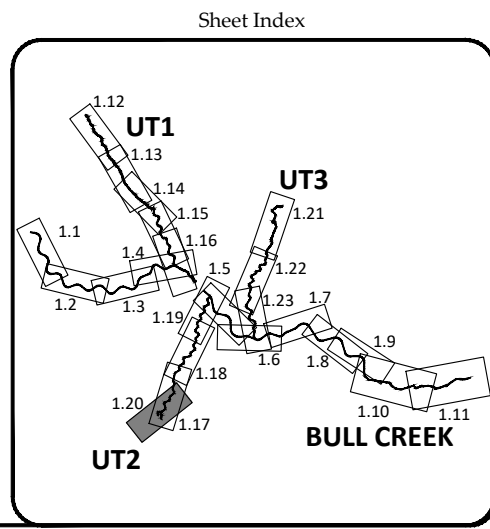
Professional seal for Prof. H. Carolee Williams, State of North Carolina, License No. 28203. The seal includes the text 'PROF. H. CAROLEE WILLIAMS', 'STATE OF NORTH CAROLINA', 'LICENSE NO. 28203', and 'SEAL'.

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October 6, 2020  
 T:\ACTIVE PROJECTS\100-1005-0105 Key Mill\CD\1 As-Built\UT2\AS-Built\UT2.dwg



**NOTE:**  
 1. STA. 350+08 & 350+27: ROCK SILLS REPLACED WITH LOG SILLS DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.



**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**

UT2  
 Stream Plan and Profile

Revisions:

09/29/2020	

Date: August 27, 2020

Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

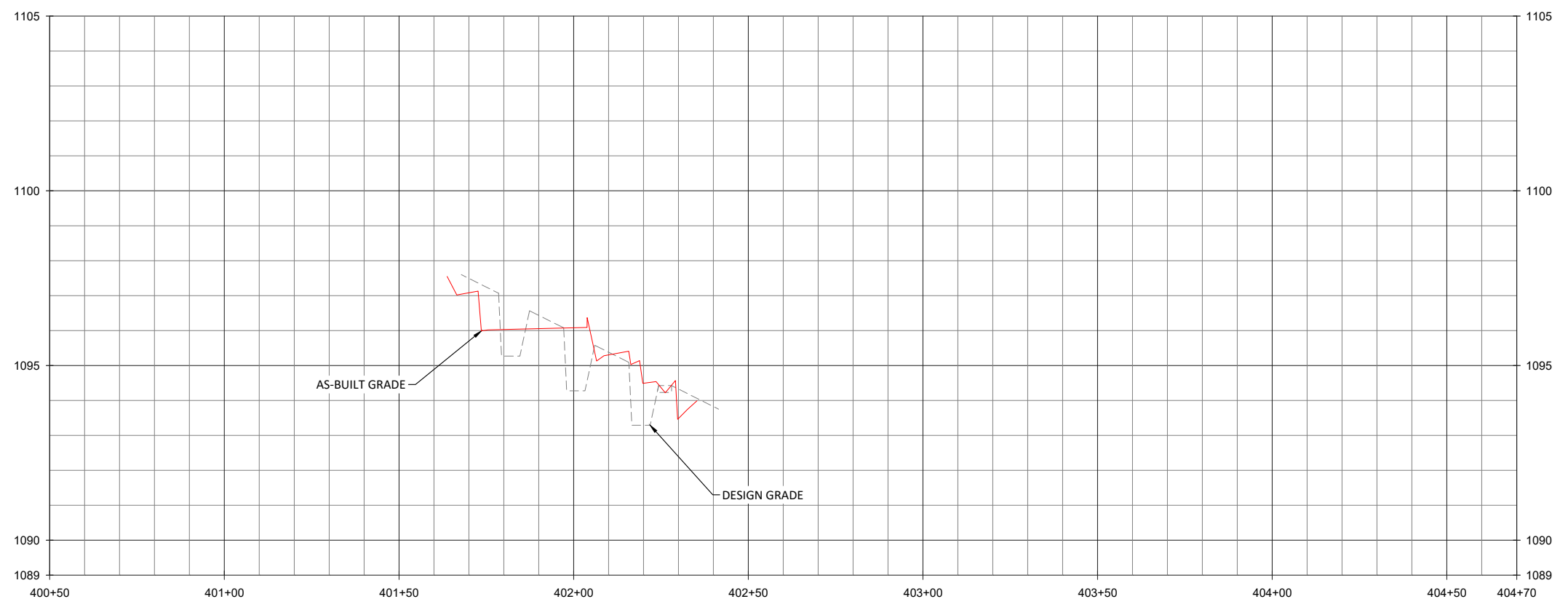
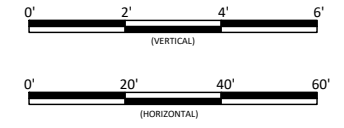
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 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
 Firm License No. F-0831



October 6, 2020

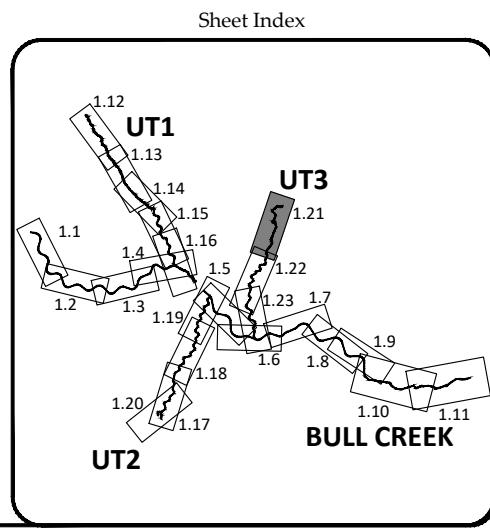
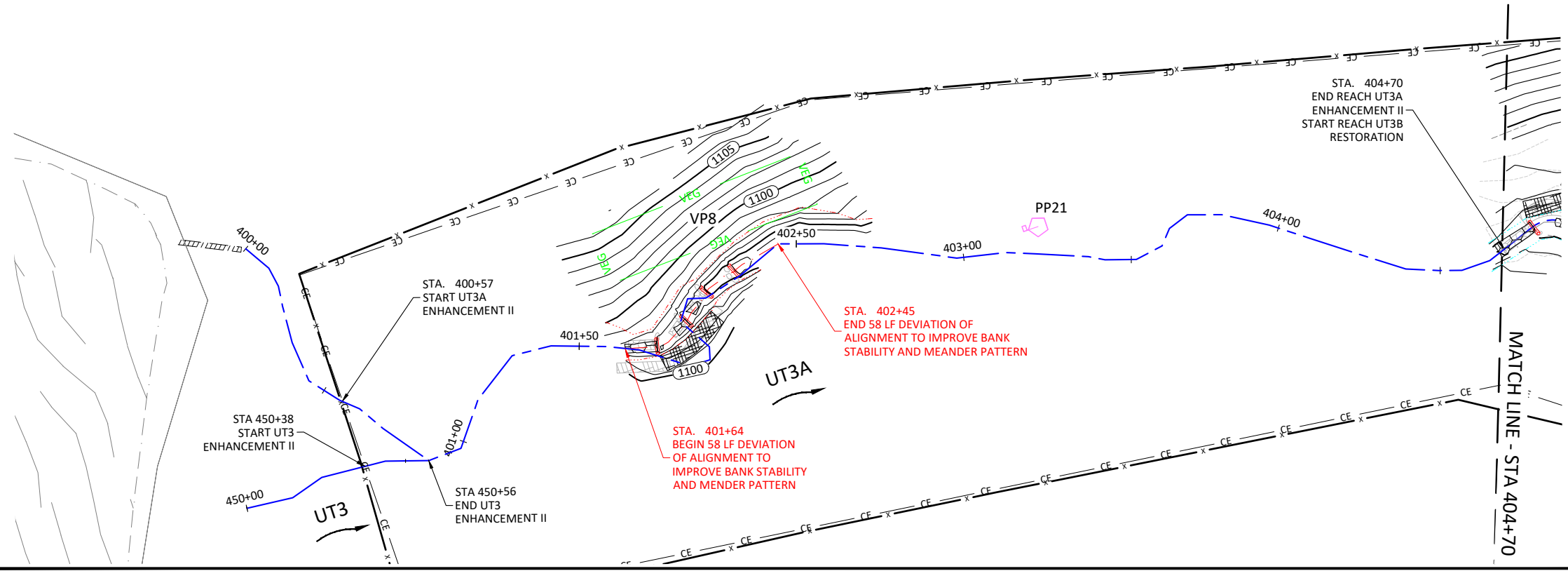


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CHARLOTTE, NC 28203  
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Fax: 704.332.3306  
Firm License No. F-0831



**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
UT3 and UT3A  
Stream Plan and Profile

- NOTE:**
1. STA. 401+64 - 402+45: THE CHANNEL DESIGN WAS ALTERED AND REALIGNED TO IMPROVE BANK STABILITY AND MEANDER PATTERN WHICH RESULTED IN 58 LF OF CONSTRUCTED CHANNEL, COMPARED TO 81 LF IN THE ORIGINAL DESIGN.
  2. STA. 401+71 - 402+29: ROCK SILLS REPLACED WITH LOG SILLS DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.

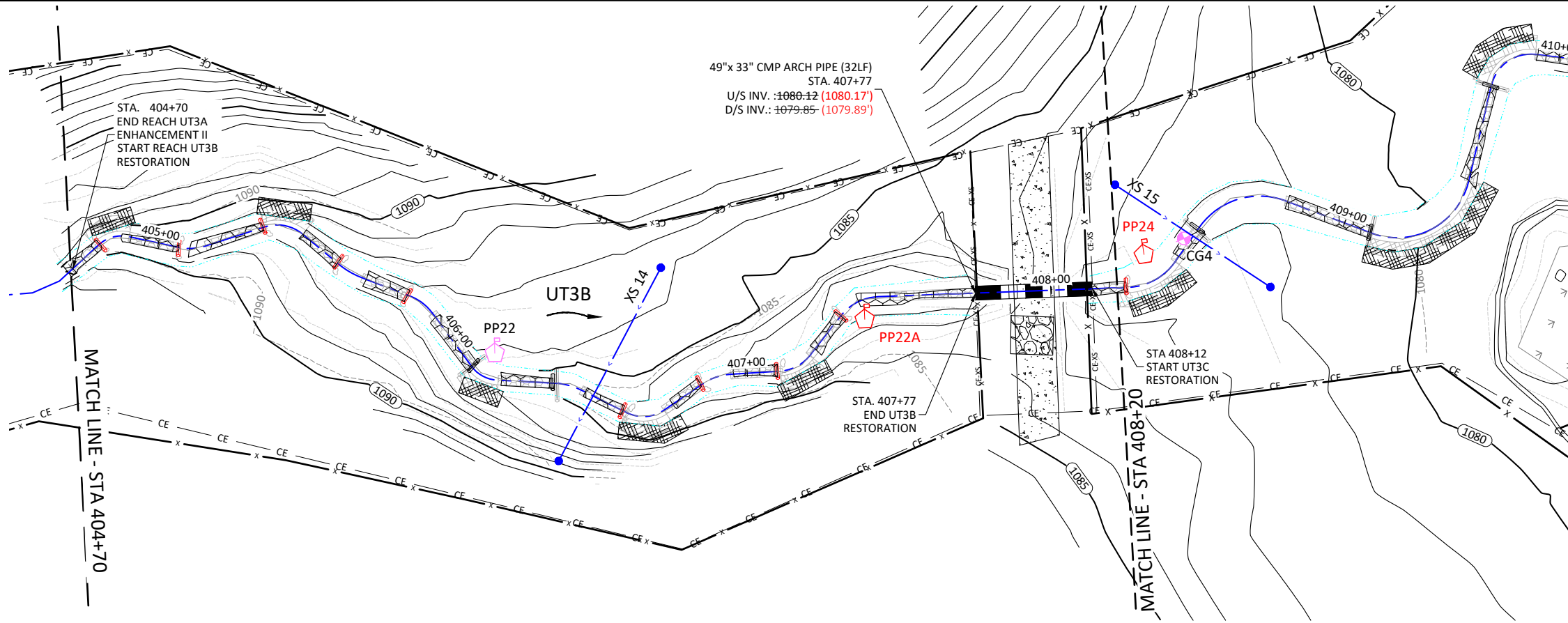
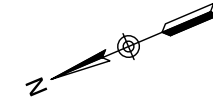
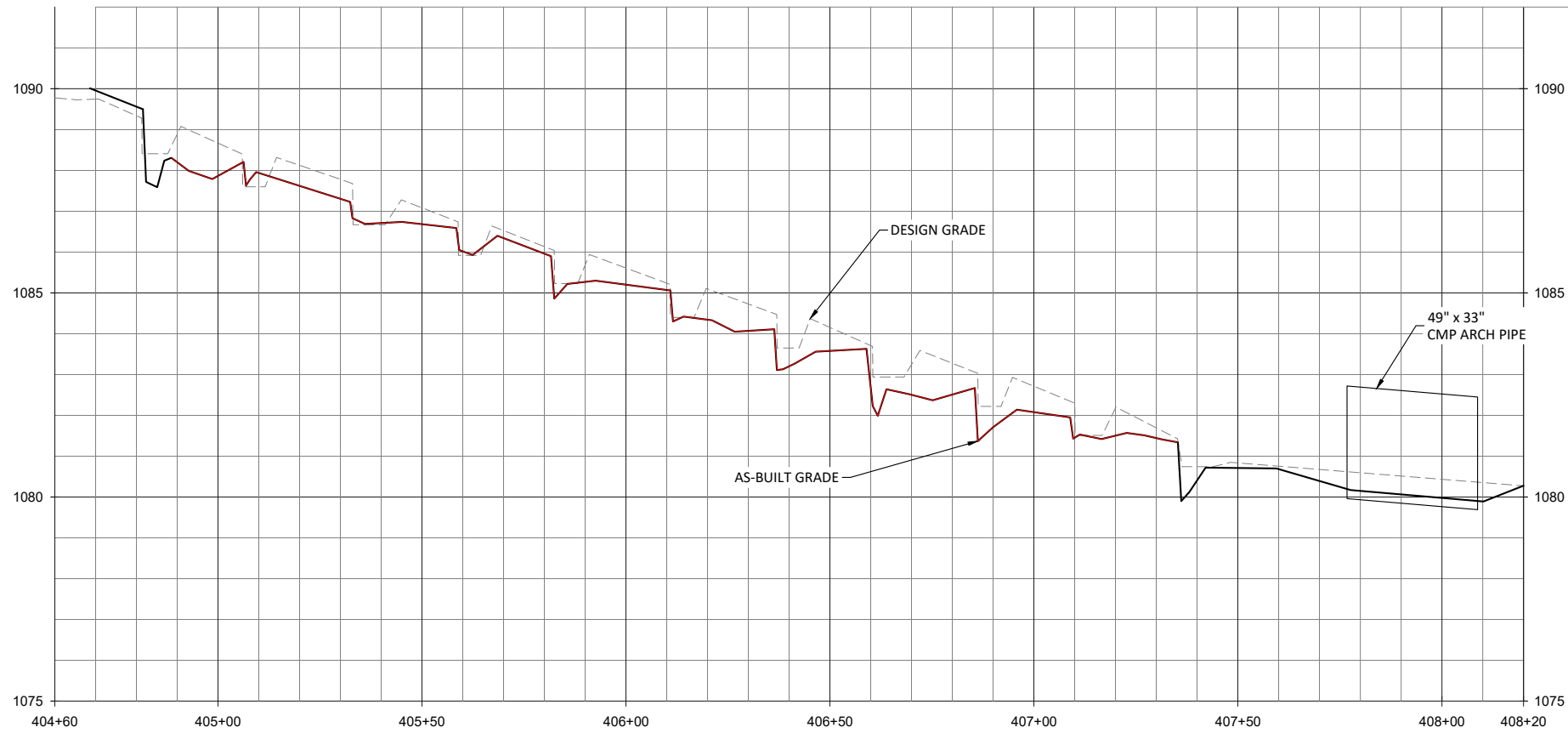


Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK
Revisions:	09/29/2020
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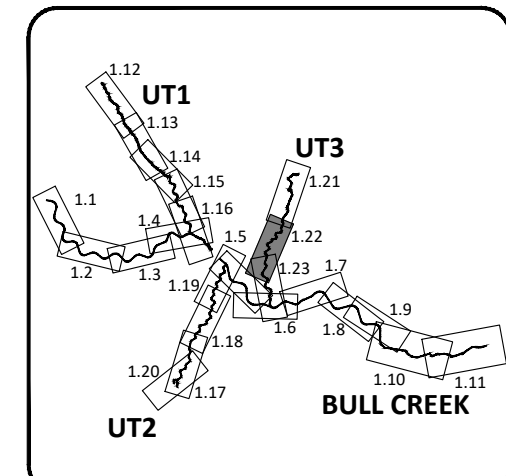


October 6, 2020



- NOTE:**
1. STA. 404+82, 405+06, 405+32, 405+58, 405+82, 406+59, 406+85, 407+09 AND 407+35: ROCK SILLS REPLACED WITH LOG SILLS DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.
  2. STA. 404+89 - 407+35: RIFFLE ELEVATIONS ADJUSTED DUE TO THE UPSTREAM TIE IN ELEVATION BEING CHANGED DUE TO FIELD CONDITIONS.
  3. STA. 407+41: PHOTO POINT 22A WAS ADDED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE A DOWNSTREAM VIEW OF THE CULVERT CROSSING.

Sheet Index



Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina

UT3B and UT3C  
Stream Plan and Profile

**WILDLANDS**  
ENGINEERING  
1405 B STREET, SUITE 104  
CHARLOTTE, NC 28203  
Tel: 704.332.7754  
Fax: 704.332.3306  
Firm License No. F-0831

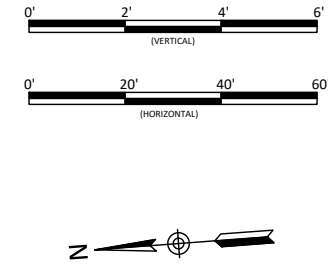
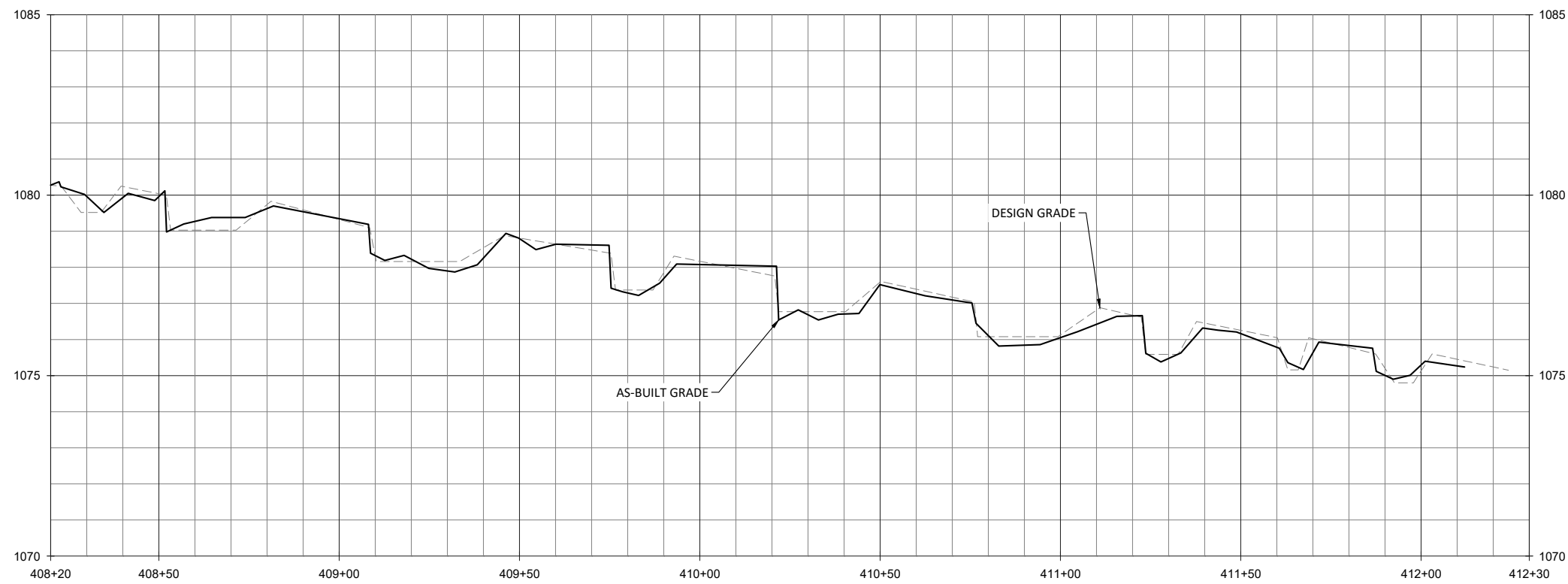


Revisions:
09/29/2020

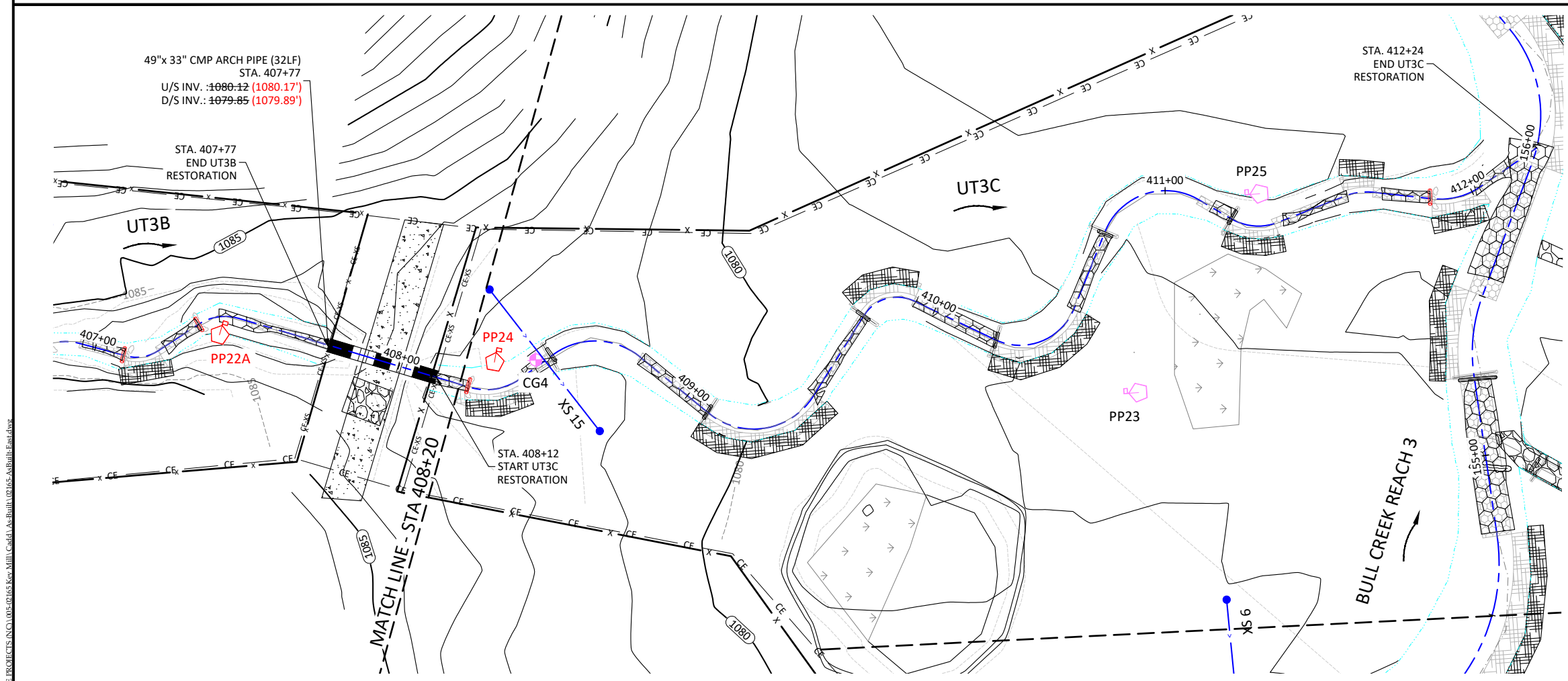
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Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

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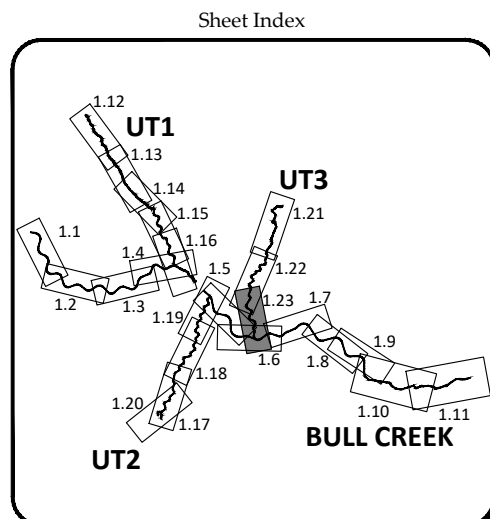
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 CHARLOTTE, NC 28203  
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- NOTE:**
1. STA. 408+22: ROCK SILLS REPLACED WITH LOG SILLS DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.
  2. STA. 408+33: PHOTO POINT 24 WAS MOVED AFTER THE SURVEY WAS COMPLETED AT THE REQUEST OF DMS TO CAPTURE AN UPSTREAM VIEW OF THE CULVERT CROSSING.
  3. STA. 411+86: ROCK SILL REPLACED WITH LOG SILL DUE TO LOCAL MATERIAL AVAILABILITY AND SIMILAR FUNCTIONALITY.



**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**

UT3C  
 Stream Plan and Profile

Date:	August 27, 2020
Job Number:	005-02165
Project Engineer:	AE
Drawn By:	ABP/JTC
Checked By:	JCK

**1.23**

Streambank Planting Zone						
Live Stakes						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Physocarpus opulifolius</i>	Ninebark	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	20% 10%
<i>Cornus amomum</i>	Silky Dogwood	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	40% 30%
<i>Salix sericea</i>	Silky Willow	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	40%
<i>Cephalanthus occidentalis</i>	Button Bush	8 ft.	2-8ft.	0.5" 1.5" cal.	Shrub	10%
<i>Sambucus canadensis</i>	Elderberry	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	10%
						100%

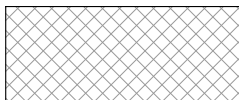
Buffer Planting Zone						
Bare Root						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Alnus serrulata</i>	Tag Alder	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20% 0%
<i>Quercus rubra</i>	Northern Red Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	12.5%
<i>Platanus occidentalis</i>	Sycamore	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20% 18%
<i>Betula nigra</i>	River Birch	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	25% 18%
<i>Quercus falcata</i>	Southern Red Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	8%
<i>Asimina triloba</i>	Paw Paw	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	3%
<i>Nyssa sylvatica</i>	Black Gum	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	6%
<i>Acer saccharinum</i>	Silver Maple	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	3%
<i>Fraxinus pennsylvanica</i>	Green Ash	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	12.5%
<i>Carpinus caroliniana</i>	Ironwood	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	5% 4%
<i>Viburnum dentatum</i>	Arrowwood	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	5% 4%
<i>Ilex opaca</i>	American Holly	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	4%
<i>Fagus grandifolia</i>	American Beech	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	7%
<i>Quercus phellos</i>	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20% 0%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20% 0%
<i>Magnolia macrophylla</i>	Bigleaf Magnolia	12 ft.	6-12 ft.	0.25-1.0"	Canopy	5% 0%
						100%

Note:

- Planting contractor provided plant quantities for entire site. Total plant quantities were not broken up between shaded and unshaded areas.



Buffer Planting Zone

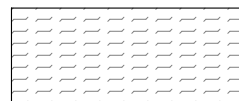


Buffer Planting Zone - Shaded

Streambank, Vernal Pool and Wetland Planting Zone						
Herbaceous Plugs						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Scirpus atrovirens</i>	Green Bulrush	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	8%
<i>Juncus effusus</i>	Common Rush	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	35% 40%
<i>Calamagrostis canadensis</i>	Bluejoint Grass	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	30% 0%
<i>Carex crinita</i>	Fringed Sedge	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	13%
<i>Andropogon glomeratus</i>	Bushy Beardgrass	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	4%
<i>Caryx stricta</i>	Upright Sedge	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	18%
<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	17%
<i>Carex alata</i>	Broadwing Sedge	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	35% 0%
						100%

Note:

- Planting Contractor provided plant quantities for entire site. Total plant quantities were not broken up between streambank, vernal pool and wetland area planting zones.
- Herbaceous plugs shifted to similar species due to quality of materials available at nursery.



Vernal Pool and Wetland Planting Zone

Permanent Riparian Seeding				
Pure Live Seed (20 lbs/ acre)				
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	1.0
All Year	<i>Agrostis hyemalis</i>	Winter Bentgrass	Herb	3.0
All Year	<i>Chasmanthium latifolium</i>	Indian Woodoats	Herb	0.4
All Year	<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	1.0
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	1.0
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	1.5
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	3.0
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	3.5
All Year	<i>Panicum virgatum</i>	Switchgrass	Herb	2.0
All Year	<i>Schizachyrium scoparium</i>	Little Bluestem	Herb	2.0
All Year	<i>Asclepias syrica</i>	Common Milkweed	Herb	0.4
All Year	<i>Bidens aristosa</i>	Bearded Beggartick	Herb	1.0
All Year	<i>Eupatorium perfoliatum</i>	Boneset	Herb	0.2
All Year	<i>Lobelia cardinalis L.</i>	Cardinal Flower	Herb	0.4 0.0
All Year	<i>Liatris spicata</i>	Dense Blazing Star	Herb	0.4 0.0

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

\*All disturbed areas.



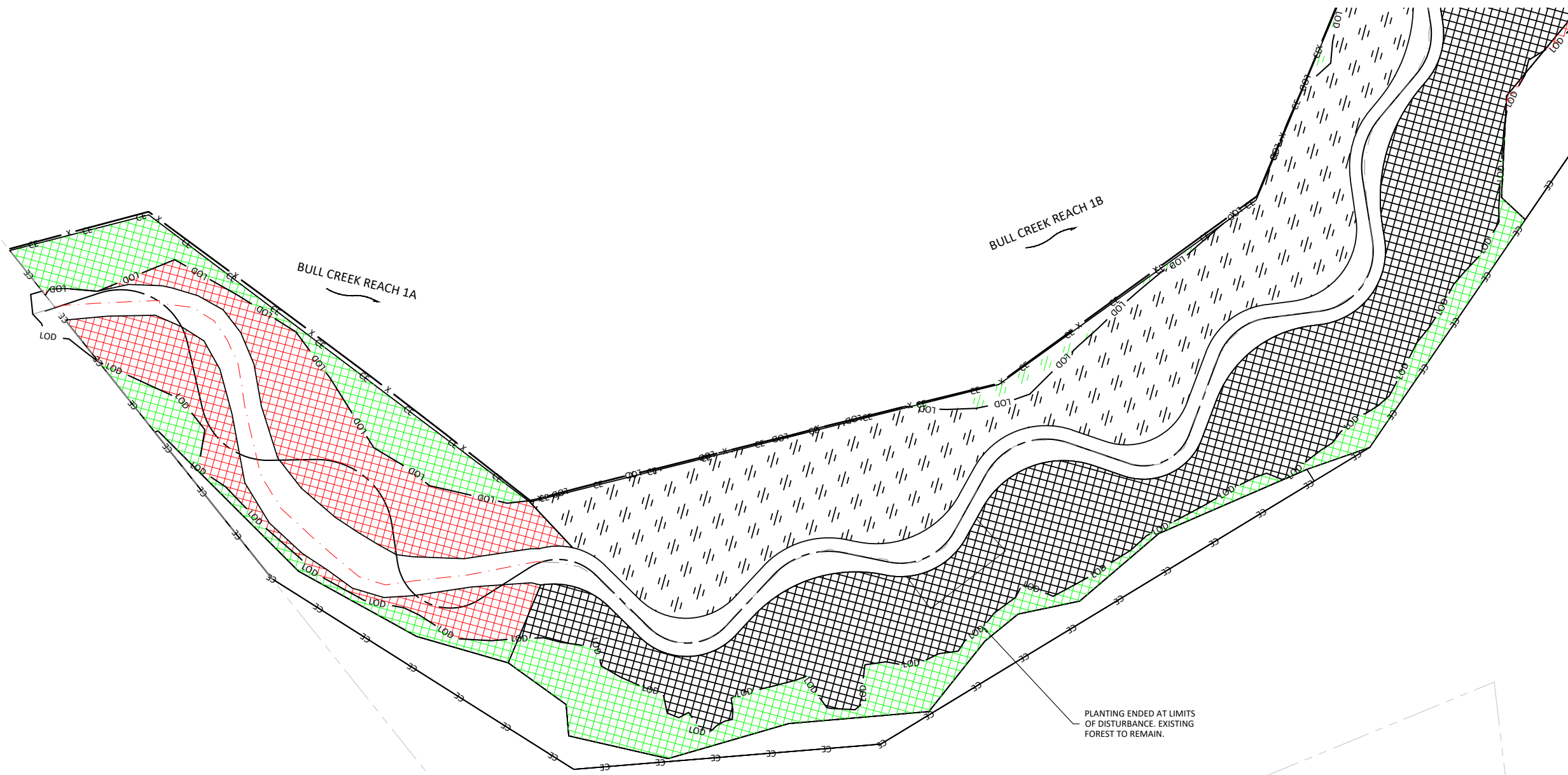
Pasture Areas Outside Easement

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

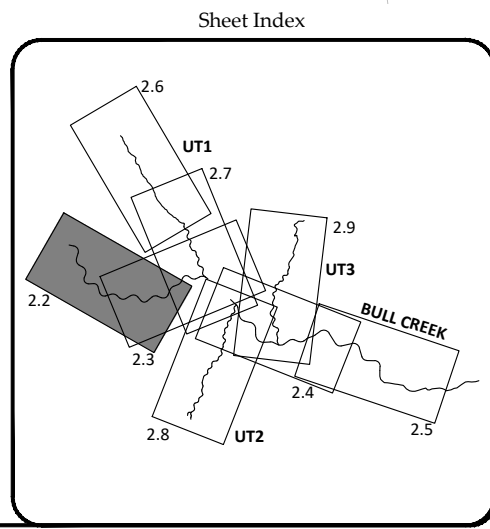
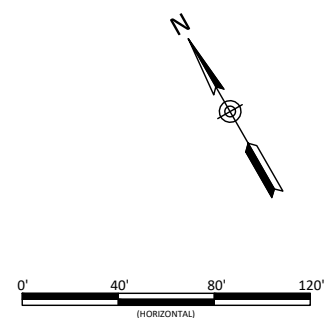


Revisions:  
 09-25-2020

Date: August 27, 2020  
 Job Number: 005-02105  
 Project Engineer: A.E.  
 Drawn By: ABT/JTC  
 Checked By: JCK



- NOTES:**
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  2. DEVIATIONS TO THE DESIGN PLANTING PLAN THAT WERE OUTSIDE THE AS-BUILT LIMIT OF DISTURBANCE AND WERE NOT PLANTED ARE SHOWN IN **GREEN**.
  3. **STA.100+95-105+39: PLANTING AREA ALTERED DUE TO BEDROCK THAT WAS PRESENT IN THE LEFT FLOODPLAIN.**



**Key Mill Mitigation Site - Record Drawings**  
**Surry County, North Carolina**  
 Bull Creek West  
 Planting Plan

**WILDLANDS**  
 ENGINEERING  
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 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
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Revisions:

10-01-2020	

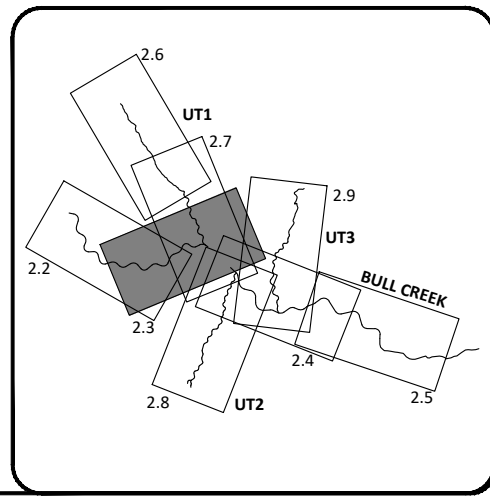
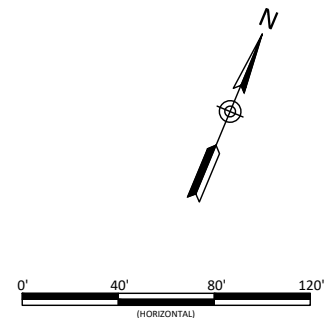
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 Job Number: 005-02105  
 Project Engineer: A.E.  
 Drawn By: ABP/JTC  
 Checked By: JCK

**2.2**

October 6, 2020  
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Sheet Index

Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

Bull Creek West  
 Planting Plan


Revisions:

10-01-2020	


Date:	August 27, 2020
Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABT/JTC
Checked By:	JCK

2.3

Sheet



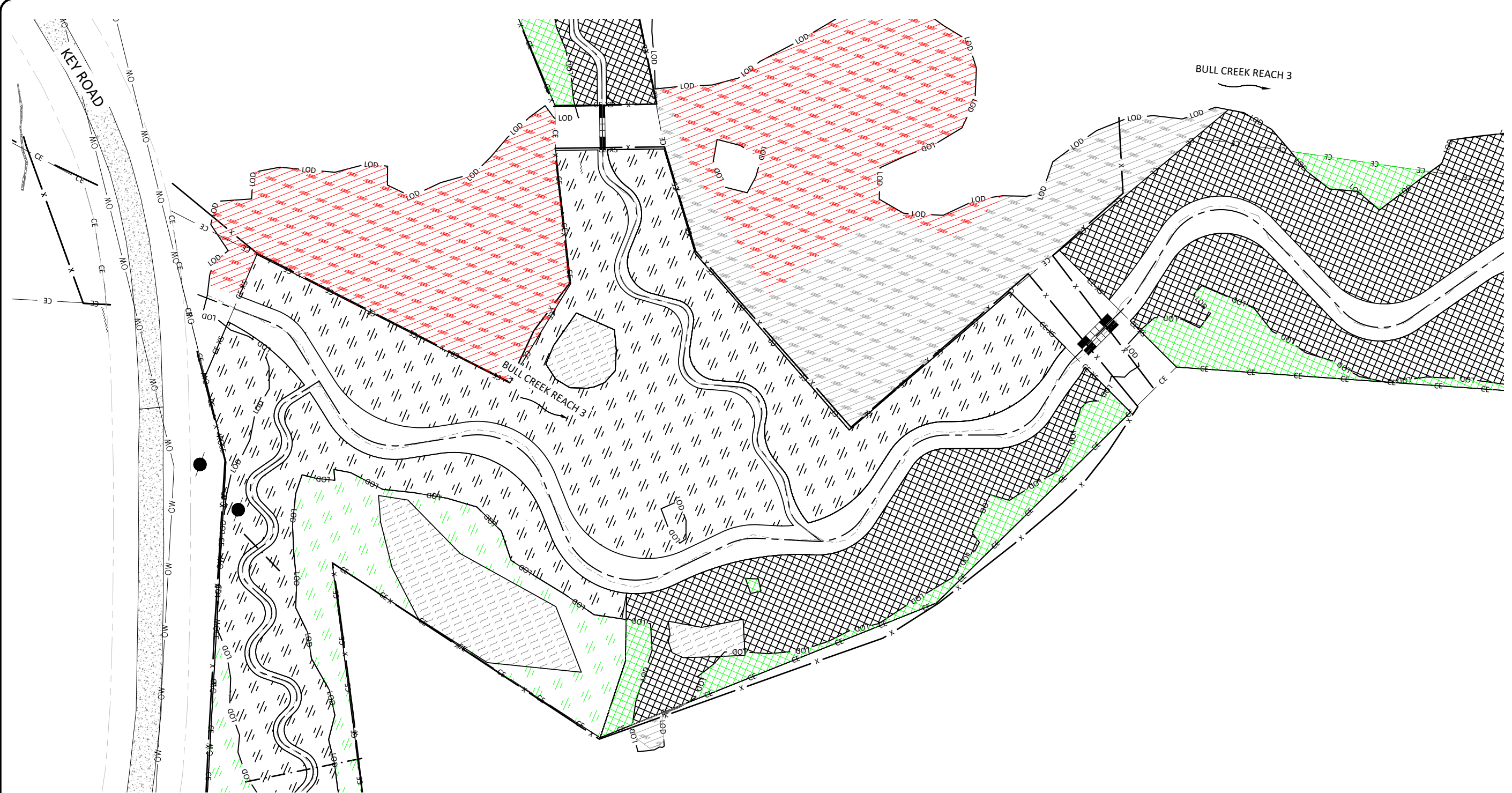
**WILDLANDS**  
 ENGINEERING  
 1405 E. WILSON DRIVE, 104  
 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
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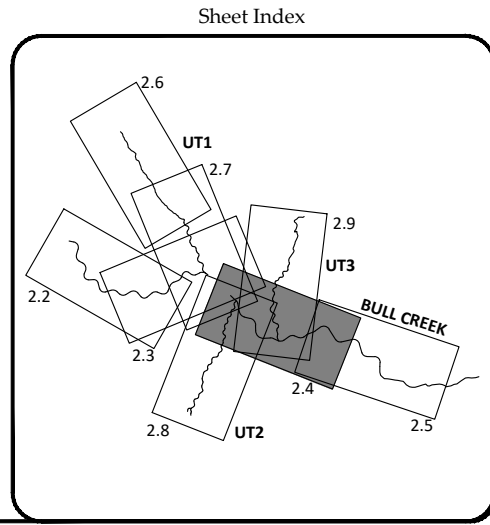
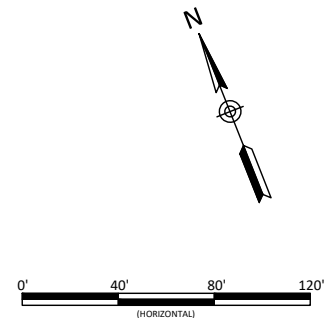
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October 6, 2020

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- NOTES:
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Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 Bull Creek East  
 Planting Plan

Date:	August 27, 2020
Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABP/JTC
Checked By:	JCK

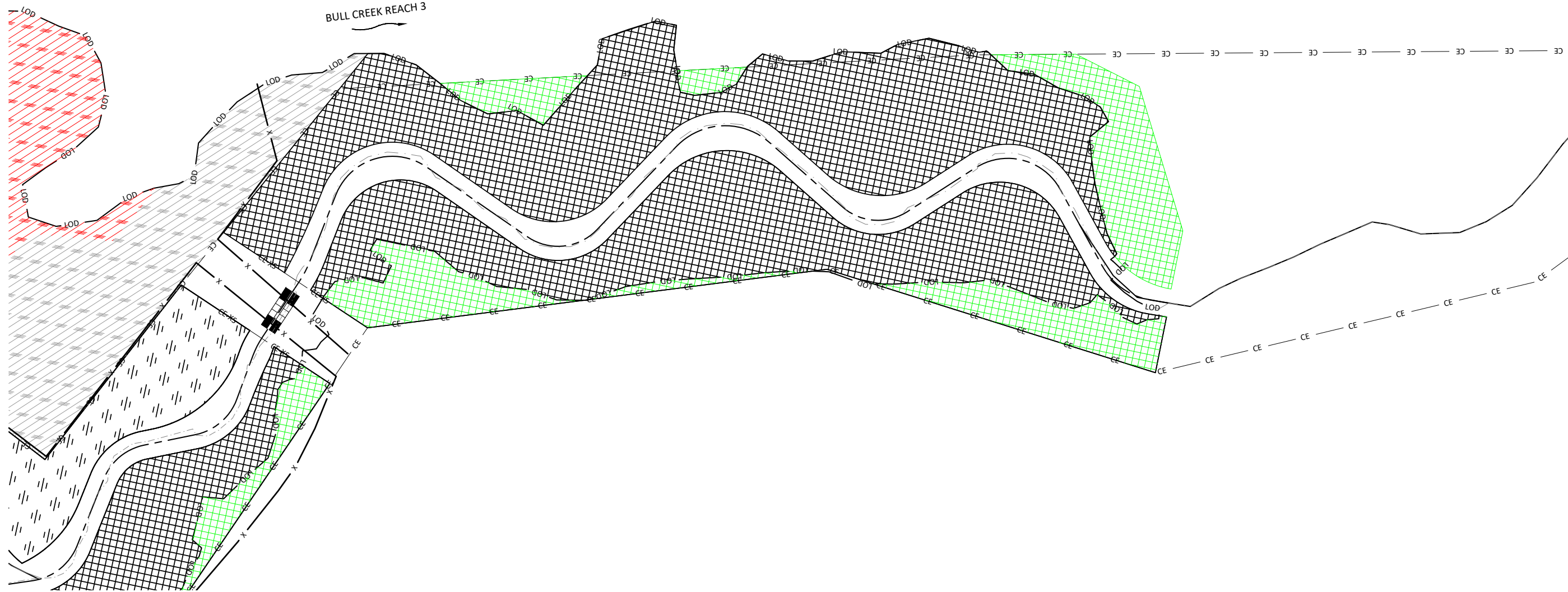
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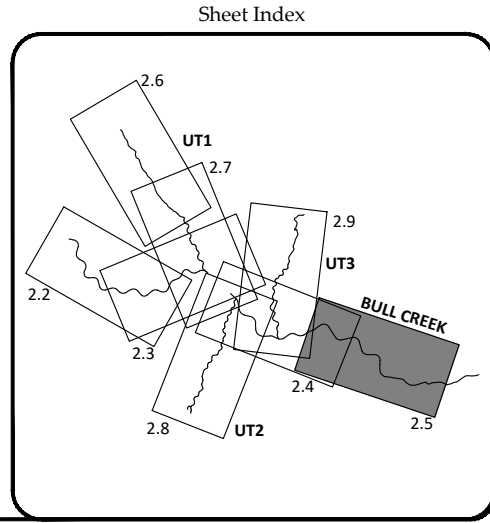
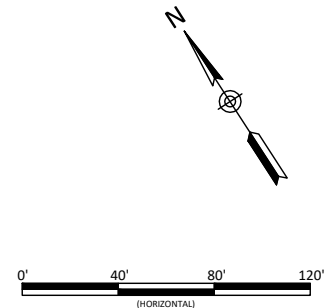


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17-20



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Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina  
 Bull Creek East  
 Planting Plan

Revisions:

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Date:	August 27, 2020
Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABF/JTC
Checked By:	JCK

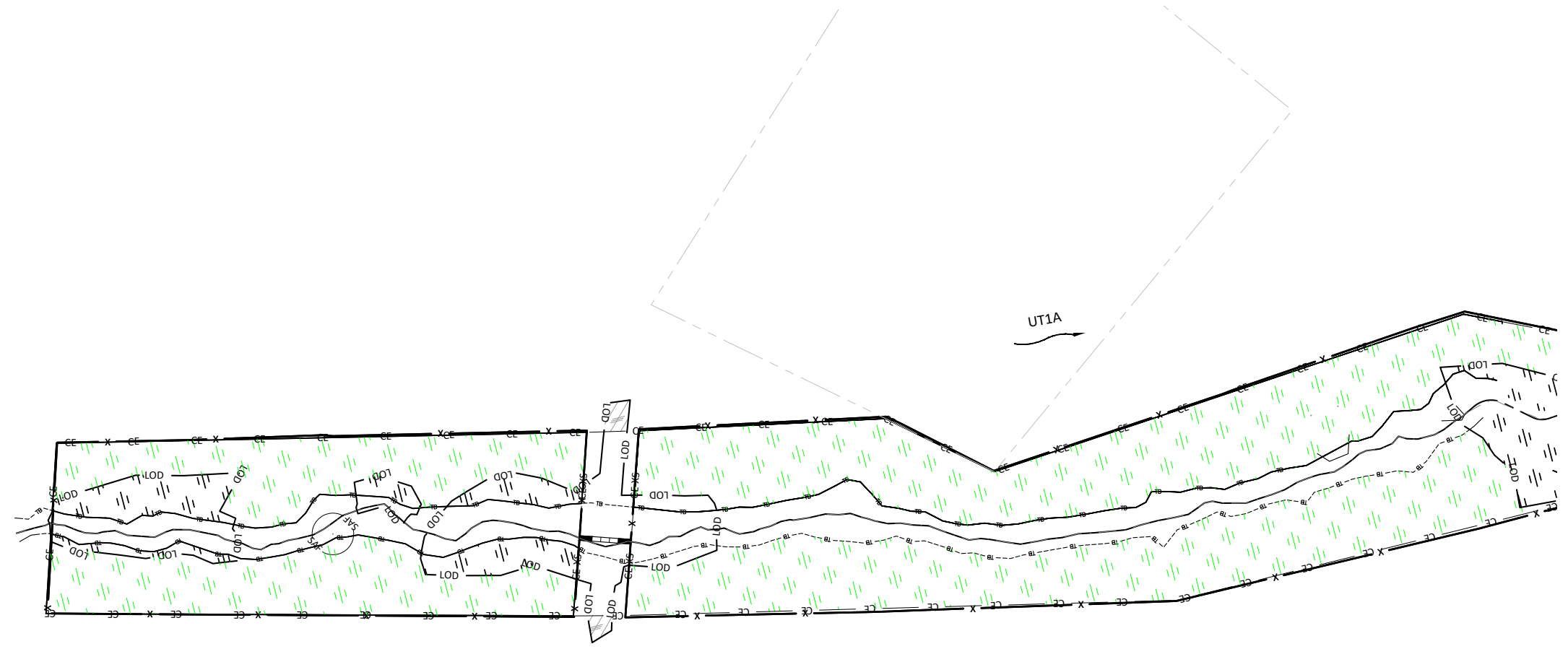
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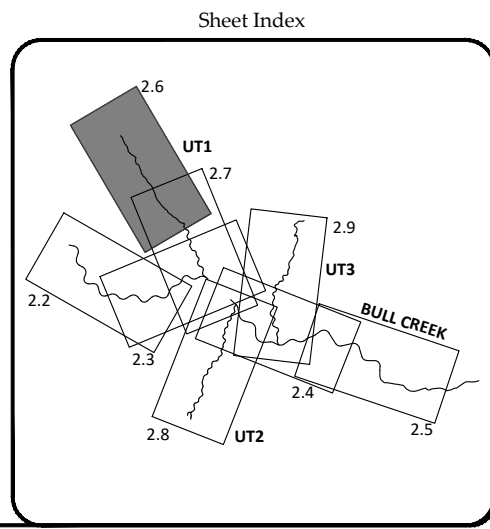
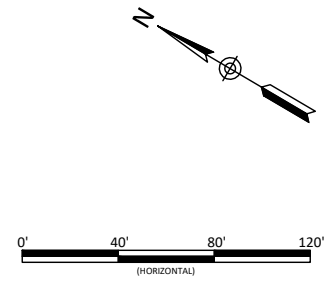
**WILDLANDS**  
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October 6, 2020  
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Key Mill Mitigation Site - Record Drawings  
Surry County, North Carolina

UT1  
Planting Plan

Revisions:

10-01-2020	

Date: August 27, 2020

Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABT/JTC
Checked By:	JCK

2.6

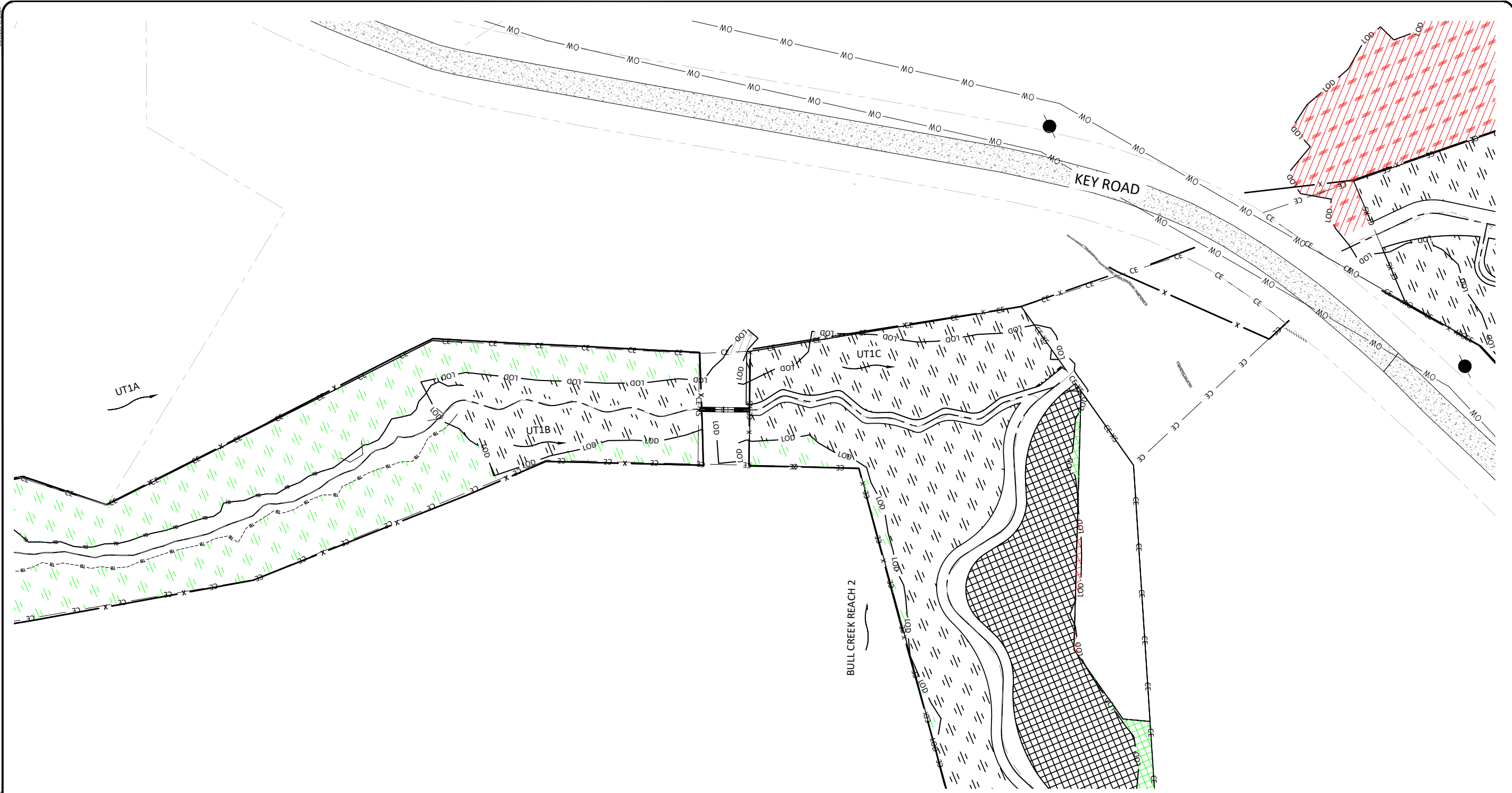
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CHARLOTTE, NC 28203  
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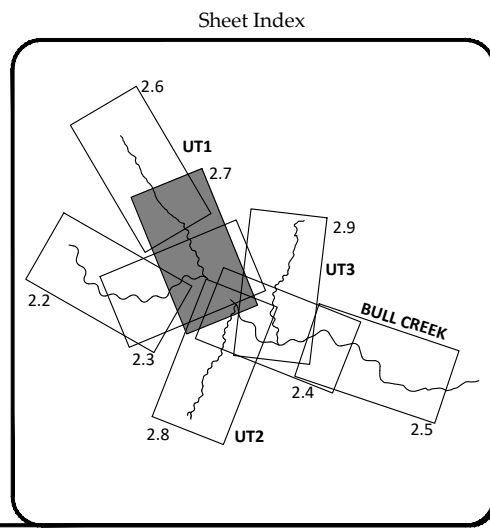
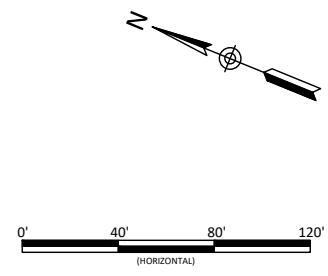




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Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

UT1  
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Revisions:

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Date:	August 27, 2020
Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABT/JTC
Checked By:	JCK

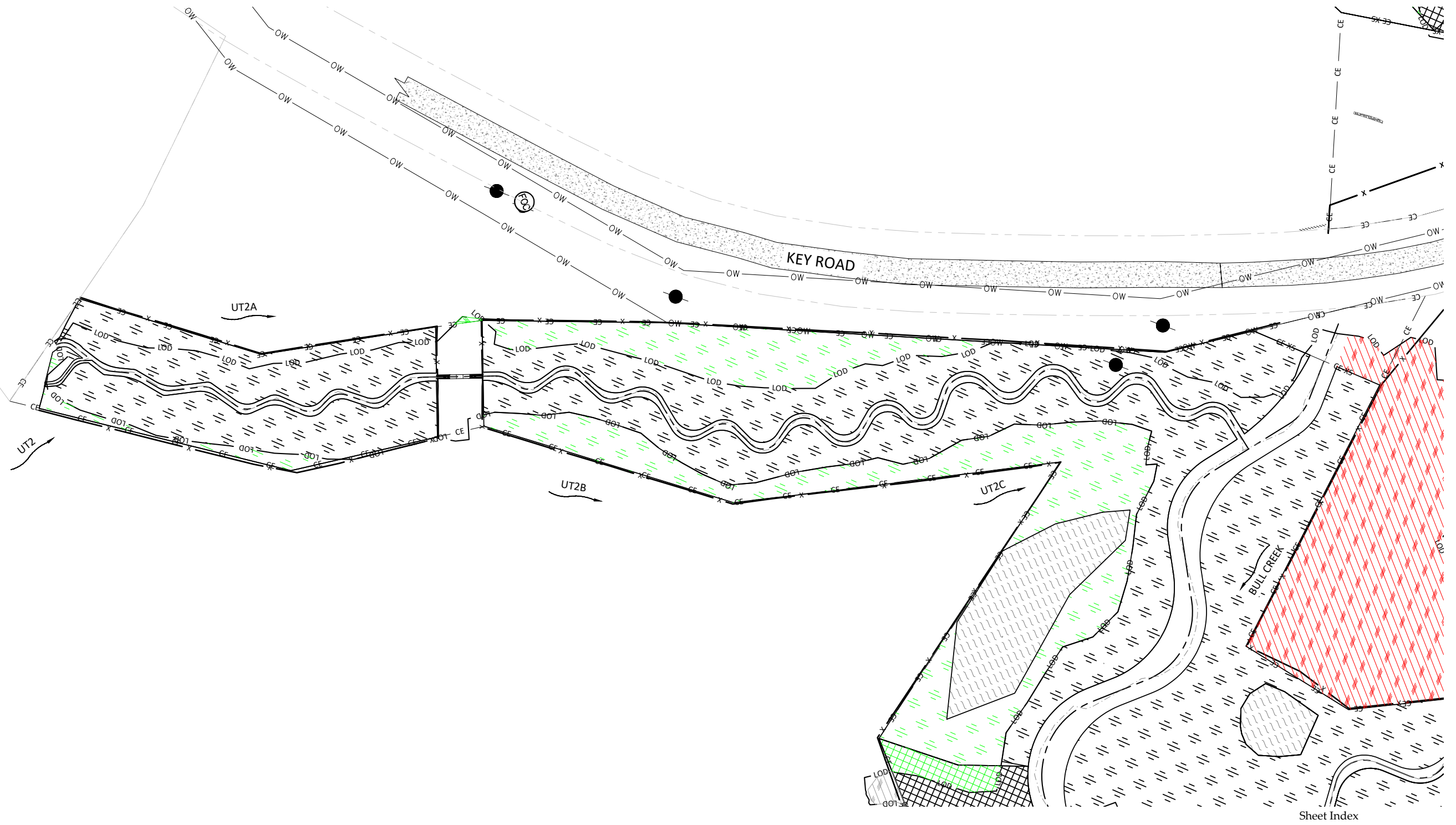
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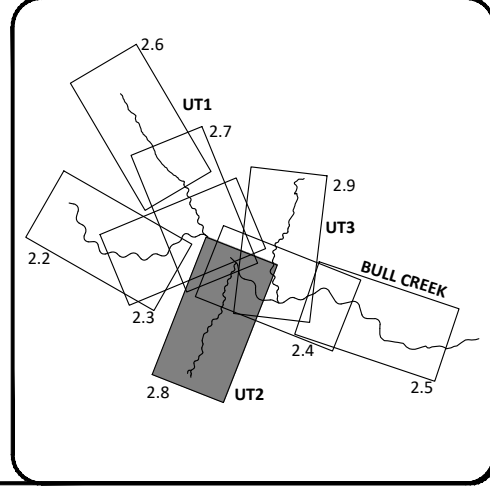
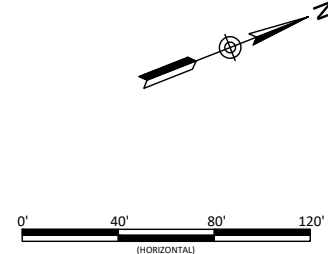
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 1405 E. WILSON ROAD, SUITE 104  
 CHARLOTTE, NC 28203  
 Tel: 704.332.7754  
 Fax: 704.332.3306  
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Professional Engineer  
 License No. 02344  
 Name: ABRAHAM S. WILSON  
 Exp. Date: 12/31/2021  
 State of North Carolina

2-17-20



Sheet Index



Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

UT2  
 Planting Plan

Revisions:

10-01-2020	

Date:	August 27, 2020
Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABT/JTC
Checked By:	JCK

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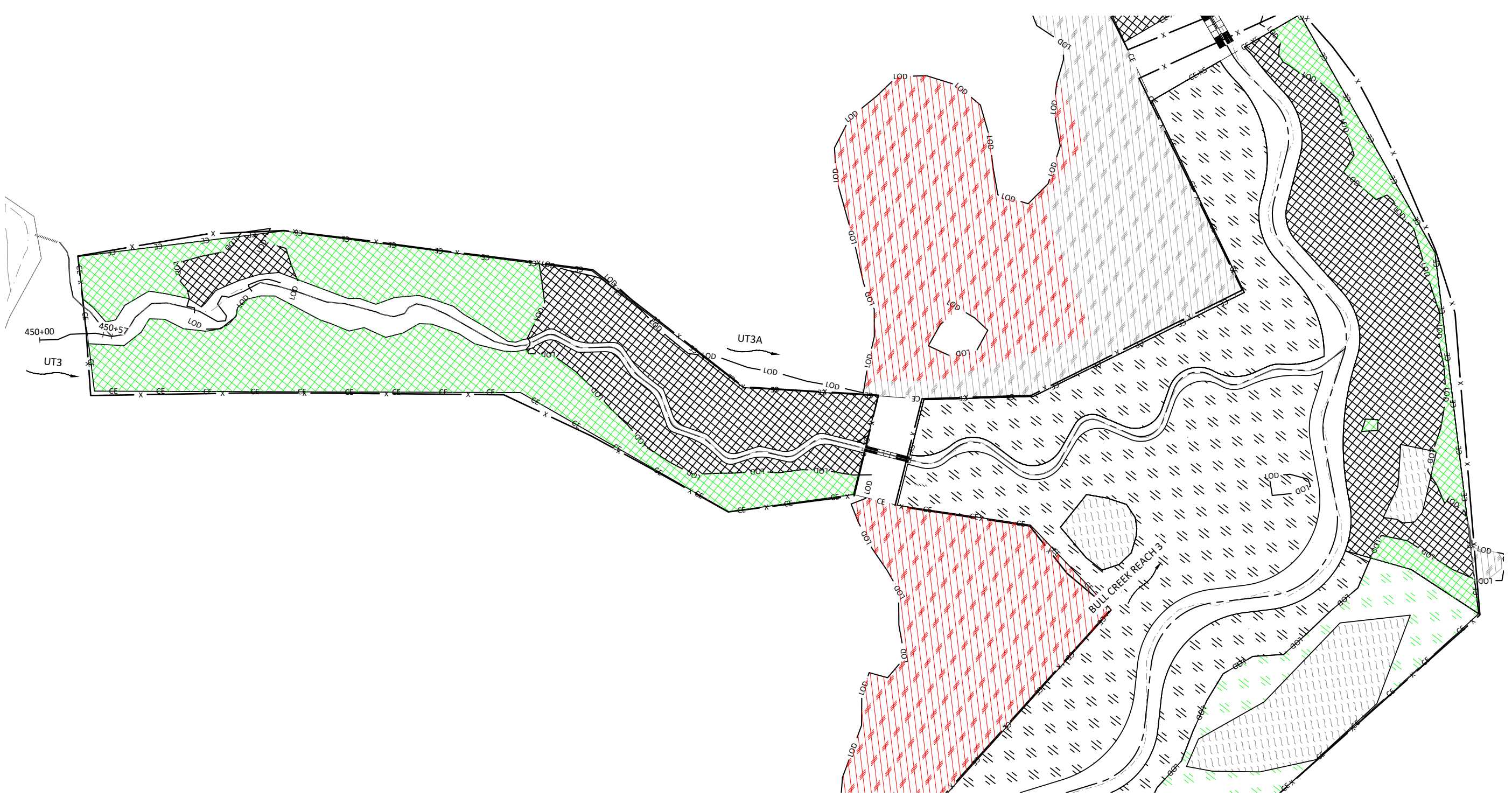
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 Tel: 704.332.7754  
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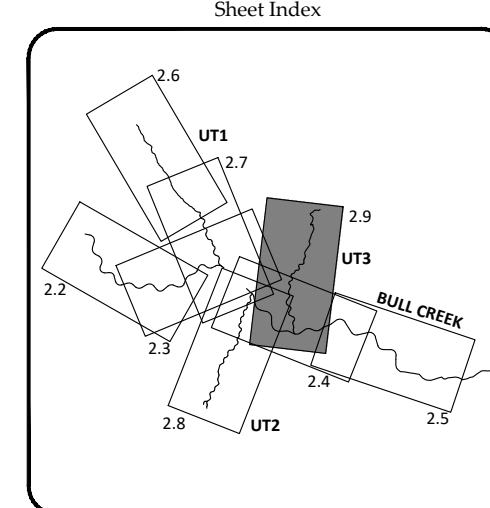
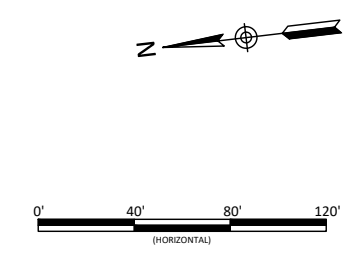
Professional Engineer Seal for North Carolina, License No. 023447, Name: JAMES W. SMITH, Exp. Date: 12/31/2021.

October 6, 2020

PLANTING PLAN (NO. 1001-2020) Key Mill Creek, As-Built, UT3, As-Built, Planting Plan, etc.



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Key Mill Mitigation Site - Record Drawings  
 Surry County, North Carolina

UT3  
 Planting Plan

Revisions:

10-01-2020	

Date:	August 27, 2020
Job Number:	005-02105
Project Engineer:	A.E.
Drawn By:	ABT/JTC
Checked By:	JCK

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