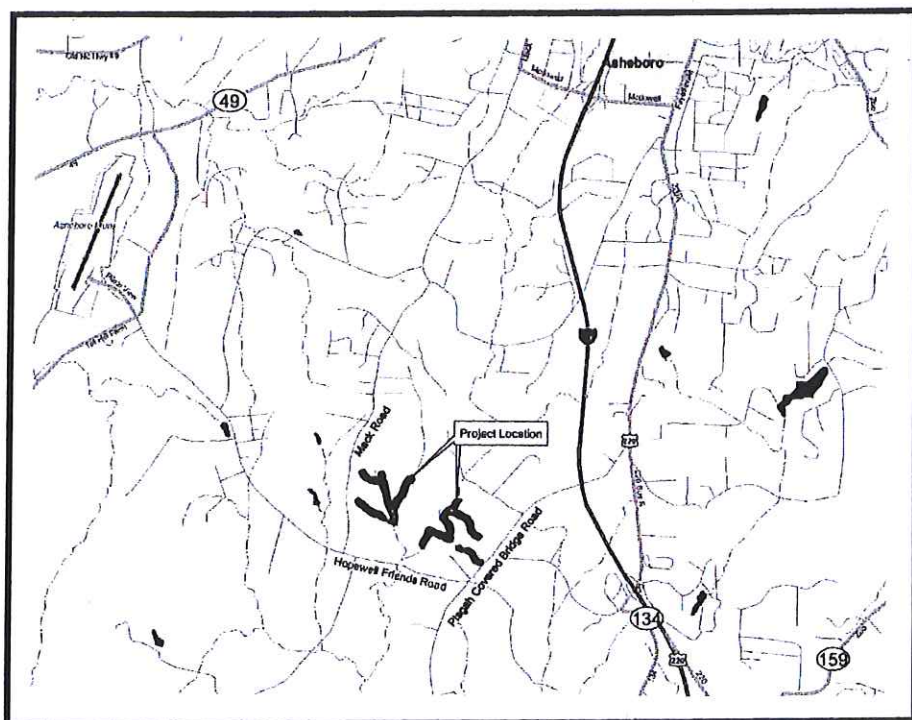


Hopewell Stream Mitigation Site Record Drawings

Yadkin River Basin 03040105
Randolph County, North Carolina
for
North Carolina Ecosystem
Enhancement Program



Vicinity Map
Not to Scale

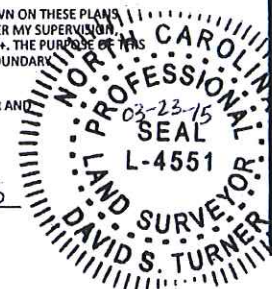


RECORD DRAWINGS
ISSUED FEBRUARY 27, 2015

AS-BUILT PLANS
SURVEYOR'S CERTIFICATION
I, DAVID S. TURNER, CERTIFY THAT THE INFORMATION SHOWN ON THESE PLANS
WAS DERIVED FROM AN ACTUAL FIELD SURVEY MADE UNDER MY SUPERVISION
AND THAT THE RATIO OF PRECISION AS CALCULATED IS 1:10,000+. THE PURPOSE OF THIS
SURVEY IS FOR TOPOGRAPHIC INFORMATION ONLY, NO BOUNDARY
DETERMINATIONS WERE MADE AT THIS TIME.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND
SEAL THIS 23 DAY OF March 2015

David S. Turner 03-23-15
PROFESSIONAL LAND SURVEYOR L-4551 DATE



Sheet Index

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General Notes and Symbols	0.2
Stream Plan and Profile	
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UT1B	1.6-1.8
UT2	1.9-1.13
UT2A	1.14-1.17
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UT2C	1.21-1.25
Little River	1.26-1.31
Planting	2.1-2.5

Project Directory

Surveying:
Turner Land Surveying, PLLC
3201 Glenridge Drive
Raleigh, NC 27604
David S. Turner, PLS
919-875-1378

Owner:
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652
Jeff Jurek
919-707-8976

Engineering:
Wildlands Engineering, Inc
License No. F-0831
5605 Chapel Hill Road, Suite 122
Raleigh, NC 27607
Jeff Keaton, PE
919-851-9986

DENR Contract No. 004642
NCEEP ID No. 95352



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1436 QUINN STREET, SUITE 104
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Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina

Title Sheet

Revision:

Date: February 27, 2015
Job Number: 005-02133
Project Engineer: JNK
Drawn By: RPH
Checked By: KVC

0.1

Sheet










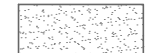
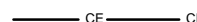




Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina





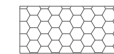
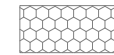
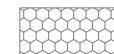
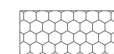
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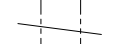
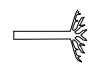
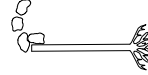

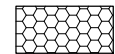
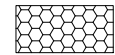
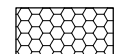
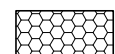
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 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

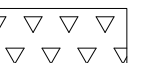
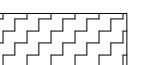
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-  PL Property Line
-  R/W Right of Way
-  100 Designed Major Contour
-  --- Designed Minor Contour
-  - - - - - Designed Bankfull
-  Trees Saved During Construction
-  Power Pole
-  Farm Road
-  CE Conservation Easement
-  10+00 As-Built Thalweg Alignment
-  As-Built Bankfull
-  100 As-Built Major Contour
-  --- As-Built Minor Contour

-  Designed Angle Log Drop
-  Designed Rootwad
-  Designed J-Hook
-  Designed Cover Log
-  CR-NM Designed Constructed Riffle
-  CR-CH Designed Chunky Riffle
-  CR-RR Designed Rock and Roll Riffle
-  CR-WD Designed Woody Riffle

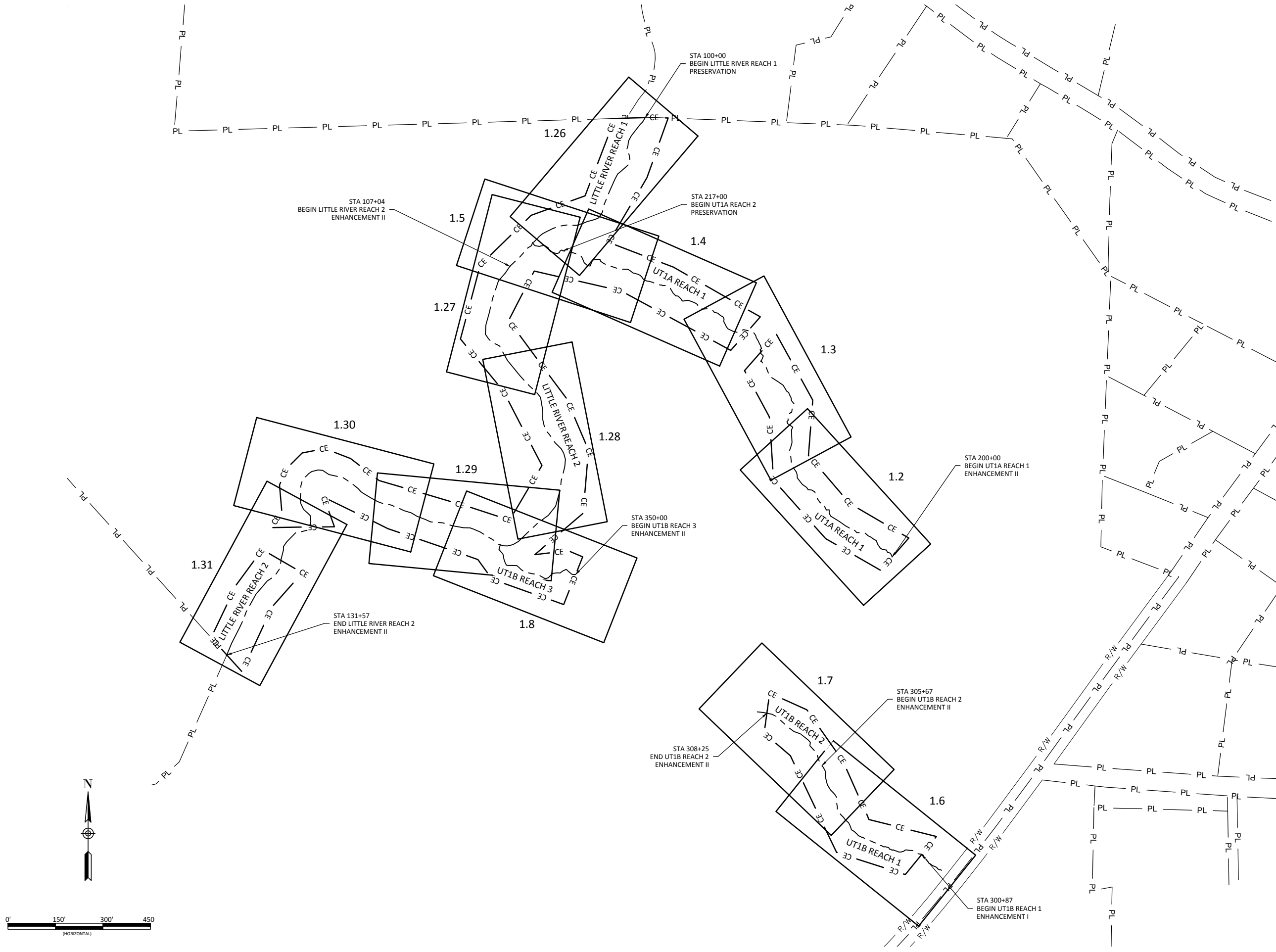
-  As-Built Angle Log Drop
-  As-Built Rootwad
-  As-Built J-Hook
-  As-Built Cover Log
-  CR-NM As-Built Constructed Riffle
Deviation from specified riffle type noted on plan sheets.
-  CR-CH As-Built Chunky Riffle
-  CR-RR As-Built Rock and Roll Riffle
-  CR-WD As-Built Woody Riffle

-  Designed Brush Mattress
-  Designed Brush Toe
-  Designed Permanent Ford Crossing

-  As-Built Brush Mattress
-  As-Built Brush Toe

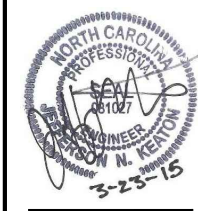
Deviation from design shown in red.

March 24, 2015
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Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina
Project Overview - East Side
Stream Plan and Profile

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CHARLOTTE, NC 28203
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Firm License No. F-0831



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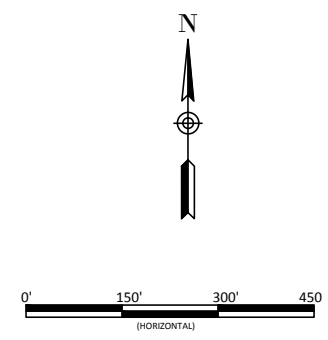
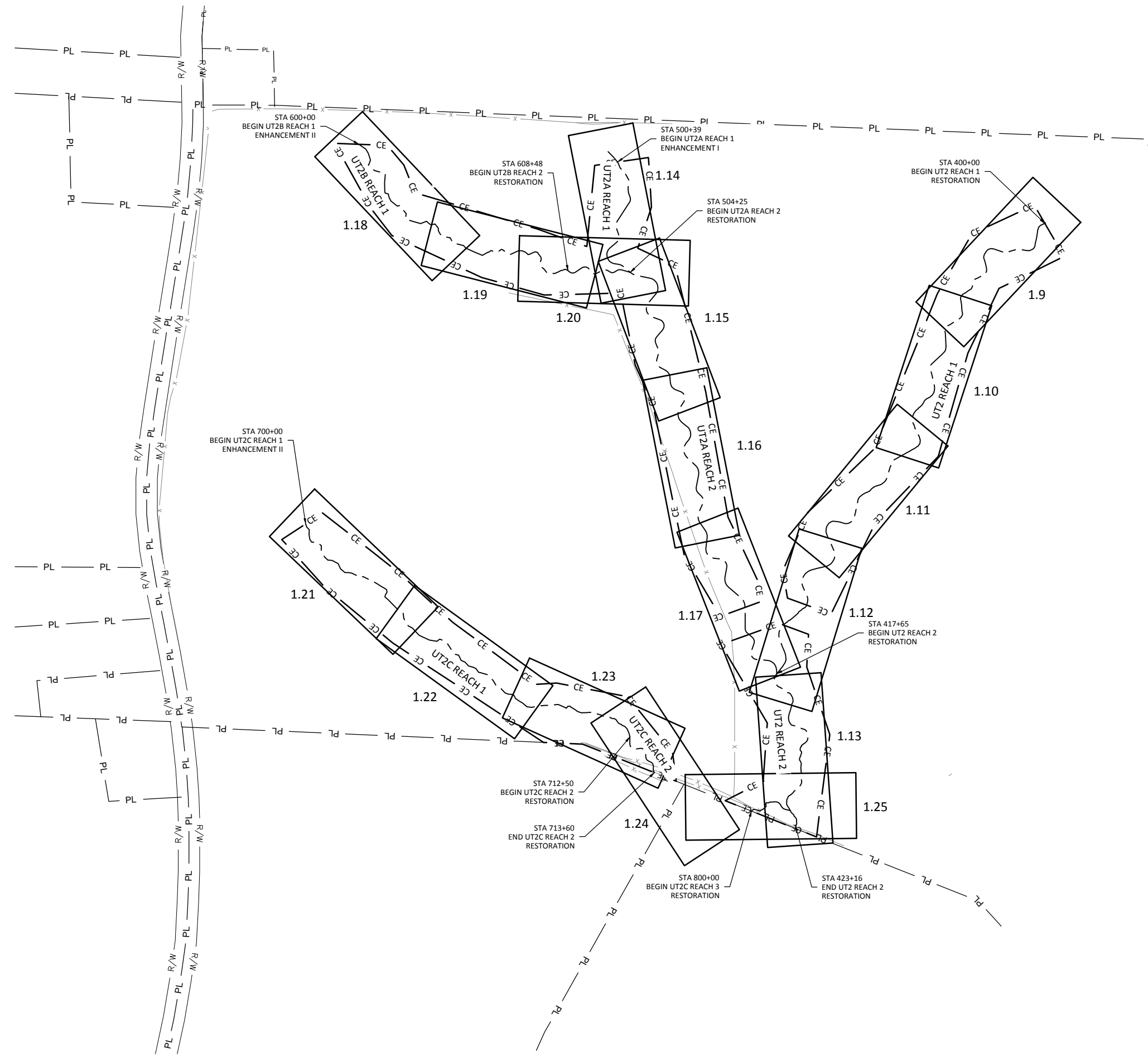
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Date: February 27, 2015
Job Number: 005-02133
Project Engineer: JNK
Drawn By: RPH
Checked By: KYG

1.0

Sheet

March 24, 2015
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Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina
 Project Overview - West Side
 Stream Plan and Profile

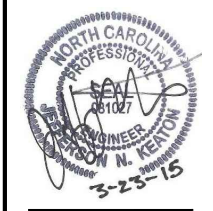
Revisions:

Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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Sheet

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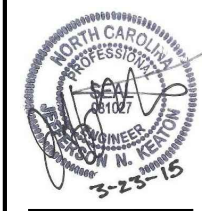


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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT1A
 Stream Plan and Profile

Revisions:

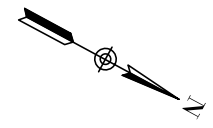
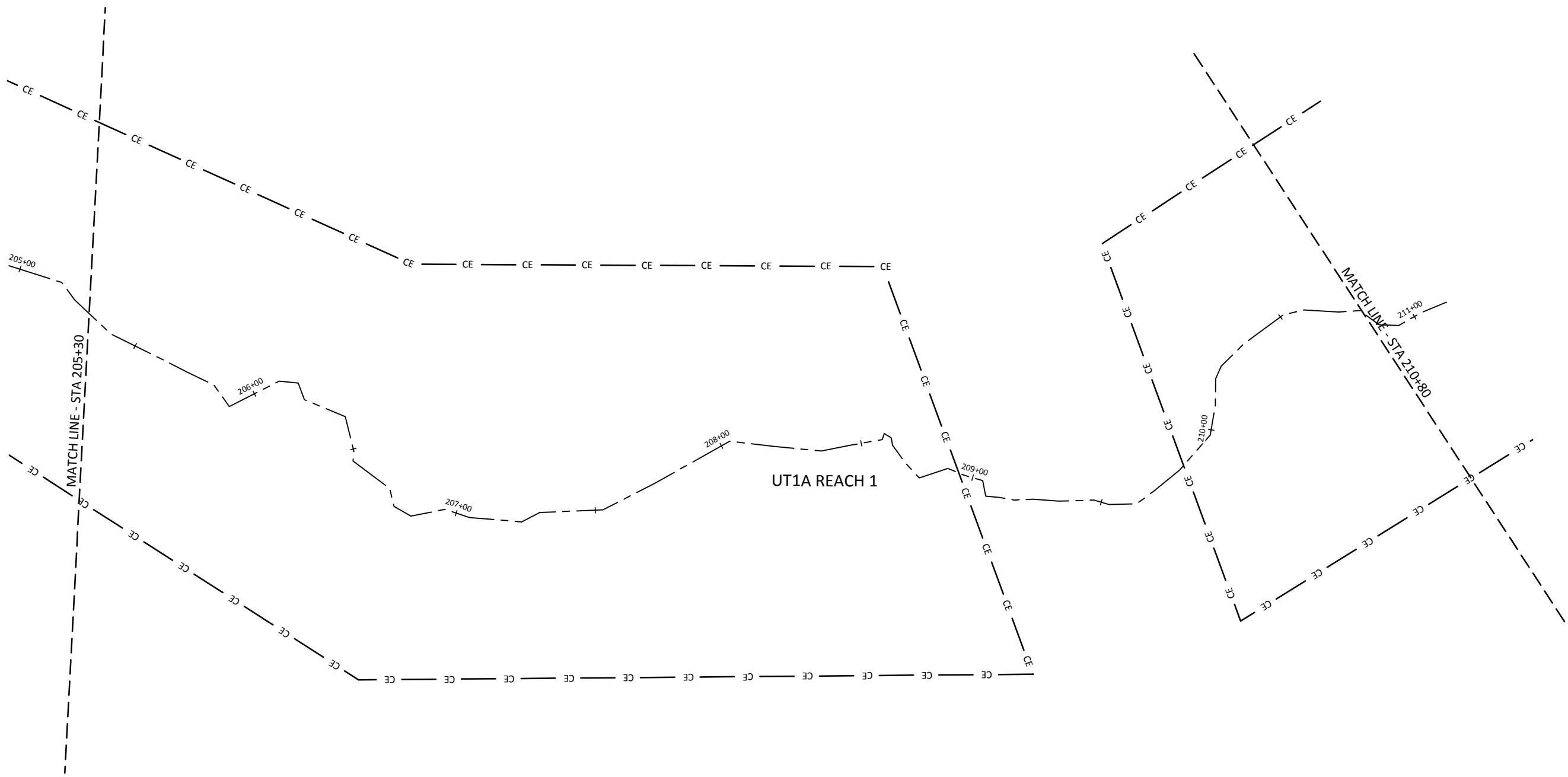
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 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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March 24, 2015

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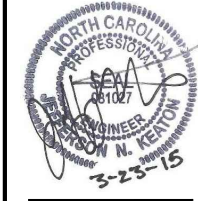
Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina

UT1A
Stream Plan and Profile

Date:	February 27, 2015
Job Number:	005-02133
Project Engineer:	JNK
Drawn By:	RPH
Checked By:	KYG

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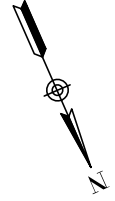
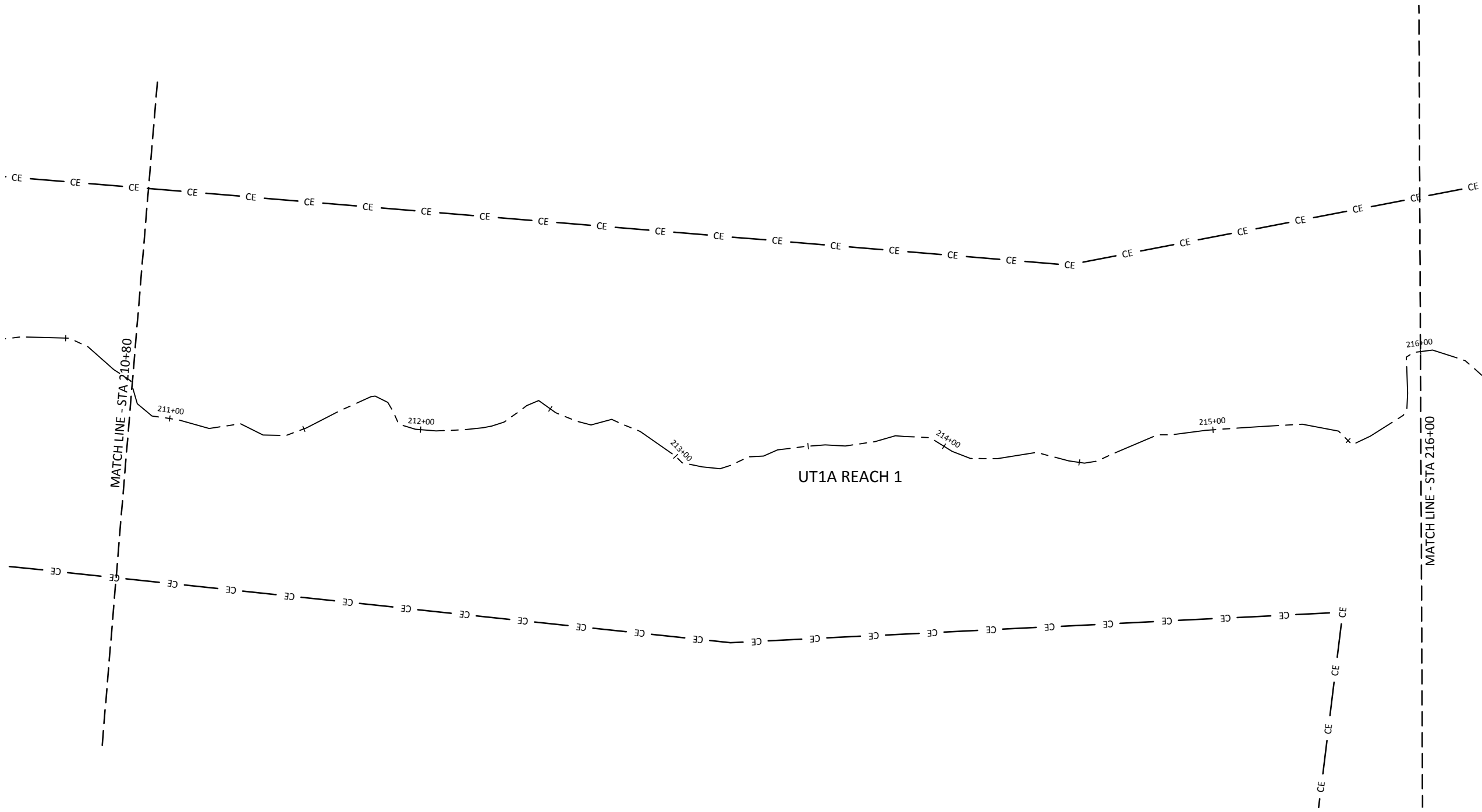
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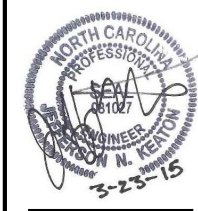
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Charlotte, NC 28203
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March 24, 2015

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Hopewell Mitigation Site Record Drawings
 Randolph County, North Carolina

UT1A
 Stream Plan and Profile

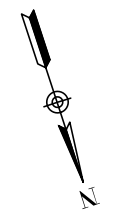
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Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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March 24, 2015
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Date: February 27, 2015
Job Number: 005-02133
Project Engineer: JNK
Drawn By: RPH
Checked By: KYG

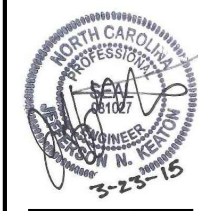
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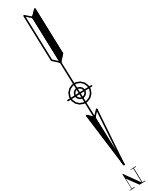
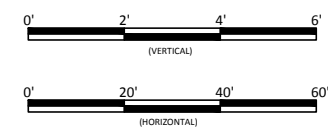
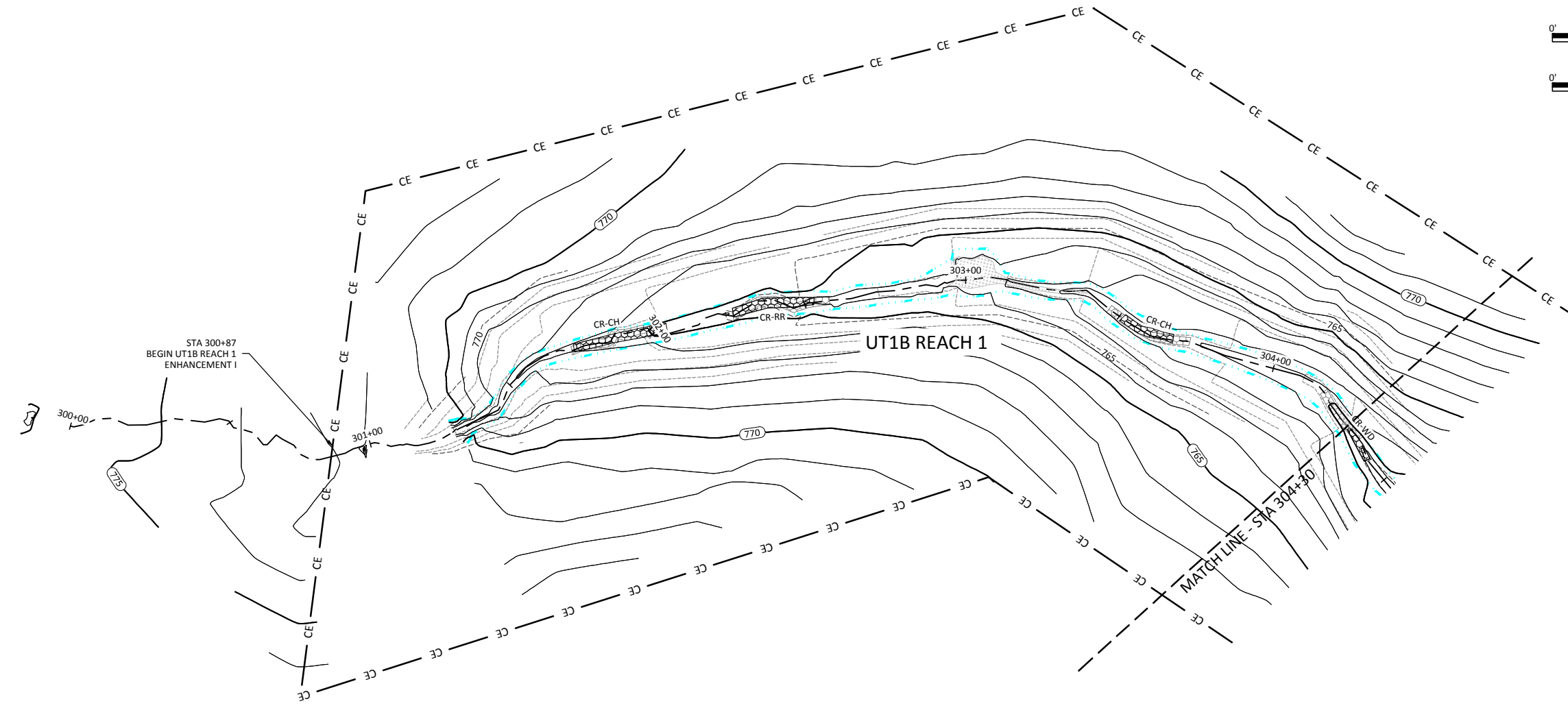
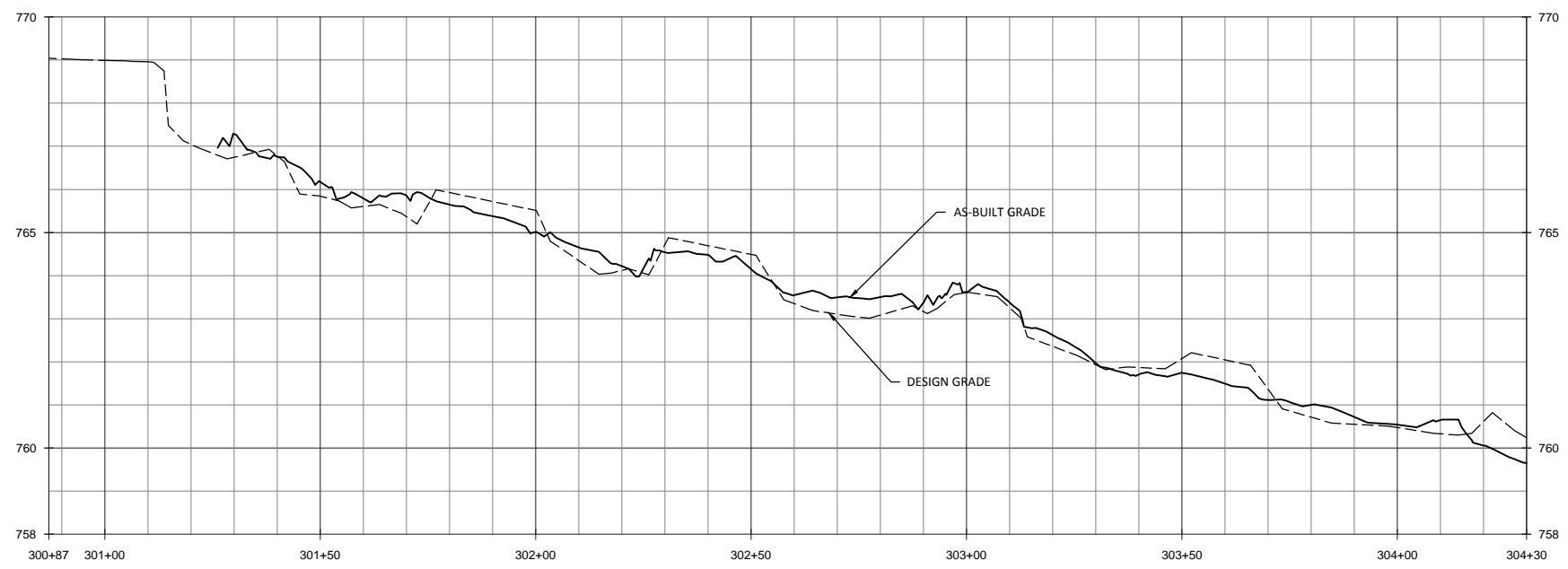
Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina

UT1A
Stream Plan and Profile



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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT1B
 Stream Plan and Profile

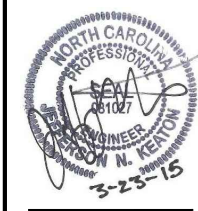
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Date:	February 27, 2015
Job Number:	005-02133
Project Engineer:	INK
Drawn By:	RPH
Checked By:	KYG

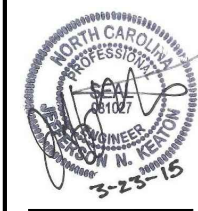
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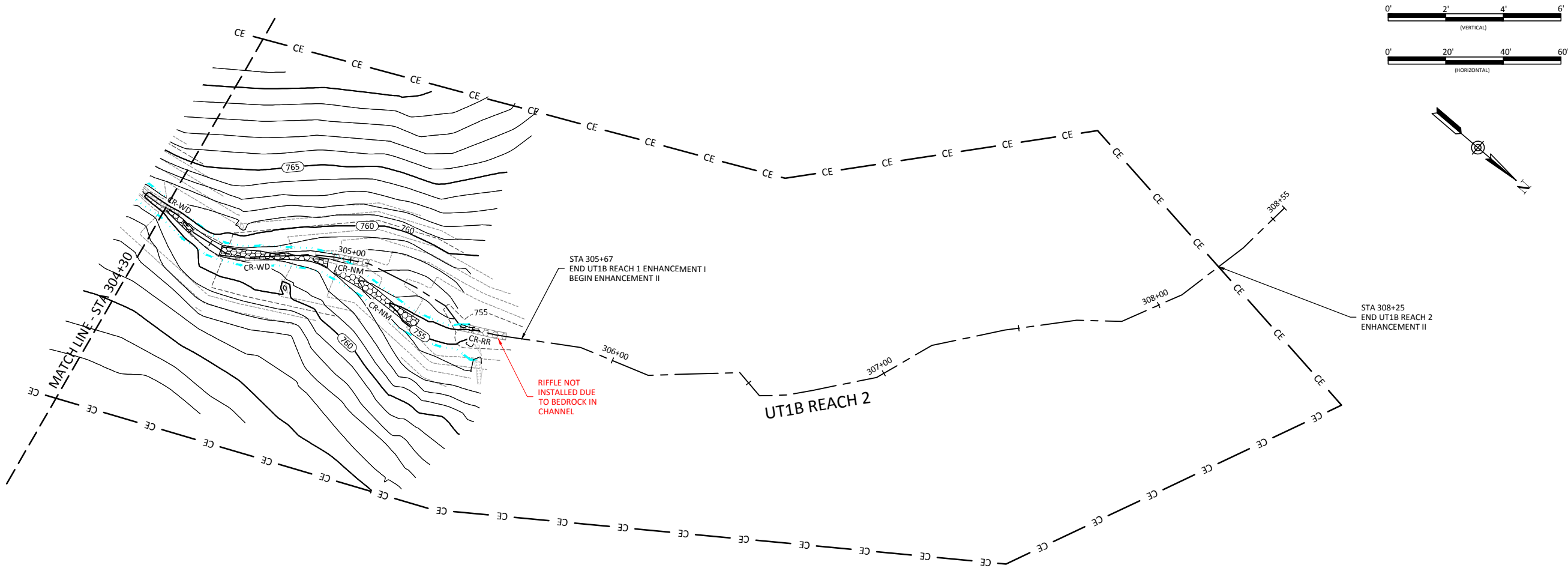
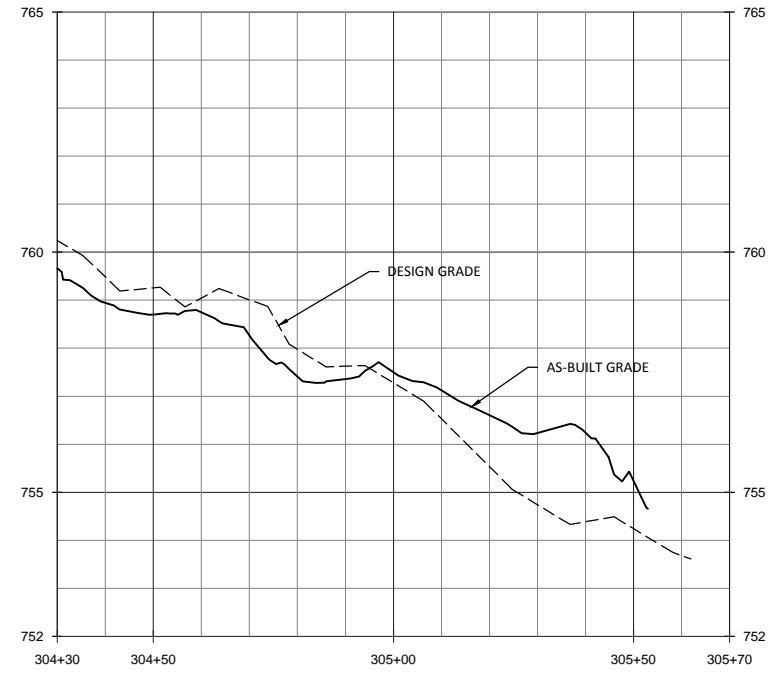


Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina
UT1B
Stream Plan and Profile

Revisions:

Date:	February 27, 2015
Job Number:	005-02133
Project Engineer:	INK
Drawn By:	RPH
Checked By:	KYG

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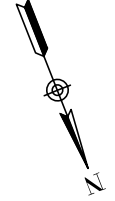
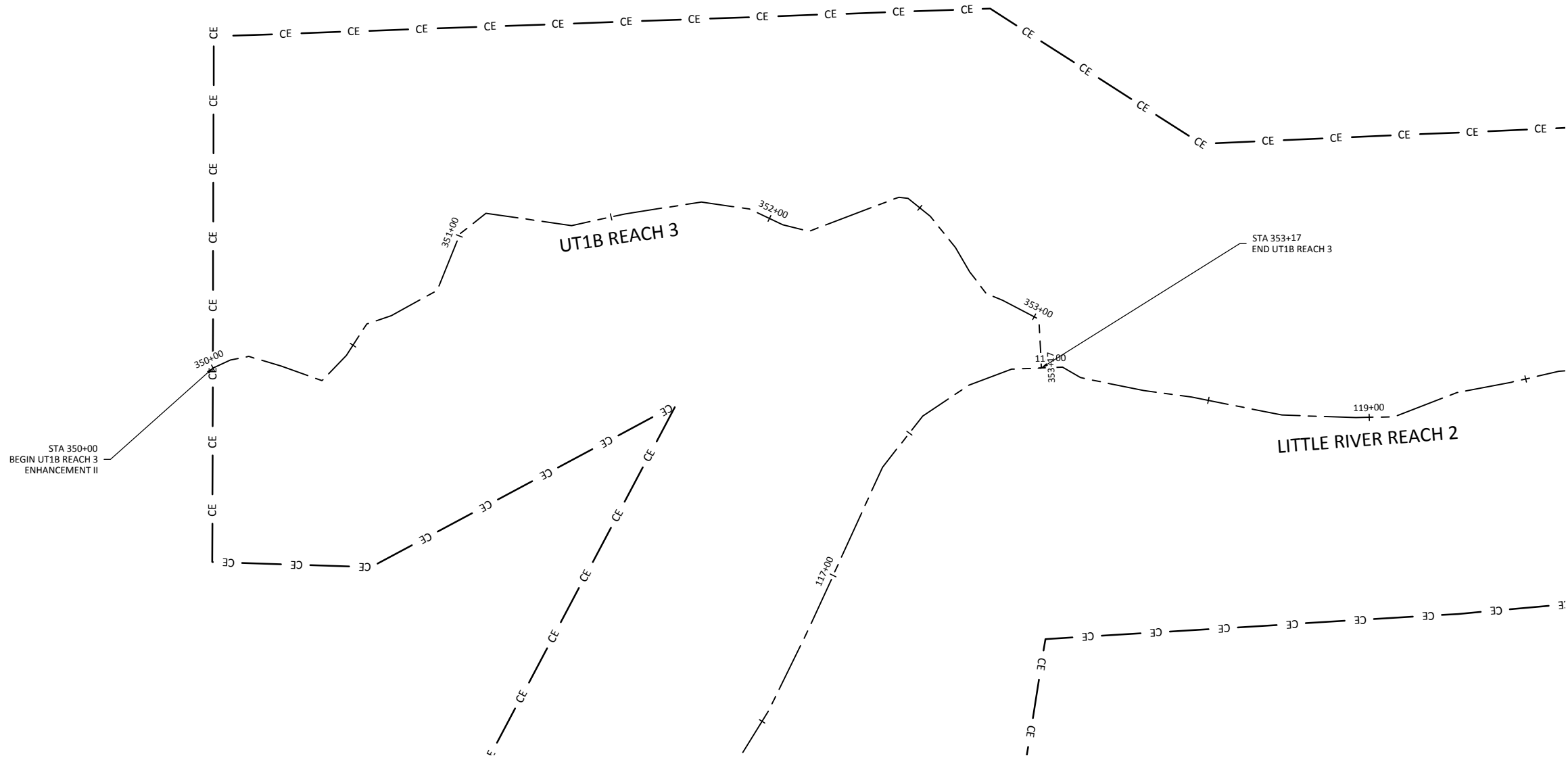


STA 305+67
END UT1B REACH 1 ENHANCEMENT I
BEGIN ENHANCEMENT II

RIFFLE NOT
INSTALLED DUE
TO BEDROCK IN
CHANNEL

UT1B REACH 2

STA 308+25
END UT1B REACH 2
ENHANCEMENT II



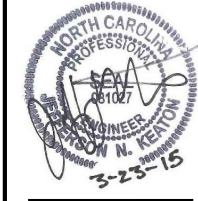
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 Checked By: KYG

Revisions:

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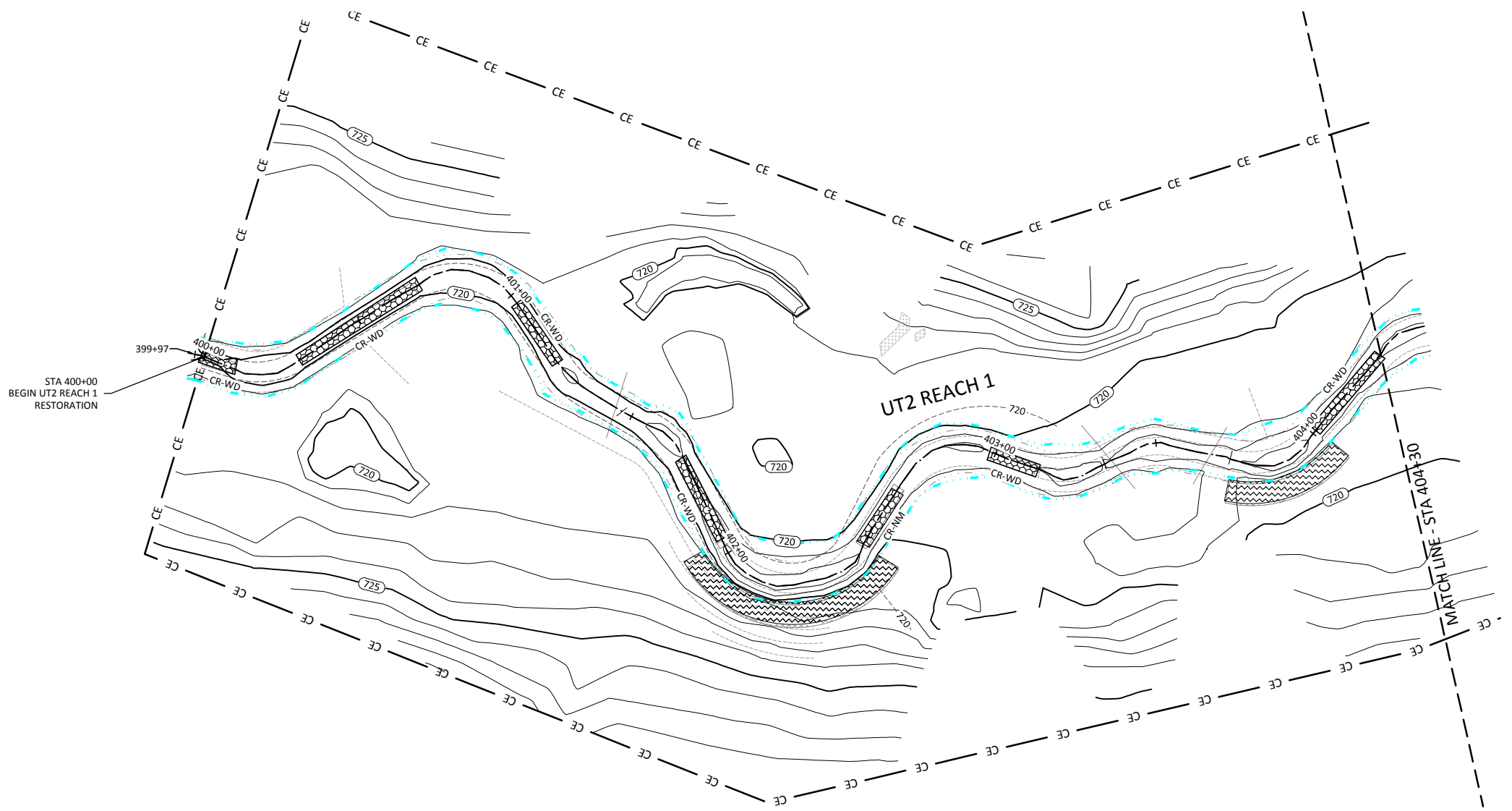
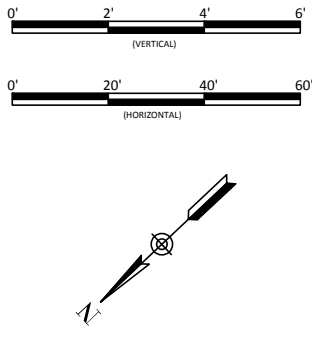
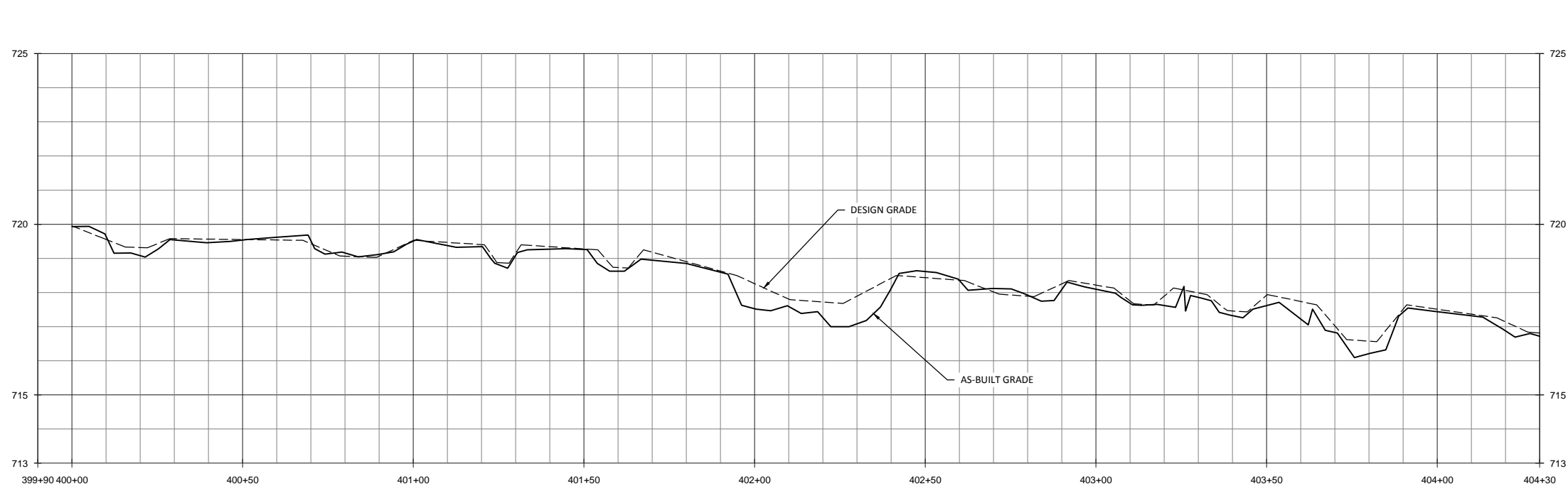
Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT1B
 Stream Plan and Profile

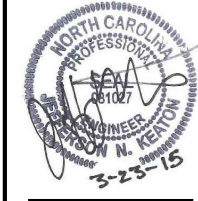


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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2
 Stream Plan and Profile

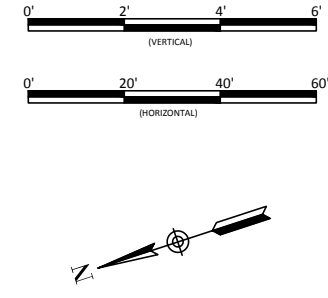
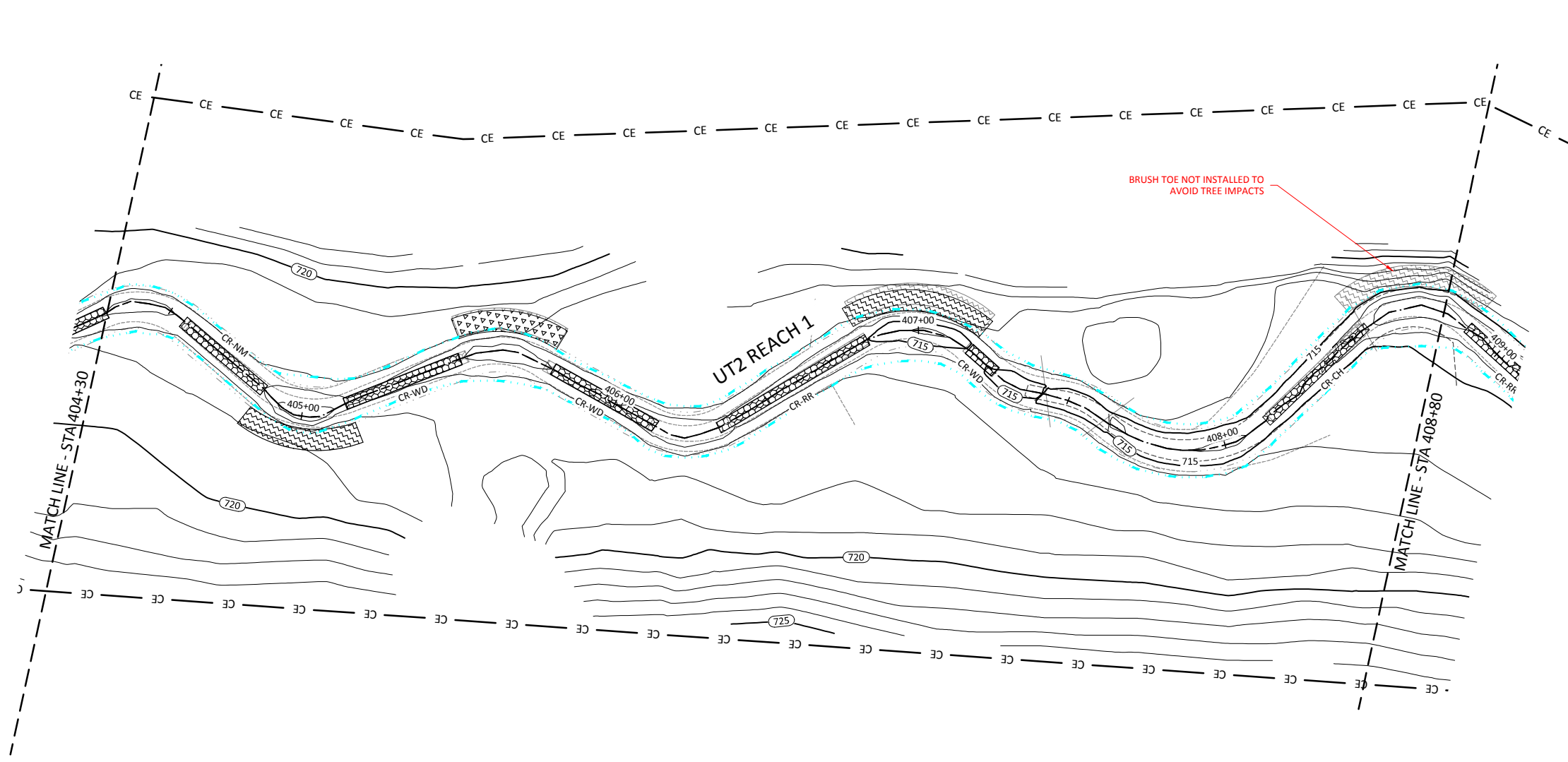
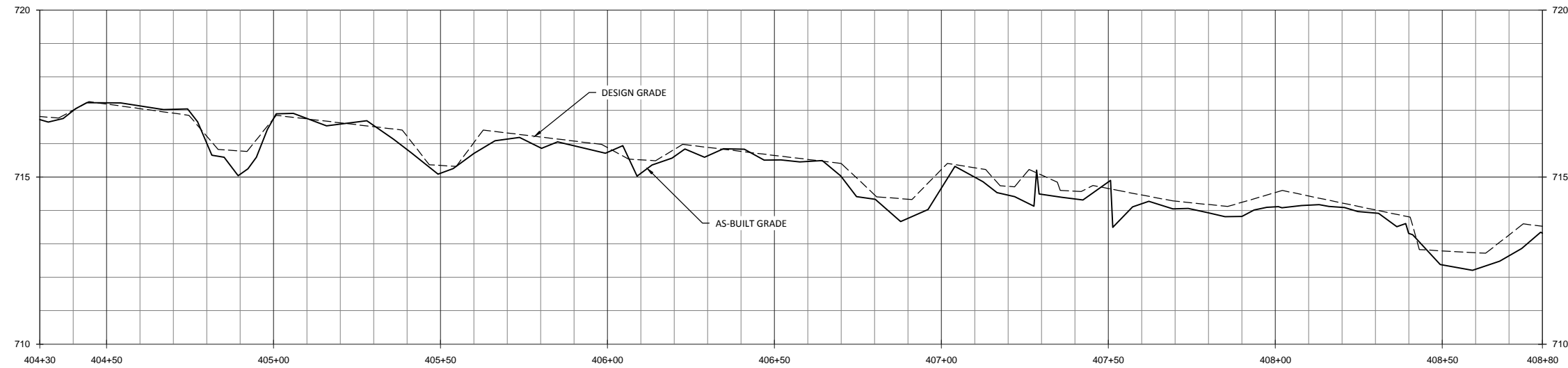
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 Job Number: 005-02133
 Project Engineer: INK
 Drawn By: RPH
 Checked By: KYG

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March 24, 2015
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2
 Stream Plan and Profile

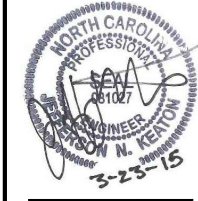
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 Job Number: 005-02133
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 Drawn By: RPH
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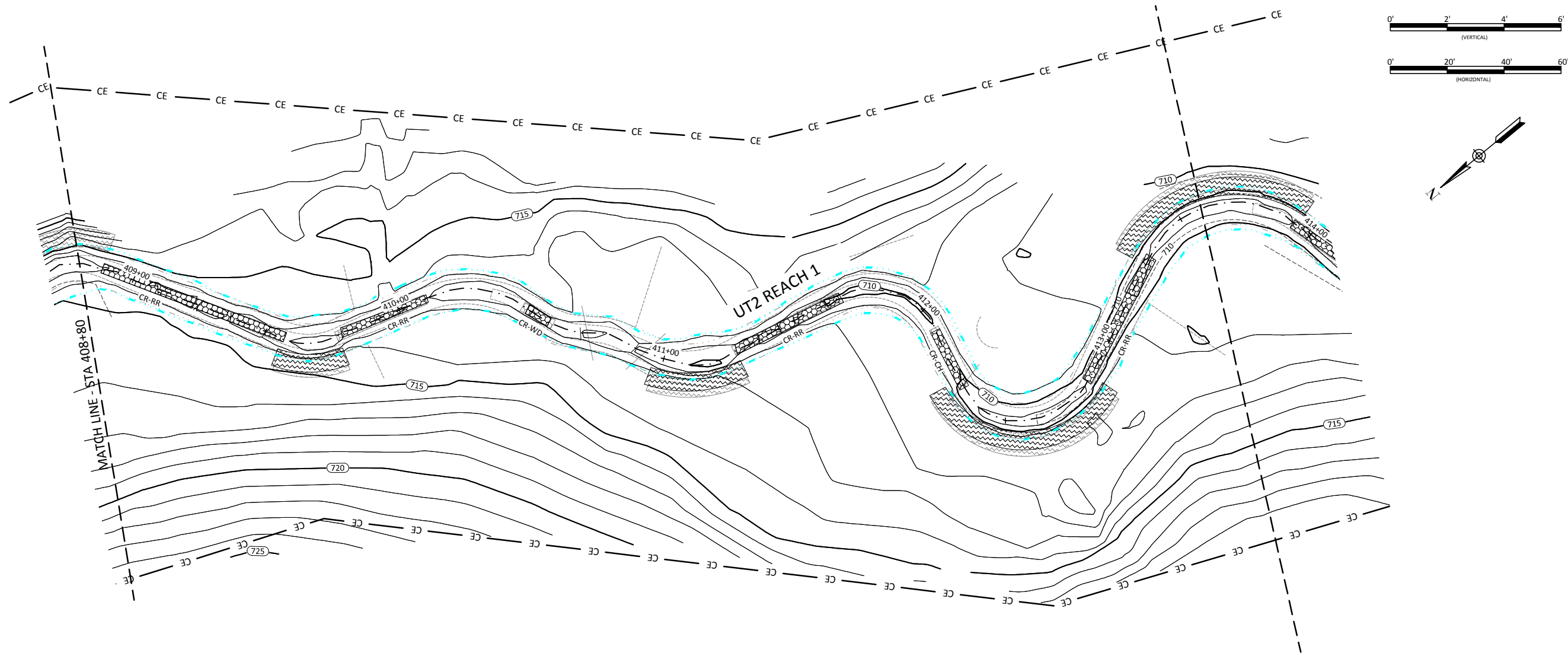
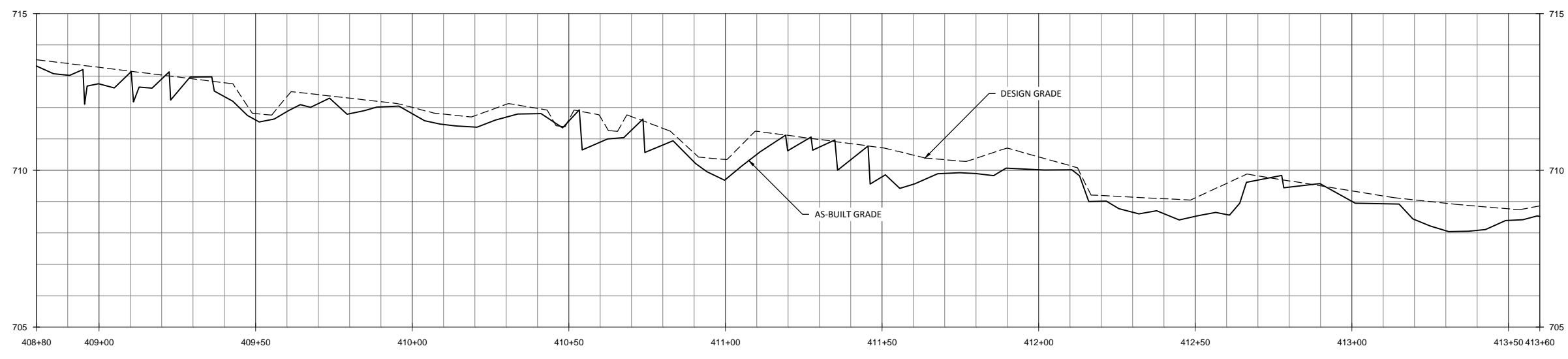
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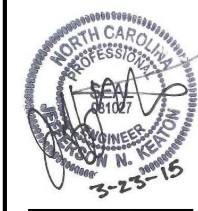
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 UT2
 Stream Plan and Profile

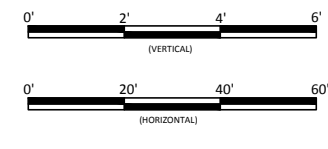
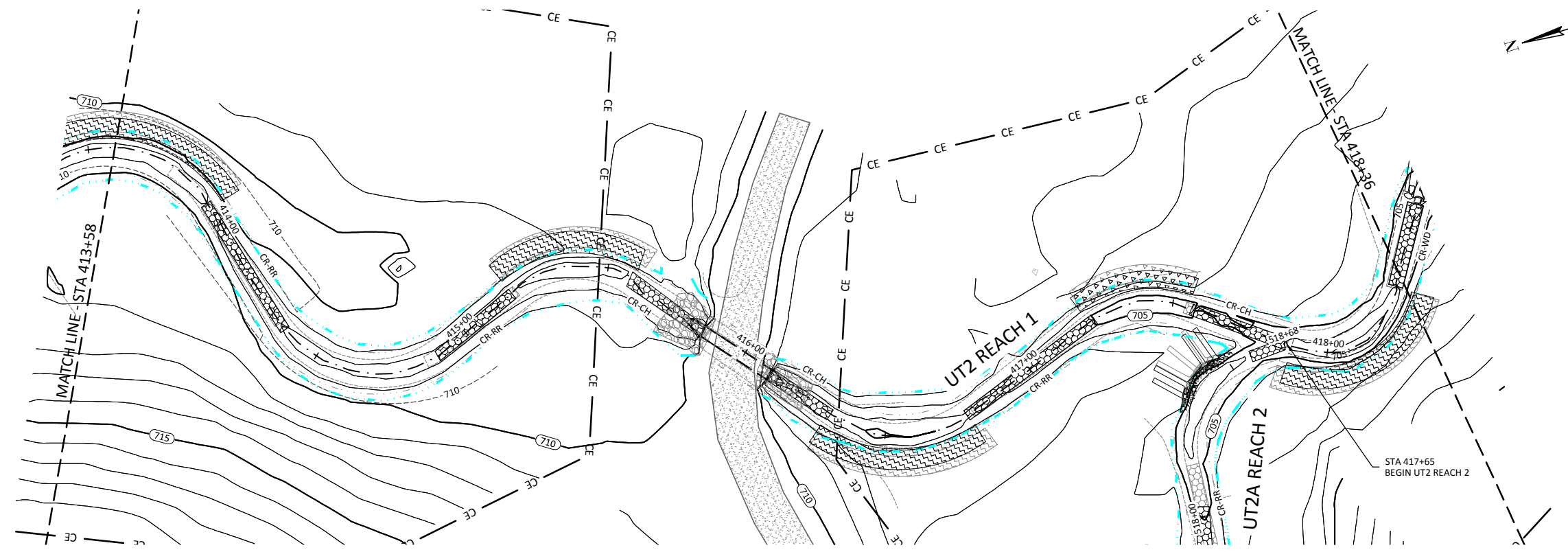
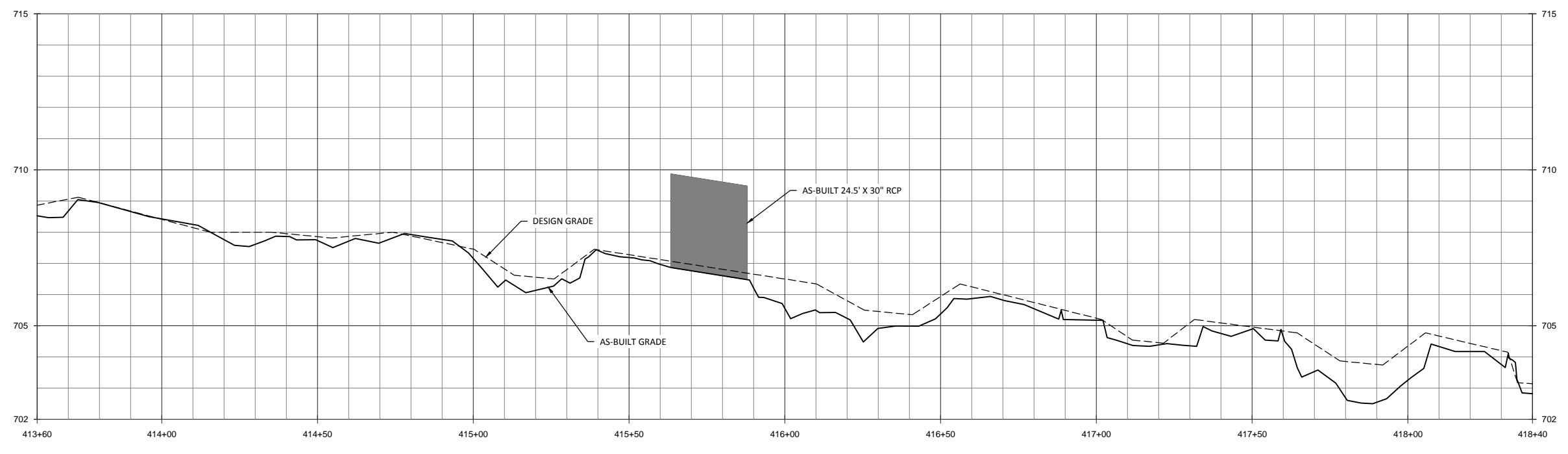
Revisions:

Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: INK
 Drawn By: RPH
 Checked By: KYG

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March 24, 2015
INACTIVE PROJECTS: INCA 1005-02133 Hopewell Mitigation EPPM Monitors - Residue - Monitors - Plans - UT2 Reach Profile - Above



Date: February 27, 2015
Job Number: 005-02133
Project Engineer: INK
Drawn By: RPH
Checked By: KYG

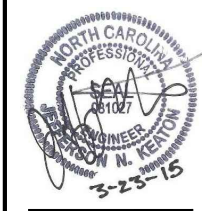
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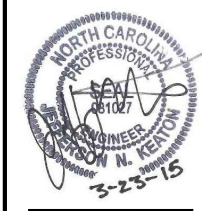
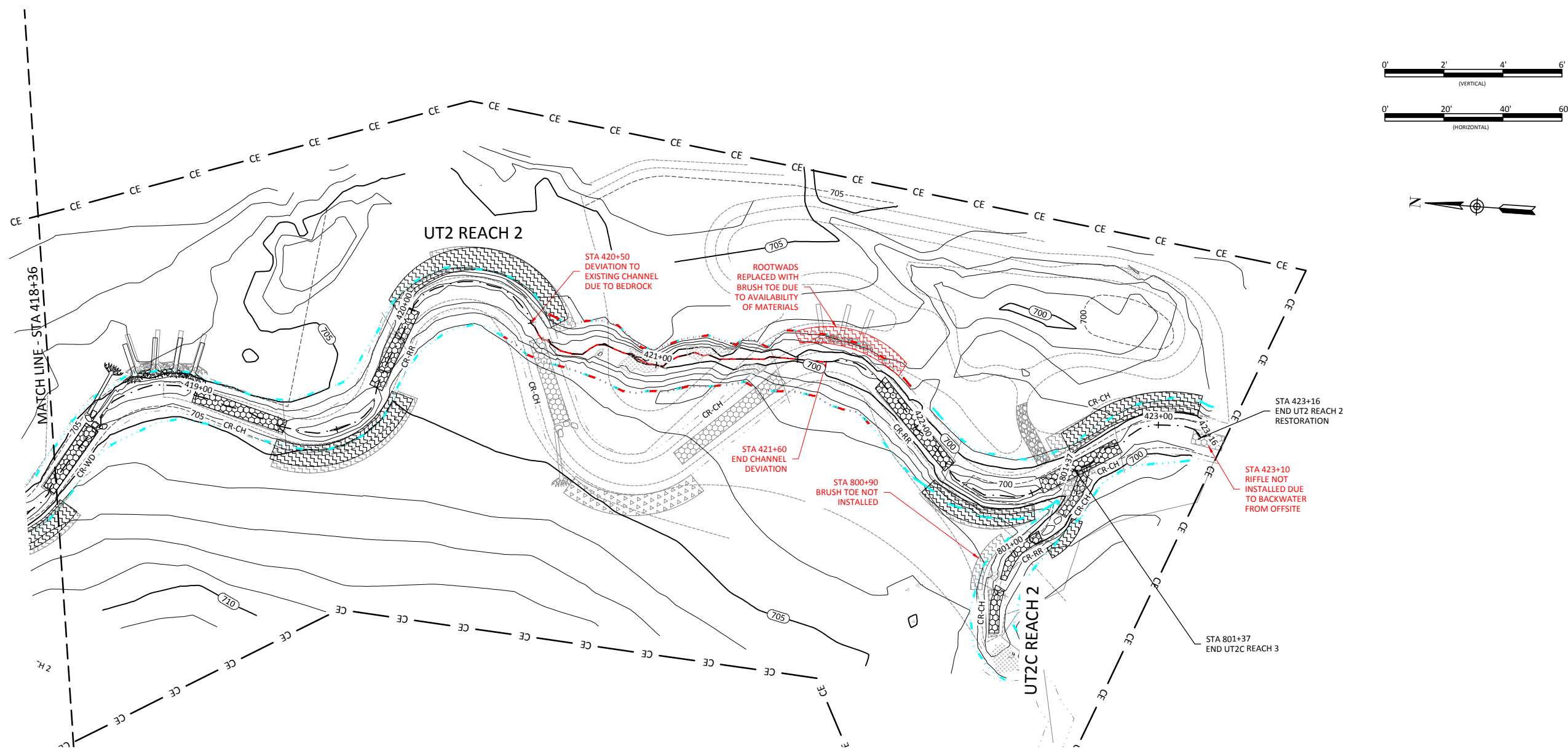
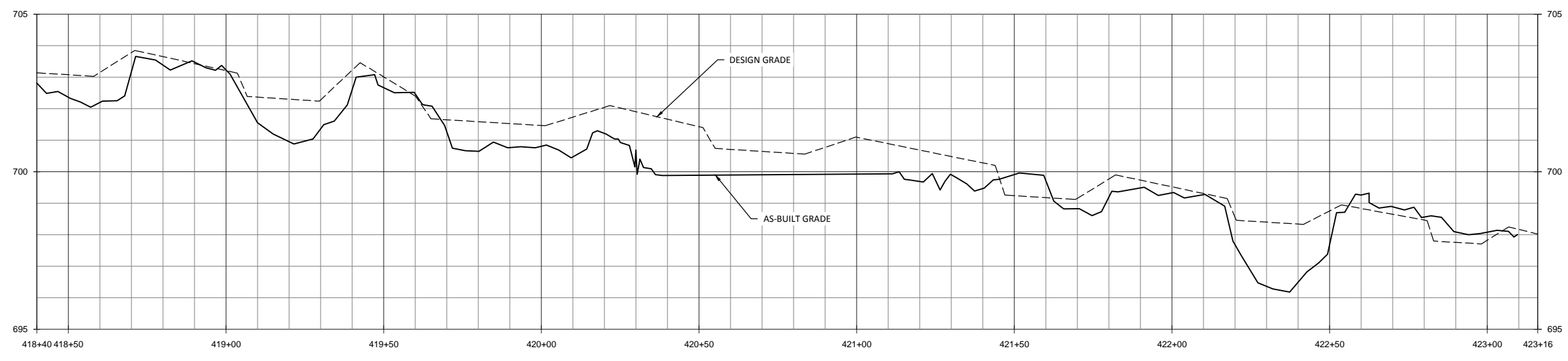
Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina

UT2
Stream Plan and Profile



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 INACTIVE PROJECTS: INCA 1005-02133 Hopewell Mitigation EPPM Monitors, Baseline, Maintenance Plans, UPI, S&P Profiles, etc.

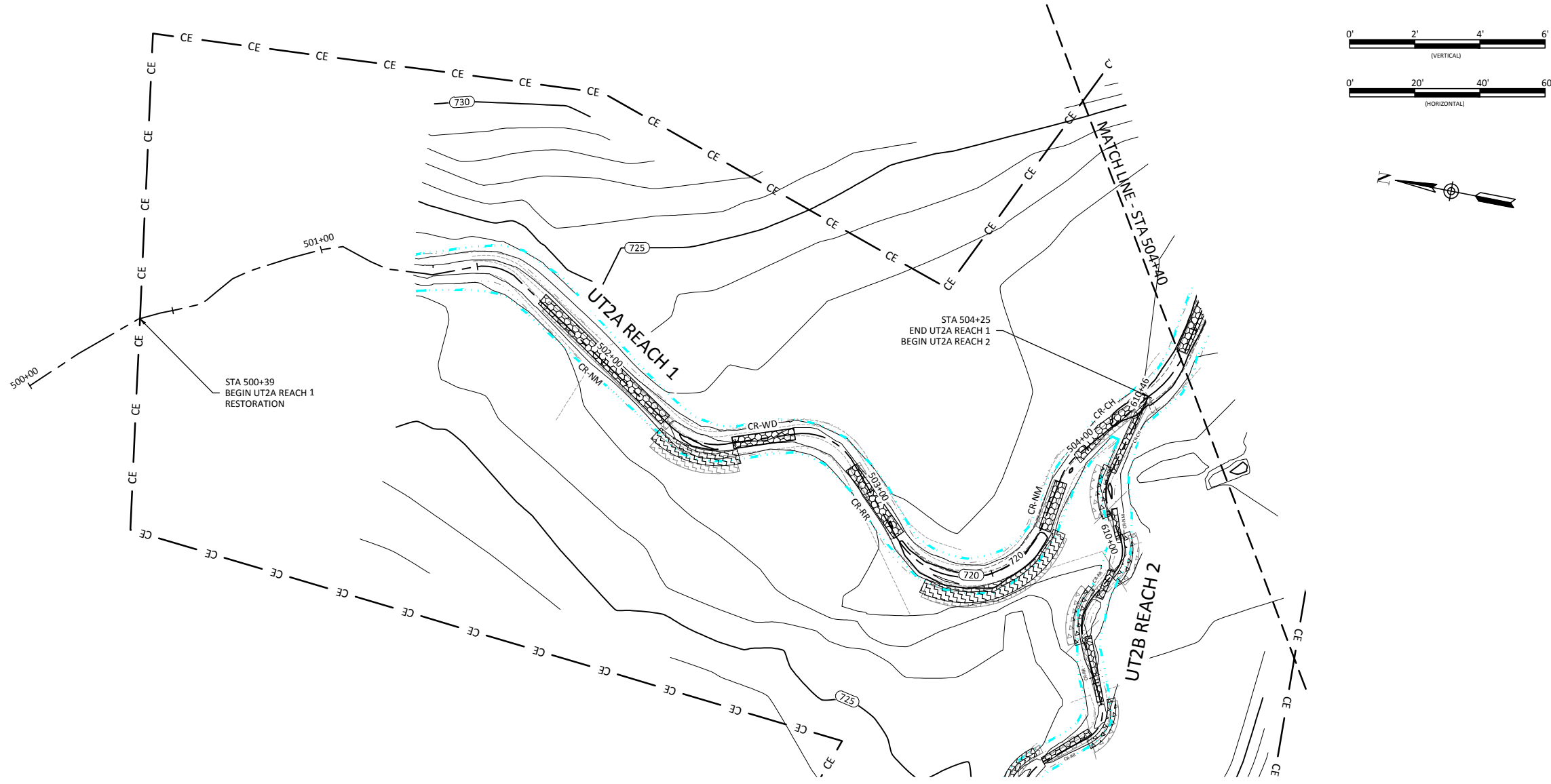
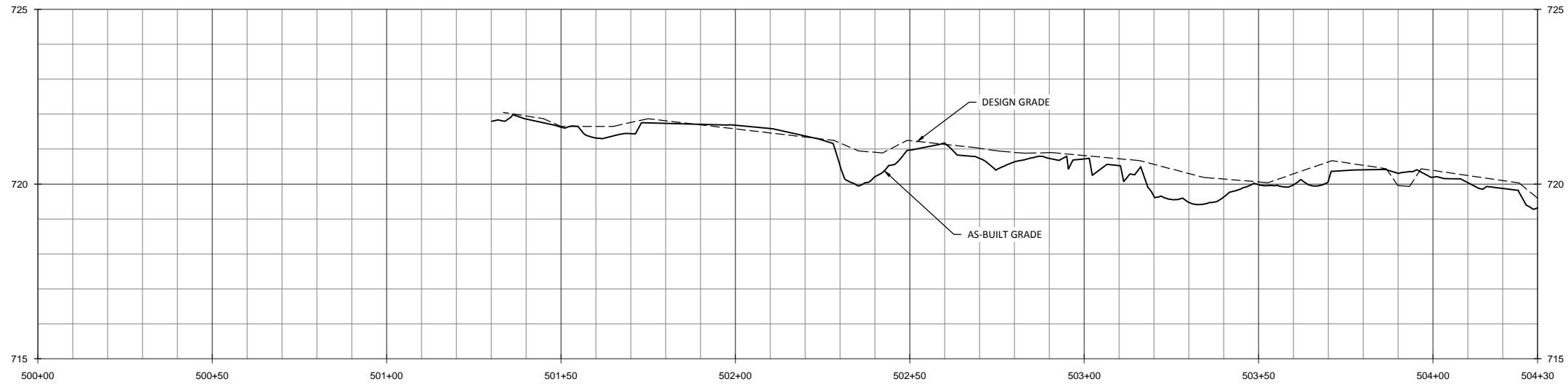


Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 UT2
 Stream Plan and Profile

Revisions:

Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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Date: February 27, 2015

Job Number: 005-02133

Project Engineer: JNK

Drawn By: RPH

Checked By: KYG

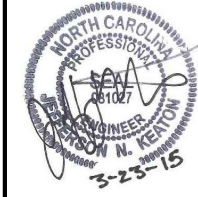
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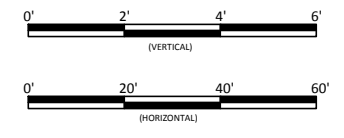
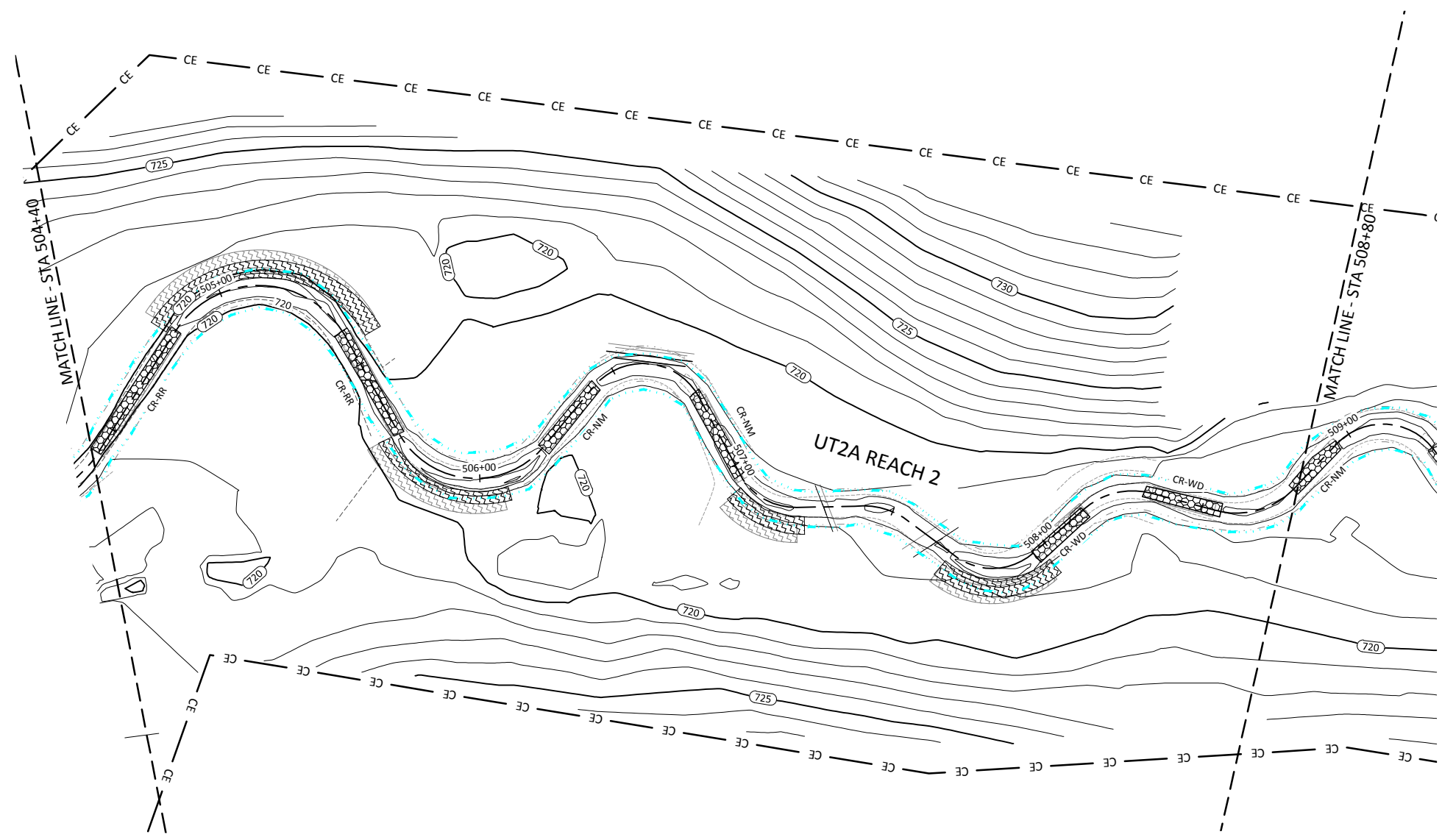
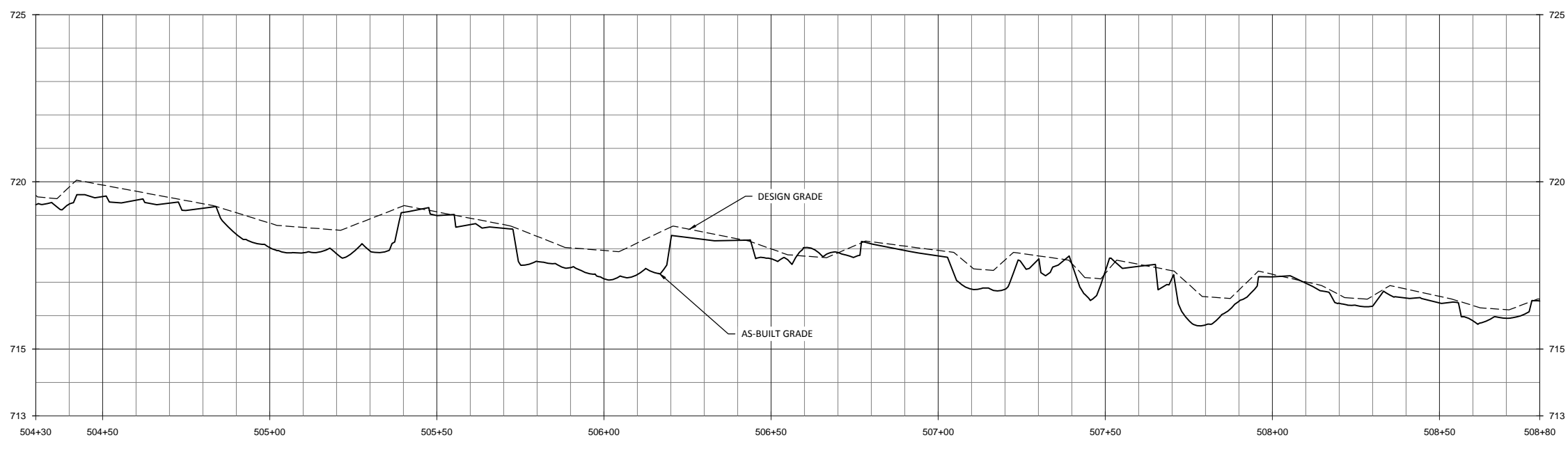
Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2A
 Stream Plan and Profile

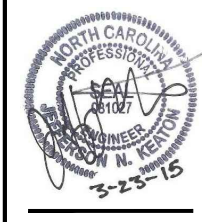


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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 UT2A
 Stream Plan and Profile

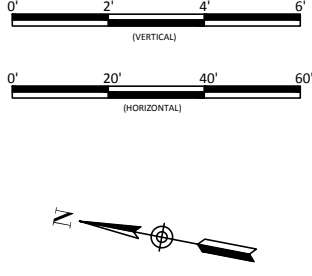
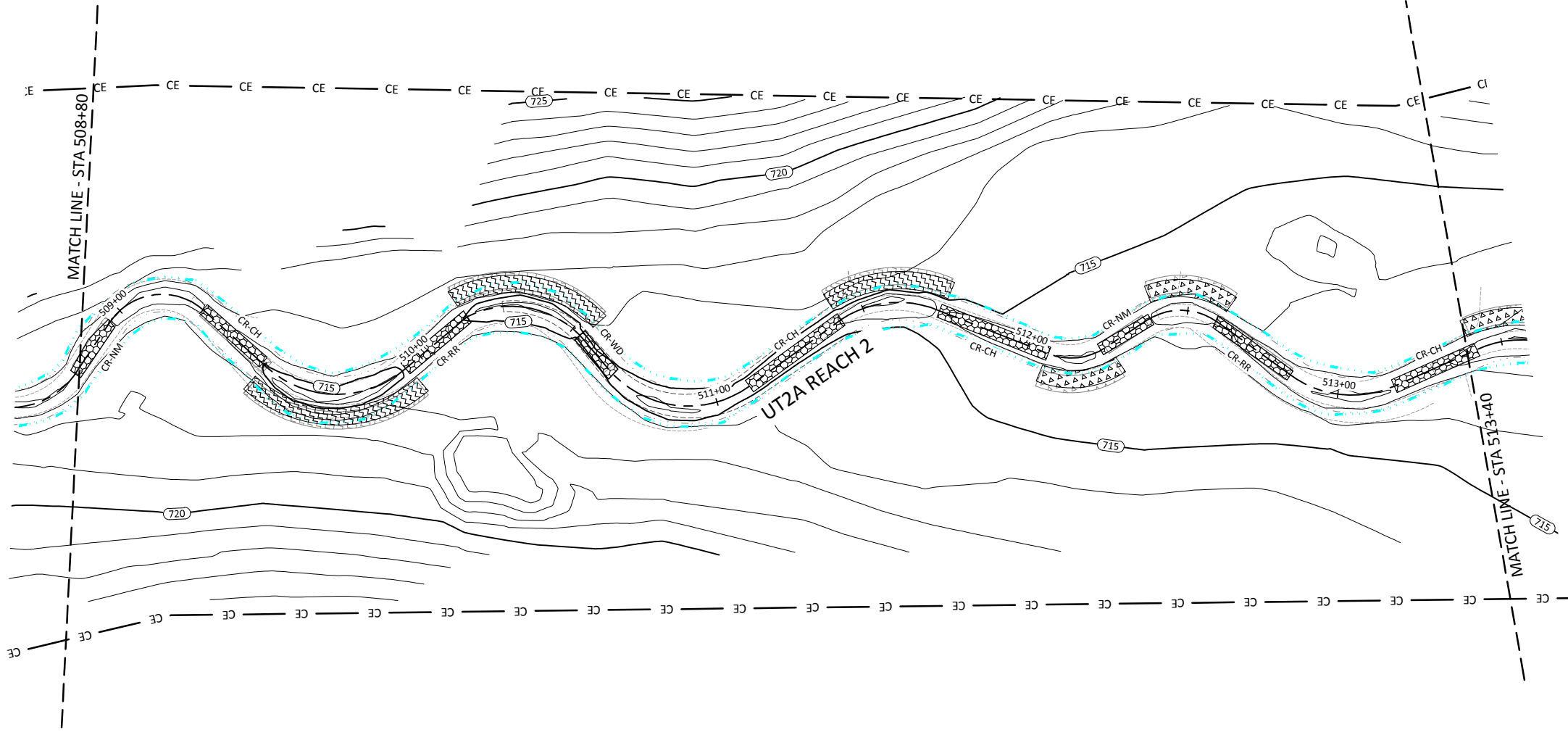
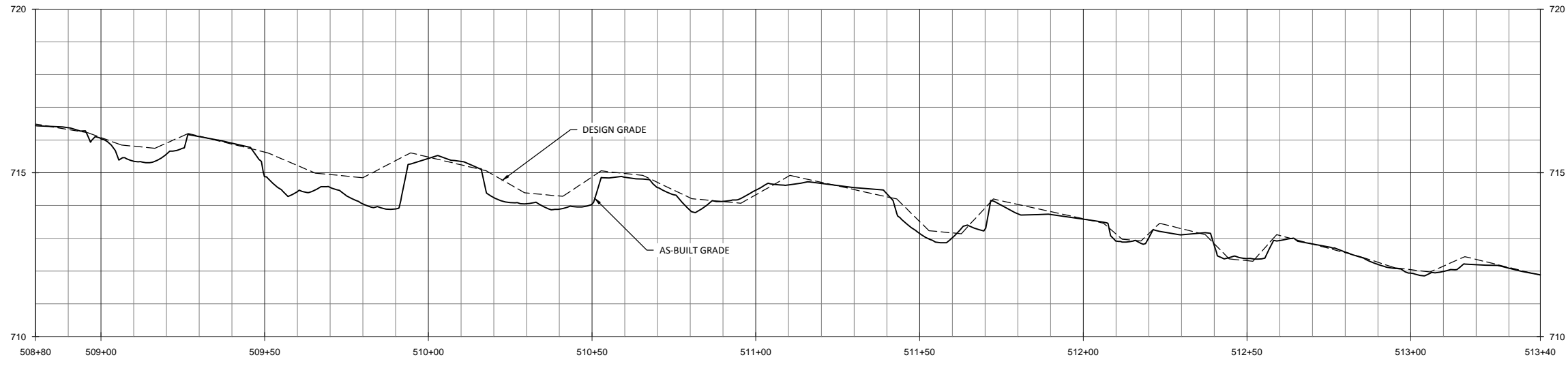
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 Project Engineer: INK
 Drawn By: RPH
 Checked By: KYG

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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 UT2A
 Stream Plan and Profile

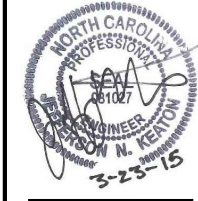
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Date: February 27, 2015
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 Project Engineer: JNK
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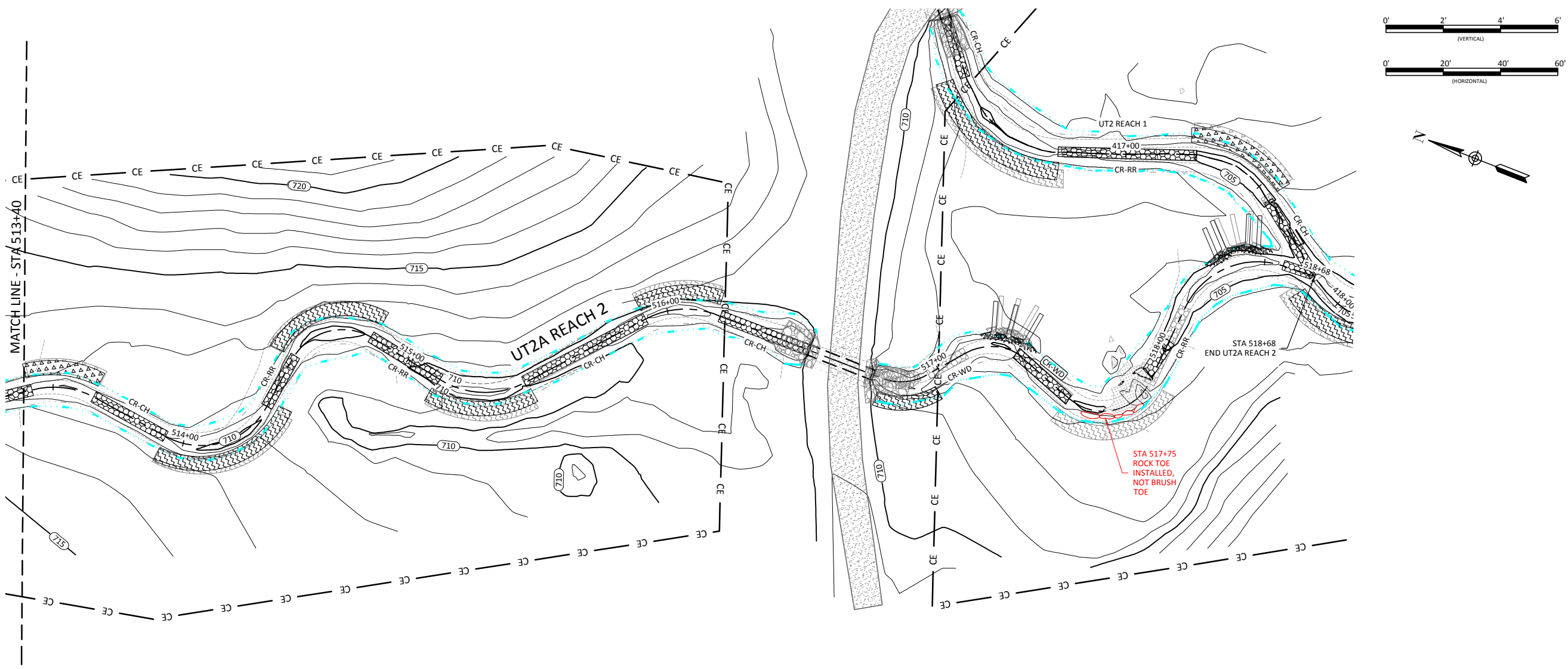
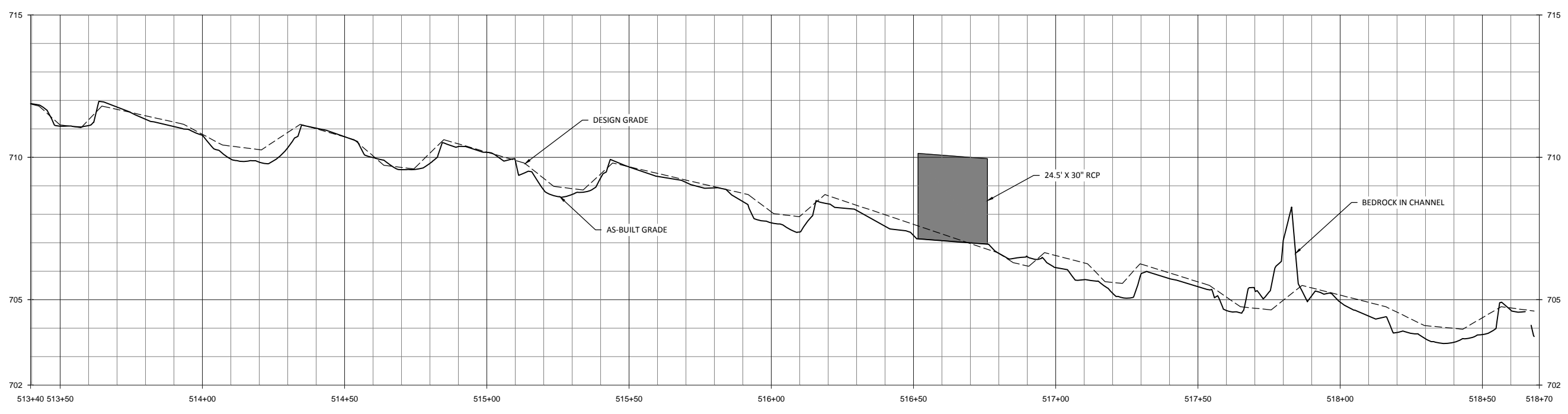
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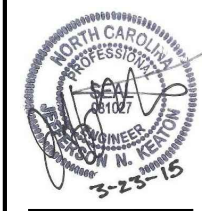
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 INACTIVE PROJECTS (NCDOT 1005-02133 Hopewell Mitigation EPPM Monitors) Resubmit Monitors Plans (02133A) Profile above



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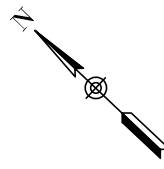
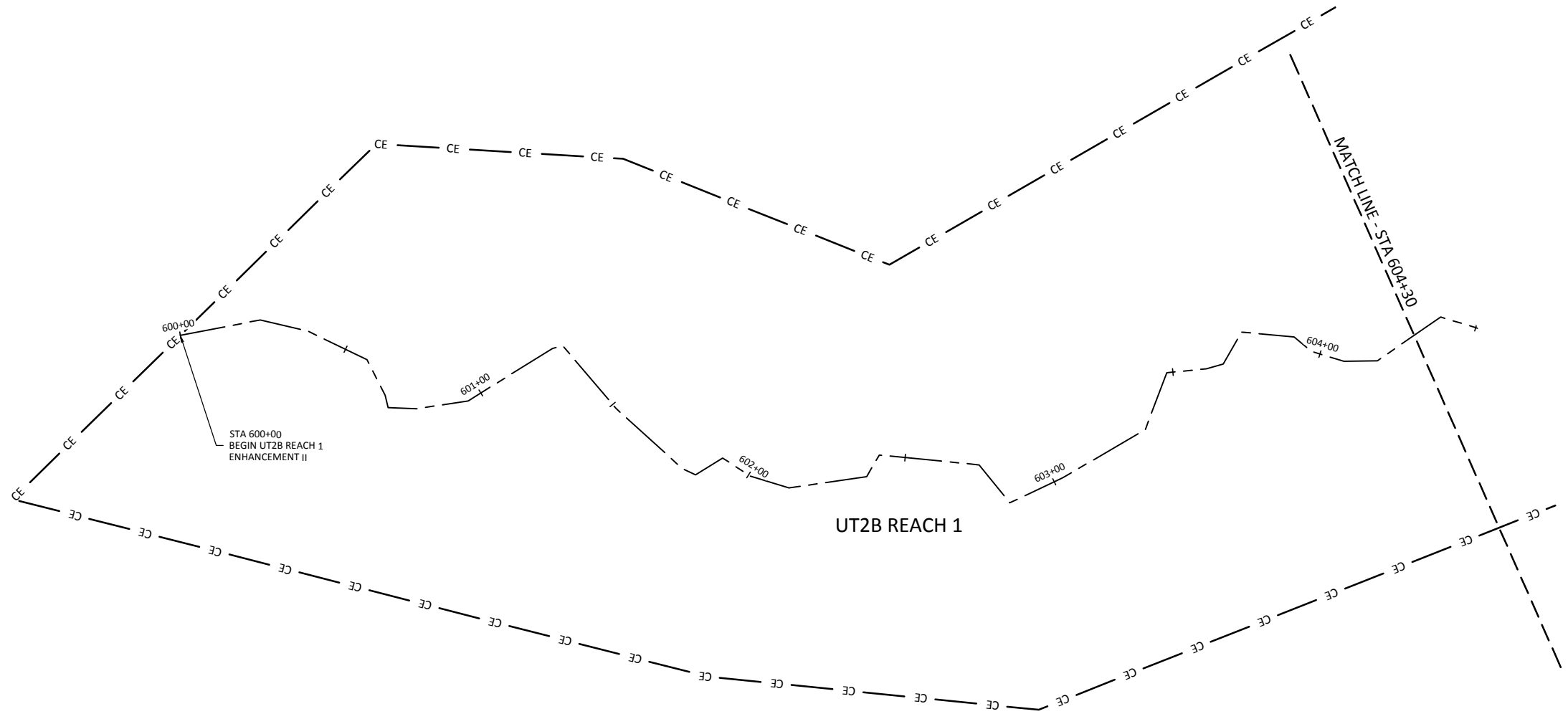


Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 UT2A
 Stream Plan and Profile

Revisions:

Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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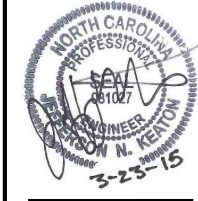


Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 UT2B
 Stream Plan and Profile

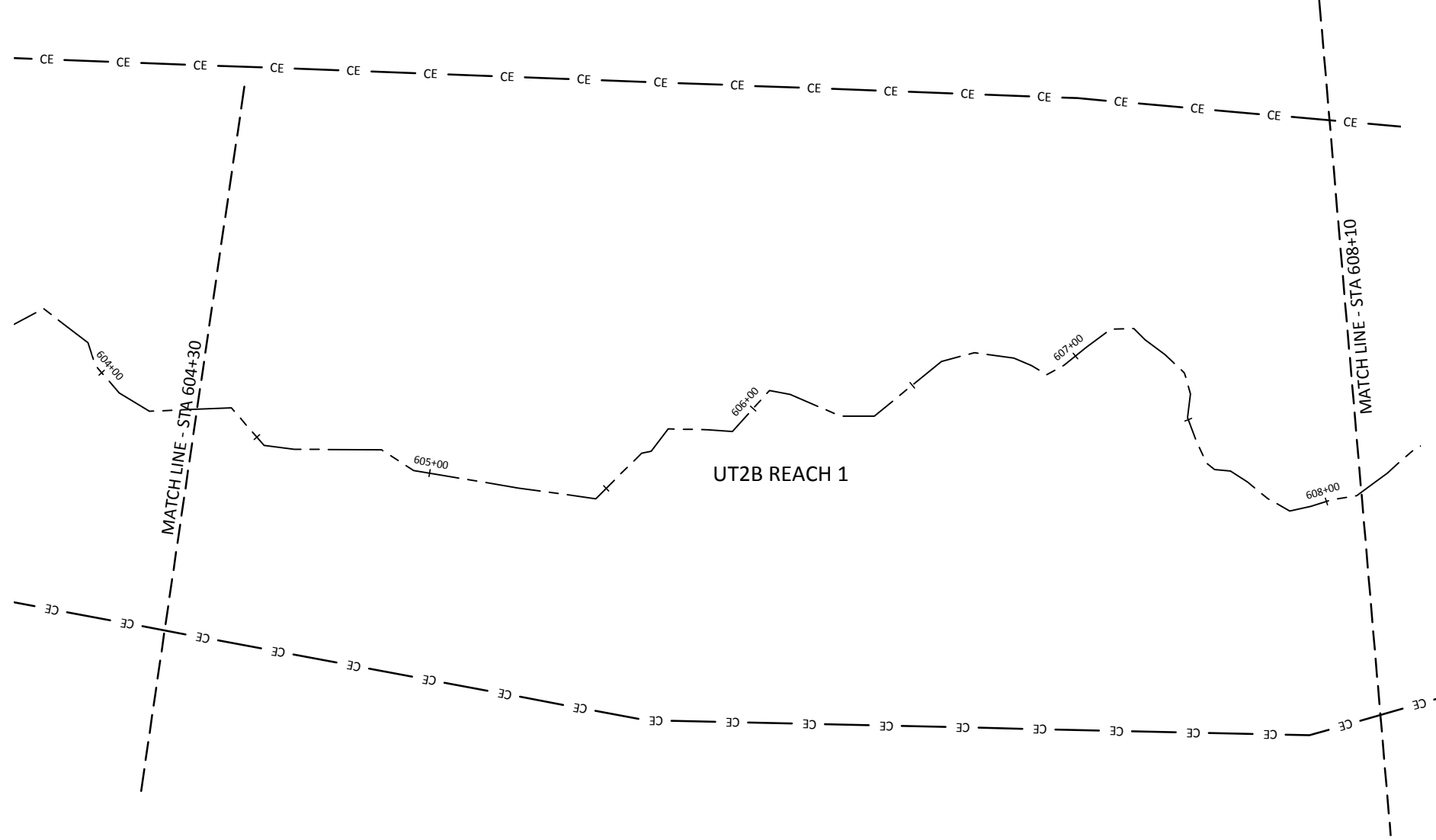
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Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
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Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

Revisions:

1.19

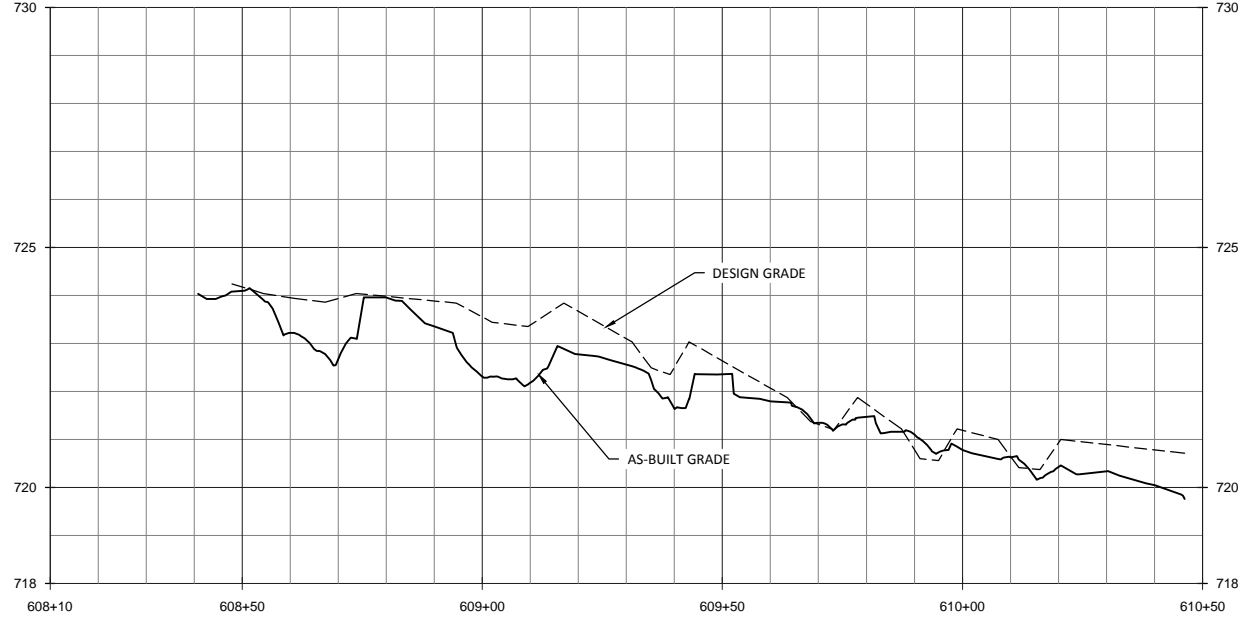
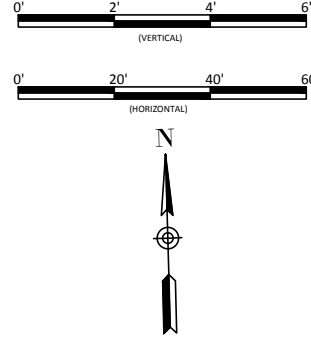
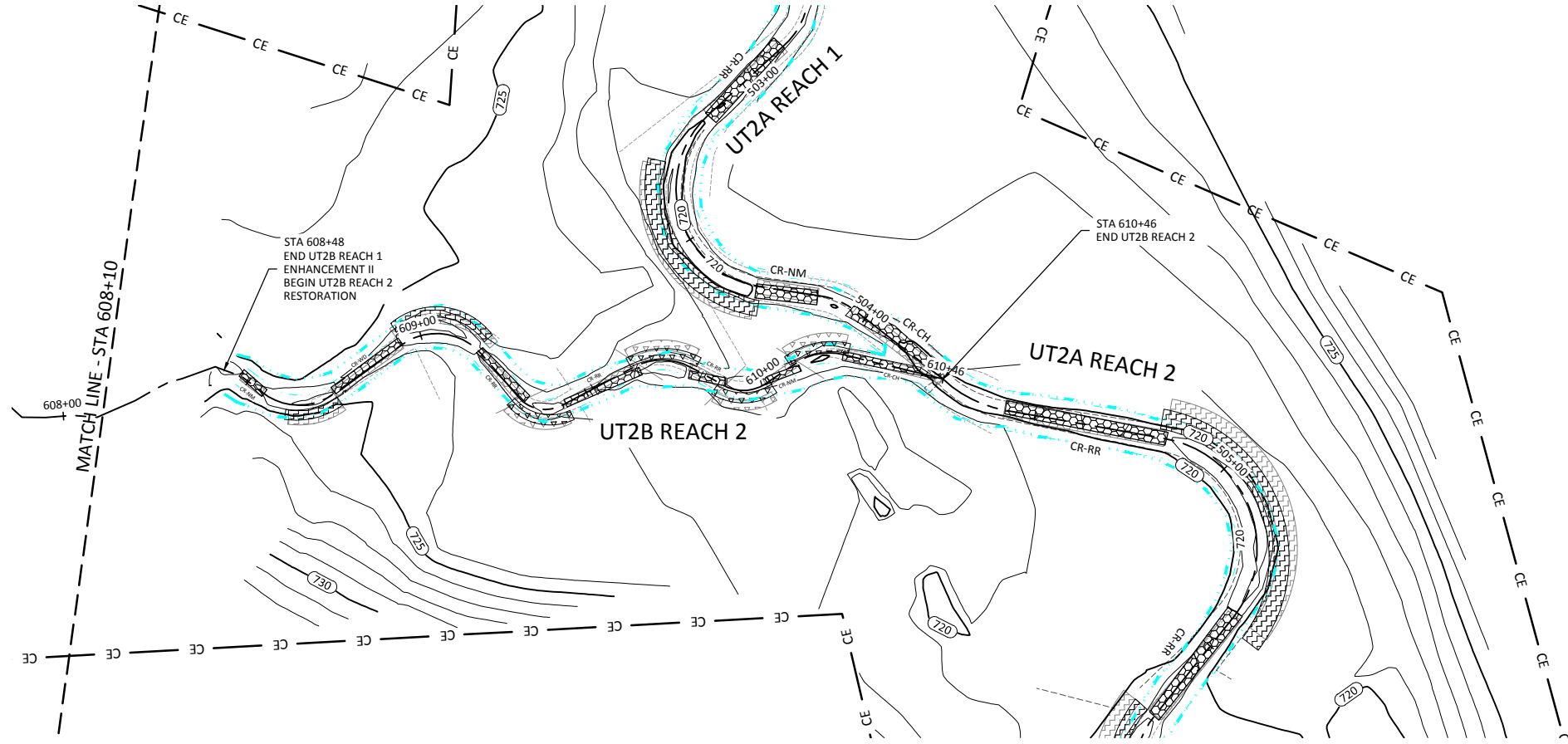
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2B
 Stream Plan and Profile



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Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
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Revisions:

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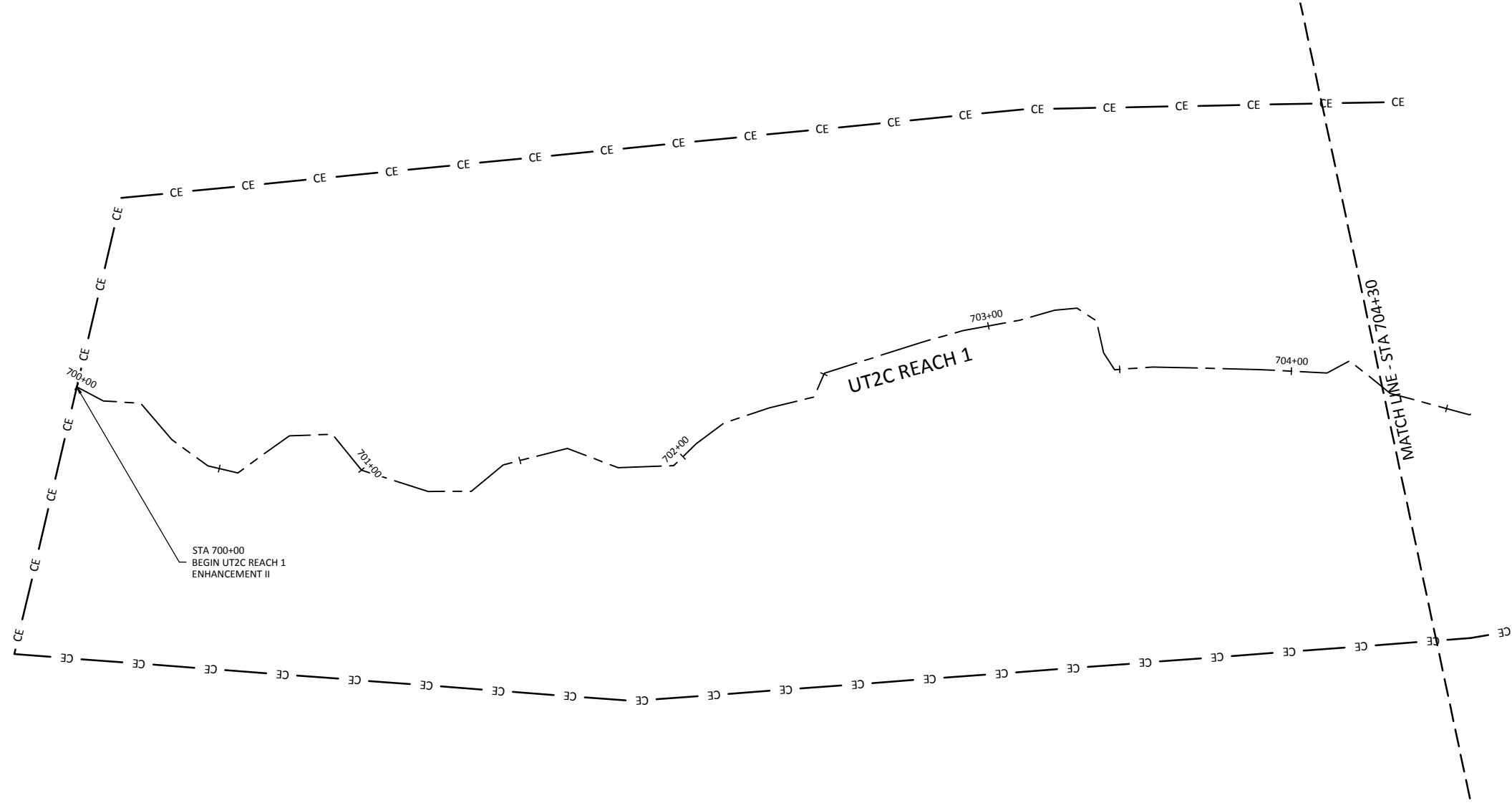
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2B
 Stream Plan and Profile



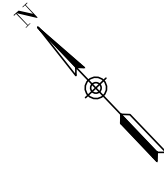
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STA 700+00
 BEGIN UT2C REACH 1
 ENHANCEMENT II

UT2C REACH 1

MATCH LINE - STA 704+30



Date: February 27, 2015
 Job Number: 005-02133
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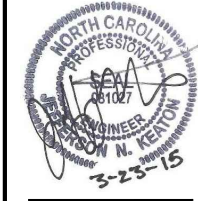
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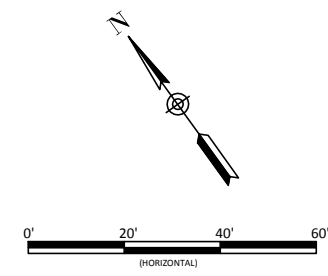
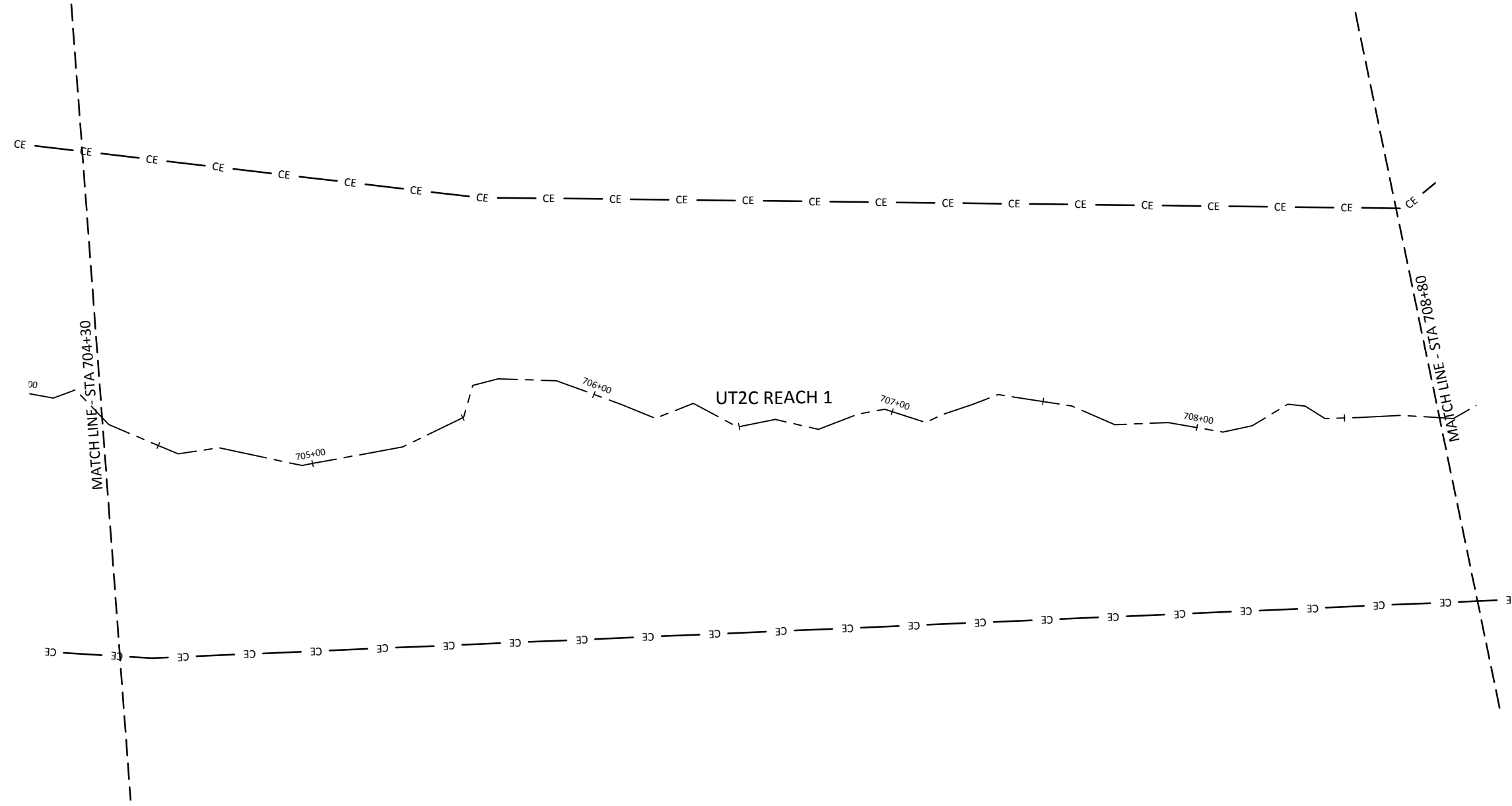
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2C
 Stream Plan and Profile



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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

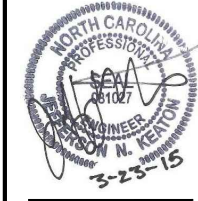
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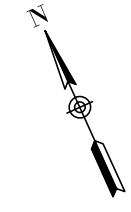
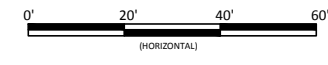
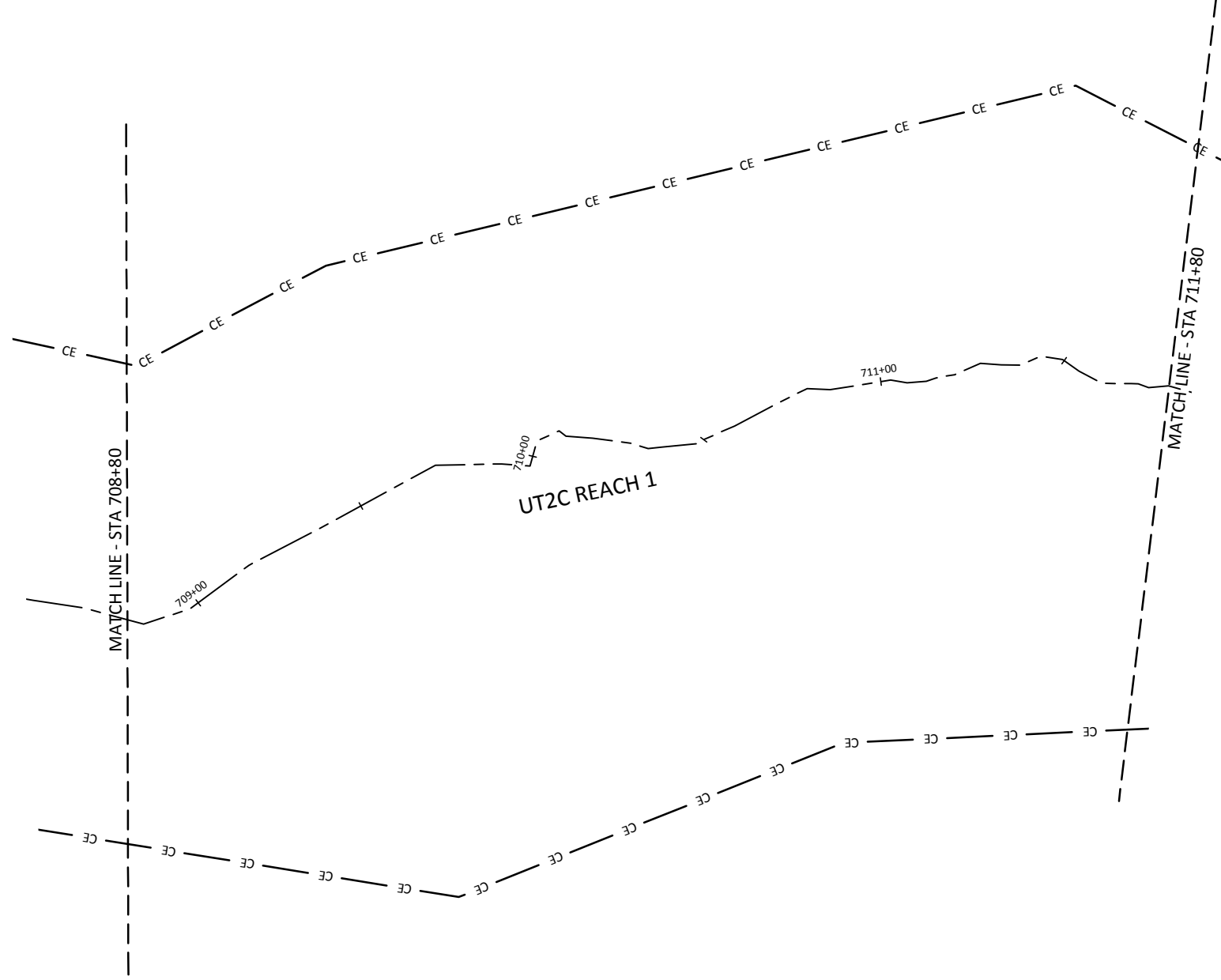
Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
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Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
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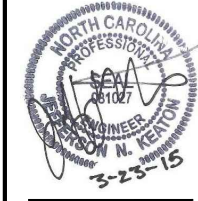
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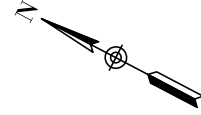
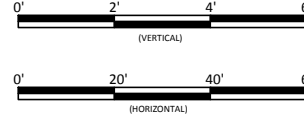
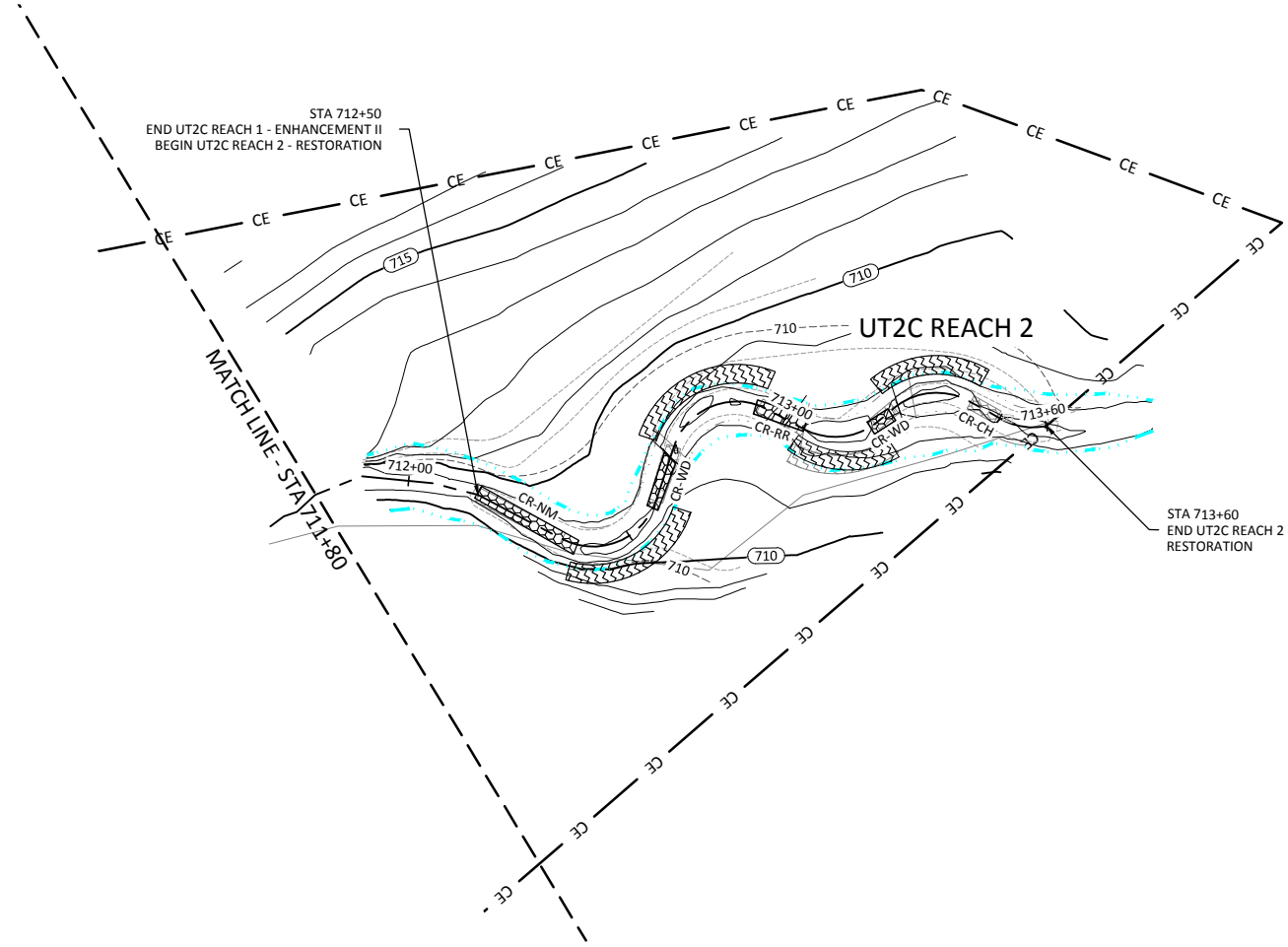
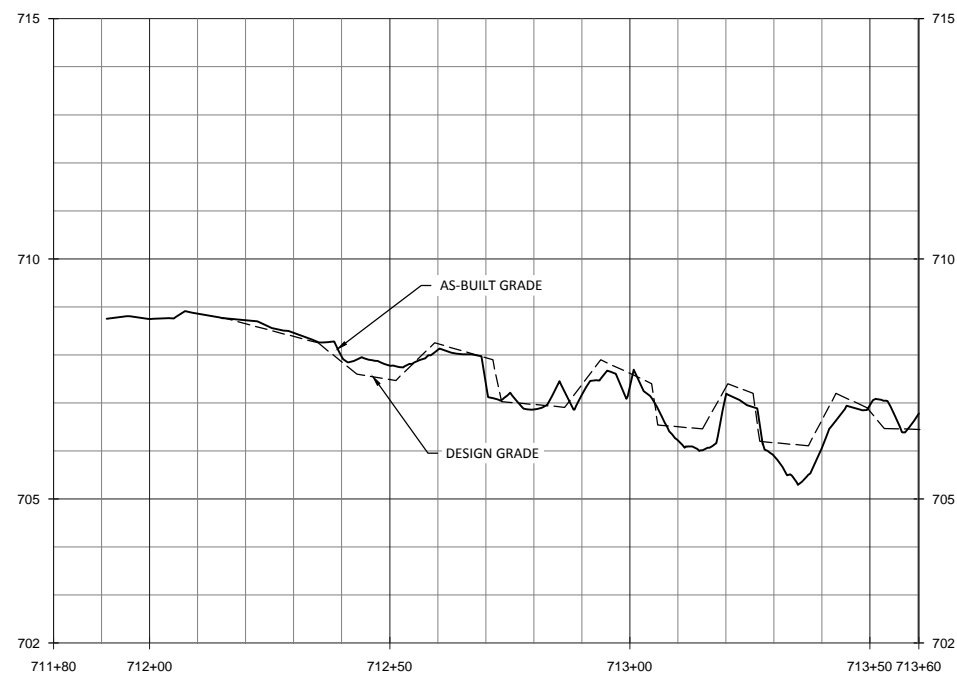
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2C
 Stream Plan and Profile



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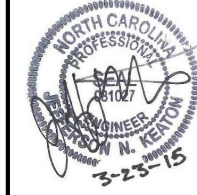
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 Job Number: 005-02133
 Project Engineer: JNK
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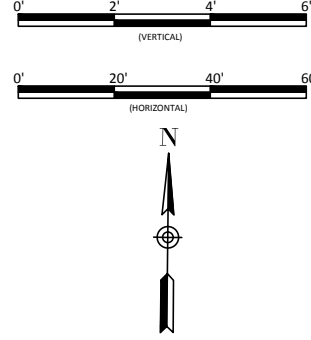
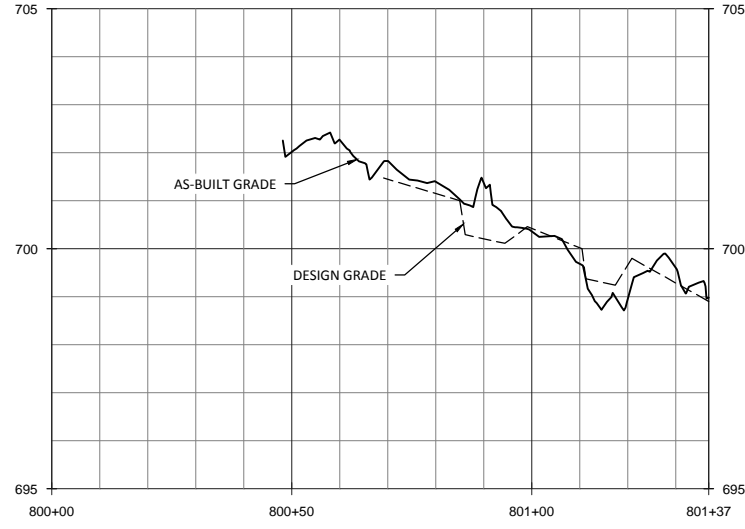
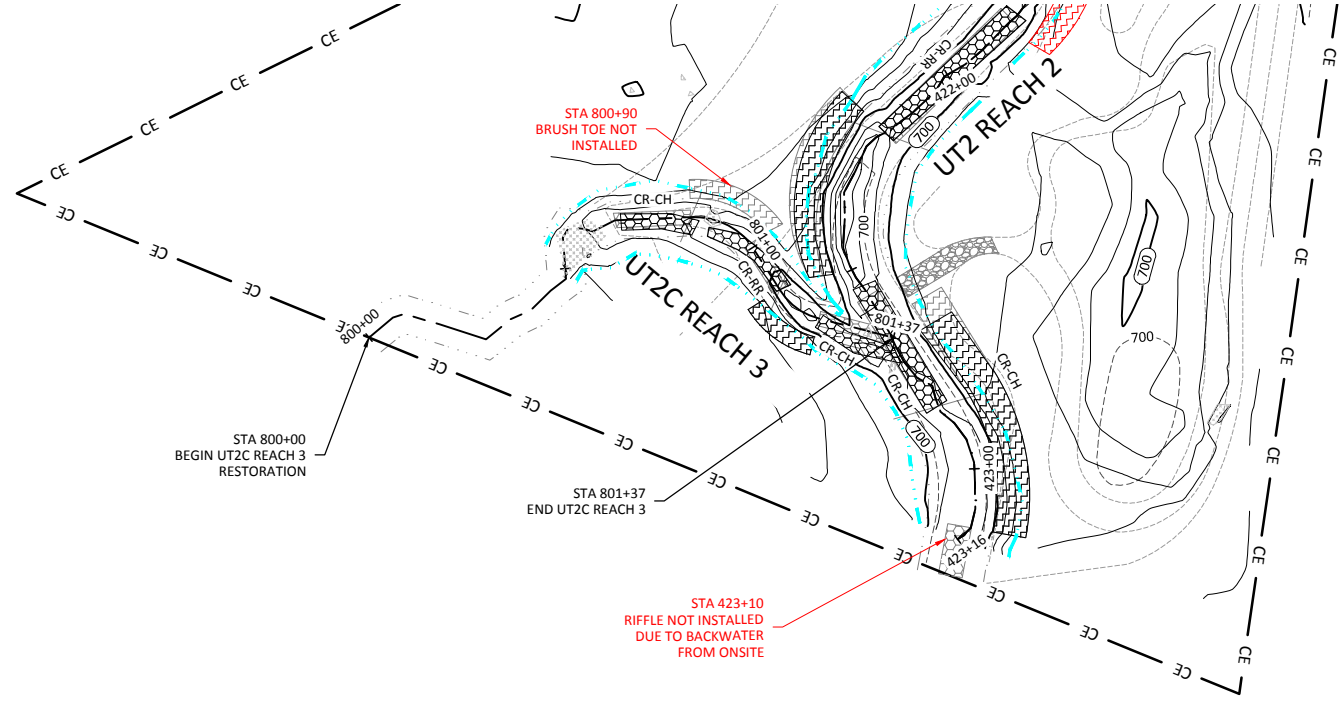
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

UT2C
 Stream Plan and Profile



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Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
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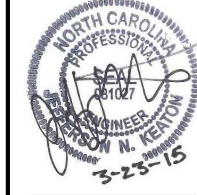
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

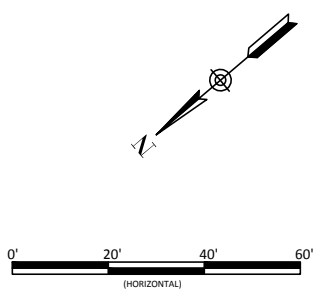
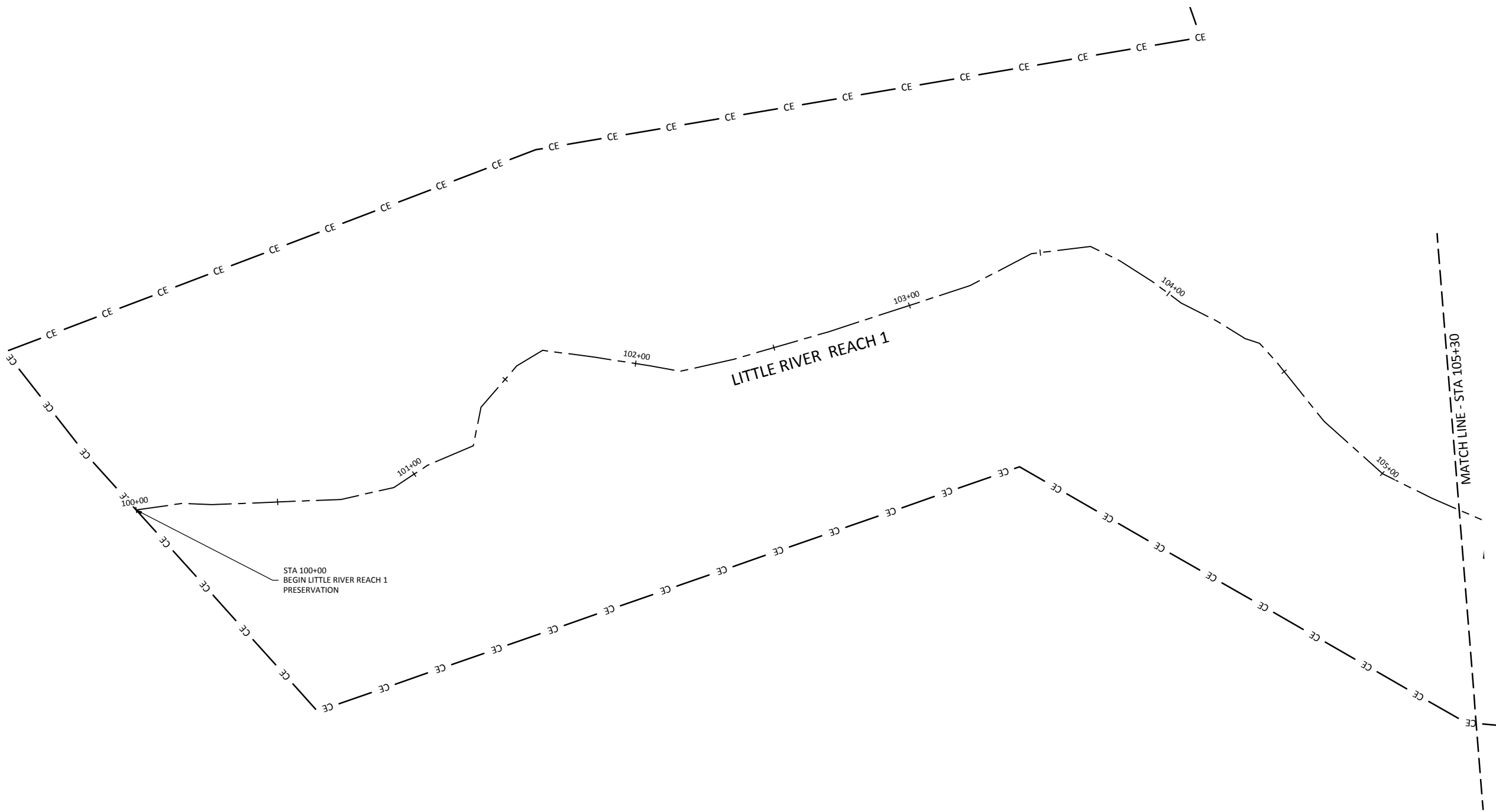
UT2C
 Stream Plan and Profile



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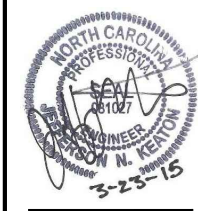
Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 Little River
 Stream Plan and Profile

Revisions:

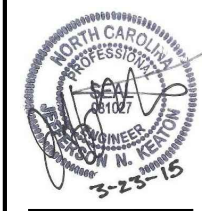
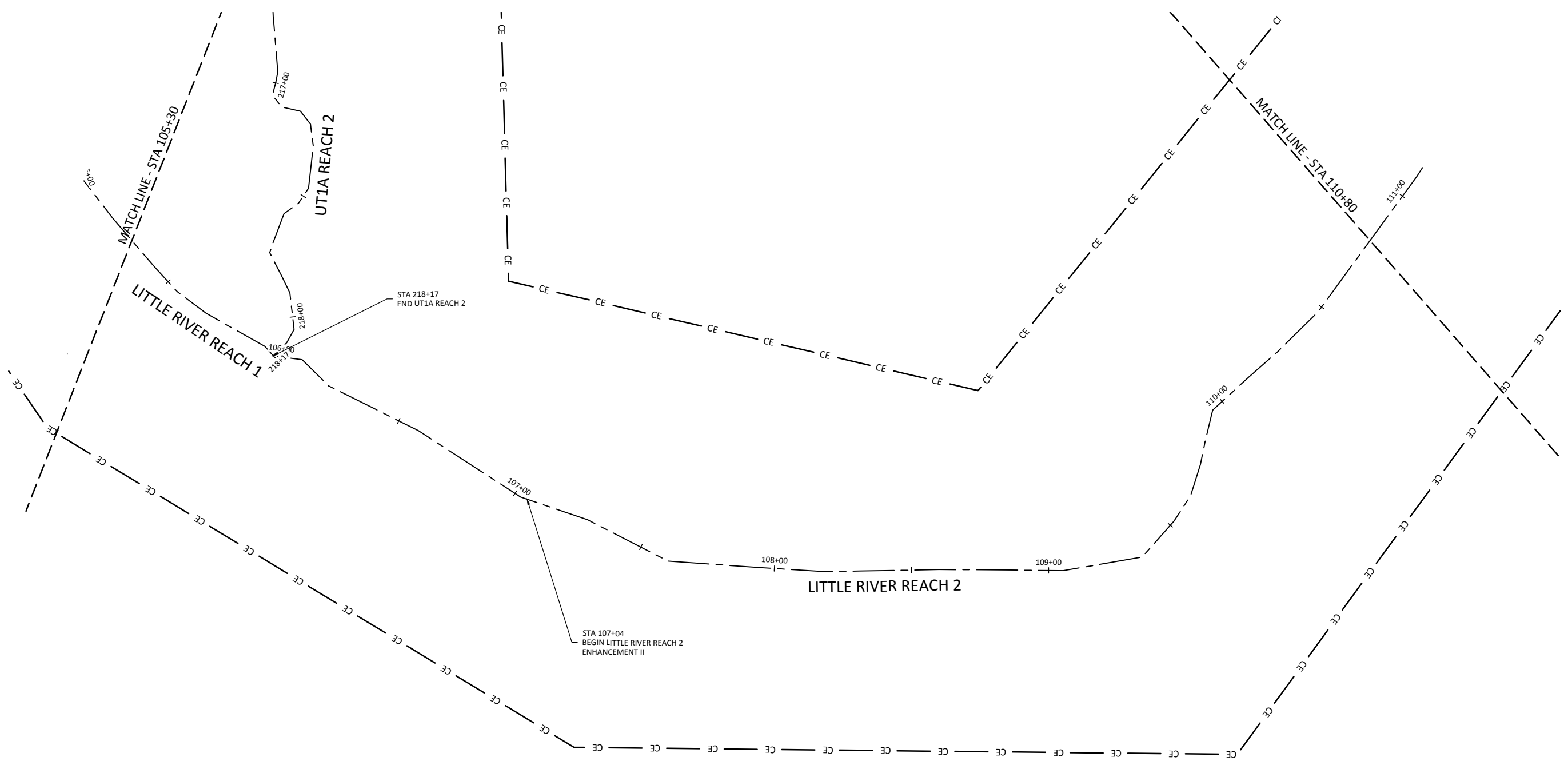
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 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina

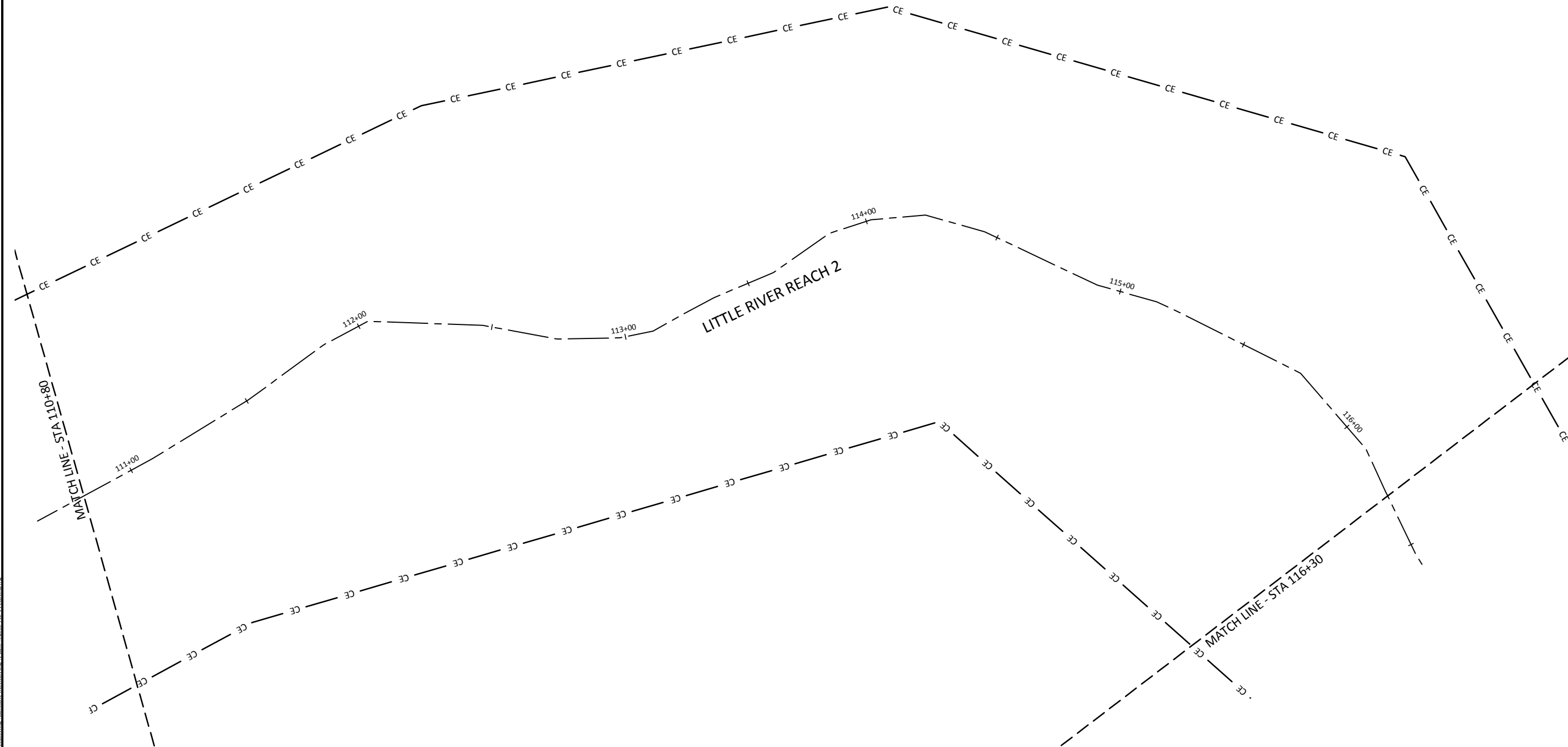
Little River
 Stream Plan and Profile

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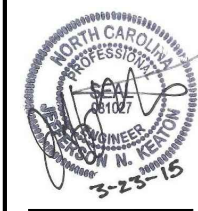
Date: February 27, 2015
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 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

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Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina
Little River
Stream Plan and Profile

Revisions:

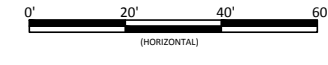
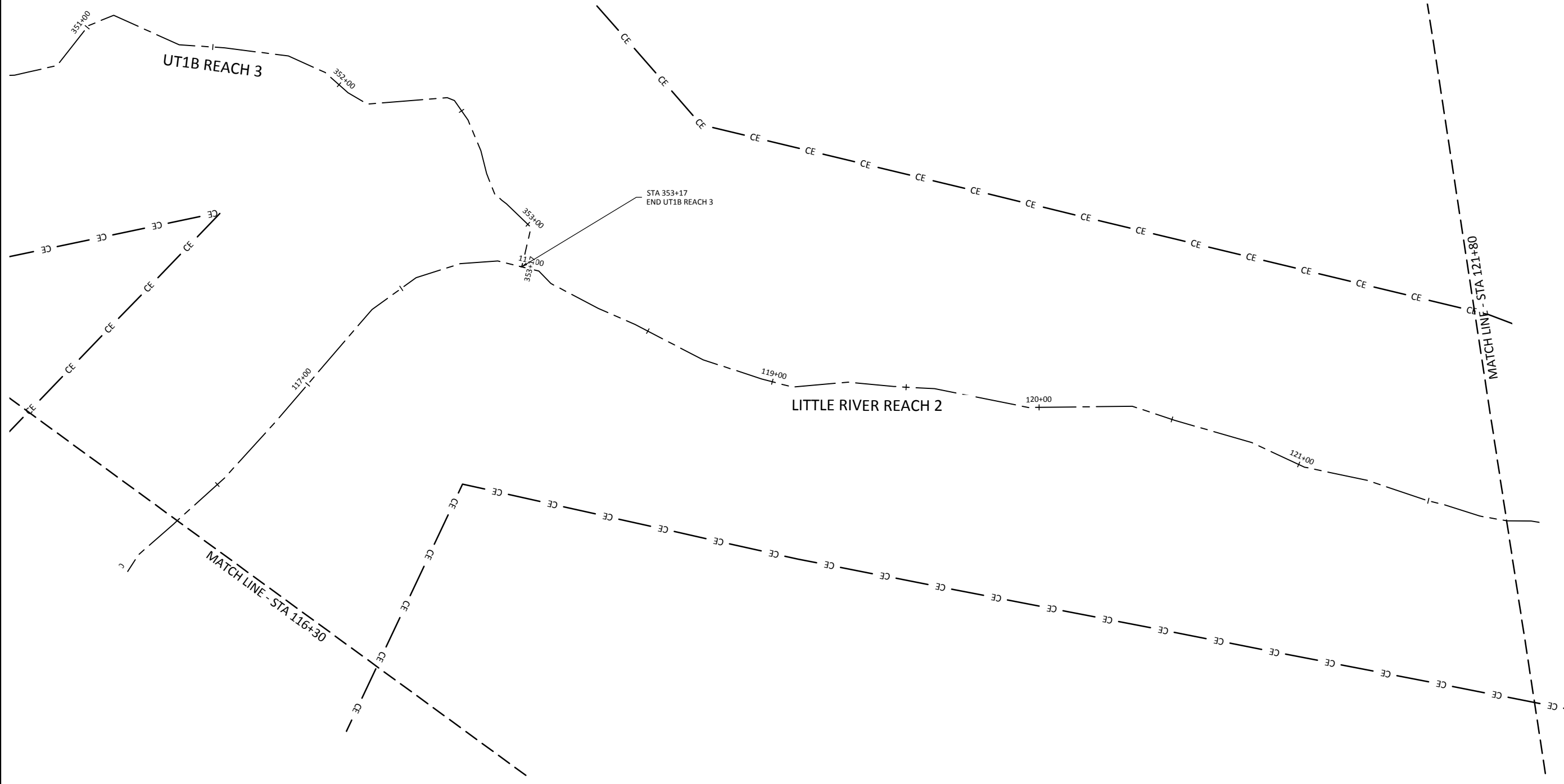
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Project Engineer: JNK
Drawn By: RPH
Checked By: KYG

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Date: February 6, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

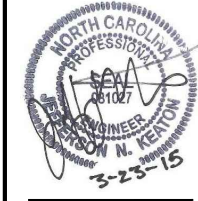
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Hopewell Stream Mitigation Record Drawings
 Randolph County, North Carolina

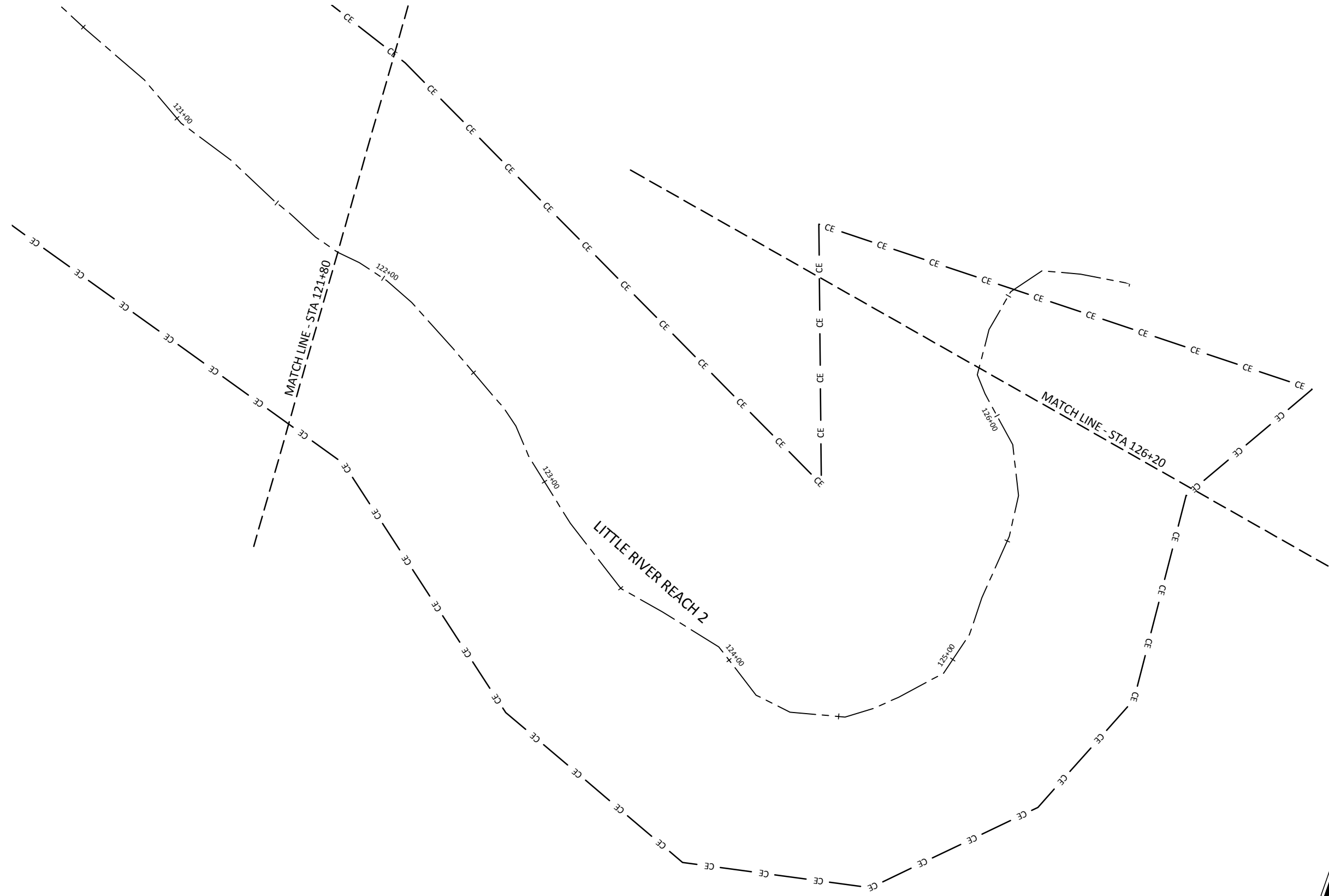
Little River
 Stream Plan and Profile



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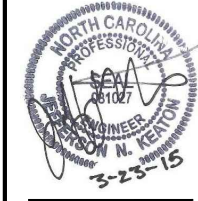
Date: February 27, 2015
 Job Number: 005-02133
 Project Engineer: JNK
 Drawn By: RPH
 Checked By: KYG

Revisions:

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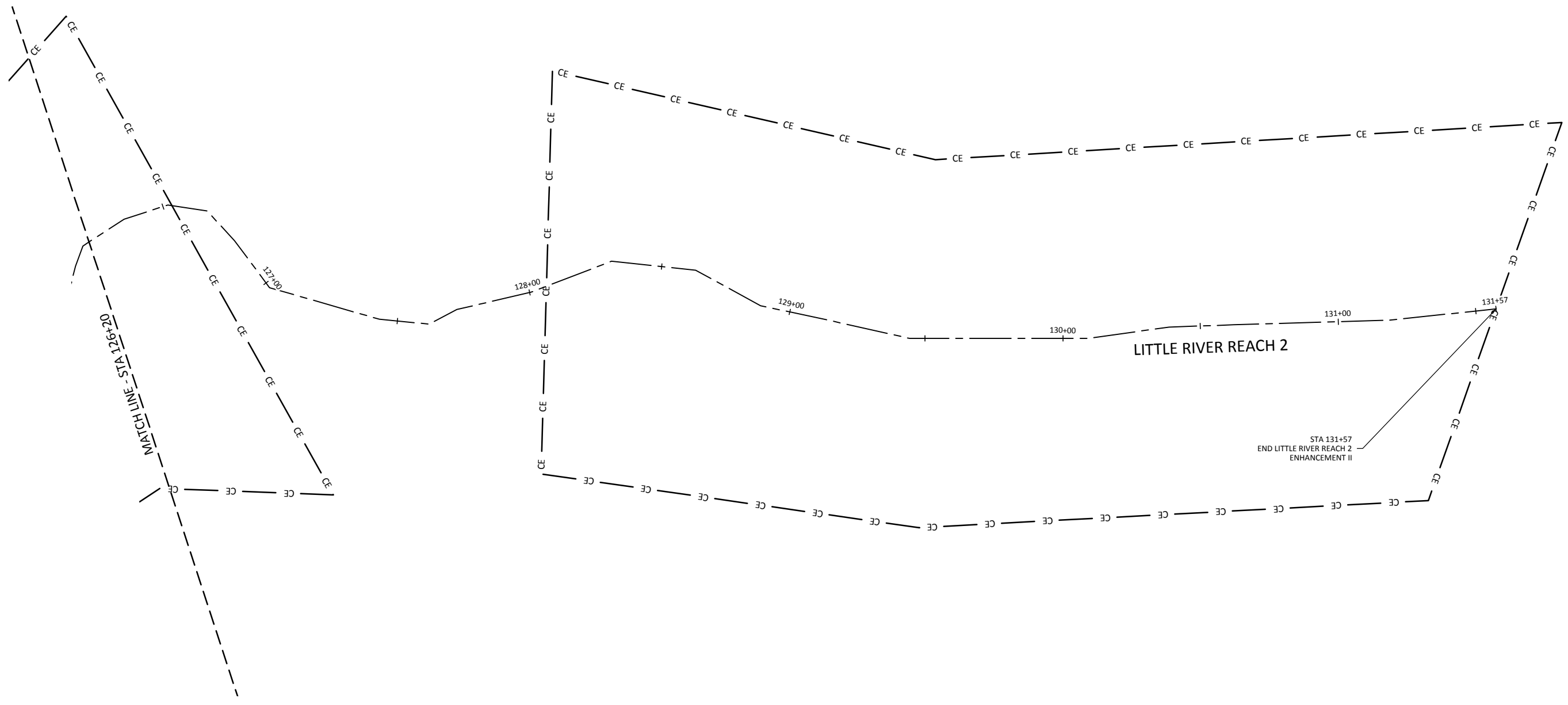
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Hopewell Stream Mitigation Site Record Drawings
 Randolph County, North Carolina
 Little River
 Stream Plan and Profile

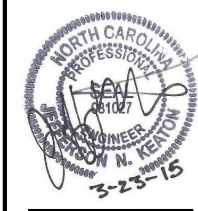


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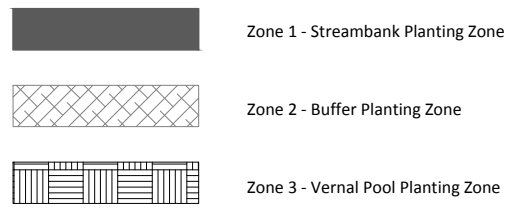
Hopewell Stream Mitigation Site Record Drawings
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Streambank Planting Zone						
Live Stakes and Herbaceous Plugs						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Cornus amomum</i>	Silky Dogwood	8 ft.	2-8 ft.	0.5"-1.0" cal.	Shrub	50%
<i>Salix sericea</i>	Silky Willow	8 ft.	2-8 ft.	0.5"-1.0" cal.	Shrub	50%
<i>Juncus effusus</i>	Common Rush	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	N/A
						100%

Buffer Planting Zone						
Bare Root						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Quercus rubra</i>	Northern Red Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus phellos</i>	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Plantus 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	10%
<i>Liriodendron tulipifera</i>	Tulip Poplar	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	10%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	10%
<i>Fraxinus pennsylvanica</i>	Green Ash	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	20%
						100%

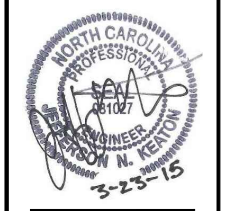
Vernal Pool Planting Zone			
Plugs (2 ft on center)			
Species	Common Name	Min. Size	# of Stems
<i>Acorus subcordatum</i>	Sweetflag	4 in3	30%
<i>Juncus effusus</i>	Common Rush	4 in3	40%
<i>Peltandra virginica</i>	Quill Sedge	4 in3	30%
			100%

Zones 1 - 3

Zones 1 - 3

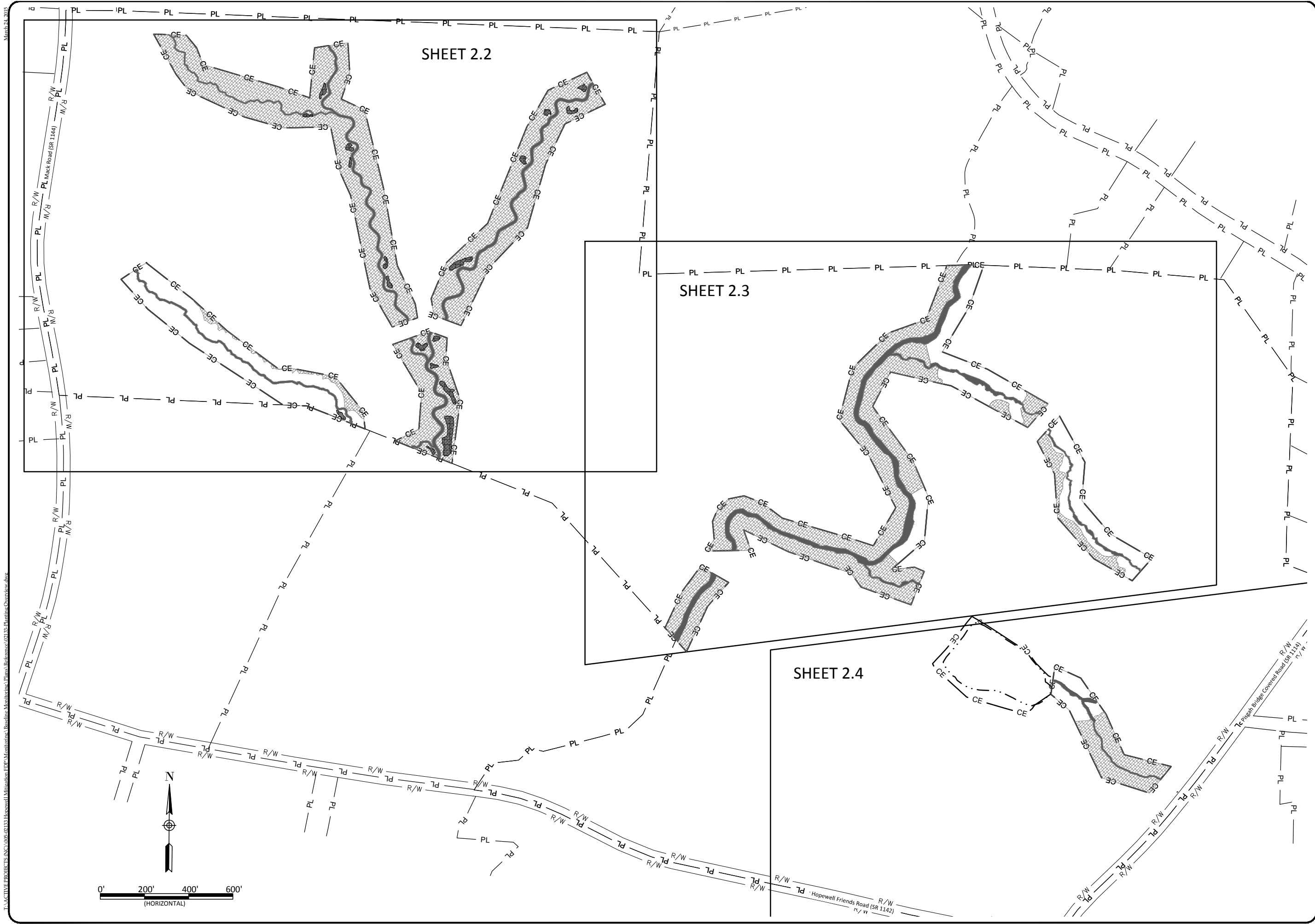
Permanent Riparian Seed Planting Zone				
Pure Live Seed (22 lbs/ acre)				
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	3.0
All Year	<i>Agrostis hyemalis</i>	Winter Bentgrass	Herb	3.0
All Year	<i>Chasmanthium latifolium</i>	Indian Wood Oats	Herb	3.0
All Year	<i>Rudbeckia subtomentosa</i>	Blackeyed Susan	Herb	2.0
All Year	<i>Panicum clandestinum</i>	Deer tongue	Herb	4.0
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	3.0
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	2.0
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	2.0

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



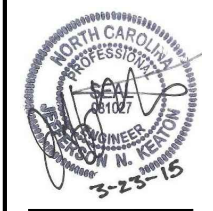
Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina
Planting Notes & Vegetation Tables

Revisions:



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Hopewell Stream Mitigation Site Record Drawings
Randolph County, North Carolina
 Planting Overview
 Planting

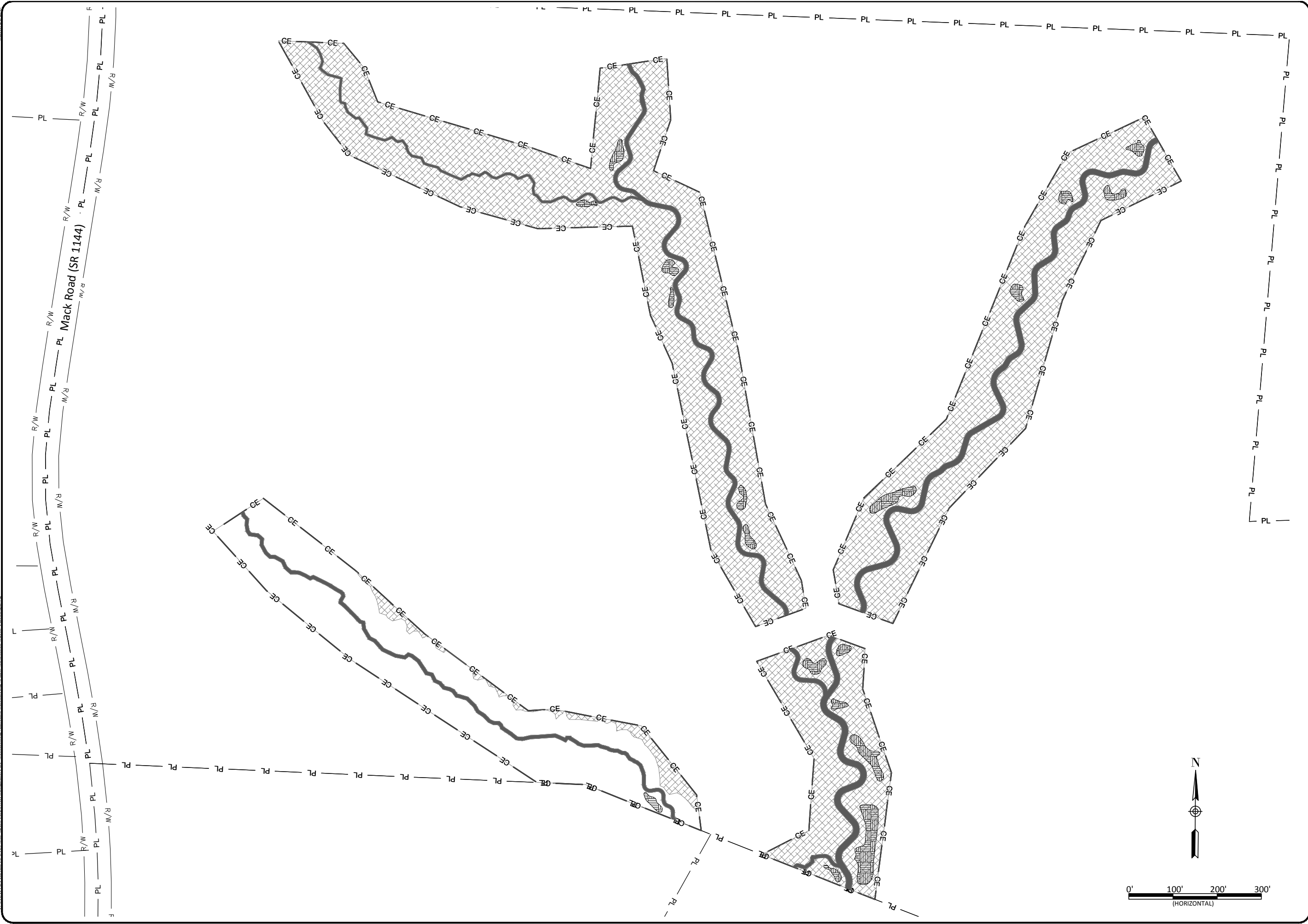
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Hopewell Stream Mitigation Site Record Drawings

Randolph County, North Carolina

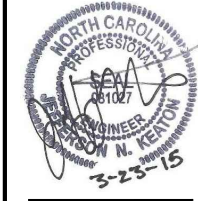
Planting Plan

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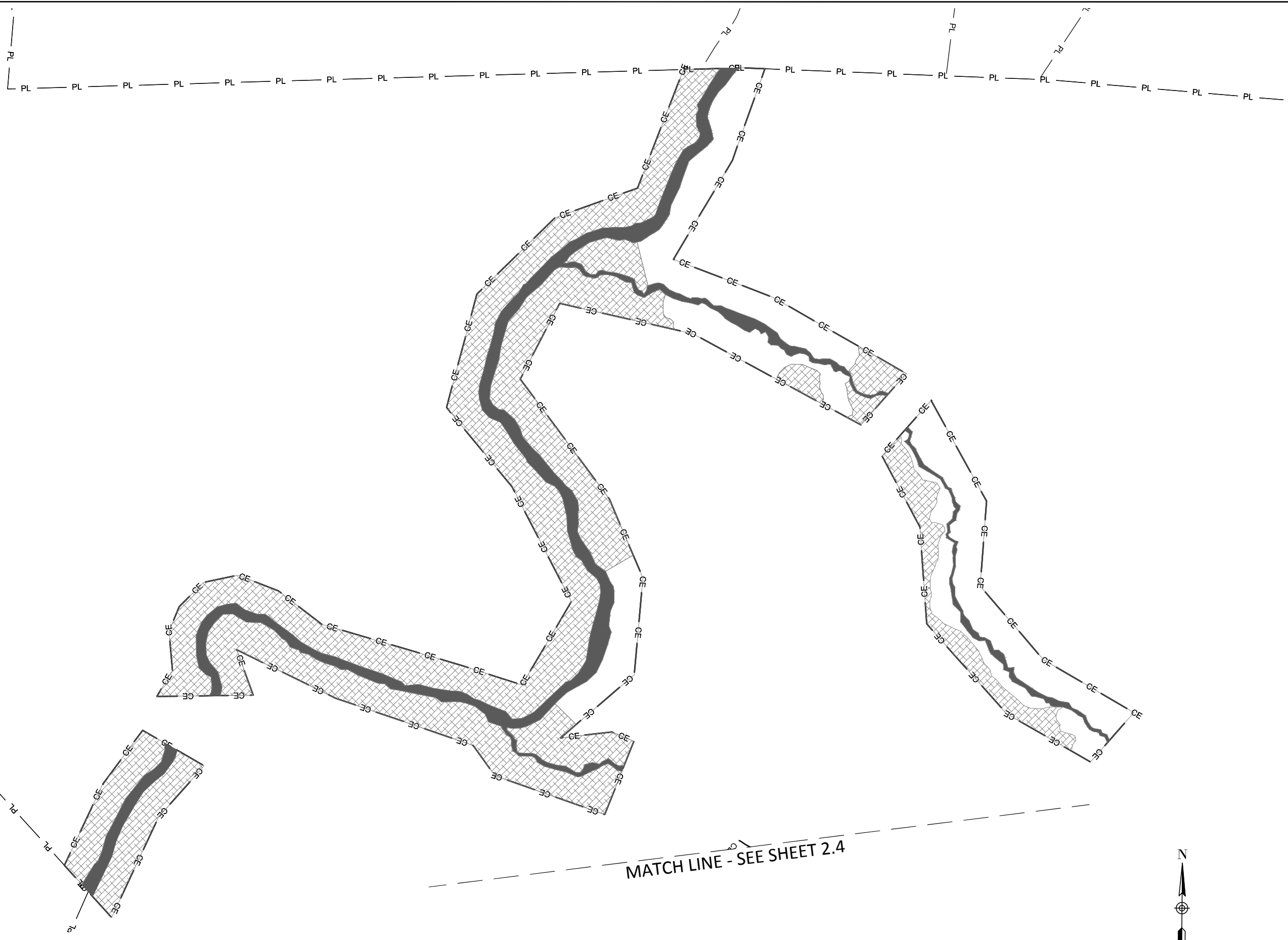
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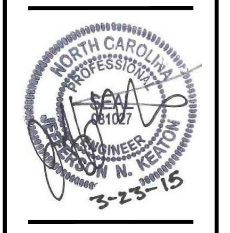


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Hopewell Stream Mitigation Site Record Drawings
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Planting Plan

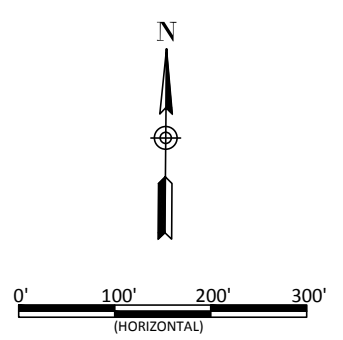
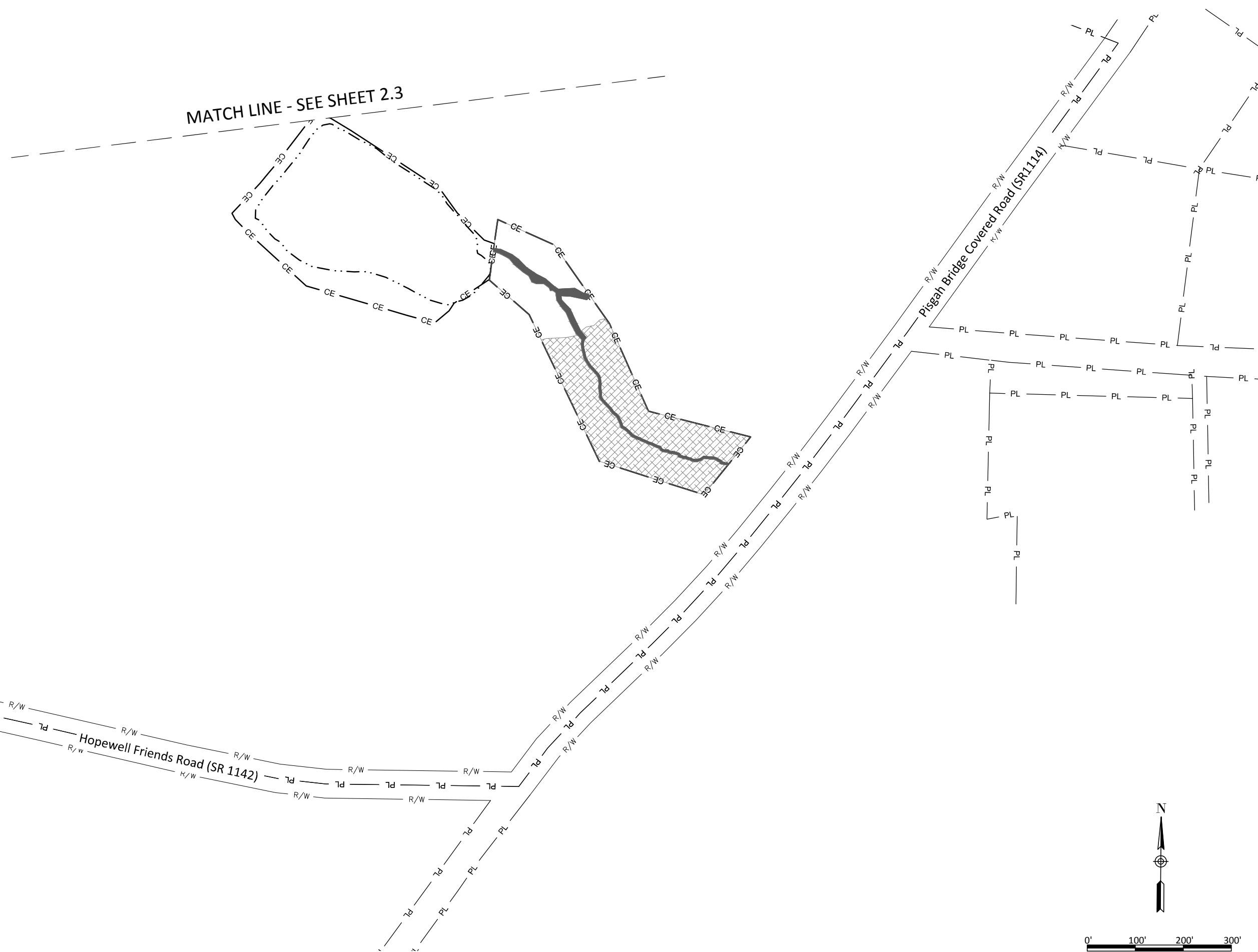
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Hopewell Stream Mitigation Site Record Drawings

Randolph County, North Carolina

Planting Plan

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