

APPENDIX D

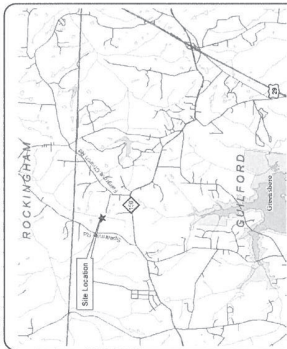
As-Built Plan Sheets/Record Drawings

PROJECT: 140048 BROWNS SUMMIT

NORTH CAROLINA DIVISION OF MITIGATION SERVICES GUILFORD COUNTY

LOCATION: APPROX. 3 MILES NORTHWEST OF BROWNS SUMMIT
TYPE OF WORK: AS-BUILT SURVEY / RECORD DRAWINGS

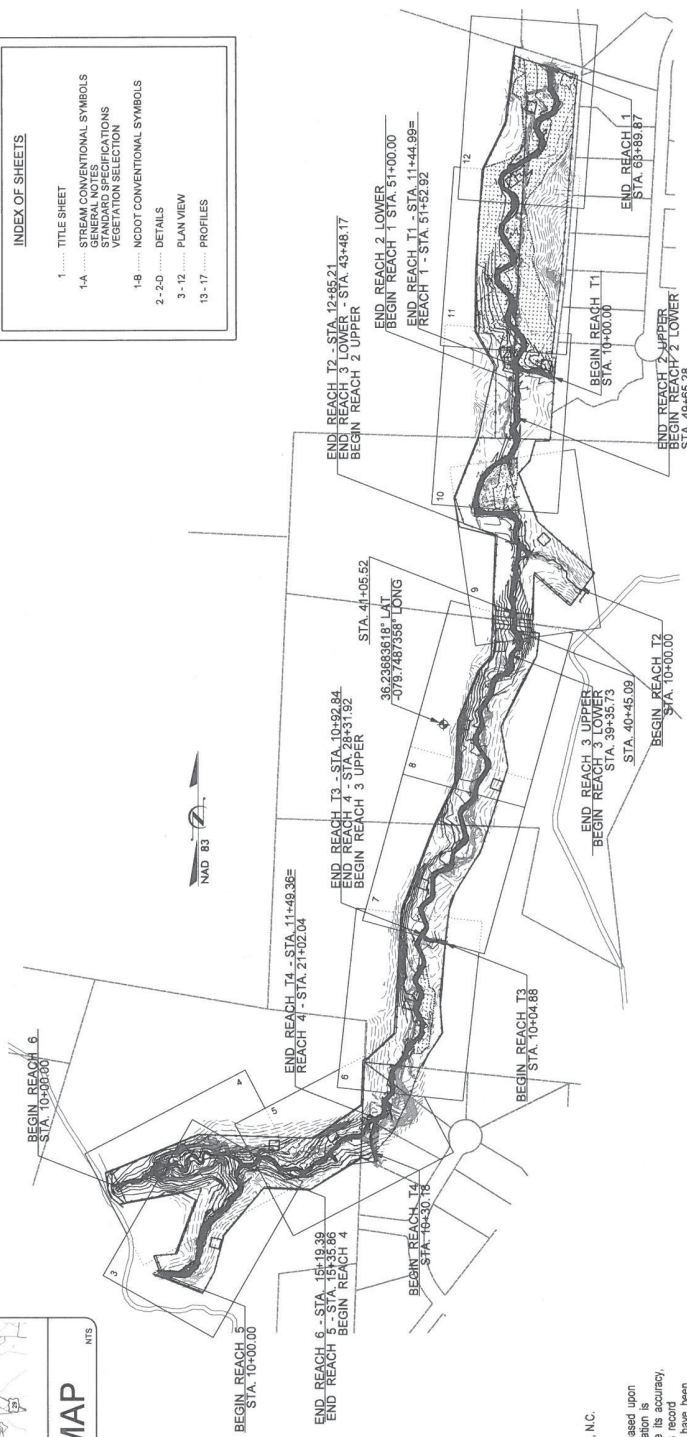
STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	140048	1	23
NCDMS ID. NO. 96313			



VICINITY MAP

INDEX OF SHEETS

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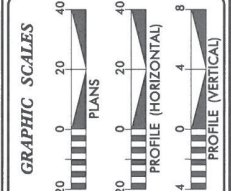


AS-BUILT SURVEY PREPARED BY:
LEVEL CROSS SURVEYING, PLLC - Randleman, N.C.

RECORD DRAWINGS
This record drawing has been prepared in part based upon information furnished by others. While this information is believed to be reliable, the Engineer cannot assure its accuracy, and this is not responsible for the accuracy of this record drawing or for any errors or omissions which may have been incorporated into it as a result. Those relying on this record drawing should verify the accuracy of the information and its accuracy before applying for any purposes.

DESIGN SUMMARY

REACH NAME	PROPOSED LENGTH (LF)	AS-BUILT LENGTH (LF)
REACH 1	1,233	1,290
REACH 2	805	752
REACH 3	1,469	1,456
REACH 4	1,296	1,296
REACH 5	562	536
REACH 6	454	442
T1	145	145
T2	283	285
T3	70	88
T4	117	119
TOTAL	6,345	6,409

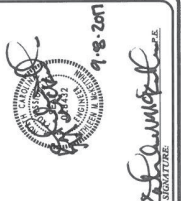


PREPARED FOR THE OFFICE OF:
NCDENR
DIVISION OF MITIGATION SERVICES
1652 MAIL SERVICE CENTER
RALEIGH, NC 27699-1652
CONTACT: JEFF SCHAEFFER
PROJECT MANAGER

PREPARED IN THE OFFICE OF:
Michael Baker International, Inc.
INTERNATIONAL HEADQUARTERS
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Tel: 303.440.4000 Fax: 303.440.4001
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PROJECT ENGINEER
KATHLEEN M. MCKEITHAN, PE
PROJECT ENGINEER / MANAGER

LETTING DATE: _____



STREAM CONVENTIONAL SYMBOLS

- ROCK J-HOOK
- ROCK VANE
- ROCK CROSS VANE
- LOG J-HOOK
- LOG VANE
- LOG WEIR
- LOG STEP POOL
- GRADE CONTROL LOG JAM
- CONSTRUCTED RIFFLE
- ROCK STEP POOL
- PHOTO POINT
- MONITORING WELL
- FLOW GAUGE
- CREST GAUGE

GENERAL NOTES

1. THE CONTRACTOR IS REQUIRED TO INSTALL IN-STREAM STRUCTURES USING A TRACK HOE WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS (3'x2'x2'), LOGS AND ROOTWADS.
2. WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PLAN. THE CONTRACTOR SHOULD MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING THE CONSTRUCTION WORK.
3. CONSTRUCTION IS SCHEDULED TO BEGIN SUMMER OF 2015.
4. CONTRACTOR SHOULD CALL NORTH-CAROLINA 'ONE-CALL' BEFORE EXCAVATION STARTS. (1-800-532-4849)
5. ENGINEER WILL FLAG TREES TO BE SAVED PRIOR TO CONSTRUCTION.

STANDARD SPECIFICATIONS

NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL MARCH 2009 (REV 2013)

- 6.05 TREE PROTECTION
- 6.06 TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
- 6.24 RIPARIAN AREA SEEDING
- 6.60 TEMPORARY SEDIMENT TRAP
- 6.62 TEMPORARY SILT FENCE
- 6.63 TEMPORARY ROCK DAM
- 6.70 TEMPORARY STREAM CROSSING

PROJECT REFERENCE NO. 140048
SHEET NO. 1-A
PROJECT ENGINEER
APPROVED BY:
DATE: 9.9.17
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AS-BUILT SURVEY PREPARED BY:
LEVEL CROSS SURVEYING, PLLC - Raleigh, N.C.
RECORD DRAWINGS
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VEGETATION SELECTION

Prepared Permanent Seed Mixture
Brown Summit Creek Restoration Project

Botanical Name	Common Name	% Planted by Species	Density (lb/acre)	Wetland Tolerance
<i>Andropogon gerardi</i>	Big blue stem	10%	1.5	FAC
<i>Dichanthium clandestinum</i>	Deer tongue	15%	2.25	FAC
<i>Carex crinita</i>	Fringed sedge	10%	1.5	OBL
<i>Elymus virginicus</i>	Virginia wild rye	10%	1.5	FACW
<i>Juncus effusus</i>	Soft rush	10%	1.5	FACW
<i>Panicum virgatum</i>	Switchgrass	15%	2.25	FAC
<i>Schizachyrium scoparium</i>	Little blue stem	10%	1.5	FACU
<i>Sorghastrum nutans</i>	Indiangrass	10%	1.5	FACU
<i>Impatiens capensis</i>	Jewelweed	10%	1.5	FACW
	Total	100%	15	

Note: Final species selection may change due to refinement or availability at the time of planting. If species substitution is required, the planting Contractor will submit a revised planting list to Baker for approval prior to the procurement of plant stock.

Proposed Plug Species for Reach R6 Constructed Wetland
Brown Summit Creek Restoration Project

Botanical Name	Common Name	% Planted by Species	Wetland Tolerance
Deep Pool Plantings			
Four Cubic Inch Herbaceous Plugs to be Installed 4' On Center			
<i>Lemna spp.</i>	Duckweed	25%	OBL
<i>Najas julita ssp. advena</i>	Yellow pond-lily	25%	OBL
<i>Najas julita</i>	American lily	25%	OBL
<i>Elodea canadensis</i>	Needle spikerush	25%	OBL
High Marsh Plantings			
Four Cubic Inch Herbaceous Plugs to be Installed 3' On Center			
<i>Lobelia cardinalis</i>	Cardinal Flower	10%	FACW
<i>Eupatorium altissimum</i>	Joe Pye Weed	15%	FACW
<i>Hibiscus scaberrimus</i>	Scarlet Rose Mallow	15%	OBL
<i>Lobelia elongata</i>	Longleaf lobelia	15%	OBL
<i>Rhynchospora colorata</i>	Shrubb white-top	20%	FACW
<i>Carex tenax</i>	Quill sedge	25%	FAC
Low Marsh Plantings			
Four Cubic Inch Herbaceous Plugs to be Installed 3' On Center			
<i>Sagittaria lanifolia</i>	Buttercup	10%	OBL
<i>Iris pseudacorus</i>	Yellow Flag	15%	OBL
<i>Acorus americanus</i>	Sweetflag	15%	OBL
<i>Peltandra virginica</i>	Arrow arum	15%	OBL
<i>Pontederia cordata</i>	Pickertweed	20%	OBL
<i>Scirpus cyperinus</i>	Woolgrass	25%	FACW

Prepared Bare-Root and Livestock Species
Brown Summit Creek Restoration Project

Botanical Name	Common Name	% Planted by Species	Wetland Tolerance
Riparian Buffer Plantings - Overstory (For all reaches except R1, R2)			
8' x 8' spacing - 680 stems/acre			
<i>Prunus pennsylvanica</i>	Green Ash	10%	FACW
<i>Betula nigra</i>	River Birch	10%	FACW
<i>Quercus lyrata</i>	Overcup Oak	10%	OBL
<i>Acer negundo</i>	Box Elder	10%	FACW
<i>Platanus occidentalis</i>	American Sycamore	5%	FACW
<i>Celtis laevigata</i>	Sugarberry	5%	FACW
<i>Nyssa sylvatica</i>	Black gum	5%	FAC
Wetland Buffer Plantings - Understory (For Reaches R1, R2)			
8' x 8' spacing - 680 stems/acre			
<i>Carpinus caroliniana</i>	American Hornbeam	10%	FAC
<i>Alnus serrulata</i>	Thick Alder	10%	OBL
<i>Ilex verticillata</i>	Winterberry	10%	FACW
<i>Viburnum nudum</i>	Possumhaw	10%	OBL
Riparian Live Stake Plantings			
<i>Salix sericea</i>	Silky Willow	25%	OBL
<i>Elaeagnus</i>	Elaeagnus	15%	FACW
<i>Cephalanthus occidentalis</i>	Butterbush	25%	OBL
<i>Cornus amomum</i>	Silky Dogwood	25%	FACW
<i>Salix nigra</i>	Black Willow	10%	OBL

Note: Final species selection may change due to refinement or availability at the time of planting. If species substitution is required, the planting Contractor will submit a revised planting list to Baker for approval prior to the procurement of plant stock.

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E. = SUBSURFACE UTILITY ENGINEER

BOUNDARIES AND PROPERTY:

- State Line _____
- County Line _____
- Township Line _____
- City Line _____
- Reservation Line _____
- Property Line _____
- Existing Iron Pin _____
- Property Corner _____
- Property Monument _____
- Parcel/Sequence Number _____
- Existing Fence Line _____
- Proposed Woven Wire Fence _____
- Proposed Chain Link Fence _____
- Proposed Barbed Wire Fence _____
- Existing Wetland Boundary _____
- Proposed Wetland Boundary _____
- Existing Endangered Animal Boundary _____
- Existing Endangered Plant Boundary _____

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or UG Tank Cap _____
- Sign _____
- Well _____
- Small Mine _____
- Foundation _____
- Area Outline _____
- Cemetery _____
- Building _____
- School _____
- Church _____
- Dam _____

HYDROLOGY:

- Stream or Body of Water _____
- Hydro, Pool or Reservoir _____
- Jurisdictional Stream _____
- Buffer Zone 1 _____
- Buffer Zone 2 _____
- Flow Arrow _____
- Disappearing Stream _____
- Spring _____
- Wetland _____
- Proposed Lateral, Tail, Head Ditch _____
- False Sump _____

RAILROADS:

- Standard Gauge _____
- RR Signal Milepost _____
- Switch _____
- RR Abandoned _____
- RR Dismantled _____

RIGHT OF WAY:

- Baseline Control Point _____
- Existing Right of Way Marker _____
- Existing Right of Way Line _____
- Proposed Right of Way Line _____
- Proposed Right of Way Line with Iron Pin and Cap Marker _____
- Proposed Right of Way Line with Concrete or Granite Marker _____
- Existing Control of Access _____
- Proposed Control of Access _____
- Existing Easement Line _____
- Proposed Temporary Construction Easement _____
- Proposed Temporary Drainage Easement _____
- Proposed Permanent Drainage Easement _____
- Proposed Permanent Utility Easement _____
- Proposed Temporary Utility Easement _____
- Proposed Permanent Easement with Iron Pin and Cap Marker _____

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement _____
 - Existing Curb _____
 - Proposed Slope Stakes Cut _____
 - Proposed Slope Stakes Fill _____
 - Proposed Wheel Chair Ramp _____
 - Existing Metal Guardrail _____
 - Proposed Guardrail _____
 - Existing Cable Guidrail _____
 - Proposed Cable Guidrail _____
 - Equality Symbol _____
 - Pavement Removal _____
- VEGETATION:**
- Single Tree _____
 - Single Shrub _____
 - Hedge _____
 - Woods Line _____
 - Orchard _____
 - Vineyard _____

EXISTING STRUCTURES:

- MAJOR:**
- Bridge, Tunnel or Box Culvert _____
 - Bridge Wing Wall, Head Wall and End Wall _____
- MINOR:**
- Head and End Wall _____
 - Pipe Culvert _____
 - Footbridge _____
 - Drainage Box: Catch Basin, DI or JB _____
 - Paved Ditch Gutter _____
 - Storm Sewer Manhole _____
 - Storm Sewer _____

UTILITIES:

- POWER:**
- Existing Power Pole _____
 - Proposed Power Pole _____
 - Existing Joint Use Pole _____
 - Proposed Joint Use Pole _____
 - Power Manhole _____
 - Power Line Tower _____
 - Power Transformer _____
 - UG Power Cable Hand Hole _____
 - H-Frame Pole _____
 - Recorded UG Power Line _____
 - Designated UG Power Line (S.U.E.*) _____
- TELEPHONE:**
- Existing Telephone Pole _____
 - Proposed Telephone Pole _____
 - Telephone Manhole _____
 - Telephone Booth _____
 - Telephone Pedestal _____
 - Telephone Cell Tower _____
 - UG Telephone Cable Hand Hole _____
 - Recorded UG Telephone Cable _____
 - Designated UG Telephone Cable (S.U.E.*) _____
 - Recorded UG Telephone Conduit _____
 - Designated UG Telephone Conduit (S.U.E.*) _____
 - Recorded UG Fiber Optics Cable _____
 - Designated UG Fiber Optics Cable (S.U.E.*) _____

WATER:

- Water Manhole _____
- Water Meter _____
- Water Valve _____
- Water Hydrant _____
- Recorded UG Water Line _____
- Designated UG Water Line (S.U.E.*) _____
- Above Ground Water Line _____
- AUG Water _____

TV:

- TV Satellite Dish _____
- TV Pedestal _____
- TV Tower _____
- UG TV Cable Hand Hole _____
- Recorded UG TV Cable _____
- Designated UG TV Cable (S.U.E.*) _____
- Recorded UG Fiber Optic Cable _____
- Designated UG Fiber Optic Cable (S.U.E.*) _____

GAS:

- Gas Valve _____
- Gas Meter _____
- Recorded UG Gas Line _____
- Designated UG Gas Line (S.U.E.*) _____
- Above Ground Gas Line _____
- AUG Gas _____

SANITARY SEWER:

- Sanitary Sewer Manhole _____
- Sanitary Sewer Cleanout _____
- UG Sanitary Sewer Line _____
- Above Ground Sanitary Sewer _____
- Recorded SS Forced Main Line _____
- Designated SS Forced Main Line (S.U.E.*) _____

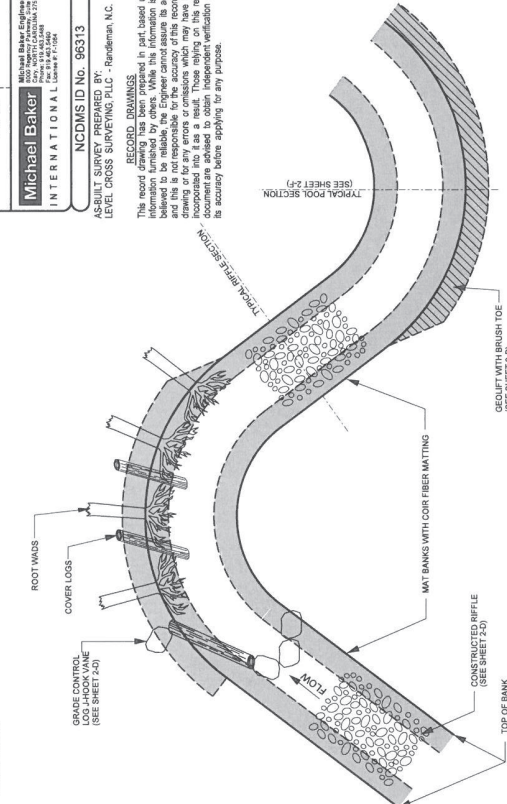
MISCELLANEOUS:

- Utility Pole _____
- Utility Pole with Base _____
- Utility Located Object _____
- Utility Traffic Signal Box _____
- Utility Unknown UG Line _____
- UG Tank; Water, Gas, Oil _____
- AG Tank; Water, Gas, Oil _____
- UG Test Hole (S.U.E.*) _____
- Abandoned According to Utility Records _____
- End of Information _____
- AATUR _____
- E.O.I. _____

TYPICAL STRUCTURE PLACEMENT

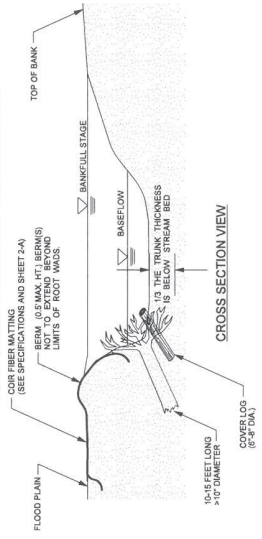
- STRUCTURE NOTES:**
1. LOG WADES AND CORR FIBER MATTING MUST BE INSTALLED AT THE LOCATION AND SEQUENCE AS SHOWN.
 2. ANY CHANGES TO NUMBER OR LOCATION OF CORR FIBER MATTING MUST BE APPROVED BY THE DESIGN ENGINEER.
 3. CORR FIBER MATTING TO BE INSTALLED ON ALL RESTORED STREAMBANKS, FLOODPLAIN BENCHING, AND FLOODPLAIN BENCHING TO BE DESCRIBED IN THE TECHNICAL SPECIFICATIONS.

BAKER PROJECT REFERENCE NO. 140048
SHEET NO. 2
PROJECT ENGINEER
APPROVED BY: *K. McElreath*
DATE: 1-8-17
MICHAEL BAKER INTERNATIONAL
NCDMS ID No. 96313
AS-BUILT SURVEY PREPARED BY: [Name]
RECORD DRAWINGS
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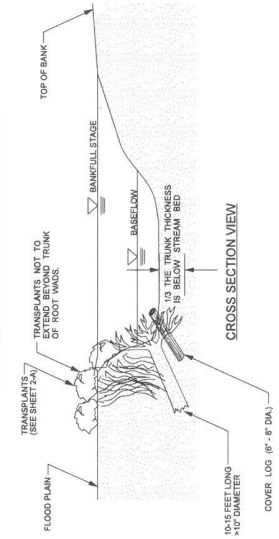


ROOT WADES

**ROOT WADES WITHOUT TRANSPLANTS
USE IF TRANSPLANTS ARE NOT AVAILABLE ON-SITE**

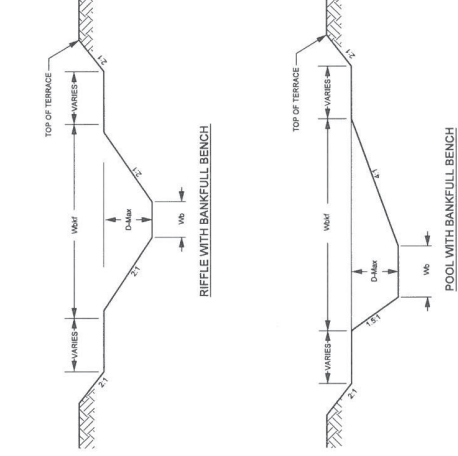


**ROOT WADES WITH TRANSPLANTS
USE IF TRANSPLANTS ARE AVAILABLE ON-SITE**



- NOTES:**
1. THE TRENCH BEING EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD SHOULD BE EXCAVATED TO A MINIMUM OF 12\"/>
 - 2. THE NUMBER OF ROOT WADES ESTIMATED MAY VARY DEPENDING ON CHANNEL CHARACTERISTICS AND LOCAL CONDITIONS. SEE STRUCTURE TABLE FOR APPROXIMATE STATION AND LOCATION.
 - 3. INITIAL COVER LOGS BETWEEN ROOT WADES TO PROVIDE HABITAT SHALL BE AVAILABLE FROM ON-SITE LOGS.

TYPICAL RIFLE, POOL, AND BANKFULL BENCH CROSS-SECTIONS



R1		R2		R3	
RIFLE	POOL	RIFLE	POOL	RIFLE	POOL
11.5	2.7	11.0	2.2	11.0	2.0
11.0	11.2	11.0	11.4	11.0	11.5
11.0	11.0	11.0	11.0	11.0	11.0
8.8	2.6	5.1	2.8	5.4	2.9

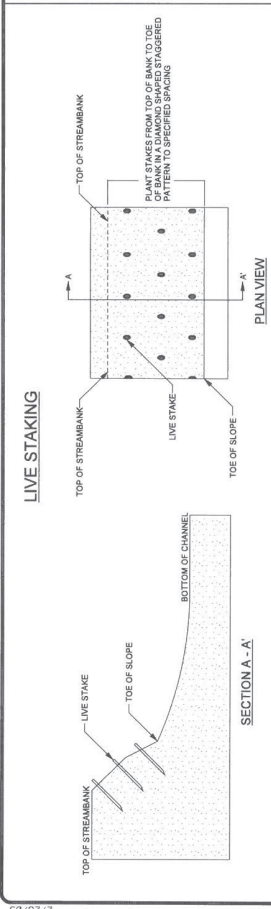
R4 - UPPER		R4 - LOWER		R5 - BE-STREAM	
RIFLE	POOL	RIFLE	POOL	RIFLE	POOL
8.1	10.9	8.2	12.4	7.0	10.0
10.8	1.5	0.9	1.8	0.6	1.5
10.0	10.0	10.0	10.0	10.0	10.0
5.0	10.2	6.5	13.4	3.5	8.0
5.0	2.7	5.7	2.5	4.6	3.4

T3 / T4	
RIFLE	POOL
6.1	7.0
7.0	8.8
12.0	12.8
12.0	13.0
12.0	12.4
3.1	4.9
3.0	4.4
2.9	3.3
2.6	2.6

- NOTES:**
1. DURING CONSTRUCTION CORNERS OF DESIGN CHANNEL WILL BE ROUNDED TO MATCH THE CHANNEL BENCHES.
 2. POOLS SHOWN ABOVE ARE LEFT POOLS FOR MEANDER CHANNELS.

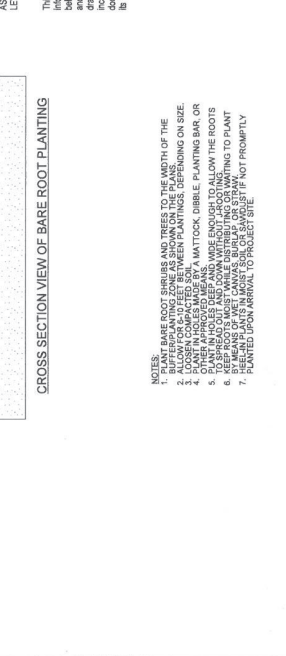
SECOND DRAWINGS
 AS-BUILT SURVEY PREPARED BY:
 LEVEL CROSS SURVIVING, PLLC - Handlerville, NC.

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LIVE STAKING
 TOP OF STREAMBANK
 TOE OF SLOPE
 BOTTOM OF CHANNEL
 LIVE STAKE
 SECTION A-A
 NO LIVE STAKES ON POINT BAR
 TOP OF STREAMBANK
 TOE OF SLOPE
 LIVE STAKE
 6'-8" SPACING
 2'-3" LENGTH
 SQUARE CUT TOP
 BUDS FACING UPWARD
 LIVE CUTTING MIN. 1/2 DIA.
 ANGLE CUT 30°-45 DEGREES
 LIVE STAKE DETAIL

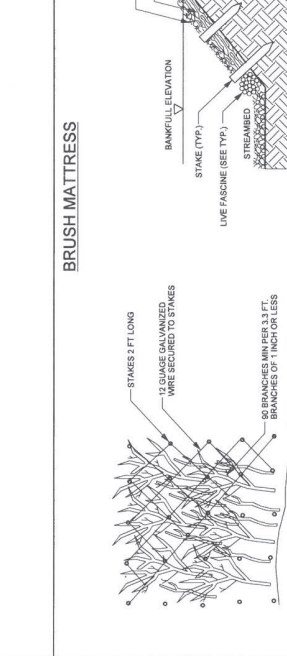
NOTES:
 1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE CHANNEL.
 2. ALLOW FOR ADEQUATE BEARING CAPACITY DEPENDING ON SIZE.
 3. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR
 4. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS
 5. KEEP ROOTS MOIST UNTIL PLANTING.
 6. PLANTING SHOULD BE DONE PROMPTLY.
 7. HELMETS MUST BE WORN AT ALL TIMES.
 8. PLANTED UPON ARRIVAL TO PROJECT SITE.



BRUSH MATTRESS
 TOP OF BANK
 TOE OF BANK
 FLOW
 STAKES 2 FT LONG
 12 GAUGE GALVANIZED WIRE SECURED TO STAKES
 88 BRANCHES MIN PER 3.3 FT
 BRANCHES OF THICK GALES
 NOTES:
 1. BRUSH MATTRESS SHOULD BE INSTALLED DURING SECTION OF VEGETATION SELECTION.
 2. ONLY USE SPECIES SPECIFIED UNDER LIVE STAKES.

NOTES:
 1. STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
 2. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
 3. STAKES SHOULD BE INSTALLED PERPENDICULAR TO BANK.
 4. STAKES SHOULD BE 1/2 TO 3/4 INCH IN DIAMETER AND 2 TO 3 FT LONG.
 5. STAKES SHOULD BE INSTALLED LEAVING 1/8 OF STAKE ROOTS ABOVE GROUND.

PLANTING SPECIFICATIONS
 PLANTINGS
 TOP OF STREAMBANK
 BOTTOM OF CHANNEL
 CROSS SECTION VIEW OF BARE ROOT PLANTING



TRANSPLANTED VEGETATION
 TOP OF STREAMBANK
 TOE OF BANK
 BOTTOM OF CHANNEL
 TRANSPLANTED VEGETATION, ROOTMASS, AND SOIL MATERIAL
 LIVE STAKE
 6'-8" SPACING
 2'-3" SPACING
 LIVE STAKE SPACING PLAN VIEW
 CROSS SECTION VIEW
 PLAN VIEW

NOTES:
 1. EXCAVATE ANGLE IN THE BANK TO BE STABILIZED THAT WILL BEGIN EXCAVATION AT THE TOE OF THE BANK.
 2. SOIL MATERIAL AS POSSIBLE. IF ENTIRE ROOT MASS CAN NOT BE PLACED IN THE BANK, TRANSPANT IS TOO LARGE AND ANOTHER SHOULD BE SELECTED.
 3. PLACE TRANSPANT IN THE BANK TO BE STABILIZED SO THAT IT WILL BE FULLY SURROUNDED BY SOIL.
 4. FILL IN ANY HOLES AROUND THE TRANSPANT AND COMPACT.
 5. WHEN POSSIBLE, PLACE MULTIPLE TRANSPANTS CLOSE TOGETHER SUCH THAT THEY TOUCH.

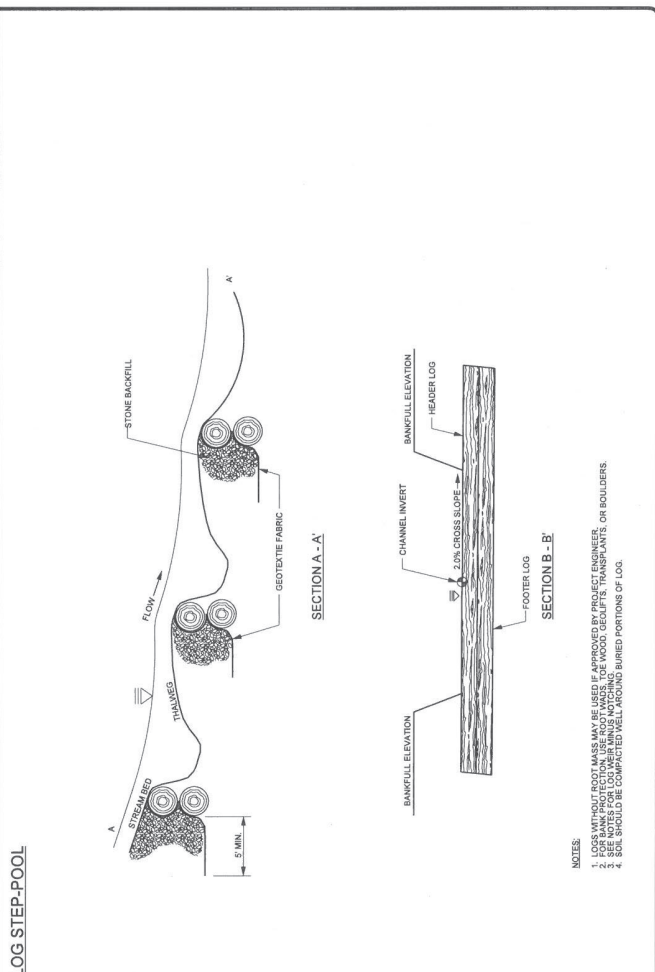
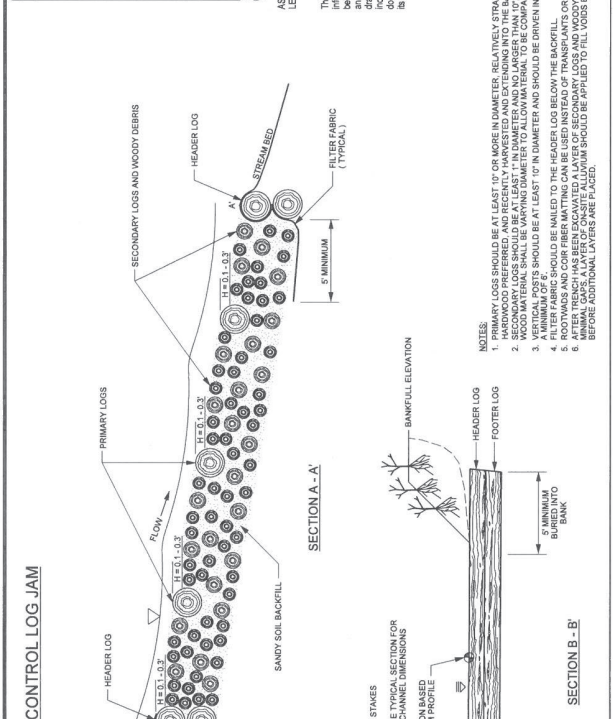
CROSS SECTION
 BANK FILL ELEVATION
 STAKE (SEE TYP.)
 STREAMBED
 LIVE FASCINE (SEE TYP.)
 ON-SITE ALLUVIUM
 BRUSH LAYER
 NOTES:
 1. CREATE 12" DEEP TRENCH
 2. STAKE AND WIRE BRUSH LAYER INTO TRENCH
 3. BACK FILL OF ON-SITE ALLUVIUM OVER BRUSH LAYER



TYPICAL STAKE
 TOP OF BANK
 TOE OF BANK
 FLOW
 2' x 4' x 2' BOARD FOR STAKE
 2' x 4' x 2' TIMBER
 NOTES:
 1. BOARD FOR STAKE SHOULD BE 2' x 4' x 2'.
 2. SAW 2' x 4' TIMBER DIAGONALLY TO PRODUCE DEAD STOUT STAKES.

NOTES:
 1. EXCAVATE ANGLE IN THE BANK TO BE STABILIZED THAT WILL BEGIN EXCAVATION AT THE TOE OF THE BANK.
 2. SOIL MATERIAL AS POSSIBLE. IF ENTIRE ROOT MASS CAN NOT BE PLACED IN THE BANK, TRANSPANT IS TOO LARGE AND ANOTHER SHOULD BE SELECTED.
 3. PLACE TRANSPANT IN THE BANK TO BE STABILIZED SO THAT IT WILL BE FULLY SURROUNDED BY SOIL.
 4. FILL IN ANY HOLES AROUND THE TRANSPANT AND COMPACT.
 5. WHEN POSSIBLE, PLACE MULTIPLE TRANSPANTS CLOSE TOGETHER SUCH THAT THEY TOUCH.

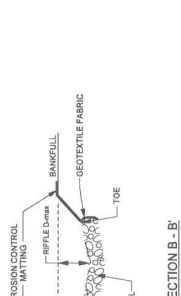
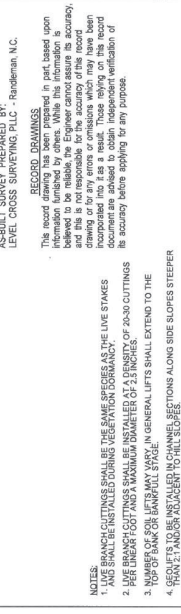
AS-BUILT SURVEY PREPARED BY:
LEVEL CROSS SURVEYING, P.L.C. - Randleman, N.C.
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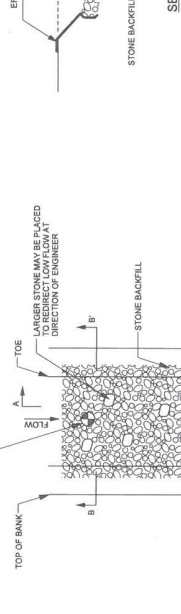
NOTES:
 1. LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD PREFERRED, AND RECENTLY HARVESTED AND EXTENDED INTO THE BANKS ON EACH SIDE.
 2. SECONDARY LOGS SHOULD BE AT LEAST 10" IN DIAMETER AND NOT MORE THAN 10' LONG AND EXTEND INTO THE BANKS ON EACH SIDE.
 3. VERTICAL POSTS SHOULD BE AT LEAST 10" IN DIAMETER AND SHOULD BE DRIVEN INTO THE GROUND.
 4. FILTER FABRIC SHOULD BE MAILED TO THE HEADER LOG BELOW THE BACKFILL.
 5. ROOTWASMS AND CORP FIRMING MAT CAN BE USED INSTEAD OF TRANSPLANTS OR LIVE STAKES. PER DIRECTION OF ENGINEER.
 6. ANNUAL GAPS A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN SECONDARY LOGS BEFORE ADDITIONAL LAYERS ARE PLACED.

NOTES:
 1. LOGS WITHOUT ROOT MASS MAY BE USED IF APPROVED BY PROJECT ENGINEER.
 2. LOGS WITHOUT ROOT MASS SHOULD BE WOOD, GEOTEXTILES, TRANSPLANTS, OR BOULDERS.
 3. SEE NOTES FOR LOGS WITH ROOT MASS NOTCHED.
 4. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.

CONSTRUCTED RIFFLE



GEOLIFT WITH BRUSH TOE



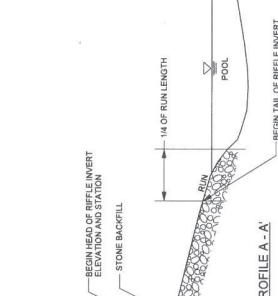
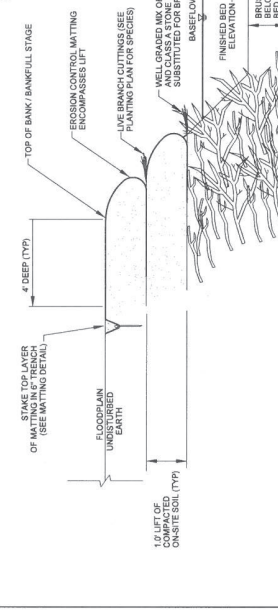
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NOTES:
 1. LIVE BRUSH CUTTINGS SHALL BE THE SAME SPECIES AS THE LIVE STAKES AND SHALL BE INSTALLED DURING VEGETATION DOMINANCE.
 2. LIVE BRUSH CUTTINGS SHALL BE 2-3 INCHES IN DIAMETER AND 2-3 INCHES LONG.
 3. NUMBER OF LIVE BRUSH CUTTINGS SHALL VARY IN GENERAL LIFTS SHALL EXTEND TO THE TOP OF BANK.
 4. RIFFLE LIFTS TO BE INSTALLED IN CHANNEL SECTIONS ALONG SIDE SLOPES STEEPER THAN 2:1 AND/OR ADJACENT TO HILL SLOPES.

NOTES:
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 3. INSTALL STONE BACKFILL COMPACTED TO GRADE.
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 12. SLOPES EXCEED 10% AS DETERMINED IN THE FIELD BY THE CONTRACTOR AND ENGINEER.

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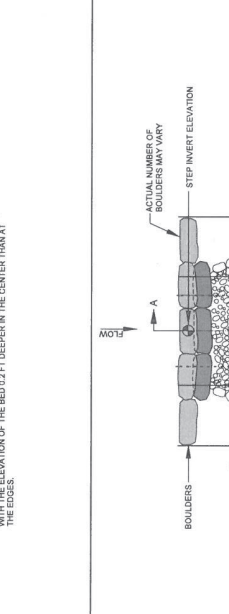
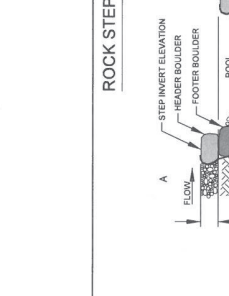
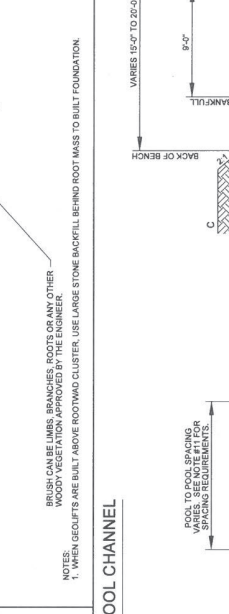


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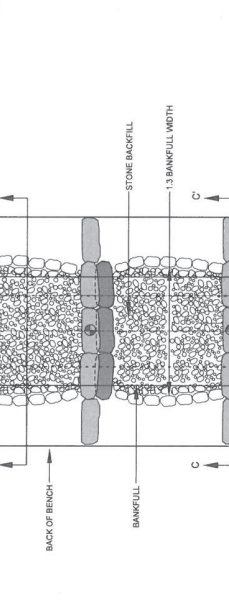
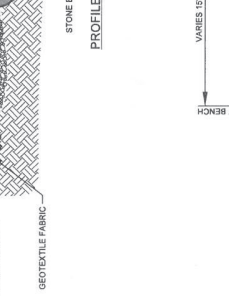


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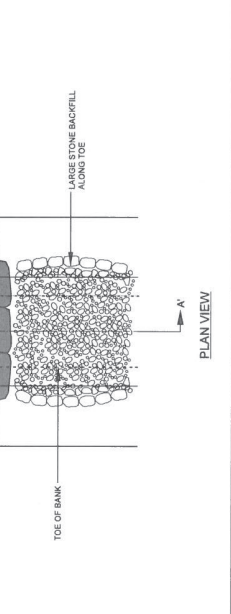
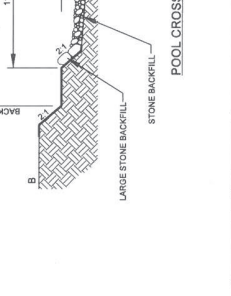


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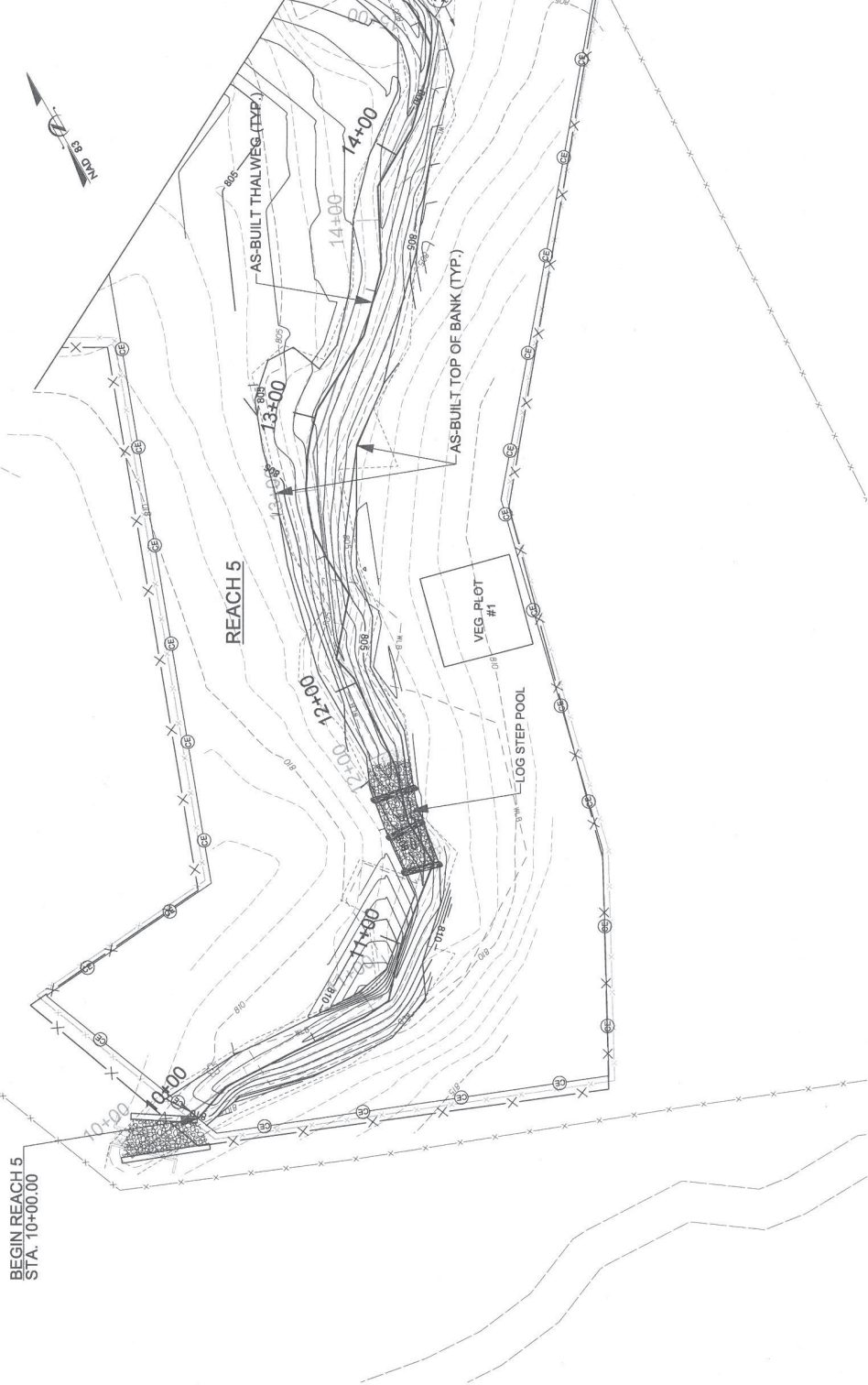
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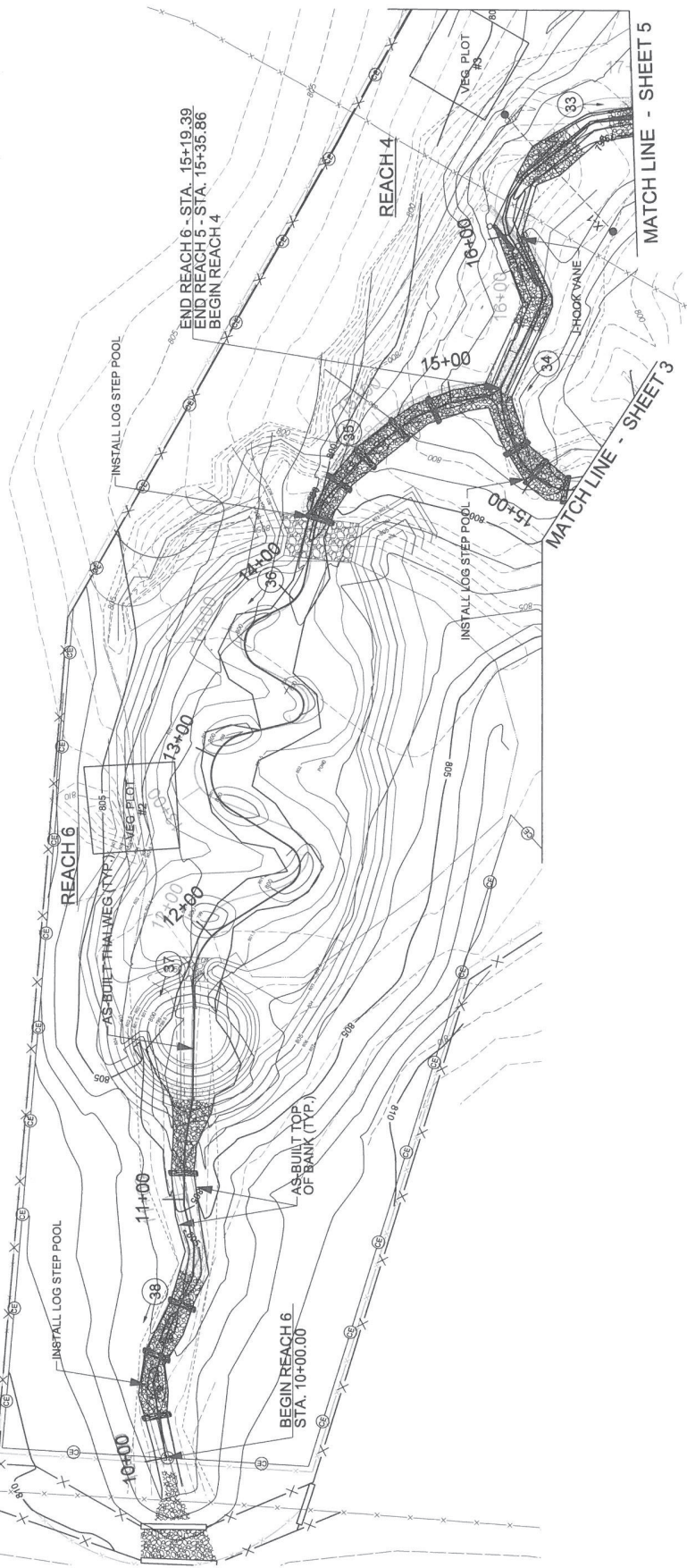
MATCH LINE - SHEET 4



BAKER PROJECT REFERENCE NO. 140048 SHEET NO. 4
 PROJECT ENGINEER
 APPROVED BY: *[Signature]*
 DATE: 9.8.17
 MICHAEL BAKER INTERNATIONAL
 NCDMS ID NO. 96313

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BROWNS SUMMIT
 AS-BUILT PLAN VIEW

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 SCALE (FT)

BAKER PROJECT REFERENCE NO. 160048
 PROJECT ENGINEER
 SHEET NO. 5

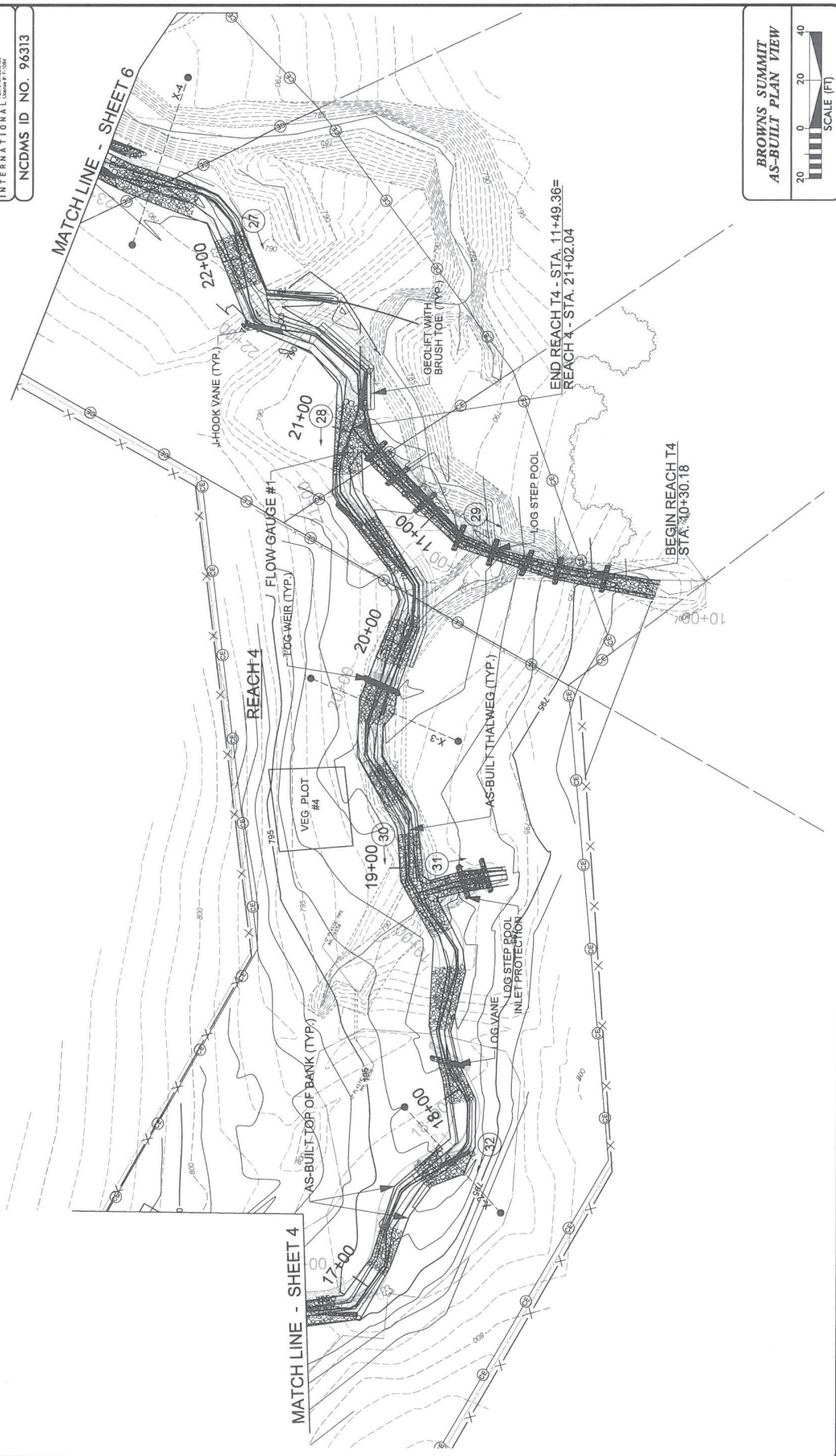
APPROVED BY: *[Signature]*
 DATE: 9.8.17

Michael Baker International
 10000 North Central Expressway
 Suite 1000
 Dallas, Texas 75243
 INTERNATIONAL

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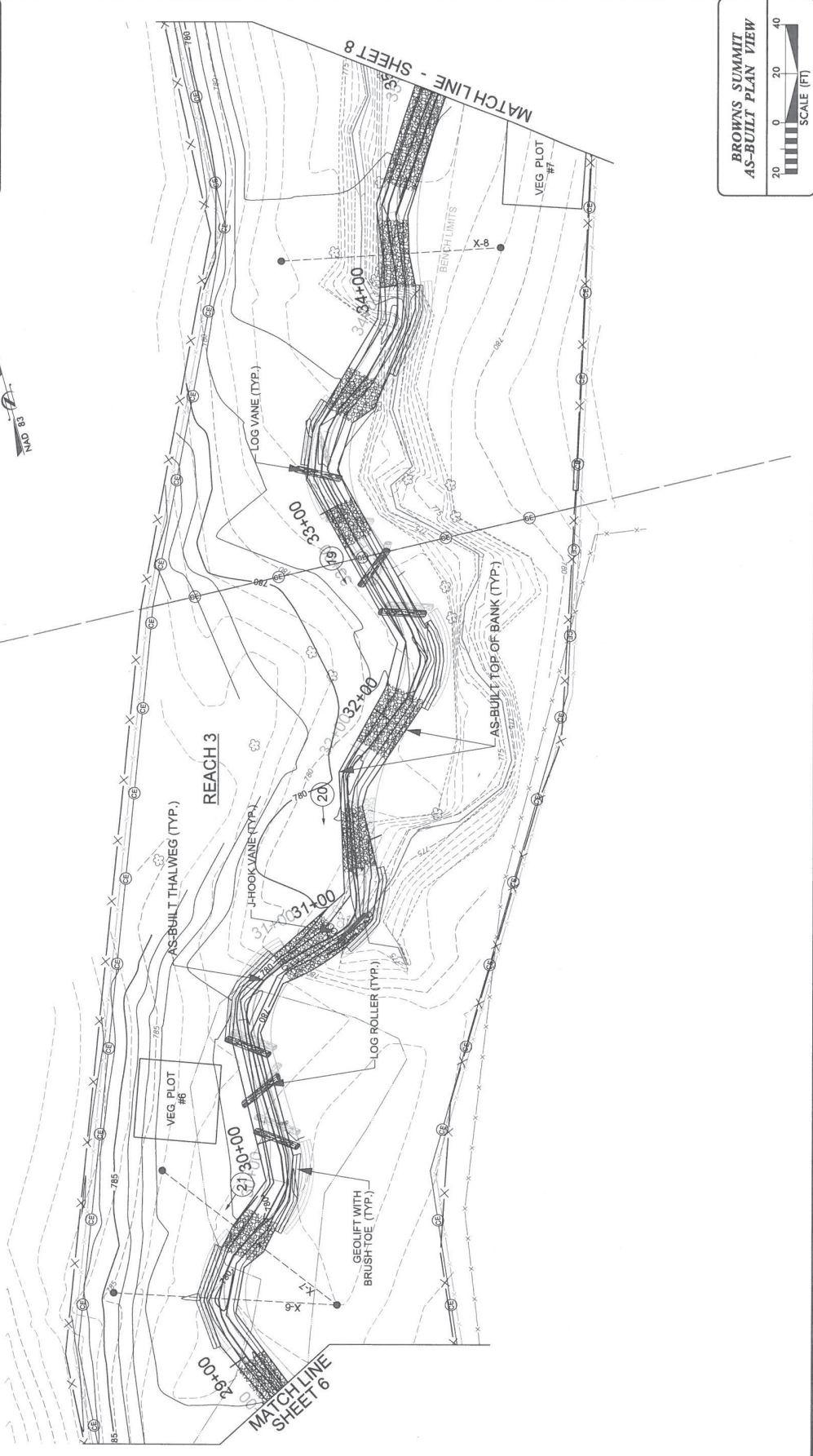
BROWNS SUMMIT
 AS-BUILT PLAN VIEW

SCALE (FT)

BAKER PROJECT REFERENCE NO. 140048
 SHEET NO. 7
 PROJECT ENGINEER
 APPROVED BY: *Michael Baker*
 DATE: 9-8-17
 Michael Baker Engineering Inc.
 INTERNATIONAL
 NCDMS ID NO. 96313

AS-BUILT SURVEY PREPARED BY:
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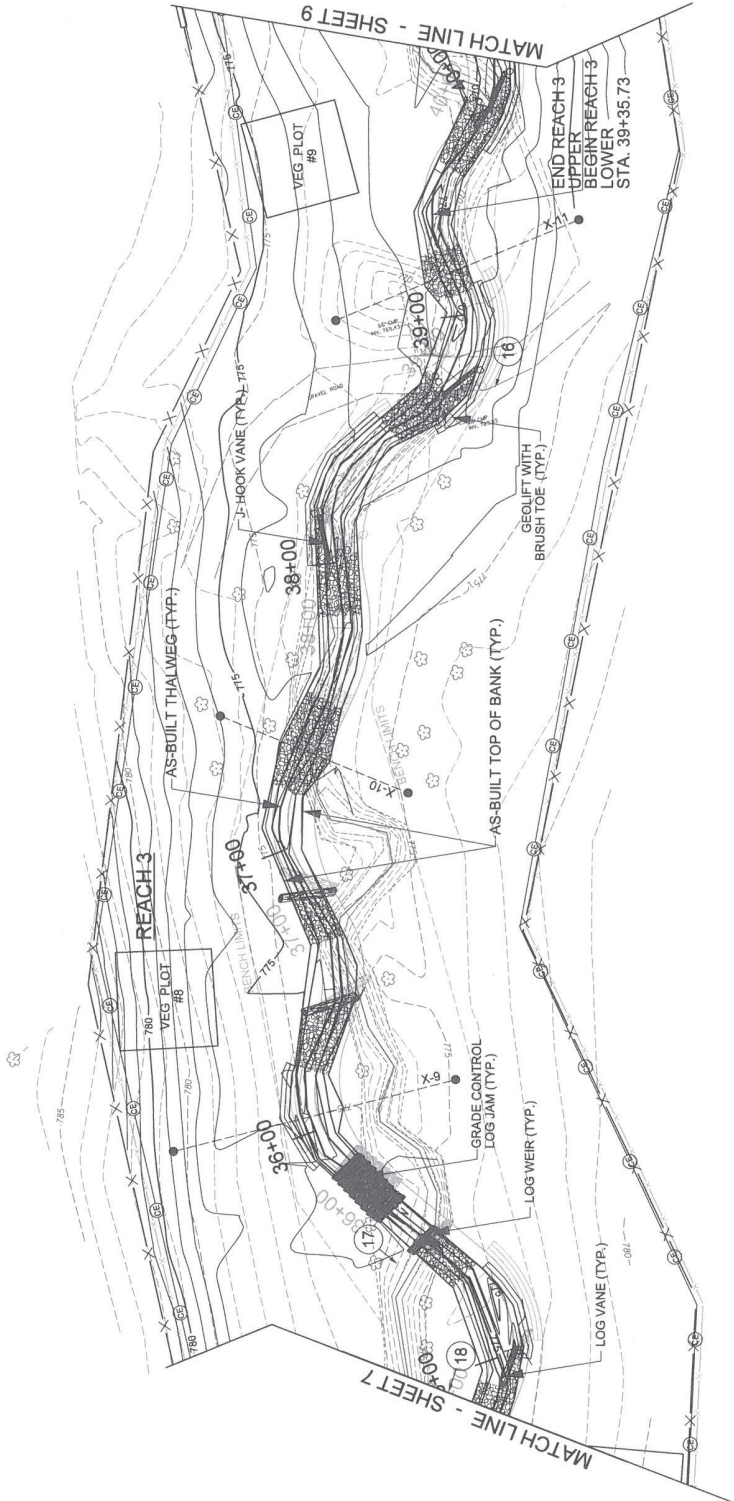
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 AS-BUILT PLAN VIEW
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BAKER PROJECT REFERENCE NO. **140048** SHEET NO. **8**
 PROJECT ENGINEER
 APPROVED BY: **KAMEKAWA**
 DATE: **9-9-17**
Michael Baker International
 INTERNATIONAL
 NCDMS ID NO. **96313**

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 SCALE (FT)

BAKER PROJECT REFERENCE NO. 140048 SHEET NO. 9

PROJECT ENGINEER

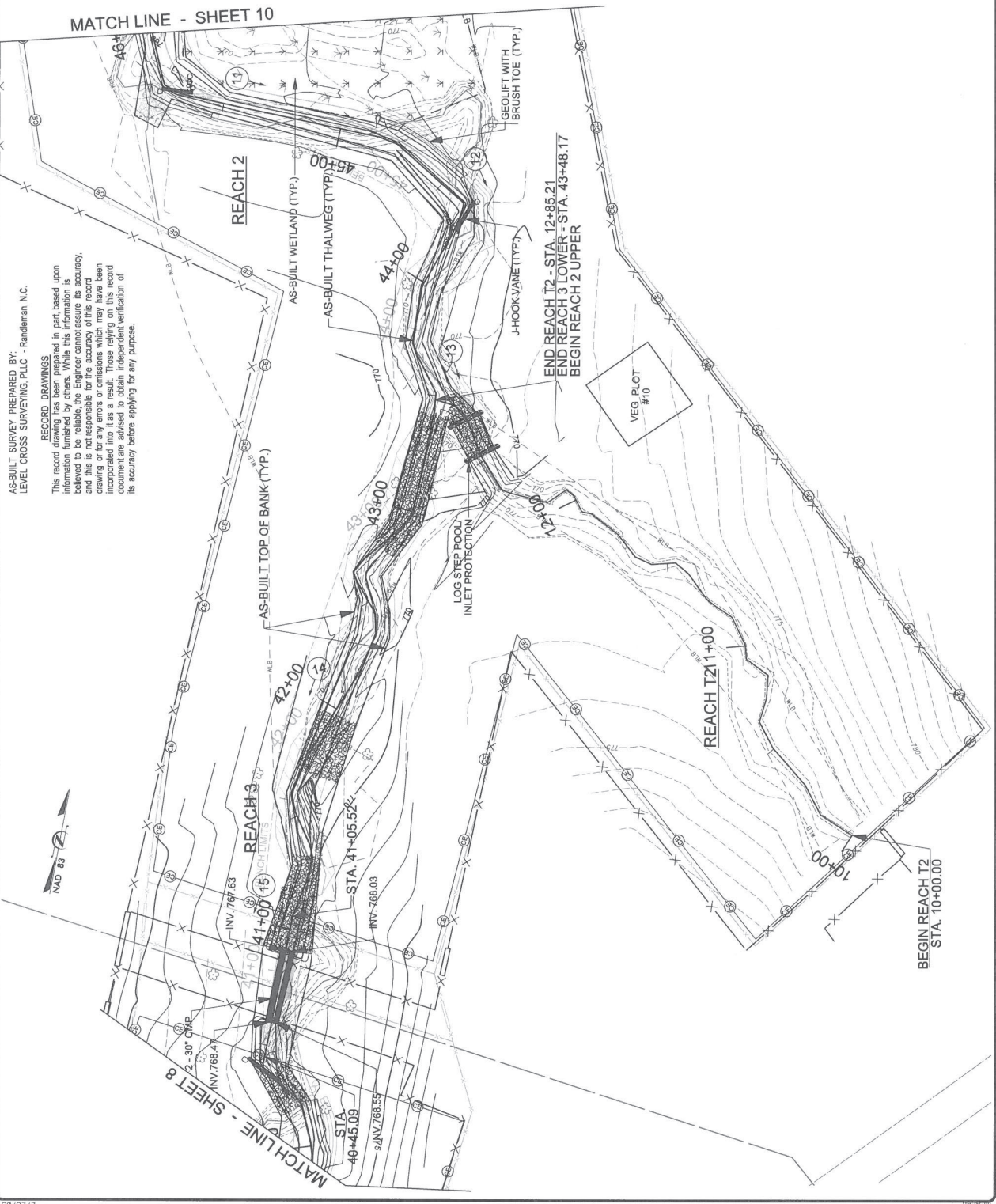
APPROVED BY: *[Signature]* DATE: 9-17-17

Mitchell Baker Engineering Inc.
 10000 W. Highway 101, Suite 100
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 Phone: 919.488.8588
 Fax: 919.488.8589
 E-mail: info@mbakereng.com

Mitchell Baker INTERNATIONAL
 NCDMS ID NO. 96313

BROWNS SUMMIT
 AS-BUILT PLAN VIEW

SCALE (FT)



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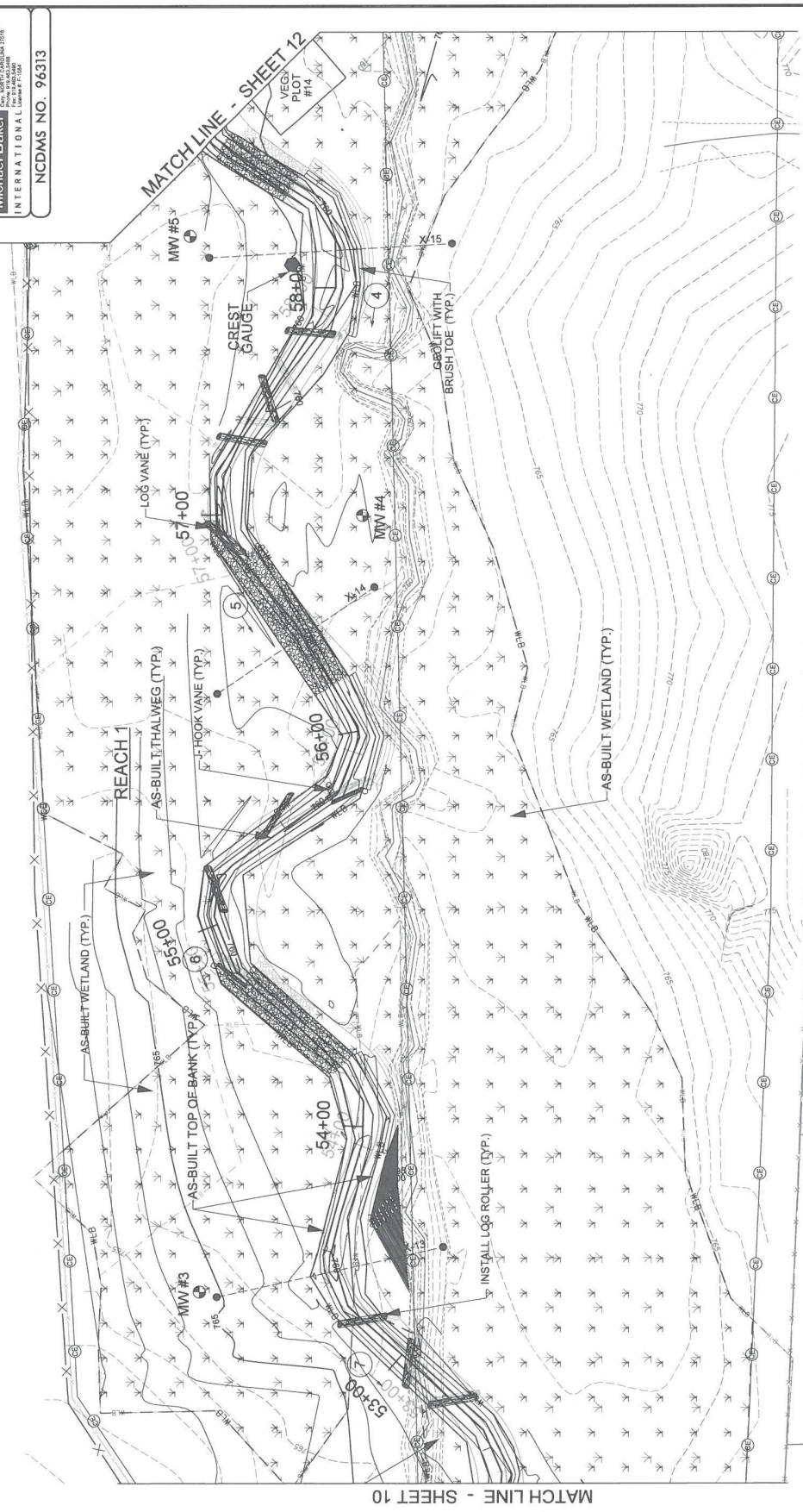
BAKER PROJECT REFERENCE NO. 140048
 PROJECT NUMBER 140048
 SHEET NO. 11

APPROVED BY: *K. M. K. K. K.*
 DATE: 9-8-17

Michael Baker Engineering Inc.
 INTERNATIONAL
 NCDMS NO. 96313

AS-BUILT SURVEY PREPARED BY:
 LEVEL CROSS SURVEYING, PLLC - Randleman, N.C.

RECORD DRAWINGS
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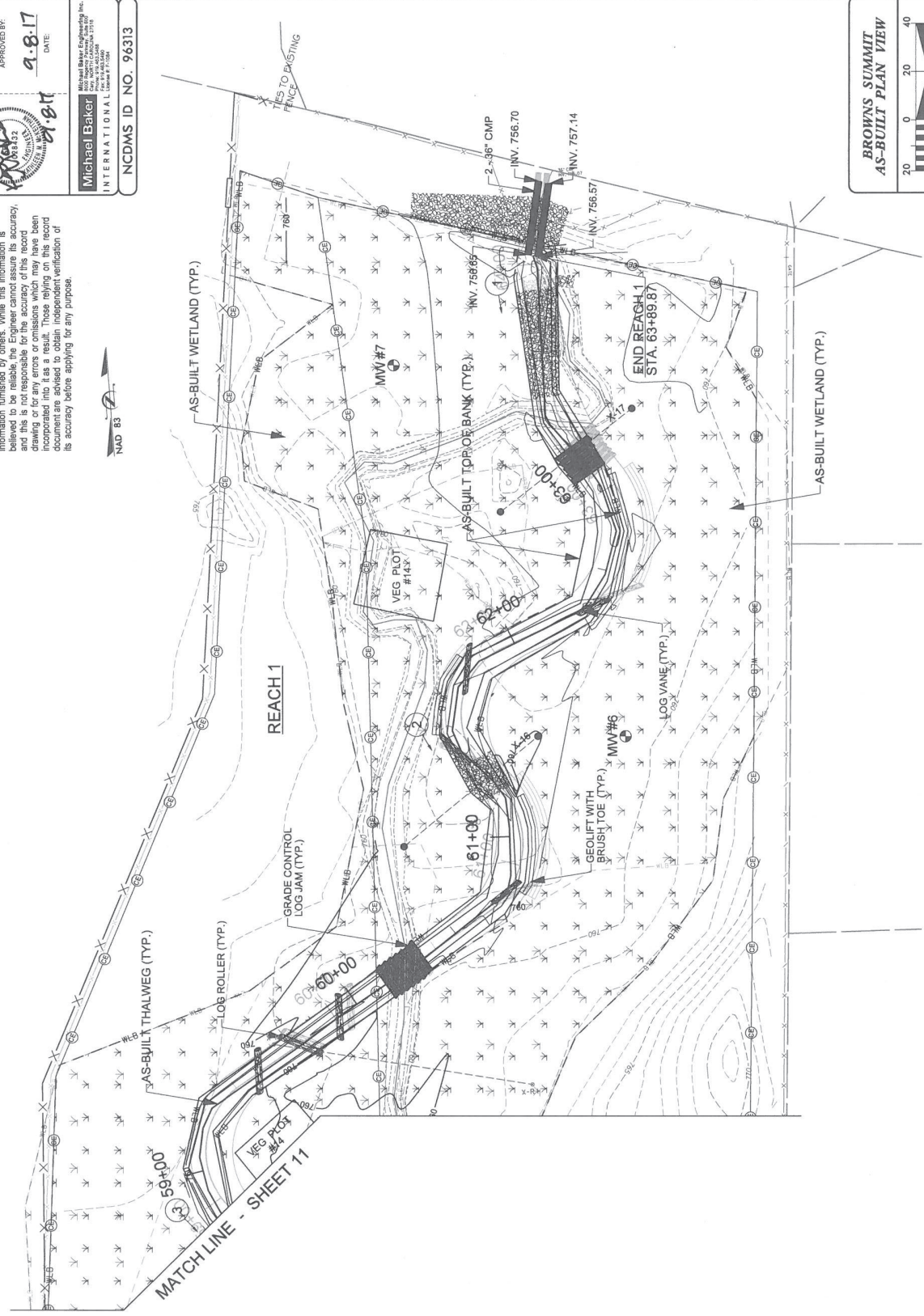
BROWNS SUMMIT
 AS-BUILT PLAN VIEW

SCALE (FT)

BAKER PROJECT REFERENCE NO. 140048
 SHEET NO. 12
 PROJECT ENGINEER
 APPROVED BY: *K. K. K...*
 DATE: 9-8-17
 MICHAEL BAKER INTERNATIONAL
 10000 W. BRIDGEWAY, SUITE 100
 DALLAS, TEXAS 75243
 (214) 635-1100
 NCDMS ID NO. 96313

AS-BUILT SURVEY PREPARED BY:
 LEVEL CROSS SURVEYING, PLLC - Randleman, N.C.

RECORD DRAWINGS
 This record drawing has been prepared in part based upon information furnished by others. While this information is believed to be reliable, the Engineer cannot assure its accuracy, and this is not responsible for the accuracy of this record drawing. The Engineer's responsibility is to ensure that the information incorporated into it as a result. Those relying on this record document are advised to obtain independent verification of its accuracy before applying for any purpose.



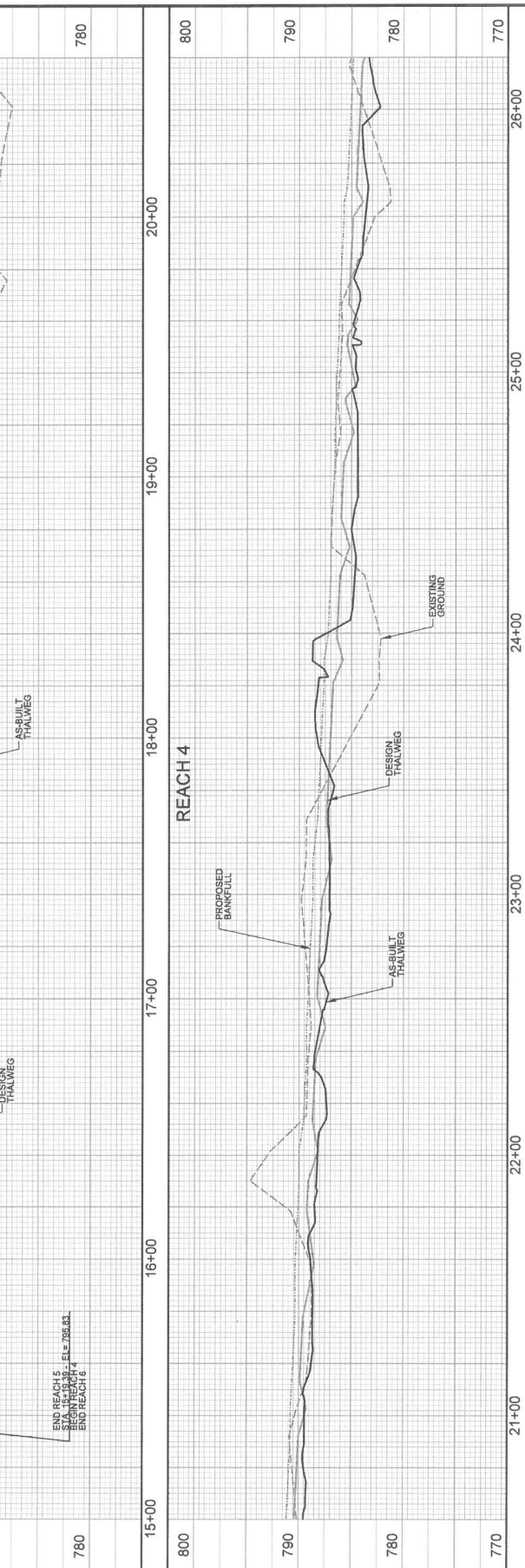
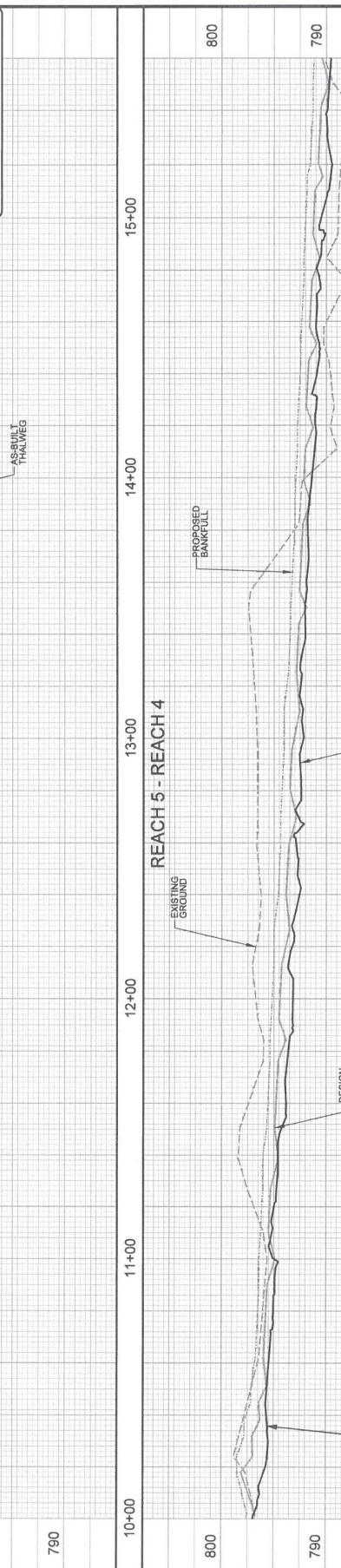
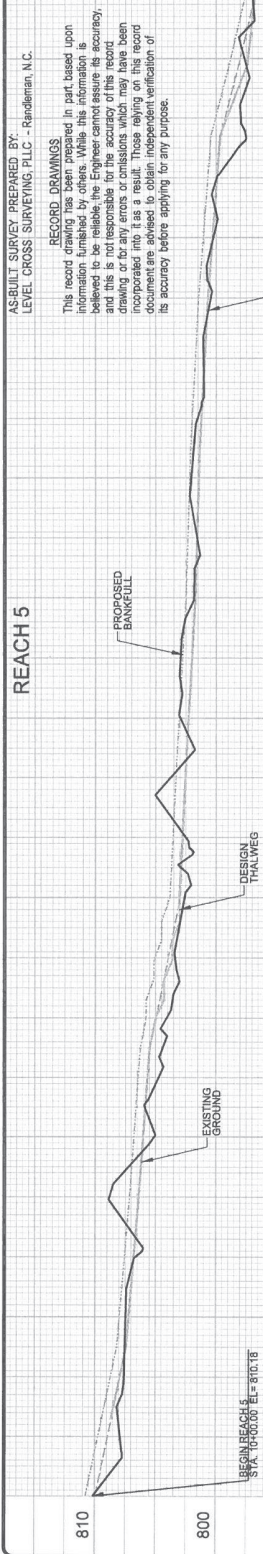
BROWNS SUMMIT
 AS-BUILT PLAN VIEW
 SCALE (FT)
 0 20 40

AS-BUILT SURVEY PREPARED BY:
LEVEL CROSS SURVEYING, PLLC - Raleigh, N.C.

RECORD DRAWINGS
This record drawing has been prepared in part based upon information furnished by others. While this information is believed to be reliable, the Engineer cannot ensure its accuracy, completeness or that the information is not in violation of any laws or regulations. The Engineer is not responsible for any errors or omissions which may have been incorporated into it as a result. Those relying on this record document are advised to obtain independent verification of its accuracy before applying for any purpose.

PROJECT ENGINEER
APPROVED BY:
K. McLehman
DATE:
9.8.17

Michael Baker Engineering Inc.
INTERNATIONAL
EEP ID NO. 96313



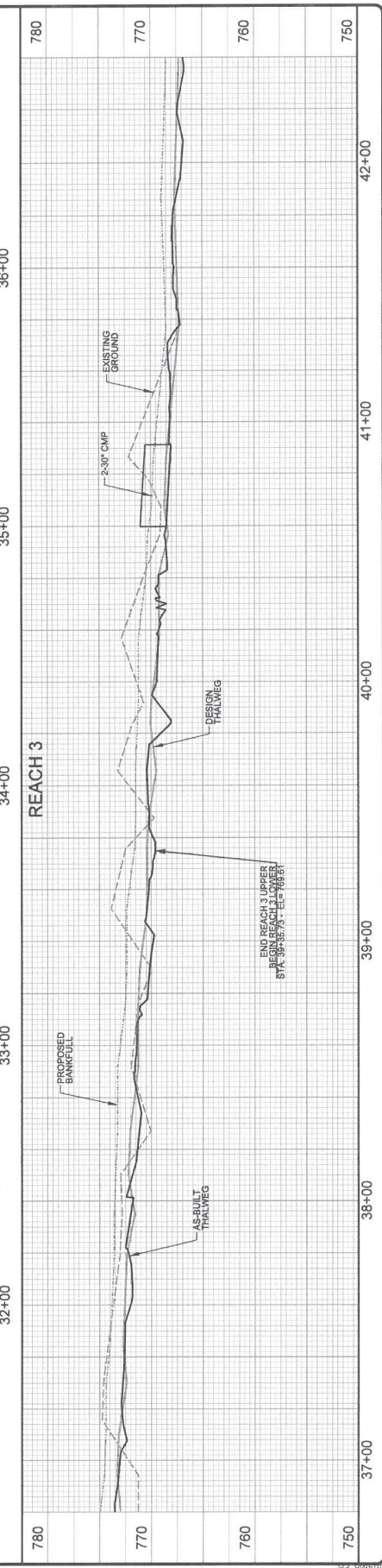
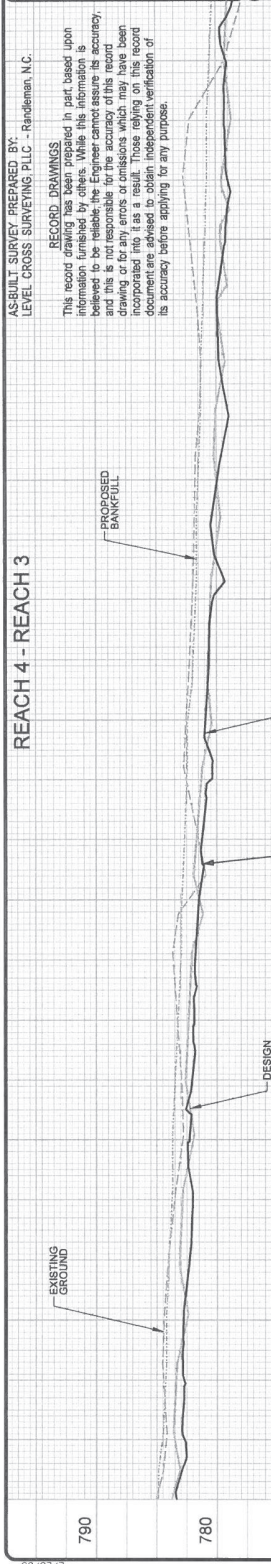
AS-BUILT SURVEY PREPARED BY:
LEVEL CROSS SURVEYING PLLC - Randleman, N.C.

RECORD DRAWINGS
This record drawing has been prepared in part based upon information furnished by others. While this information is deemed to be reliable for the purpose of this record drawing, the engineer does not warrant the accuracy of this drawing or for any errors or omissions which may have been incorporated into it as a result. Those relying on this record document are advised to obtain independent verification of its accuracy before applying for any purpose.

PROJECT ENGINEER
K. MCKENNA
APPROVED BY:
1-8-17
DATE

Michael Baker Engineering Inc.
10000 Park Lakeshore Drive
Charlotte, NC 28219
Tel: 704.541.5000
Fax: 704.541.5001
www.mbakeng.com

Michael Baker INTERNATIONAL
EEP ID No. 86313

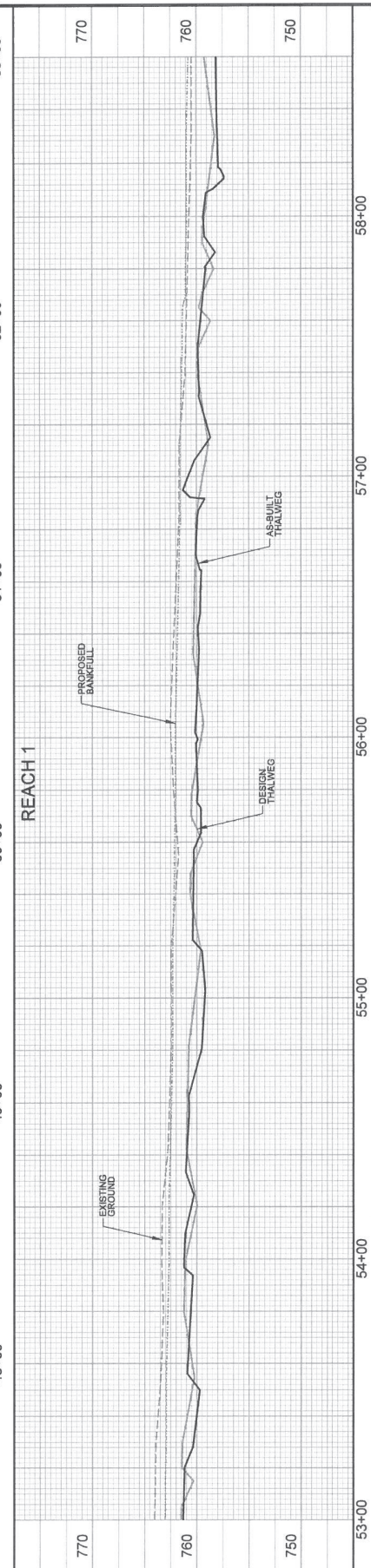
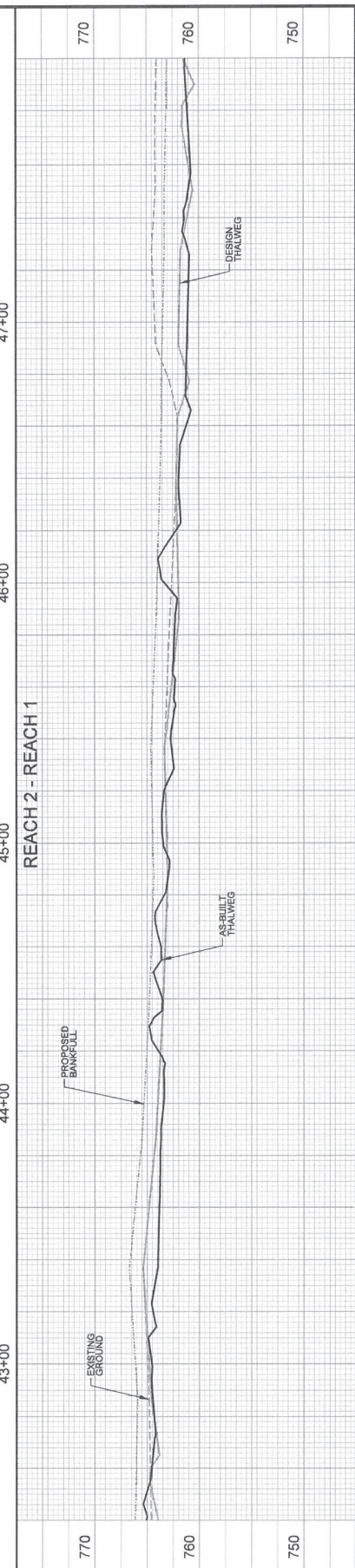
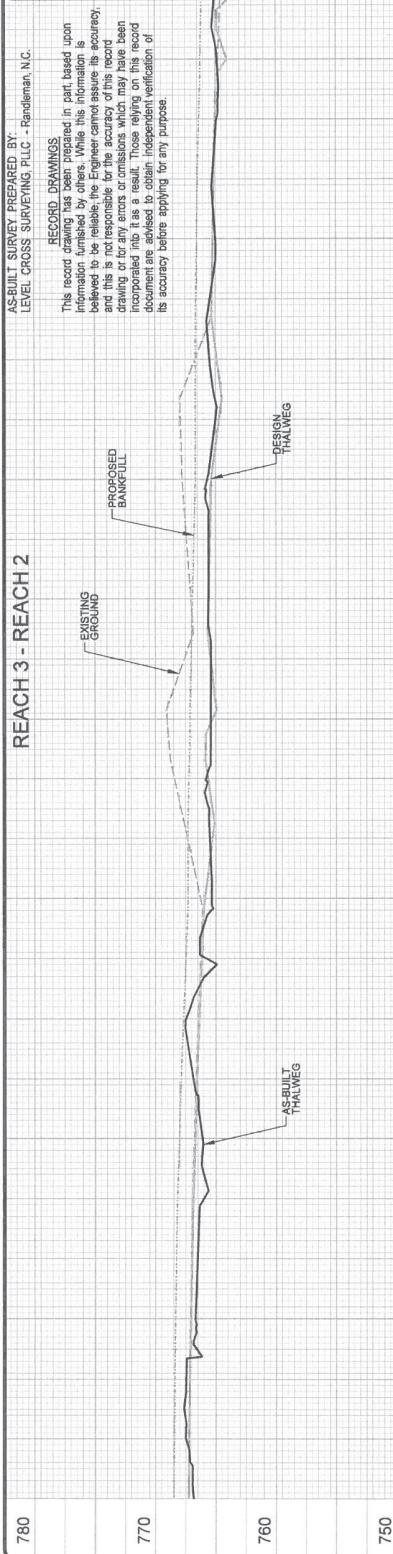


AS-BUILT SURVEY PREPARED BY:
LEVEL CROSS SURVEYING, P.L.L.C. - Randleman, N.C.

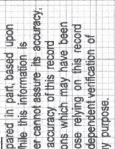
RECORD DRAWINGS
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PROJECT ENGINEER
KIM M. WILSON
APPROVED BY:
KIM M. WILSON
DATE:
9.8.17

Michael Baker International
EEP ID No. 96313



APPROVED BY: *K. McKeethan*
 DATE: 9.8.17

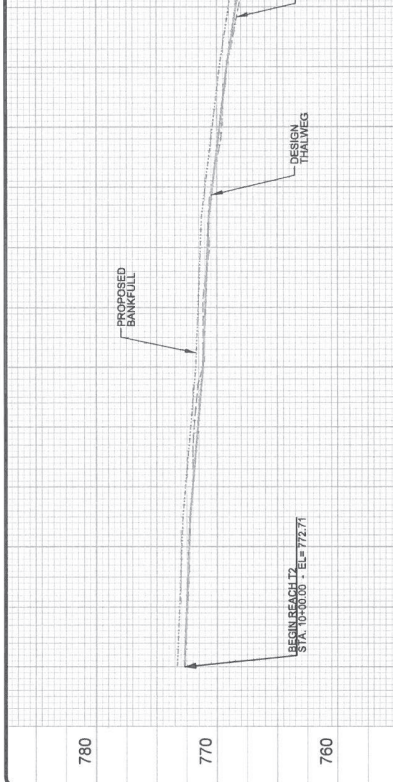


Michael Baker International
 EEP ID No. 96313

AS-BUILT SURVEY PREPARED BY:
 LEVEL CROSS SURVEYING PLLC - Raleigh, N.C.

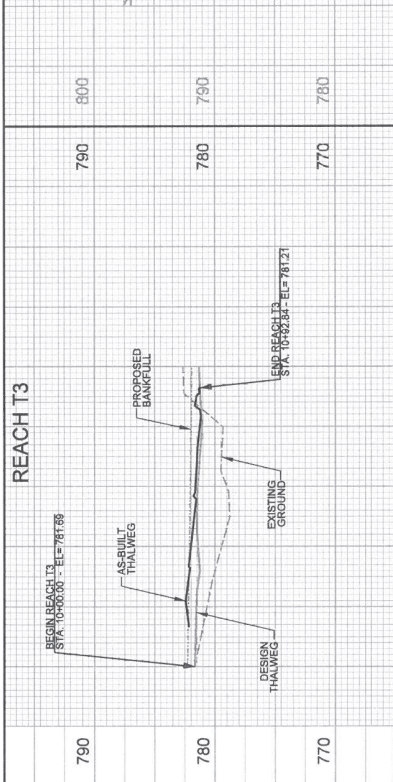
RECORD DRAWINGS
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REACH T2



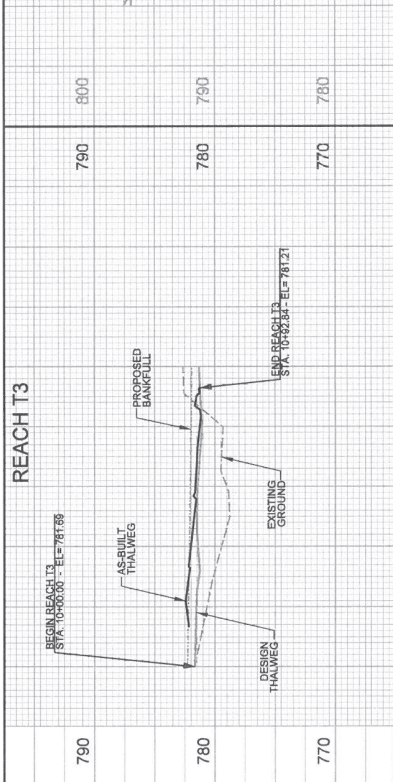
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770
760

REACH T3

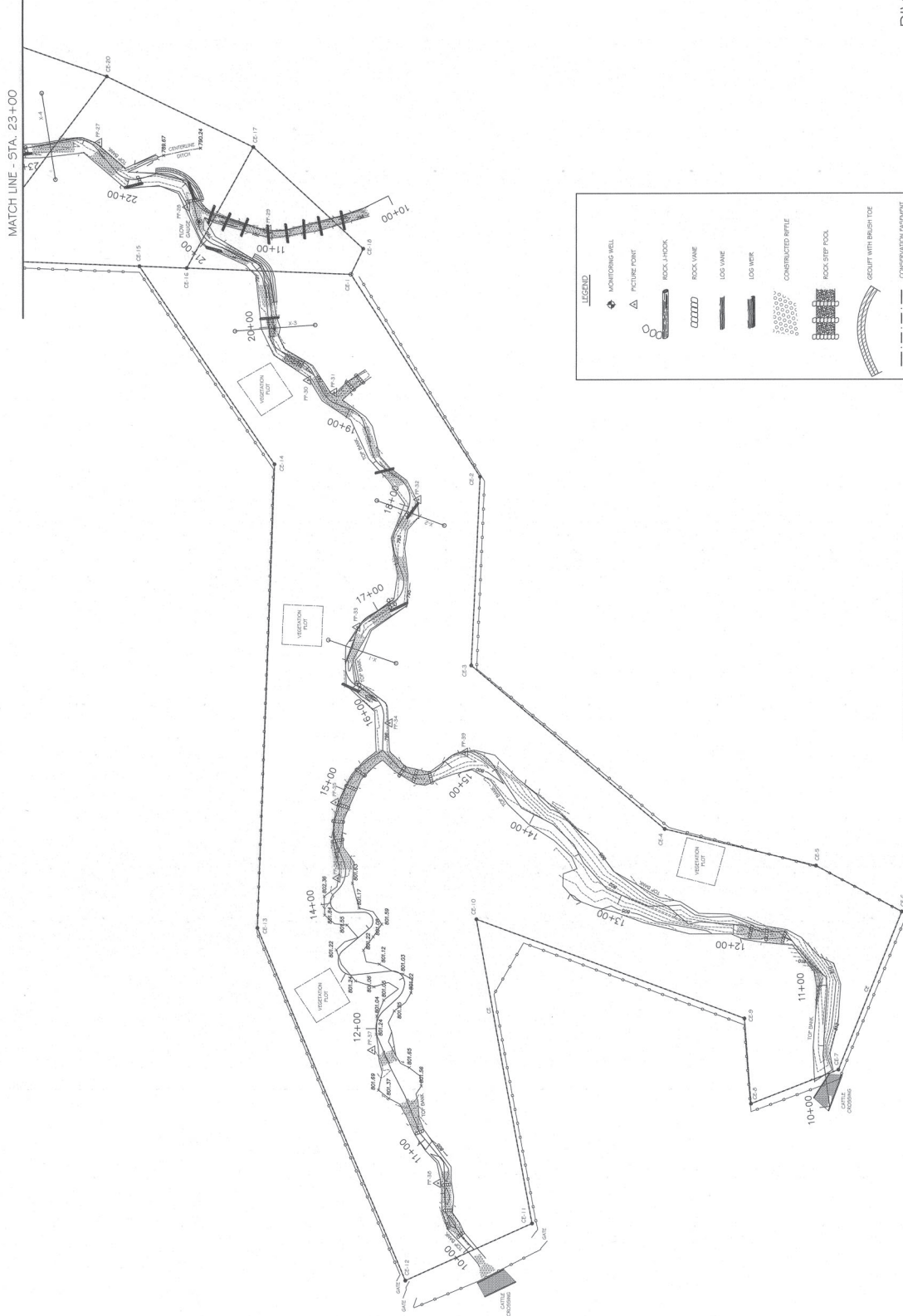


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780
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REACH T4



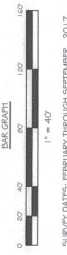
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780
770



LEGEND

	MONITORING WELL
	PICTURE POINT
	ROCK HOOK
	ROCK VANE
	LOG VANE
	LOG WORK
	CONSTRUCTED RIPRAP
	ROCK STEP POOL
	CULVERT WITH BRUSH TOE
	CONSERVATION EASEMENT
	FENCE
	CROSS SECTION
	CE CONSERVATION EASEMENT
	REMAIN WITH CAP
	EXISTING IRON PIPE

TOPOGRAPHIC & AS-BUILT SURVEY
 DIVISION OF MITIGATION SERVICES
 GUILFORD COUNTY
 NCDMS ID NO. 96313
 BAKER PROJECT NO. 140046
 GUILFORD COUNTY, NC



SURVEY DATES: FEBRUARY THROUGH SEPTEMBER, 2017



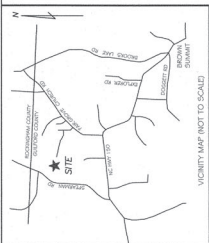
I, WILLIAM S. DURHAM, JR., HEREBY CERTIFY THAT THIS SURVEY WAS CONDUCTED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE BOARD OF EXAMINERS UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND PRESENCE, WITNESSED BY ORIGINAL JOURNAL LICENSE NUMBER AND SEAL THIS 30th DAY OF OCTOBER, 2017.

William S. Durham, Jr.
 WILLIAM S. DURHAM, JR., L.L.C.
 PROFESSIONAL LAND SURVEYOR

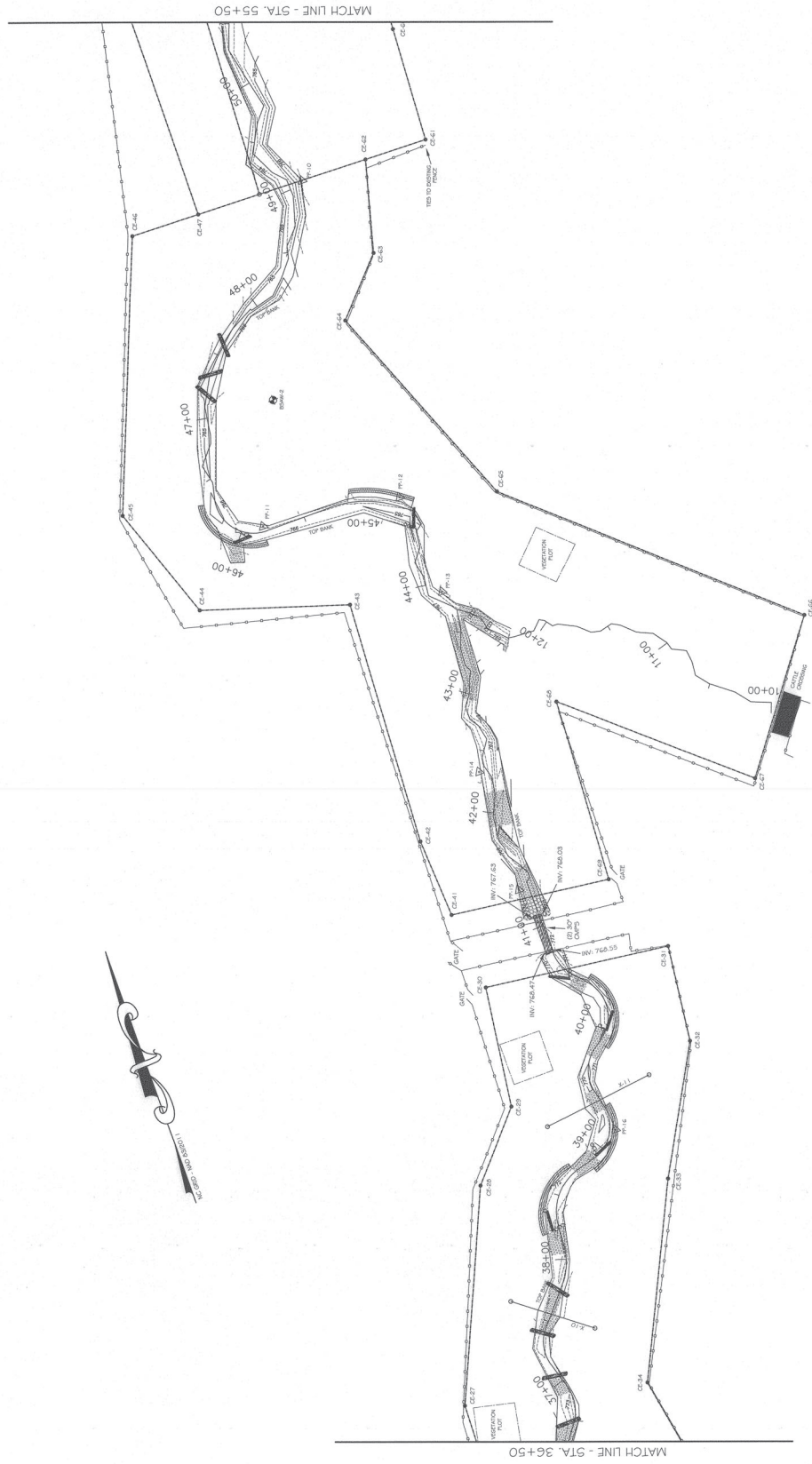
- NOTES:**
1. ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES.
 2. ALL HEIGHTS ARE BY THE COORDINATE METHOD.
 3. SHOULD A TITLE REFLECT THIS SURVEY AS SUBJECT TO A FUTURE SURVEY, THIS SURVEY SHALL BE CONSIDERED BY A FULL AND ACCURATE TITLE SEARCH.

LEVEL CROSS SURVEYING, PLLC
 P.O. Box 869
 Eden, NC 27288
 Ph. (336) 495-1713





LEGEND	
	MONITORING WELL
	PICTURE POINT
	ROCK HOOK
	ROCK VANE
	LOG VANE
	LOG MARK
	CONSTRUCTED RIPRAP
	ROCK STEP POOL
	GOULT WITH BRUSH PILE
	CONSERVATION EASEMENT
	FENCE
	CROSS SECTION
	CE CONSERVATION EASEMENT
	RESAM WITH CAP
	EXISTING IRON PIPE



TOPOGRAPHIC & AS-BUILT SURVEY
 DIVISION OF MITIGATION SERVICES
 GUILFORD COUNTY
 NCDMS ID NO. 96313
 BAKER PROJECT NO. 140046
 GUILFORD COUNTY, NC

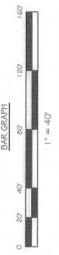


WILLIAM S. DERRHAL IS HEREBY CERTIFYING THAT THIS TOPOGRAPHIC AND AS-BUILT SURVEY WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE BY ME OR BY A LICENSED SURVEYOR UNDER MY SUPERVISION. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 30th DAY OF OCTOBER, 2017.

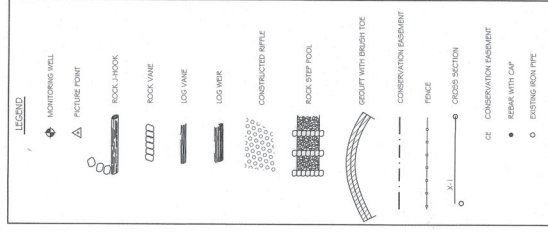
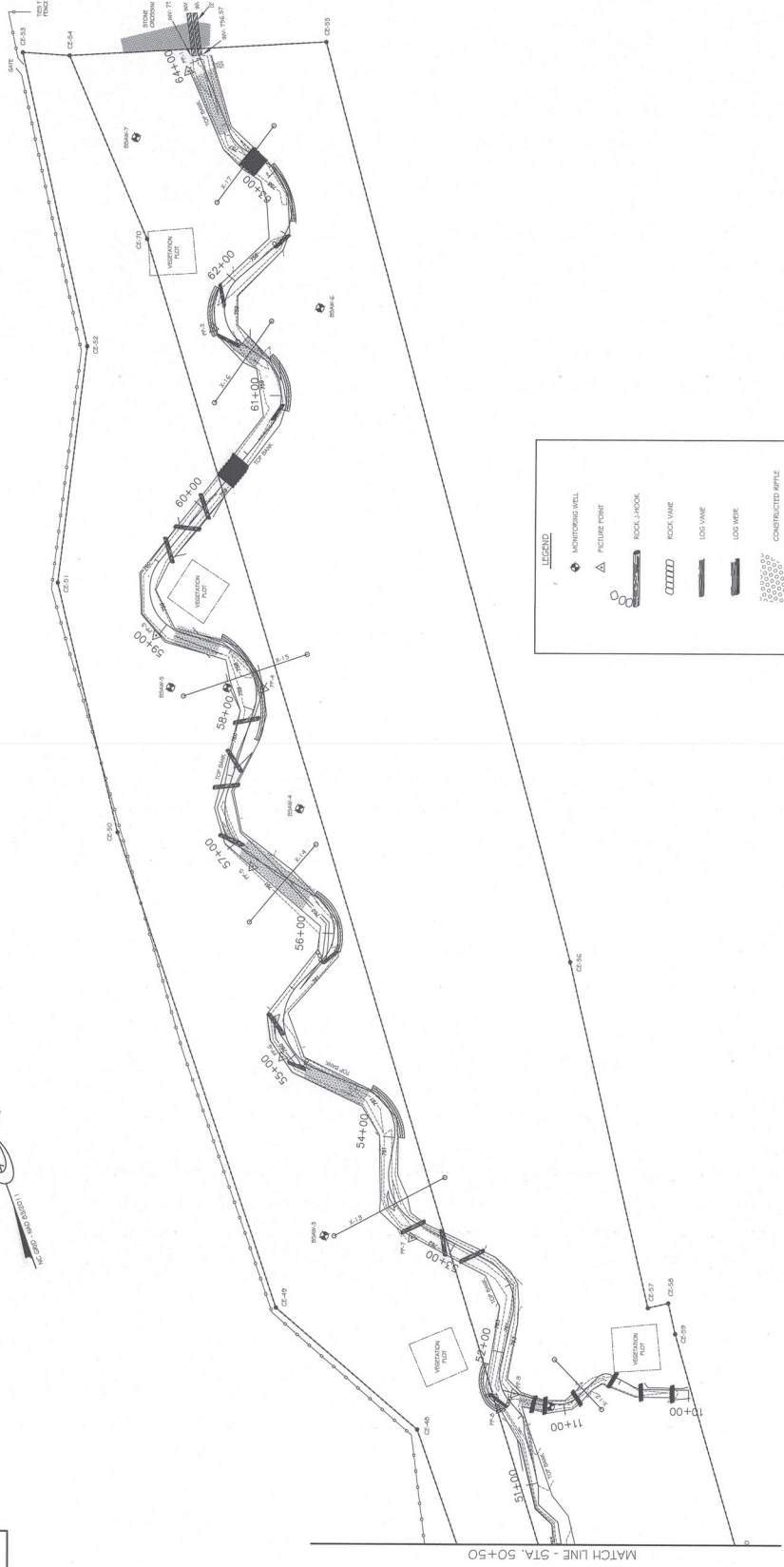
W.S. Derrhal
 WILLIAM S. DERRHAL, P.E. (11747)
 PROFESSIONAL LAND SURVEYOR

NOTES:
 1. ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET, UNLESS OTHERWISE STATED.
 2. ALL ANGLES ARE IN DEGREES, MINUTES AND SECONDS.
 3. THE HORIZONTAL DISTANCES AND ANGLES SHOWN ON THIS PLAN ARE THE RESULT OF A TIE TRIANGLE. THIS SURVEY IS SUBJECT TO A FULL AND ACCURATE TITLE SEARCH.

LEVEL CROSS SURVEYING, PLLC
 P.O. Box 699
 Liberty, NC 27288
 Ph. (336) 465-1713



DATE: FEBRUARY THROUGH SEPTEMBER, 2017
 SURVEY DATES: FEBRUARY THROUGH SEPTEMBER, 2017



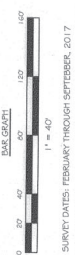
I, WILLIAM S. DURHAM, JR., HEREBY CERTIFY THAT THIS SURVEY WAS CONDUCTED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE BOARD OF SURVEYING AND MAPPING UNDER MY SUPERVISION. THE INFORMATION BEING SHOWN ON THIS DRAWING IS THE RESULT OF A FIELD SURVEY CONDUCTED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE BOARD OF SURVEYING AND MAPPING AND SEAL THIS 30th DAY OF OCTOBER, 2017.

William S. Durham, Jr.
 WILLIAM S. DURHAM, JR.
 PROFESSIONAL LAND SURVEYOR

- NOTES:
1. ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET (UNLESS OTHERWISE SHOWN)
 2. ALL ANGLES ARE BY THE COORDINATE METHOD.
 3. THE SURVEYOR'S NAME AND FIRM NAME SHALL BE PLACED AT THE RIGHT OF A TITLE BLOCK. THIS SURVEY IS SUBJECT TO ALL APPLICABLE REGULATIONS AND SHALL BE DISCLOSED BY A FULL AND ACCURATE TITLE BLOCK.

LEVEL CROSS SURVEYING, PLLC
 P.O. Box 929
 Liberty, NC 27288
 Ph. (336) 486-1713

TOPOGRAPHIC & AS-BUILT SURVEY
 DIVISION OF MITIGATION SERVICES
 GUILFORD COUNTY
 NCDMS ID NO. 96313
 BAKER PROJECT NO. 140048
 GUILFORD COUNTY, NC



SURVEY DATES: FEBRUARY THROUGH SEPTEMBER, 2017