STATE	BAKER PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	128975	1	34

NORTH CAROLINA
DIVISION OF MITIGATION SERVICES

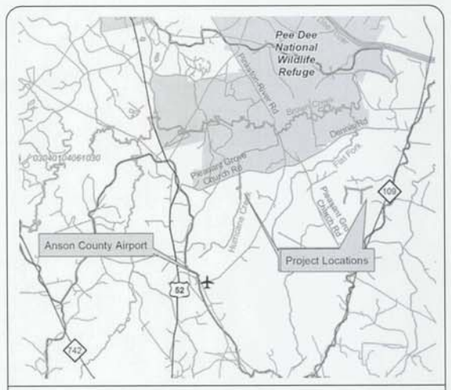
ANSON COUNTY

LOCATION: APPROX. 4 MILES SOUTHEAST OF THE TOWN OF ANSONVILLE.

TYPE OF WORK: AS–BUILT SURVEY / RECORD DRAWINGS

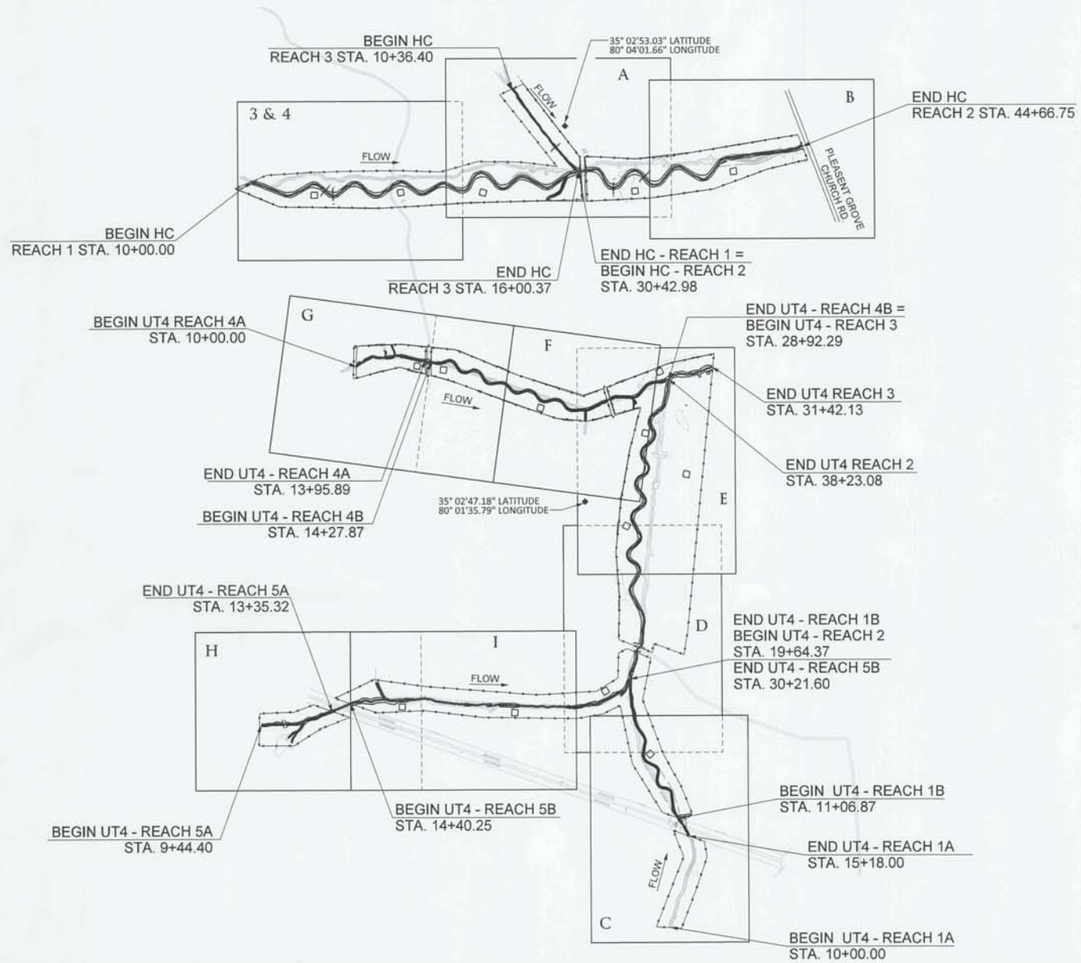
BROWN CREEK TRIBS

PROJECT: 128975



VICINITY MAP

INDEX OF SHEETS



NAD 83

USACE ID: SAW-2012-01108
NCDWR # 14-0345
PCN APPROVED ON: 08/22/14

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II
12-7-16

NCDMS ID NO. 95351

GRAPHIC SCALE

20 10 0 20 40
PLANS

DESIGN SUMMARY

AS–BUILT HC REACH 1 LENGTH	=	2043 FEET
AS–BUILT HC REACH 2 LENGTH	=	1394 FEET
AS–BUILT HC REACH 3 LENGTH	=	564 FEET
AS–BUILT UT4 – REACH 1A LENGTH	=	518 FEET
AS–BUILT UT4 – REACH 1B LENGTH	=	858 FEET
AS–BUILT UT4 – REACH 2 LENGTH	=	1828 FEET
AS–BUILT UT4 – REACH 3 LENGTH	=	250 FEET
AS–BUILT UT4 – REACH 4A LENGTH	=	396 FEET
AS–BUILT UT4 – REACH 4B LENGTH	=	1444 FEET
AS–BUILT UT4 – REACH 5A LENGTH	=	391 FEET
AS–BUILT UT4 – REACH 5B LENGTH	=	1582 FEET

PREPARED FOR THE OFFICE OF:

NCDEQ
DIVISION OF MITIGATION SERVICES
1652 MAIL SERVICE CENTER
RALEIGH, NC 27699–1652

CONTACT: HARRY TSOMIDES
PROJECT MANAGER

PREPARED IN THE OFFICE OF:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

SEPTEMBER 2014
LETTING DATE:

JACOB M. BYERS, PE
PROJECT ENGINEER

SCOTT KING, LSS, PWS
PROJECT MANAGER

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

11/23/16 P.E.
SIGNATURE:

BrownCreekTribs_95351_AB_12/15/2015_F.mxd

2/26/03

STREAM CONVENTIONAL SYMBOLS
SUPERCEDES SHEET 1-B

- ROCK J-HOOK
- ROCK VANE
- OUTLET PROTECTION
- ROCK CROSS VANE
- DOUBLE DROP ROCK CROSS VANE
- TEMPORARY SILT CHECK
- ROOT WAD
- LOG J-HOOK
- LOG VANE
- LOG WEIR
- LOG CROSS VANE
- CONSTRUCTED RIFFLE
- BOULDER CLUSTER
- LOG ROLLER
- GRADE CONTROL LOG JAM
- LOG STEP POOL
- SAFETY FENCE
- TAPE FENCE
- 100 YEAR FLOOD PLAIN
- CONSERVATION EASEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- LIMITS OF DISTURBANCE
- FOOT BRIDGE
- TEMPORARY STREAM CROSSING
- PERMANENT STREAM CROSSING
- TRANSPLANTED VEGETATION
- TREE REMOVAL
- TREE PROTECTION
- DITCH PLUG
- CHANNEL FILL
- BRUSH MATTRESS
- GEOLIFT

**NOTE: ALL ITEMS ABOVE MAY NOT BE USED ON THIS PROJECT

GENERAL NOTES

1. THE CONTRACTOR IS REQUIRED TO INSTALL INSTREAM STRUCTURES USING A TRACK HOE WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS (3' x 2' x 2'), 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 2014.
4. CONTRACTOR SHOULD CALL NORTH CAROLINA "ONE-CALL" BEFORE EXCAVATION STARTS. (1-800-632-4949)
5. ENGINEER WILL FLAG SIGNIFICANT TREES TO BE SAVED PRIOR TO CONSTRUCTION.
6. ALL GRADING ACTIVITIES SHALL TAKE PLACE WITHIN THE CONSERVATION EASEMENT OR LIMITS OF DISTURBANCE UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO.	SHEET NO.
128975	1-A

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/16/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

STANDARD SPECIFICATIONS

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

6.05 TREE PRESERVATION AND 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

VEGETATION SELECTION

The following table lists the bare root vegetation selection for the project site. Total planting area is approximately 29 acres and will vary based on areas denuded during construction. Species shall be planted at density of 680 stems per acre and a minimum of 50 feet from the stream banks to the revegetation limits. Exact placement of species will be determined prior to site planting and based on apparent wetness of planting locations and per the vegetation specialist. Refer to the Revegetation Plan Sheets & Construction Specifications for vegetation planting locations and riparian buffer requirements.

Riparian Buffer - Trees (8'x8' spacing - 680 stems/acre)				
Scientific Name	**Common Name**	**% Planted By Species**	**Wetland Tolerance**	**Approx. Number of Stems**
Fraxinus pennsylvanica	Green Ash	9%	FACW	1,775
Betula nigra	River Birch	9%	FACW	1,775
Liriodendron tulipifera	Tulip Poplar	6%	FAC	1,183
Quercus phellos	Willow Oak	6%	FACW-	1,183
Quercus michauxii	Swamp Chestnut Oak	9%	FACW-	1,775
Nyssa sylvatica	Black Gum	6%	FAC	1,183
Platanus occidentalis	American Sycamore	9%	FACW-	1,775
Quercus alba	White Oak	6%	FACU	1,183
	Sub-total	60%		**11,832**
Riparian Buffer - Understory (8'x8' spacing - 680 stems/acre)				
Scientific Name	**Common Name**			
Diospyros virginiana	Persimmon	5%	FAC	986
Alnus serrulata	Tag alder	5%	FACW	986
Lindera benzoin	Spicebush	5%	FACW	986
Hamamelis virginiana	Witch hazel	5%	FAC-	986
Viburnum dentatum	Arrowwood Viburnum	5%	FAC	986
Itea virginica	Virginia sweetspire	5%	FACW+	986
Carpinus caroliniana	American Hornbeam	5%	FAC	986
Asimina triloba	Paw paw	5%	FAC	986
	Sub-total	40%		**7,888**
	Total Bare-roots			**19,720**

Permanent herbaceous seed mixtures for the project site shall be planted throughout the floodplain and riparian buffer areas. Permanent seed mixtures shall be applied with temporary seed, as defined in the construction specifications.

Scientific Name	**Common Name**	**% Planted By Species**	**Total lbs per Acre**	**Wetland Tolerance**
Andropogon gerardii	Big blue stem	10%	1.50	FAC
Dichanthelium clandestinum	Deer Tongue	15%	1.50	FACW
Carex crinata	Fringed sedge	10%	2.25	FACW+
Chasmanthium latifolium	River oats	5%	1.50	FACU
Elymus virginicus	Virginia wild rye	15%	1.50	FAC
Juncus effusus	Soft rush	5%	2.25	FACW+
Panicum virgatum	Switchgrass	10%	1.50	FAC+
Polygonum pensylvanicum	Pennsylvania Smartweed	5%	0.75	FACW
Schizachyrium scoparium	Little blue stem	10%	0.75	FACU
Tripsacum dactyloides	Eastern gamagrass	5%	0.75	FAC+
Sorghastrum nutans	Indiangrass	10%	0.75	FACU
	Total	**100%**	**15.0**	

Live staking will be applied to all restored streambanks following the details in this plan set and according to the construction specifications.

Scientific Name	**Common Name**	**% Planted By Species**	**Wetland Tolerance**
Cornus amomum	Silky Dogwood	10%	FACW+
Salix nigra	Black Willow	10%	OBL
Salix sericea	Silky Willow	40%	OBL
Sambucus canadensis	Elderberry	40%	FACW-

The following table lists temporary seed mix for the project site. All disturbed areas will be stabilized using mulch and temporary seed as defined in the construction specifications.

Planting Dates	**Species Name**	**Rate (lbs/acre)**
September to March	Annual Rye Grain (Cool Season)	130
April to August	Browntop Millet (Warm Season)	40

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PROJECT REFERENCE NO.	SHEET NO.
128975	1-B
NCDMS ID NO. 95351	

*S.U.E = SUBSURFACE UTILITY ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole — SS
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

Revised 02/02/00

11/9/2006
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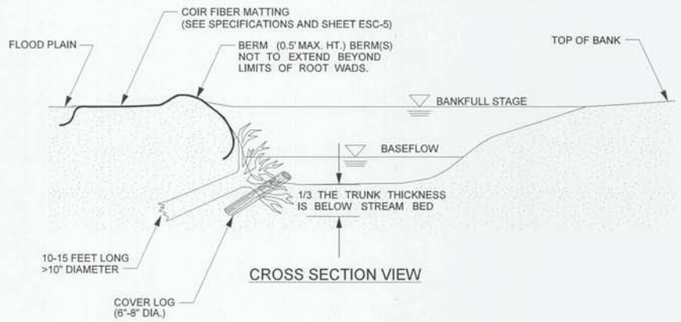
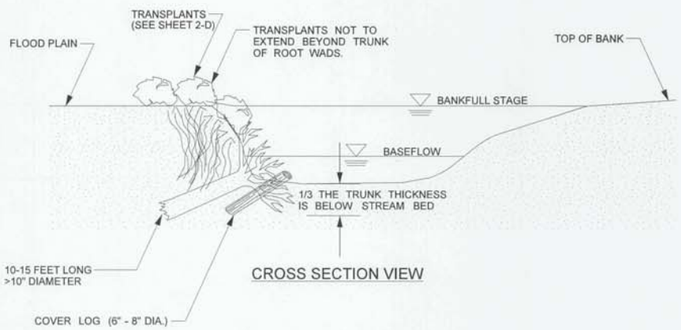
ROOT WADS

ROOT WADS WITHOUT TRANSPLANTS
USE IF TRANSPLANTS ARE NOT AVAILABLE ON-SITE



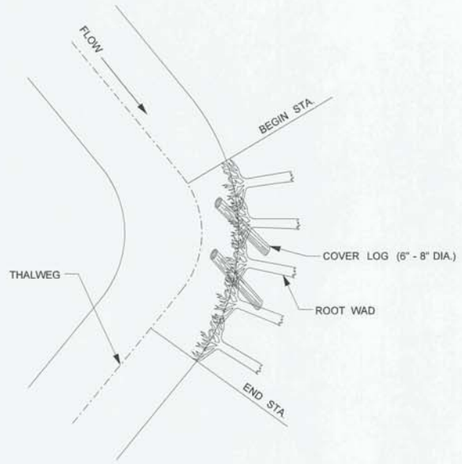
CROSS SECTION VIEW

ROOT WADS WITH TRANSPLANTS
USE IF TRANSPLANTS ARE AVAILABLE ON-SITE



CROSS SECTION VIEW

PLAN VIEW

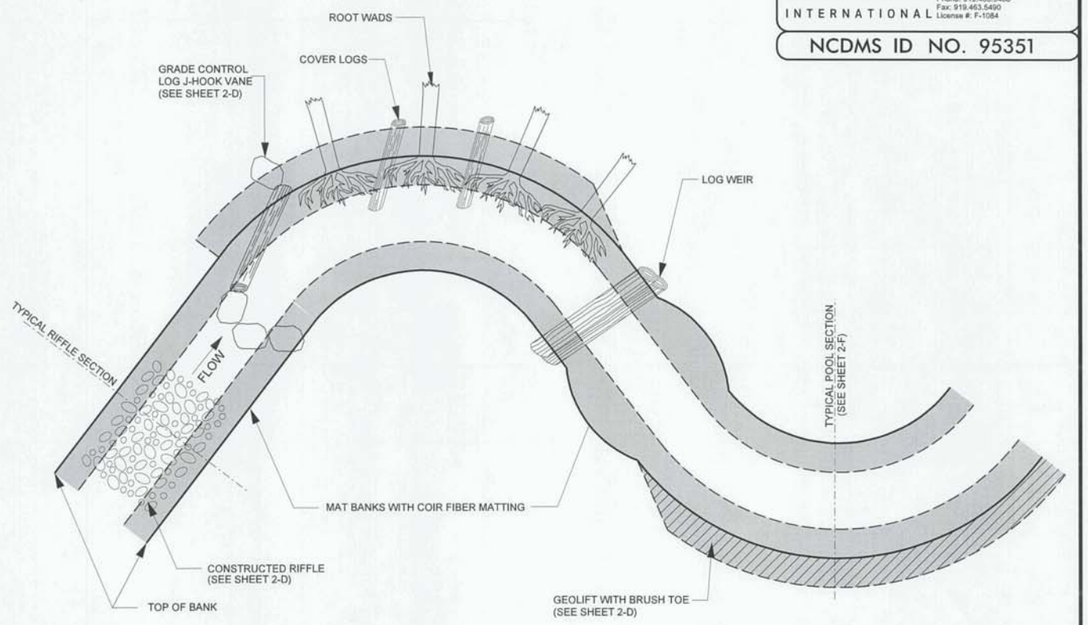


NOTES:
1. INSTALLATION USING THE TRENCHING METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS OR CHANNEL BOTTOM.
2. THE NUMBER OF ROOTWADS ESTIMATED MAY VARY DEPENDING ON THE ROOTMASS SIZE. IN GENERAL, ROOTWADS SHOULD PROTECT THE OUTER MEANDER BEND AS SHOWN. SEE PLANS FOR APPROXIMATE STATION AND LOCATION.
3. INSTALL COVER LOGS BETWEEN ROOTWADS TO PROVIDE HABITAT ONLY WHEN AVAILABLE FROM ON-SITE HARVESTING.

TYPICAL STRUCTURE PLACEMENT

STRUCTURE NOTES:
1. GENERALLY LOG WEIRS, ROOT WADS, LOG VANES AND COIR FIBER MATTING WILL BE INSTALLED IN THE LOCATION AND SEQUENCE AS SHOWN.
2. ADDITIONAL STRUCTURES OR CHANGES TO STRUCTURE LOCATIONS MAY BE MADE BY THE DESIGN ENGINEER DURING CONSTRUCTION.

NOTES:
1. COIR FIBER MATTING TO BE INSTALLED ON ALL RESTORED STREAMBANKS EXCEPT ON POINT BARS.
2. IF ROOT WADS DO NOT COVER ENTIRE SLOPE ON OUTSIDE OF MEANDER BENDS, COIR FIBER MATTING IS NEEDED.
3. ROOT WADS SHALL BE ANGLED APPROXIMATELY 90° TOWARDS THE STREAMBANK.



BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	2

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/10/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
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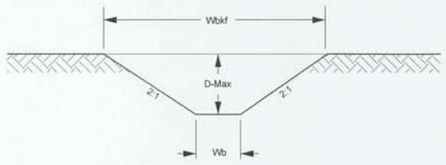
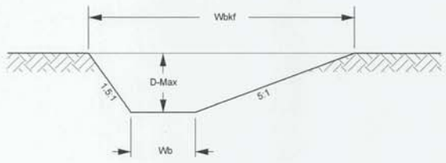
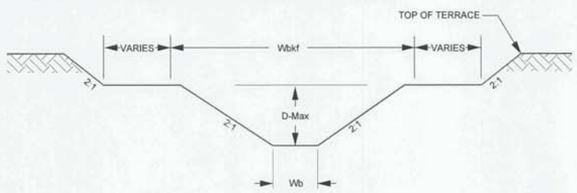
TYPICAL RIFFLE, POOL CROSS SECTIONS



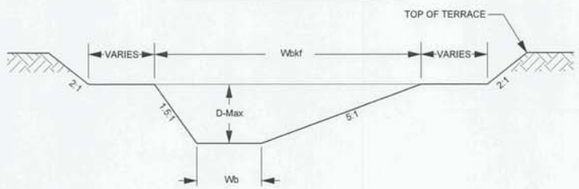
RIFFLE



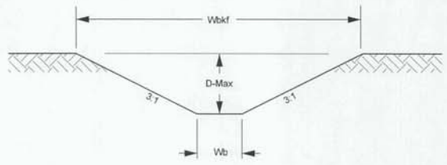
POOL



RIFFLE WITH BANKFULL BENCH



POOL WITH BANKFULL BENCH



STEP-POOL

HURRICANE CREEK						UT4									
REACH 1		REACH 2		REACH 3		REACH 1		REACH 2		REACH 3		REACH 4		REACH 5	
RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL
19.1	26.0	20.1	27.0	9.1	13.0	11.4	15.0	16.5	24.0	19.8	26.0	12.0	16.0	13.9	18.0
1.8	3.0	1.9	3.2	1.0	2.0	1.1	2.4	1.6	3.0	1.7	3.7	1.1	2.2	1.5	2.4
13.0	13.9	13.0	13.7	12.0	12.1	13.0	11.2	13.0	13.5	14.0	13.3	13.0	13.1	12.0	12.5
28.0	48.8	31.0	53.1	6.9	14.0	10.0	20.2	21.0	42.8	28.0	59.1	11.0	19.5	16.0	25.9
11.8	6.5	12.4	6.2	5.3	1.0	7.1	1.8	10.2	4.5	13.0	4.0	7.4	1.7	8.0	3.6

WIDTH OF BANKFULL (Wbkf)
MAXIMUM DEPTH (D-Max)
WIDTH TO DEPTH RATIO (Wbkf / D)
BANKFULL AREA (Abkf)
BOTTOM WIDTH (Wb)

NOTES:
1. DURING CONSTRUCTION CORNERS OF DESIGN CHANNEL WILL BE ROUNDED AND A THALWEG WILL BE SHAPED PER DIRECTION OF ENGINEER.
2. POOLS SHOWN ABOVE ARE LEFT POOLS ONLY.

11/9/2015
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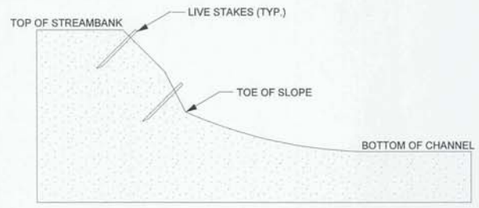
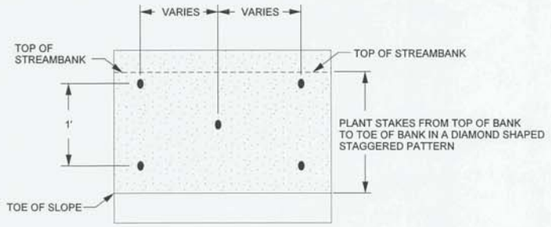
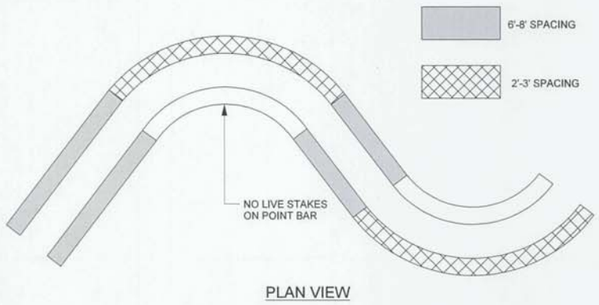
LIVE STAKING



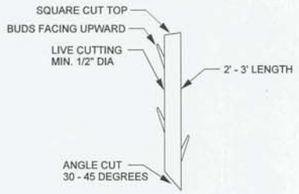
CROSS SECTION VIEW



PLAN VIEW



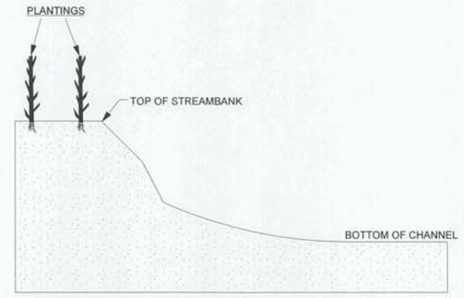
PLAN VIEW



LIVE STAKE DETAIL

NOTES:
1. STAKES PRODUCED FROM ON-SITE SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
2. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
3. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
4. STAKES SHOULD BE INSTALLED PERPENDICULAR TO BANK.
5. STAKES SHOULD BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
6. STAKES SHOULD BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.
7. DO NOT LIVE STAKE POINT BARS ALONG MEANDER BENDS.

PLANTING SPECIFICATIONS



CROSS SECTION VIEW OF BARE ROOT PLANTING

NOTES:
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER/PLANTING ZONE AS SHOWN ON THE PLANS.
2. ALLOW FOR 6-10 FEET BETWEEN PLANTINGS, DEPENDING ON SIZE.
3. LOOSEN COMPACTED SOIL.
4. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
5. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
6. KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP, OR STRAW.
7. HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO PROJECT SITE.

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	2-A

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

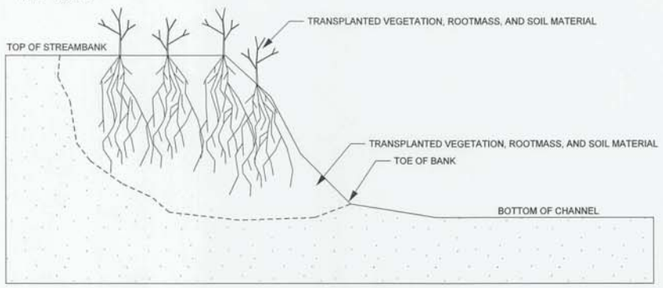
11/10/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

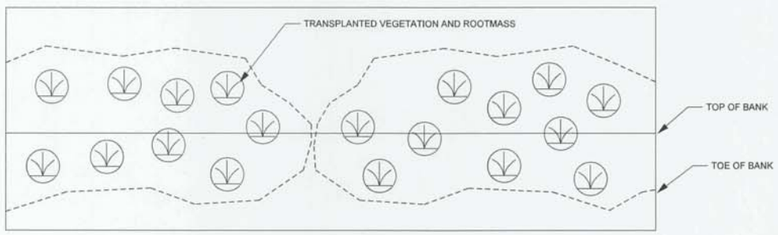
NCDMS ID NO. 95351

TRANSPLANTED VEGETATION

NOTES:
1. EXCAVATE A HOLE IN THE BANK TO BE STABILIZED THAT WILL ACCOMMODATE THE SIZE OF TRANSPLANT TO BE PLACED. BEGIN EXCAVATION AT THE TOE OF THE BANK.
2. EXCAVATE TRANSPLANT USING A FRONT END LOADER. EXCAVATE THE ENTIRE ROOT MASS AND AS MUCH ADDITIONAL SOIL MATERIAL AS POSSIBLE. IF ENTIRE ROOT MASS CAN NOT BE EXCAVATED IN ONE BUCKET LOAD, THE TRANSPLANT IS TOO LARGE AND ANOTHER SHOULD BE SELECTED.
3. PLACE TRANSPLANT IN THE BANK TO BE STABILIZED SO THAT VEGETATION IS ORIENTATED VERTICALLY.
4. FILL IN ANY HOLES AROUND THE TRANSPLANT AND COMPACT.
5. ANY LOOSE SOIL LEFT IN THE STREAM SHOULD BE REMOVED.
6. PLACE MULTIPLE TRANSPLANTS CLOSE TOGETHER SUCH THAT THEY TOUCH.

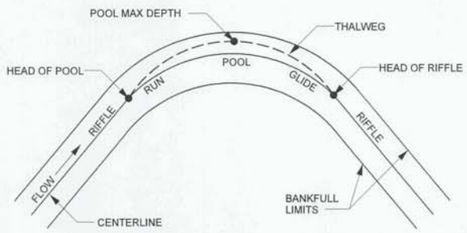


CROSS SECTION VIEW

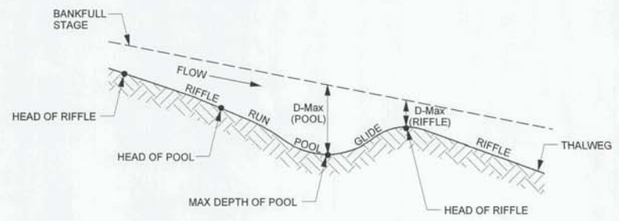


PLAN VIEW

TYPICAL PLAN VIEW AND PROFILE



PLAN VIEW



PROFILE VIEW

NOTES:
1. THE POINTS SHOWN, e.g. HEAD OF RIFFLE, HEAD OF POOL AND MAX DEPTH OF POOL ARE THE CONTROL POINTS USED TO CUT THE PROFILE; HOWEVER, THE CONTRACTOR SHOULD CREATE SMOOTH TRANSITIONS BETWEEN CONTROL POINTS AS SHOWN ABOVE.
2. THE DOWNSTREAM HEAD OF RIFFLE ELEVATION SHOULD NOT EXCEED THE HEAD OF POOL ELEVATION.
3. THE CHANGE IN WIDTH BETWEEN THE RIFFLES AND POOLS SHOULD OCCUR GRADUALLY OVER THE ENTIRE LENGTH OF THE BEND.

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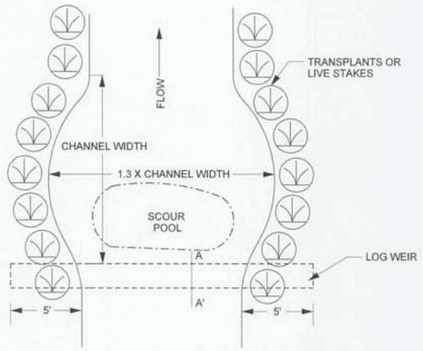
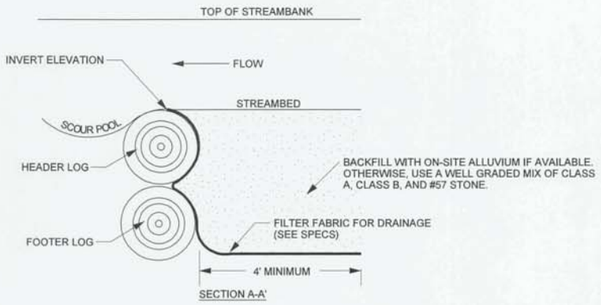
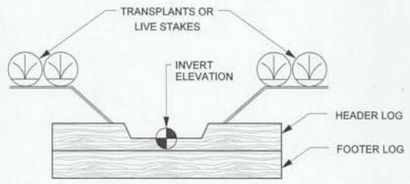
LOG WEIR



PLAN VIEW



SECTION A-A'

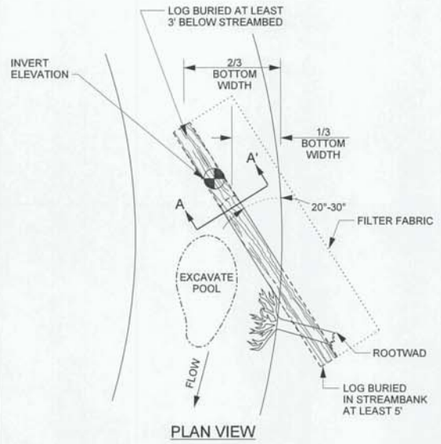


CROSS SECTION VIEW

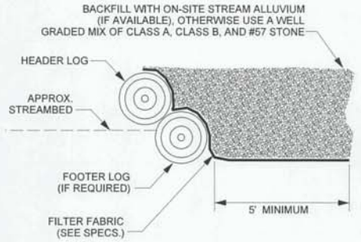
NOTES:

1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
2. LOGS >24 INCHES IN DIAMETER MAY BE USED ALONE WITHOUT AN ADDITIONAL LOG. FILTER FABRIC SHOULD STILL BE USED TO SEAL AROUND LOG.
3. PLACE FOOTER LOGS FIRST AND THEN HEADER (TOP) LOG. SET HEADER LOG AT A MAXIMUM OF 3 INCHES ABOVE THE INVERT ELEVATION.
4. CUT A NOTCH IN THE HEADER LOG APPROXIMATLEY 30% OF THE CHANNEL BOTTOM WIDTH AND EXTENDING DOWN TO THE INVERT ELEVATION. NOTCH SHALL NOT EXCEED 3 INCHES IN DEPTH.
5. USE FILTER FABRIC FOR DRAINAGE TO SEAL GAPS BETWEEN LOGS.
6. PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK.

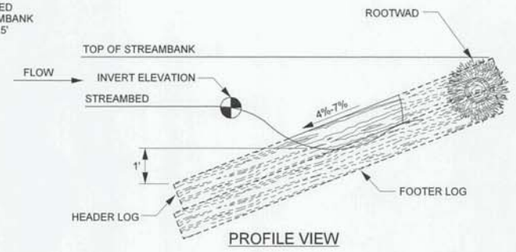
LOG VANE



PLAN VIEW



SECTION A - A'



PROFILE VIEW

NOTES:

1. LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
2. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.
3. ROOTWADS SHOULD BE PLACED BENEATH THE HEADER LOG AND PLACED SO THAT IT LOCKS THE HEADER LOG INTO THE BANK. SEE ROOTWAD DETAIL.
4. FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL.

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	2-B

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

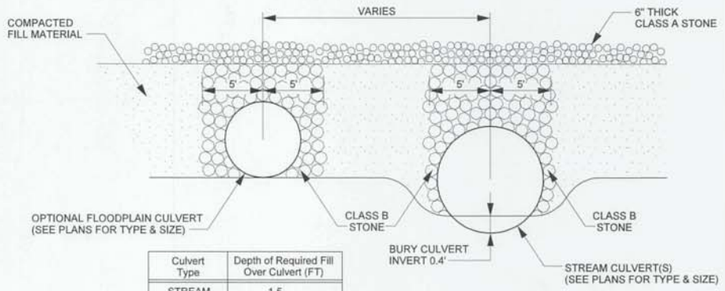
DATE: 11/10/16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

PERMANENT ROAD CULVERT CROSSING

NOT TO SCALE

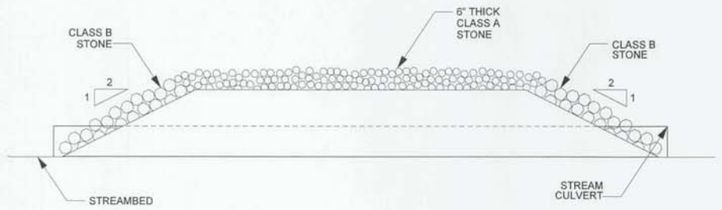


Culvert Type	Depth of Required Fill Over Culvert (FT)
STREAM	1.5
FLOOD PLAIN	1.5

PROFILE VIEW ALONG ROAD

NOTES:

1. INSTALL PIPE CULVERT IN ACCORDANCE WITH DETAIL SPECIFICATIONS.
2. INSTALL COIR FIBER MATTING FOR EROSION CONTROL ALONG FILL SLOPES

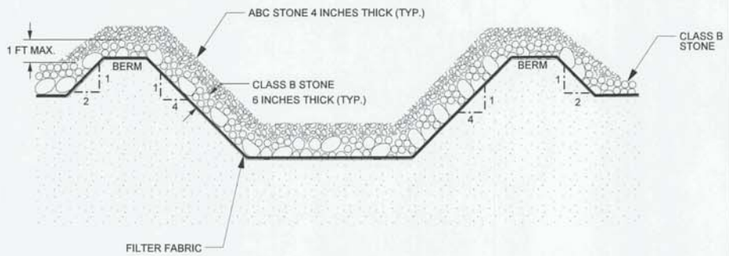


CROSS SECTION

NOTES:

1. TYPICAL SECTION APPLIES TO UT4 REACH 1B AT APPROXIMATE STATION 16+30 AND HC REACH 3, STATION 10+00.
2. CULVERTS ARE TO BE EVENLY SPACED MINIMUM OF 24" APART.
3. MINIMUM OF 18" COVER FOR ALL PIPES.

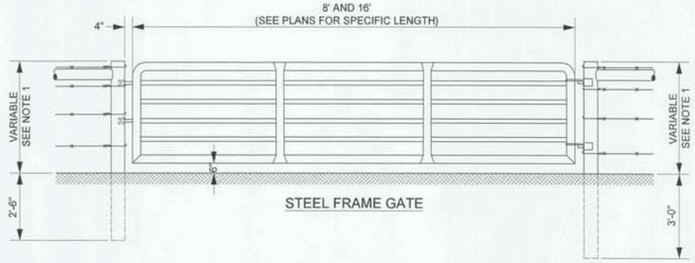
PERMANENT FORD STREAM CROSSING



NOTES:

1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. HAVE ALL NECESSARY MATERIALS AND EQUIPMENT ON-SITE BEFORE WORK BEGINS.
3. MINIMIZE CLEARING AND EXCAVATION OF STREAMBANKS. DO NOT EXCAVATE CHANNEL BOTTOM. COMPLETE ONE SIDE BEFORE STARTING ON THE OTHER SIDE.
4. INSTALL STREAM CROSSING AT RIGHT ANGLE TO THE FLOW.
5. GRADE SLOPES TO A 4:1 SLOPE. TRANSPLANT SOD FROM ORIGINAL STREAMBANK ONTO SIDE SLOPES.
6. MAINTAIN CROSSING SO THAT RUNOFF IN THE CONSTRUCTION ROAD DOES NOT ENTER EXISTING CHANNEL.
7. A STABILIZED PAD OF CLASS B STONE, 1 FOOT THICK, LINED WITH FILTER FABRIC FOR DRAINAGE SHALL BE USED OVER THE BERM AND ACCESS SLOPES. ABC STONE APPROXIMATLEY 4 INCHES THICK ADDED TO TOP LAYER.
8. WIDTH OF THE CROSSING SHALL BE SUFFICIENT TO ACCOMMODATE THE LARGEST VEHICLE CROSSING THE CHANNEL.
9. CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE ACCORDING TO EQUIPMENT UTILIZED.

STEEL GATES



STEEL FRAME GATE

NOTES:

1. POST HEIGHT DIMENSION SHALL BE THE SAME AS REQUIRED FOR THE ADJACENT FENCE.
2. CONSTRUCT AN END OR STRESS PANEL, AS REQUIRED IN THE SPECIFICATION, ON EACH SIDE OF GATE.
3. HINGES AND LOCKS SHALL BE INSTALLED AS SPECIFIED BY GATE MANUFACTURER.

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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	2-C

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M BYERS

APPROVED BY:

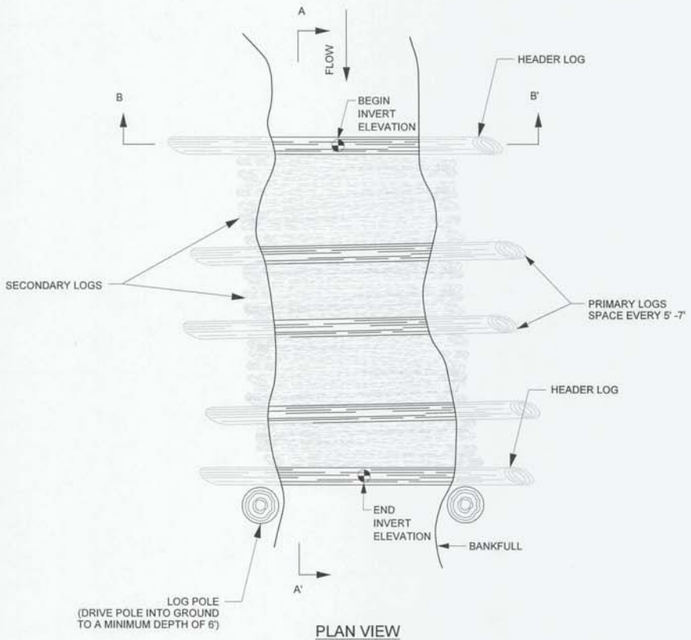
11/10/16

DATE:

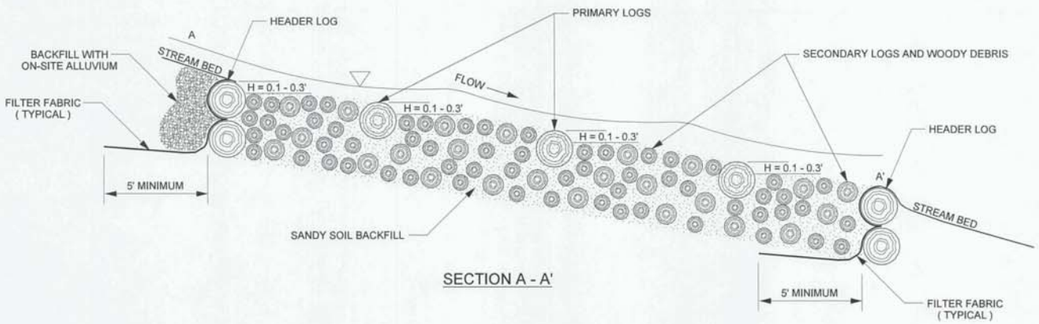
Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

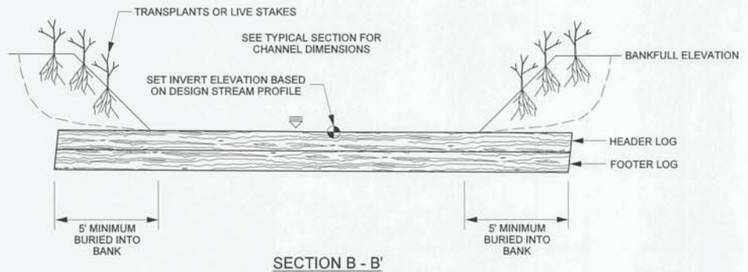
GRADE CONTROL LOG JAM



PLAN VIEW



SECTION A - A'

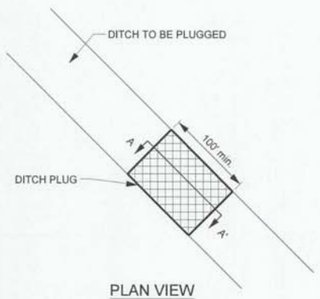


SECTION B - B'

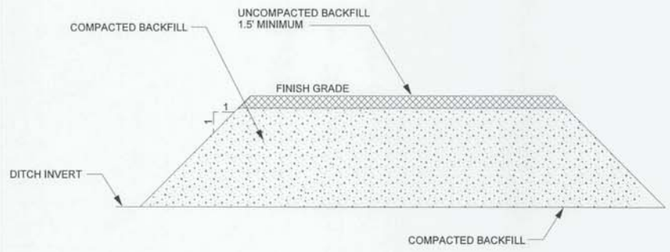
NOTES:

1. PRIMARY LOGS SHOULD BE AT LEAST 10" OR MORE IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD PREFERRED, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
2. SECONDARY LOGS SHOULD BE AT LEAST 1" IN DIAMETER AND NO LARGER THAN 10", AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOOD MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
3. VERTICAL POSTS SHOULD BE AT LEAST 10" IN DIAMETER AND SHOULD BE DRIVEN INTO THE GROUND A MINIMUM OF 6'.
4. FILTER FABRIC SHOULD BE NAILED TO THE HEADER LOG BELOW THE BACKFILL.
5. ROOTWADS AND COIR FIBER MATTING CAN BE USED INSTEAD OF TRANSPLANTS OR LIVE STAKES, PER DIRECTION OF ENGINEER.
6. AFTER TRENCH HAS BEEN EXCAVATED A LAYER OF SECONDARY LOGS AND WOODY DEBRIS SHOULD BE PLACED WITH MINIMAL GAPS. A LAYER OF ON-SITE ALLUVIUM SHOULD BE APPLIED TO FILL VOIDS BETWEEN SECONDARY LOGS BEFORE ADDITIONAL LAYERS ARE PLACED.

DITCH PLUG



PLAN VIEW

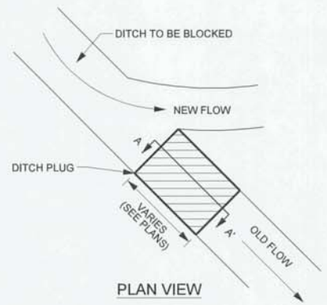


SECTION A - A'

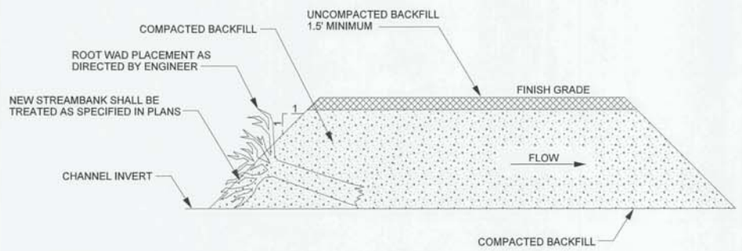
NOTES:

1. COMPACT BACKFILL USING ON-SITE HEAVY EQUIPMENT IN 10 INCH LIFTS.
2. FILL DITCH TO TOP OF BANKS OR AS DIRECTED BY ENGINEER.

CHANNEL BLOCK



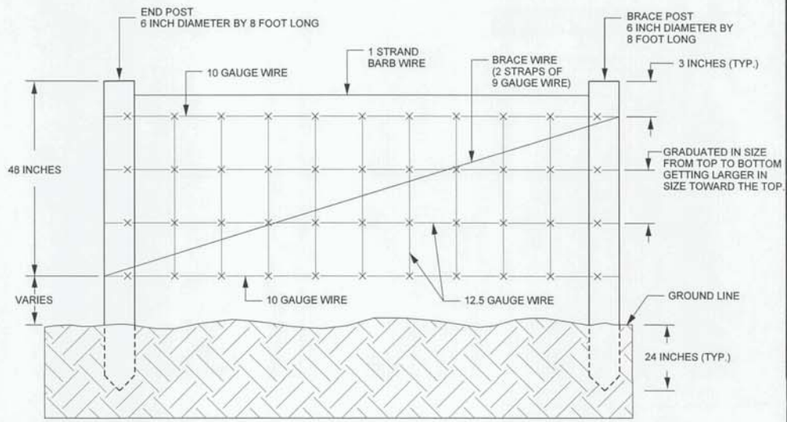
PLAN VIEW



NOTES:

1. COMPACT BACKFILL USING ON-SITE HEAVY EQUIPMENT IN 10 INCH LIFTS.
2. FILL DITCH TO TOP OF BANKS OR AS DIRECTED BY ENGINEER.

WOVEN FIELD FENCE

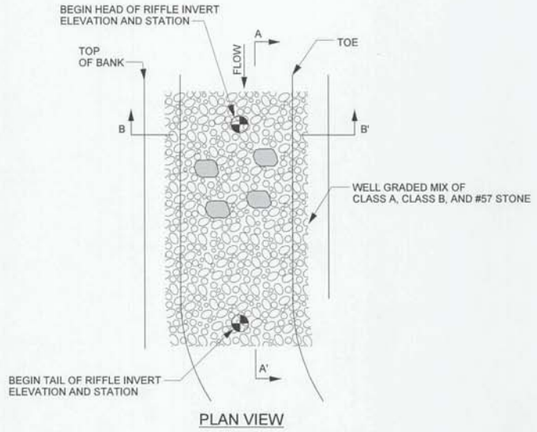


NOTE:

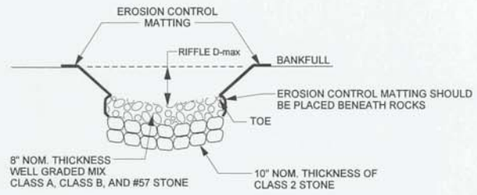
1. END POSTS SHALL BE INSTALLED AT A SPACING OF 10-15 FEET.

2/26/03

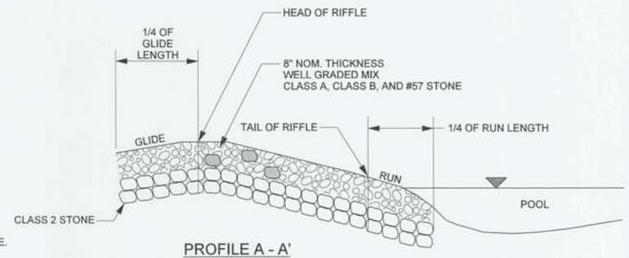
CONSTRUCTED RIFFLE



PLAN VIEW



SECTION B - B'

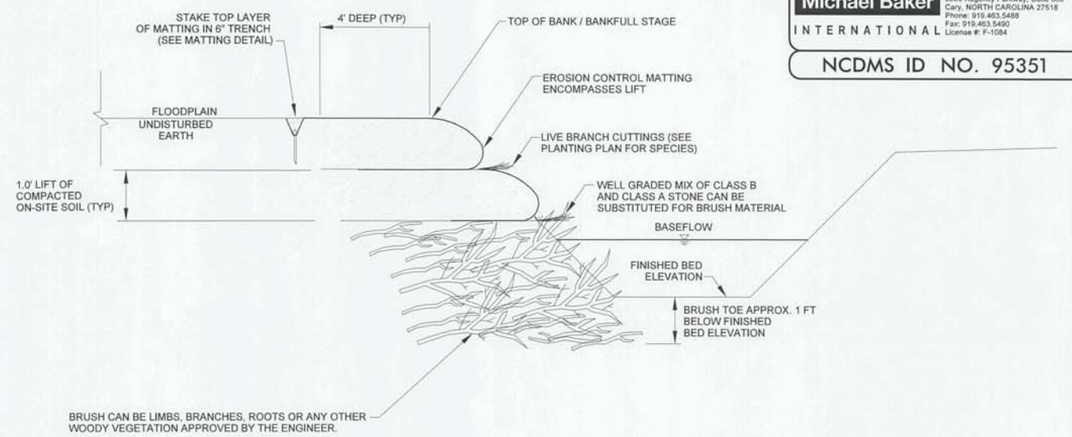


PROFILE A - A'

NOTES:
1. UNDERCUT CHANNEL BED ELEVATION 18 INCHES TO ALLOW FOR LAYERS OF STONE.
2. INSTALL EROSION CONTROL MATTING ALONG COMPLETED BANKS SUCH THAT THE EROSION CONTROL MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.
3. INSTALL SUB LAYER OF CLASS 2 STONE.
4. INSTALL A WELL GRADED MIX OF SPECIFIED STONE, COMPACTED TO GRADE.
5. FINAL CHANNEL BED SHAPE SHOULD BE ROUNDED, SMOOTH, AND CONCAVE, WITH THE ELEVATION OF THE BED 0.2 FT DEEPER IN THE CENTER THAN AT THE EDGES.
6. RIFFLE LENGTHS WILL VARY. SEE LONGITUDINAL PROFILE AND STRUCTURE TABLE FOR BEGINNING AND ENDING STATIONS AND ELEVATIONS.

GEOLIFT WITH BRUSH TOE

NOTES:
1. LIVE BRANCH CUTTINGS SHALL BE THE SAME SPECIES AS THE LIVE STAKES AND SHALL BE INSTALLED DURING VEGETATION DORMANCY.
2. LIVE BRANCH CUTTINGS SHALL BE INSTALLED AT A DENSITY OF 20-30 CUTTINGS PER LINEAR FOOT AND A MAXIMUM DIAMETER OF 2.5 INCHES.
3. NUMBER OF SOIL LIFTS MAY VARY, IN GENERAL LIFTS SHALL EXTEND TO THE TOP OF BANK OR BANKFULL STAGE.
4. GEOLIFTS TO BE INSTALLED IN CHANNEL SECTIONS ALONG SIDE SLOPES STEEPER THAN 2:1 AND/OR ADJACENT TO HILL SLOPES.



NOTES:
1. WHEN GEOLIFTS ARE BUILT ABOVE ROOTWAD CLUSTER, USE LARGE STONE BACKFILL BEHIND ROOT MASS TO BUILT FOUNDATION.

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	2-D

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

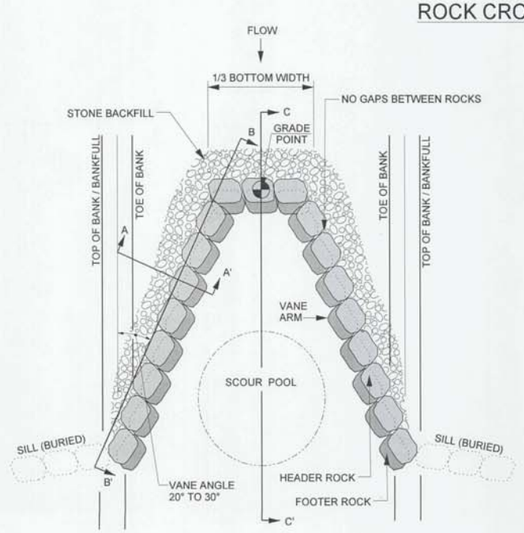
APPROVED BY:

11/10/16
DATE:

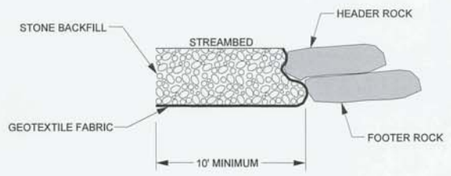
Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

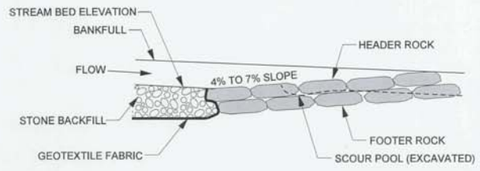
ROCK CROSS VANE



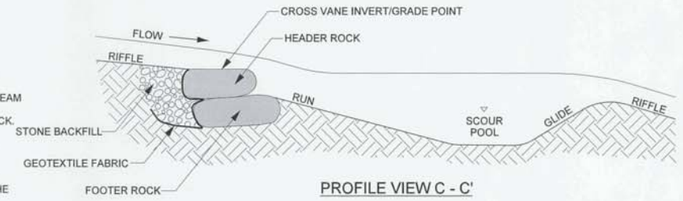
PLAN VIEW



SECTION A - A'



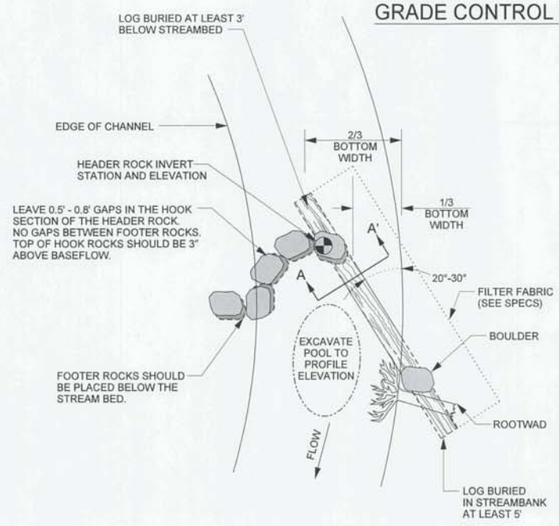
PROFILE VIEW B - B'
VANE ARM



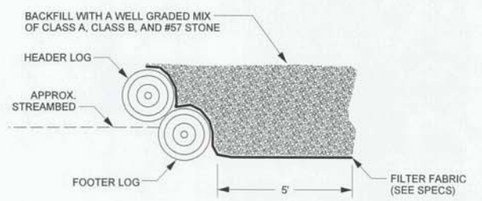
PROFILE VIEW C - C'

NOTES FOR ALL VANE STRUCTURES:
1. INSTALL BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
2. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
3. START AT BANK AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
4. CONTINUE WITH STRUCTURE, FOLLOWING ANGLE AND SLOPE SPECIFICATIONS.
5. AN EXTRA ROCK CAN BE PLACED IN SCOUR POOL FOR HABITAT IMPROVEMENT.
6. USE HAND PLACED STONE TO FILL GAPS ON UPSTREAM SIDE OF HEADER AND FOOTER ROCKS.
7. AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ON-SITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.

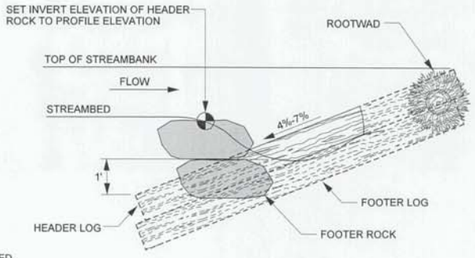
GRADE CONTROL LOG J-HOOK VANE



PLAN VIEW



SECTION A - A'



PROFILE VIEW

NOTES:
1. LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
2. BOULDERS MUST BE 3' x 2' x 2'.
3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.
4. ROOTWADS SHOULD BE PLACED BENEATH THE HEADER LOG AND PLACED SO THAT IT SECURES THE HEADER LOG INTO THE BANK. SEE ROOTWAD DETAIL.
5. BOULDERS SHOULD BE PLACED ON TOP OF HEADER LOG FOR ACHORING.
6. HEADER BOULDERS TO BE PLACED 0.5 TO 0.8 FEET APART.
7. NON-WOVEN FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL.
8. FOOTERS SHALL BE INSTALLED SUCH THAT 1/4 TO 1/3 OF THE LENGTH IS DOWNSTREAM OF THE HEADER.

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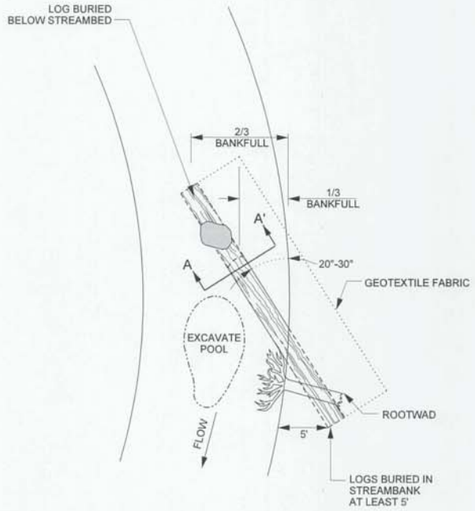
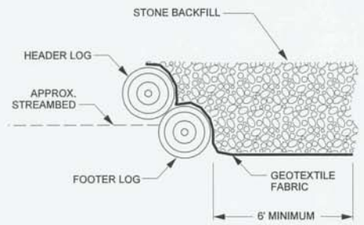
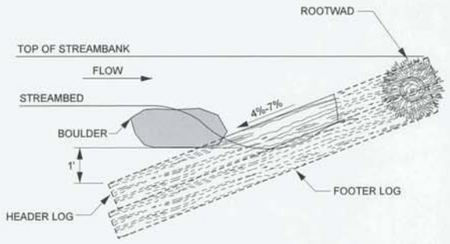
LOG VANE



PLAN VIEW



SECTION A - A'

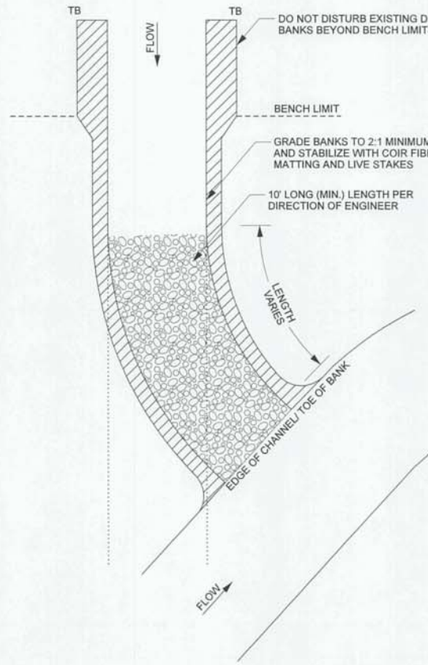


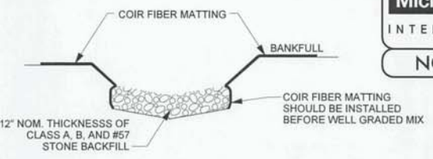
PROFILE VIEW

NOTES:

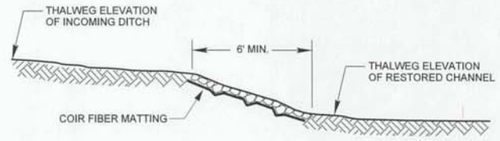
1. LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
2. BOULDERS MUST BE OF SUFFICIENT SIZE TO ANCHOR LOGS.
3. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS.
4. ROOTWADS SHOULD BE PLACED BENEATH THE HEADER LOG AND PLACED SO THAT IT LOCKS THE HEADER LOG INTO THE BANK. SEE ROOTWAD DETAIL.
5. BOULDER SHOULD BE PLACED ON TOP OF HEADER LOG FOR ANCHORING.
6. GEOTEXTILE FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL.
7. TRANSPLANTS CAN BE USED INSTEAD OF ROOTWADS, PER DIRECTION OF ENGINEER.

TIE-IN SWALE





CROSS-SECTION



TYPICAL PROFILE FOR SWALE

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	2-E

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

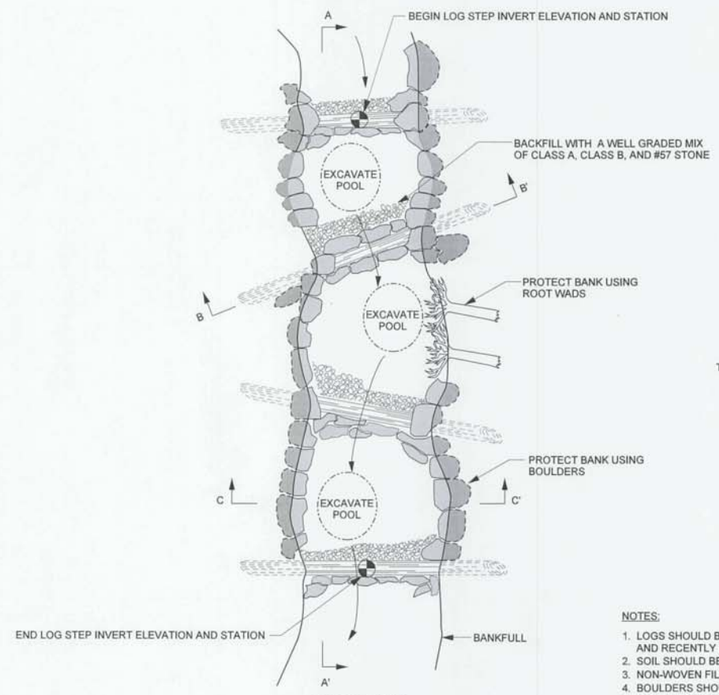
11/10/16
DATE:

Michael Baker INTERNATIONAL

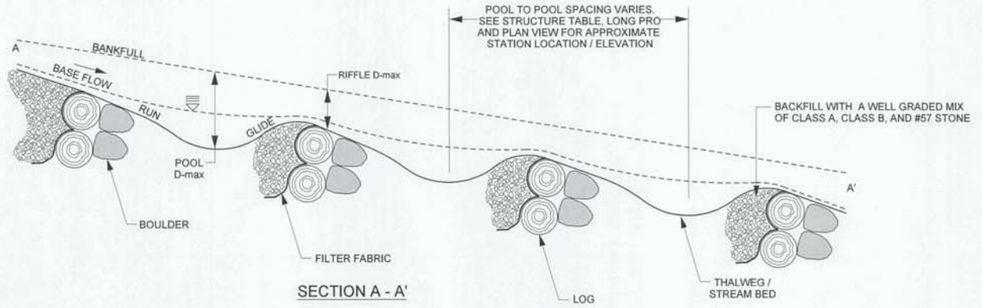
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

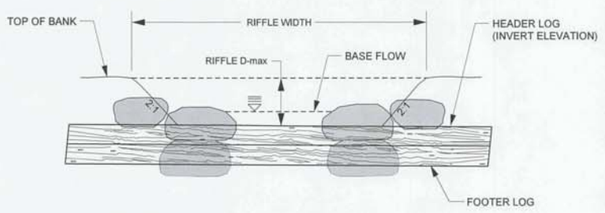
LOG AND ROCK STEP-POOL



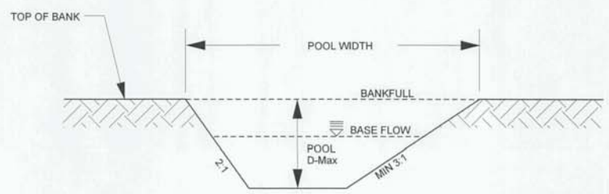
PLAN VIEW



SECTION A - A'



SECTION B - B'



SECTION C - C'

NOTES:

1. LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
2. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.
3. NON-WOVEN FILTER FABRIC SHOULD BE NAILED/STAPLED TO THE LOG BELOW THE BACKFILL.
4. BOULDERS SHOULD BE 3' X 2' X 2' AND PLACED ON TOP OF HEADER LOG FOR ANCHORING.
5. LOGS SHOULD BE ANGLED 60° - 70° FROM THE STREAM BANK AND CROSS SLOPES SHOULD NOT EXCEED 2%.
6. STEP HEIGHTS/DROPS SHALL NOT EXCEED 0.4 FT AND POOL DEPTHS NOT TO EXCEED 1.8 FT.
7. THE NUMBER LOG STEPS MAY VARY BETWEEN BEGIN AND END STATIONING DEPENDING ON LOG DIAMETER SIZE. SEE LONGITUDINAL PROFILE AND STRUCTURE TABLE FOR STATION AND ELEVATION.

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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II

12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1054

NCDMS ID NO. 95351

BEGIN HC - REACH 1
STA. 10+00.00

NAD 83

3' BARB WIRE FENCE
WOVEN WIRE FENCE
LOG VANE (TYP.)
AS-BUILT TOP OF BANK (TYP.)
GEOLIFT WITH BRUSH TOE (TYP.)
VEG PLOT #5
X-11
X-12
ROOT WADS (TYP.)
AS-BUILT THALWEG
LOG JAM (TYP.)
J-HOOK VANE (TYP.)
LOG WEIR (TYP.)
CONSTRUCTED RIFFLE (TYP.)
VEG PLOT #4
GATE
MATCHLINE SHEET 3A

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

AS-BUILT SURVEY
HURRICANE CREEK
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/9/2016
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3A

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR J. DAVID LEE II

12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83

BEGIN REACH 3
STA. 10+36.40

10+00
INV=213.45'
24" RCP
RIP RAP
INV=214.13'
GATE
WOVEN WIRE FENCE
11+00
12+00
13+00
LOG WEIR (TYP.)
14+00
LOG JAM (TYP.)
X-15
AS-BUILT THALWEG
15+00
END HC - REACH 1
BEGIN HC - REACH 2
STA. 30+42.98
END REACH 3
STA. 16+00.37
ROOT WADS (TYP.)
J-HOOK VANE (TYP.)
30+00
31+00
CONSTRUCTED RIFFLE (TYP.)
AS-BUILT TOP OF BANK (TYP.)
FLOW CAMERA
GEOLIFT WITH BRUSH TOE (TYP.)
32+00
33+00
34+00
35+00
X-13
X-14
CREST GAUGE
STA. 30+51.82
STA. 30+82.26
LOG VANE (TYP.)
24+00
25+00
26+00
27+00
28+00
29+00
MATCHLINE SHEET 3
MATCHLINE SHEET 3B
VEG PLOT #3
VEG PLOT #2
OAK
36C OAK

AS–BUILT SURVEY
HURRICANE CREEK
PLAN VIEW

40 20 0 40 80
SCALE (FT)

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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3B

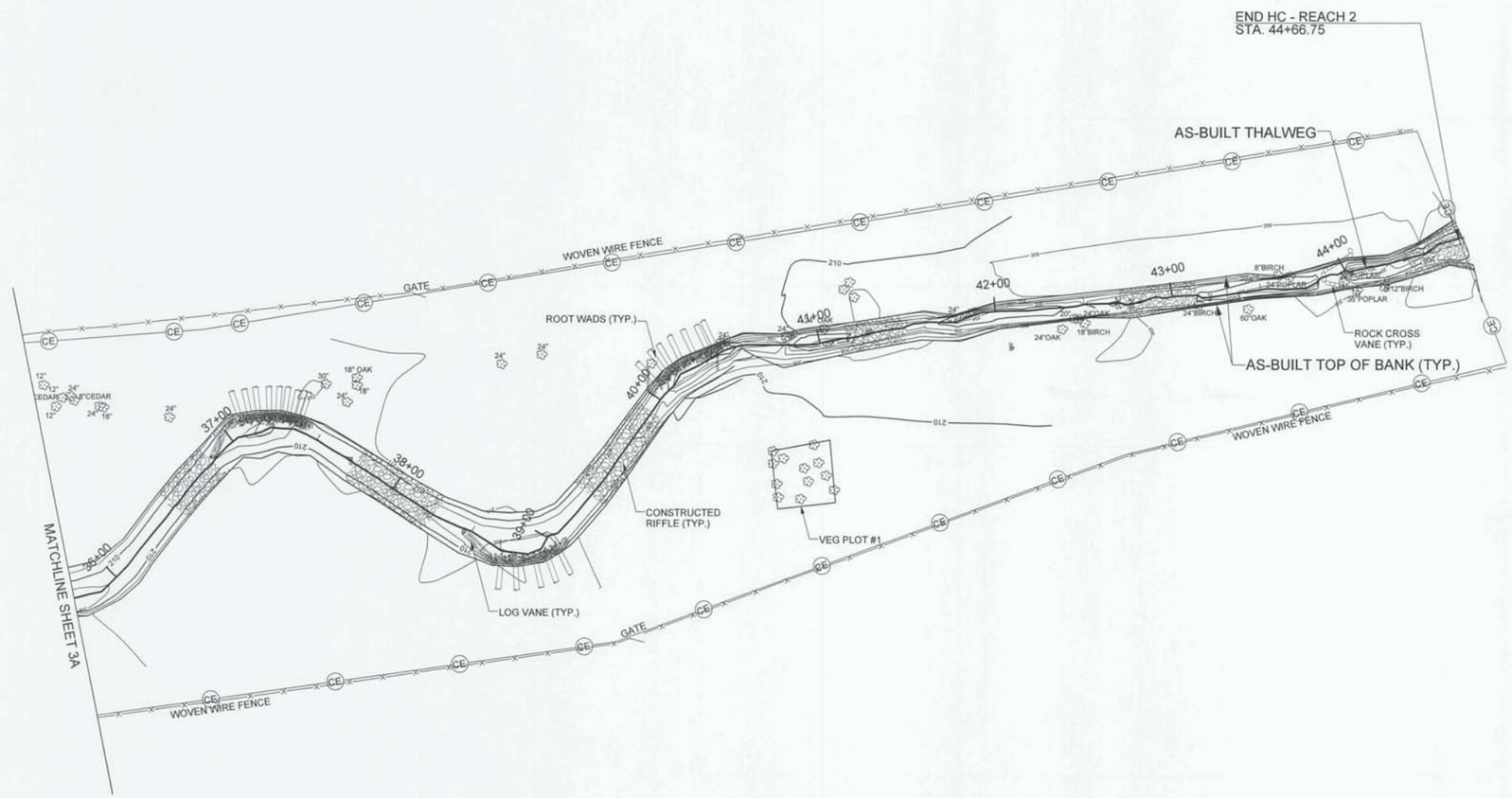
NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II

12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



AS-BUILT SURVEY
HURRICANE CREEK
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/9/2016
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2/26/03

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3C

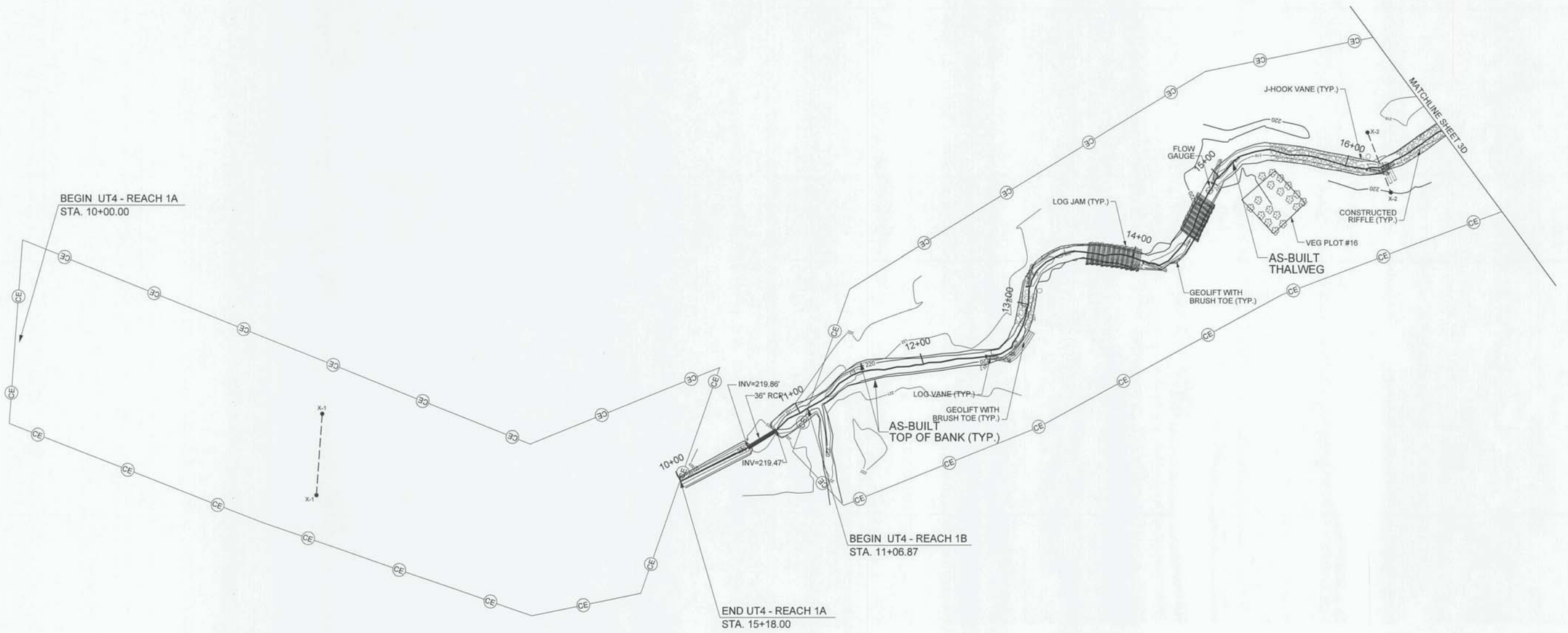
NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR J. DAVID LEE II

J. Lee 12-7-12

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



AS-BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/6/2006
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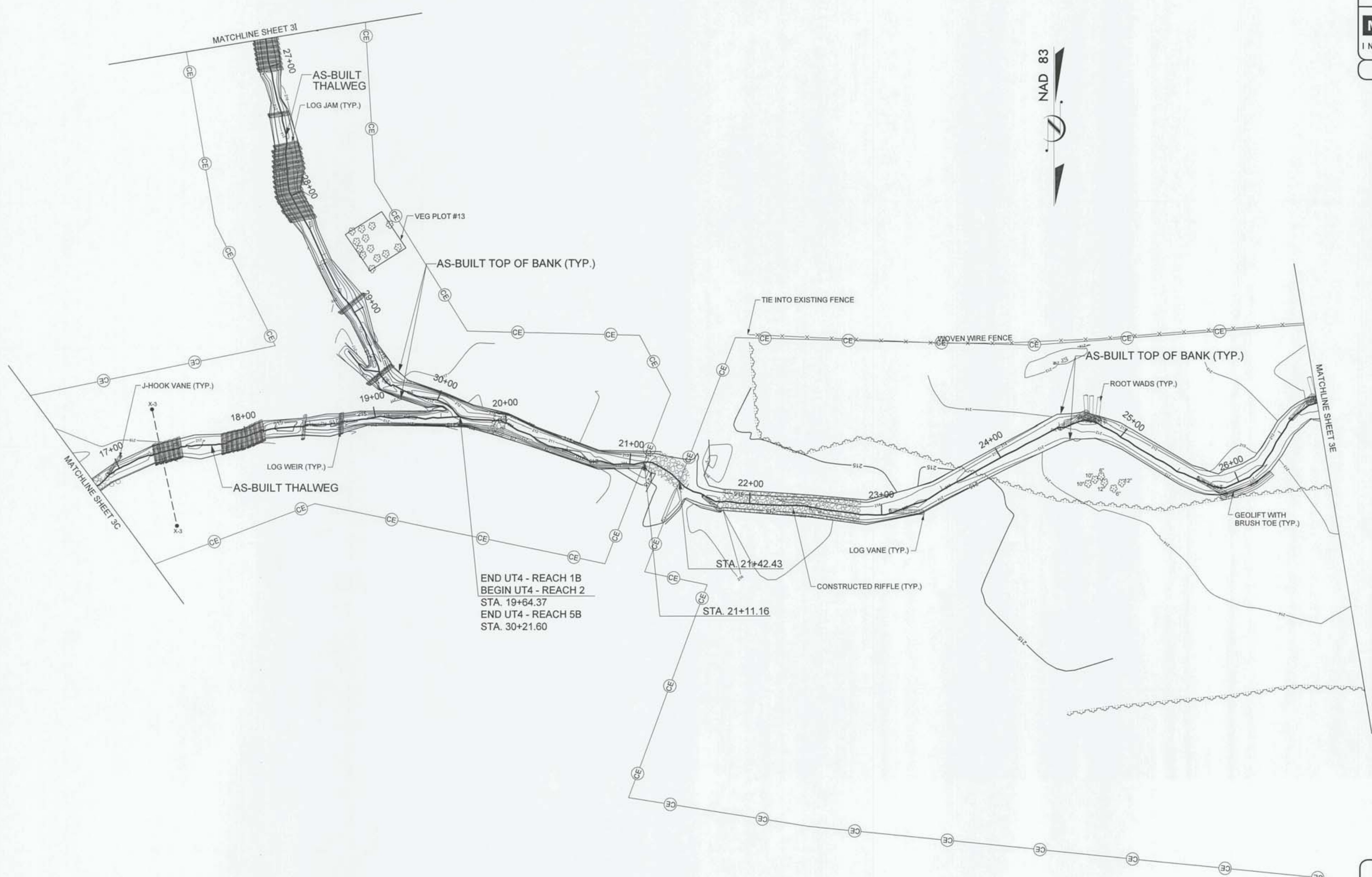

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3D

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4175 J. DAVID LEE II

12-7-16

Michael Baker INTERNATIONAL

Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

AS-BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/9/2016
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3E

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II

J. David Lee II 12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83

MATCHLINE SHEET 3F

MATCHLINE SHEET 3D

WOVEN WIRE FENCE

GATE

VEG PLOT #12

AS-BUILT THALWEG

ROOT WADS (TYP.)

GEOLIFT WITH BRUSH TOE (TYP.)

VEG PLOT #11

LOG VANE (TYP.)

AS-BUILT TOP OF BANK (TYP.)

CREST GAUGE

TWN 12"

TWN 18"

LOG JAM (TYP.)

STA. 25+22.69

STA. 25+43.46

AS-BUILT TOP OF BANK (TYP.)

END UT4 - REACH 4B =
BEGIN UT4 - REACH 3
STA. 28+92.29

END UT4 - REACH 2
STA. 38+23.08

VEG PLOT #9

CONSTRUCTED RIFFLE (TYP.)

J-HOOK VANE (TYP.)

ROCK CROSS VANE (TYP.)

TIE INTO EXISTING FENCE

VEG PLOT #10

END UT4 - REACH 3
STA. 31+42.13

25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

X-1 X-2 X-3 X-4 X-5 X-6

AS–BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/9/2016
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BAKER PROJECT REFERENCE NO.	SHEET NO.
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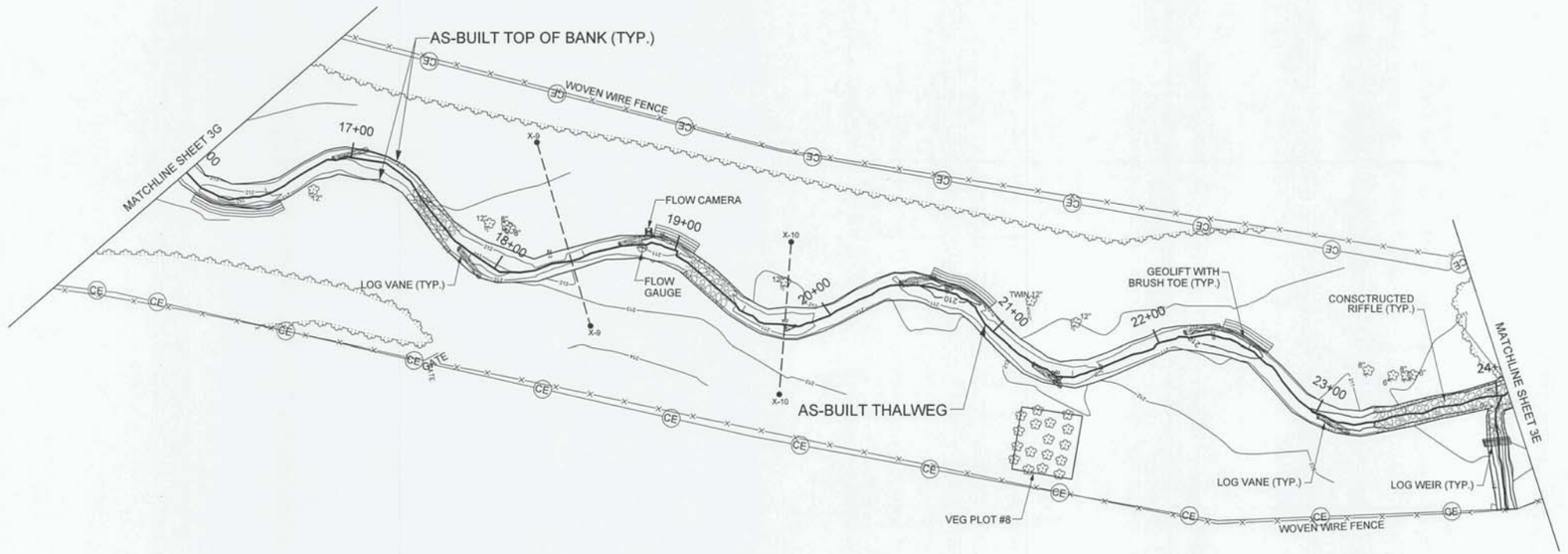
NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR J DAVID LEE II

J. D. Lee II 12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



AS-BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/15/2016
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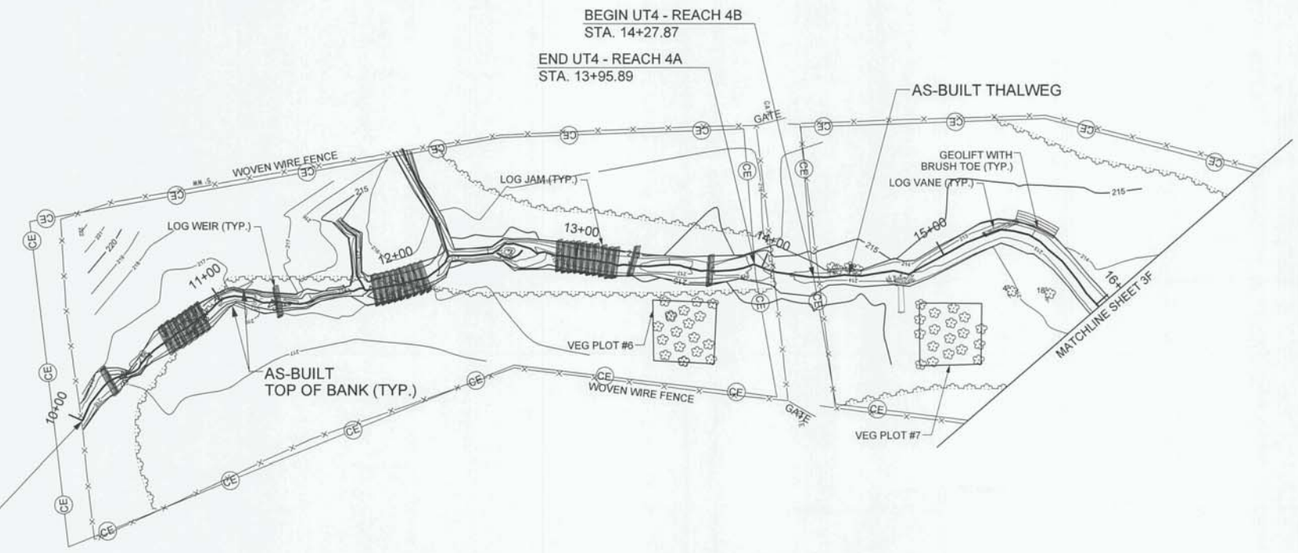
BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3G

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR J. DAVID LEE II

J. David Lee II 12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351



AS-BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/3/2016
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	3H

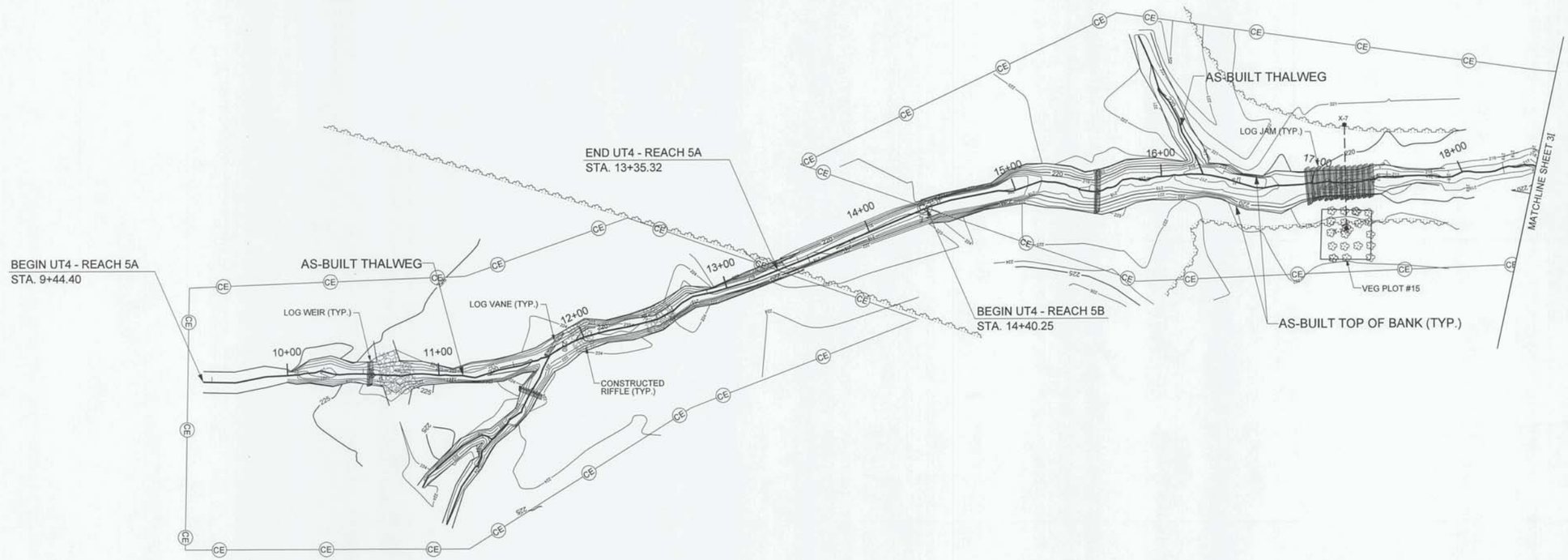
NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II

12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



AS-BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/25/03

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2/26/03

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	31

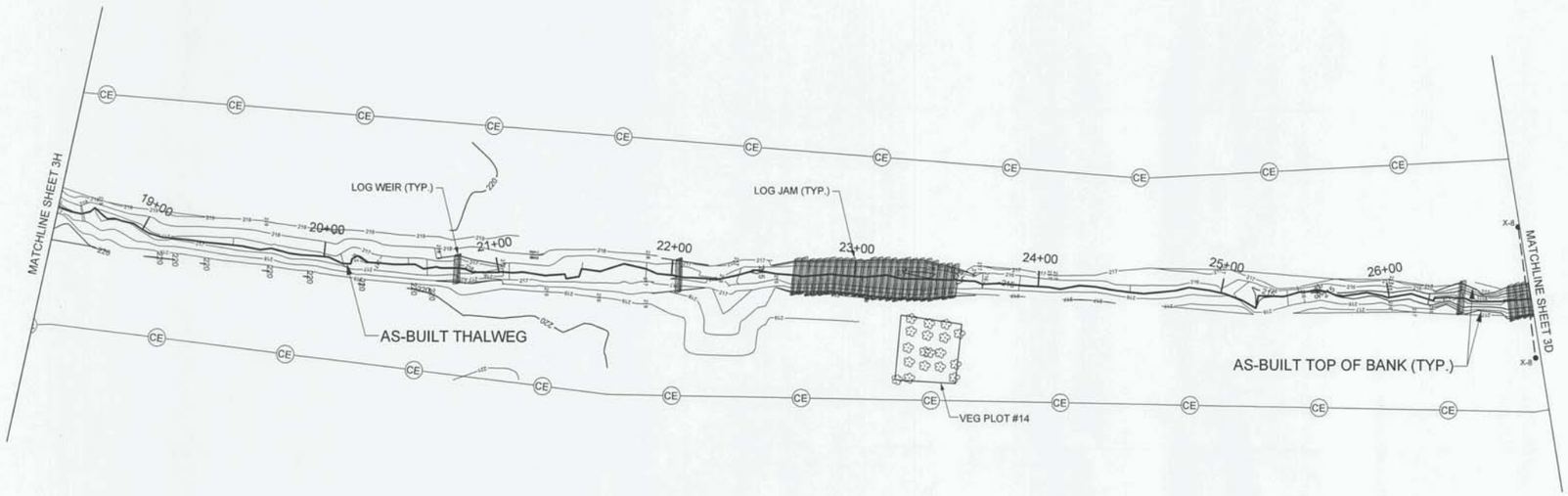
NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II

J. Rhett 12-7-16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



AS-BUILT SURVEY
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/3/2016
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mcarey
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

DATE: 11/16/16

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

BEGIN HC - REACH 1
STA. 10+00.00

NAD 83

3' BARB WIRE FENCE

WOVEN WIRE FENCE

AS-BUILT TOP OF BANK (TYP.)

ADDED LOG WEIR

CHANGED ROOT WADS TO GEO-LIFT

LOG VANE (TYP.)

GEOLIFT WITH BRUSH TOE (TYP.)

VEG PLOT #5

X-11

X-12

ROOT WADS (TYP.)

AS-BUILT THALWEG

LOG JAM (TYP.)

J-HOOK VANE (TYP.)

LOG WEIR (TYP.)

CONSTRUCTED RIFFLE (TYP.)

VEG PLOT #4

DESIGN CHANNEL ALIGNMENT

MATCHLINE SHEET 4A

GATE

ADDED LOG WEIR

RECORD DRAWING
HURRICANE CREEK
PLAN VIEW

40 20 0 40 80
SCALE (FT)

BAKER PROJECT REFERENCE NO. 128975 | SHEET NO. 4A

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039201 JACOB M. BYERS

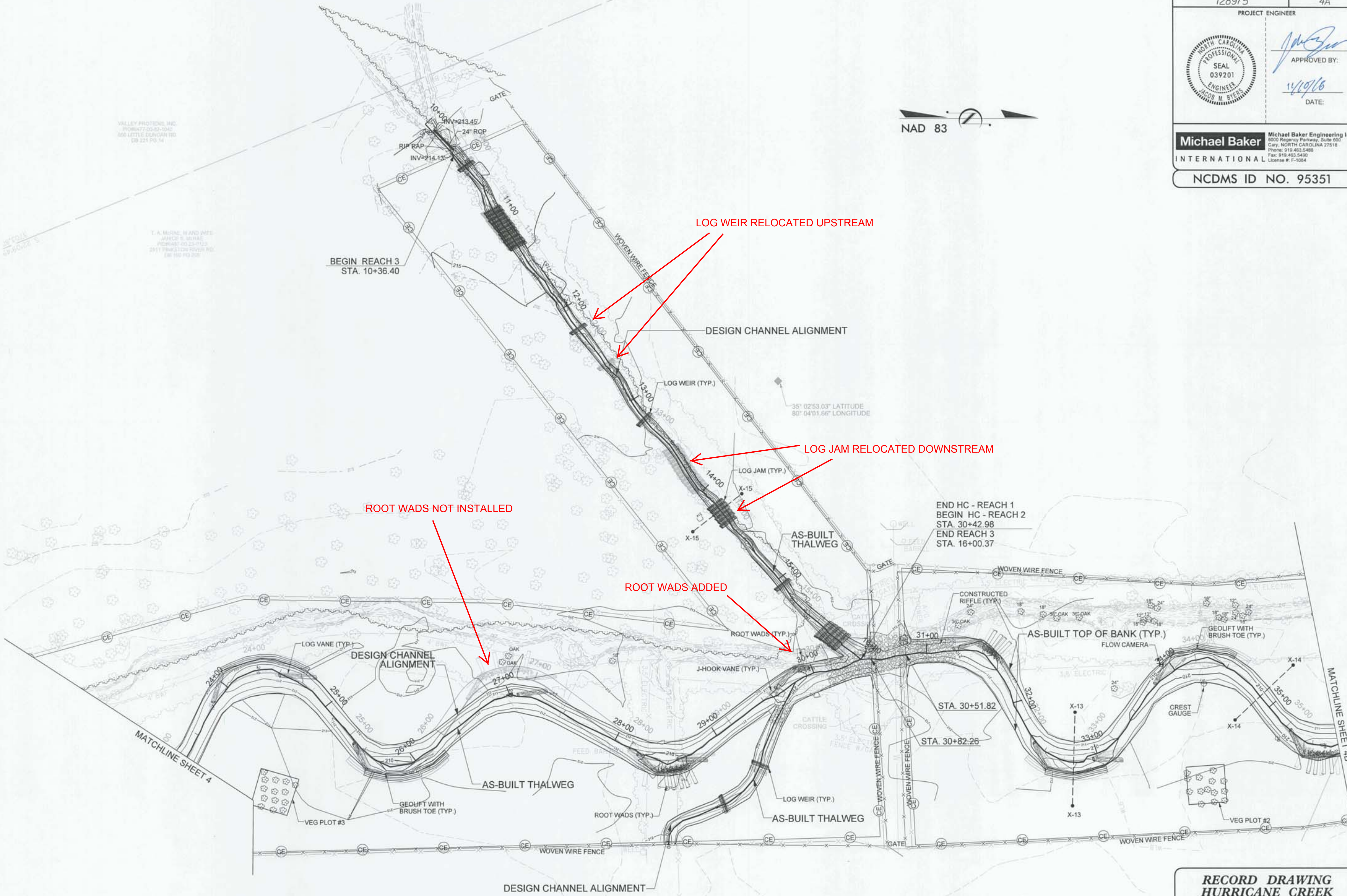
APPROVED BY:

DATE: 11/10/16

Michael Baker INTERNATIONAL

Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351



NAD 83
LOG WEIR RELOCATED UPSTREAM
DESIGN CHANNEL ALIGNMENT
LOG WEIR (TYP.)
LOG JAM RELOCATED DOWNSTREAM
LOG JAM (TYP.)
BEGIN REACH 3
STA. 10+36.40
WOVEN WIRE FENCE
GATE
INV=213.45'
24" RCP
RIP RAP
INV=214.13'
35° 02'53.03" LATITUDE
80° 04'01.66" LONGITUDE
ROOT WADS NOT INSTALLED
ROOT WADS ADDED
AS-BUILT THALWEG
END HC - REACH 1
BEGIN HC - REACH 2
STA. 30+42.98
END REACH 3
STA. 16+00.37
CONSTRUCTED RIFFLE (TYP.)
AS-BUILT TOP OF BANK (TYP.)
FLOW CAMERA
GEOLIFT WITH BRUSH TOE (TYP.)
LOG VANE (TYP.)
DESIGN CHANNEL ALIGNMENT
ROOT WADS (TYP.)
J-HOOK VANE (TYP.)
STA. 30+51.82
STA. 30+82.26
CREST GAUGE
MATCHLINE SHEET 4
MATCHLINE SHEET 4B
VEG PLOT #3
VEG PLOT #2
AS-BUILT THALWEG
LOG WEIR (TYP.)
X-13
X-14
X-15
DESIGN CHANNEL ALIGNMENT

RECORD DRAWING
HURRICANE CREEK
PLAN VIEW

40 20 0 40 80
SCALE (FT)

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4B

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

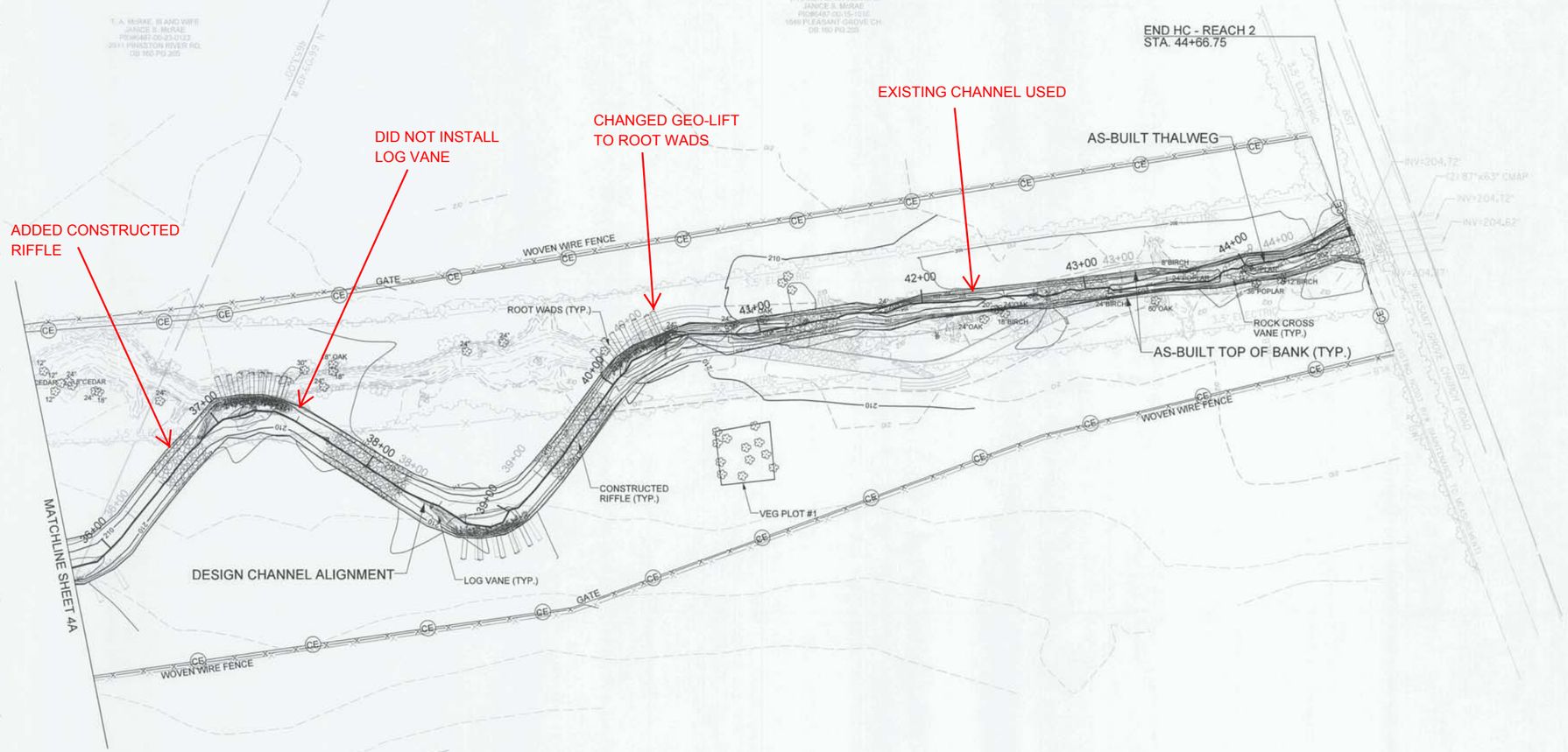
APPROVED BY:

14/10/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



RECORD DRAWING
HURRICANE CREEK
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/9/2016
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mcarey
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4C

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M BYERS

APPROVED BY:

11/23/16

DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83

DID NOT INSTALL GEO-LIFT

DESIGN CHANNEL ALIGNMENT

J-HOOK VANE (TYP.)

MATCHLINE SHEET 4D

FLOW GAUGE

LOG JAM (TYP.)

CONSTRUCTED RIFFLE (TYP.)

VEG PLOT #16

AS-BUILT THALWEG

GEOLIFT WITH BRUSH TOE (TYP.)

CHANGED ROOT WADS TO GEO-LIFT

LOG VANE (TYP.)

GEOLIFT WITH BRUSH TOE (TYP.)

AS-BUILT TOP OF BANK (TYP.)

CHANGED ROOT WADS TO GEO-LIFT

INV=219.86'
36" RCP

INV=219.47'

BEGIN UT4 - REACH 1A
STA. 10+00.00

BEGIN UT4 - REACH 1B
STA. 11+06.87

END UT4 - REACH 1A
STA. 15+18.00

10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00

X-1
X-2

ALAN DALE McRAE
PID#0407-00-45-3365
NC 109
DB 961 PG 182

TWIN PP

NAIL SET IN CONCRETE

RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/16/2016
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mcarey
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4D

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/9/16

DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83

MATCHLINE SHEET 4I

MATCHLINE SHEET 4C

MATCHLINE SHEET 4E

AS-BUILT THALWEG

LOG JAM (TYP.)

VEG PLOT #13

LOG WEIR MOVED DOWNSTREAM

AS-BUILT TOP OF BANK (TYP.)

DESIGN CHANNEL ALIGNMENT

GEO-LIFT NOT INSTALLED

J-HOOK VANE (TYP.)

LOG WEIR (TYP.)

LOG WEIR NOT INSTALLED

END UT4 - REACH 1B
BEGIN UT4 - REACH 2
STA. 19+64.37
END UT4 - REACH 5B
STA. 30+21.60

EXISTING CHANNEL USED HERE

TIE INTO EXISTING FENCE

WOVEN WIRE FENCE

ROOT WADS (TYP.)

GEOLIFT WITH BRUSH TOE (TYP.)

LOG VANE (TYP.)

CONSTRUCTED RIFFLE (TYP.)

STA. 21+42.43

STA. 21+11.16

DID NOT INSTALL ROOT WADS

ALAN DALE McRAE
PID#9497-00-45-2885
NC 109
DB 851 PG 182

LOUIS EDWARD HATEM, A UNDIVIDED INTEREST
WILLIAM MICHAEL HATEM, JR., A UNDIVIDED INTEREST
PID#9497-00-13-8104
1632 PLEASANT GROVE CH.
DB 404 PG 8

AMERICAN TIMBERLAND II, LLC
C/O POWELL, GOLDSTEIN, FRAZER & MURPHY LLP
PID#9497-00-25-5531
NC 109
DB 507 PG 190

RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/9/2016
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mcarey
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4E

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/10/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83

INSTALLED ROOT WADS
IN PLACE OF TRANSPLANTS

ADDED ROOT WAD
AND LOG WEIR

MATCHLINE SHEET 4D

MATCHLINE SHEET 4F

WOVEN WIRE FENCE

GATE

VEG PLOT #12

AS-BUILT THALWEG

ROOT WADS (TYP.)

DESIGN CHANNEL ALIGNMENT

GEOLIFT WITH BRUSH TOE (TYP.)

VEG PLOT #11

LOG VANE (TYP.)

AS-BUILT TOP OF BANK (TYP.)

CREST GAUGE

TWN 12"

INSTALLED ROOT WADS
IN PLACE OF TRANSPLANTS

INSTALLED GEO-LIFTS
IN PLACE OF TRANSPLANTS

VEG PLOT #10

STA. 25+22.69

STA. 25+43.46

AS-BUILT THALWEG

AS-BUILT TOP OF BANK (TYP.)

DESIGN CHANNEL ALIGNMENT

LOG VANE (TYP.)

LOG JAM (TYP.)

END UT4 - REACH 4B =
BEGIN UT4 - REACH 3
STA. 28+92.29

END UT4 - REACH 2
STA. 38+23.08

VEG PLOT #9

CONSTRUCTED RIFFLE (TYP.)

LOG JAM (TYP.)

J-HOOK VANE (TYP.)

MOVED ROCK CROSS VANE UPSTREAM

ROCK CROSS VANE (TYP.)

ROCK CROSS VANE (TYP.)

TIE INTO EXISTING FENCE

END UT4 - REACH 3
STA. 31+42.13

RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/9/2016
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mcarey
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4F

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/23/16

DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

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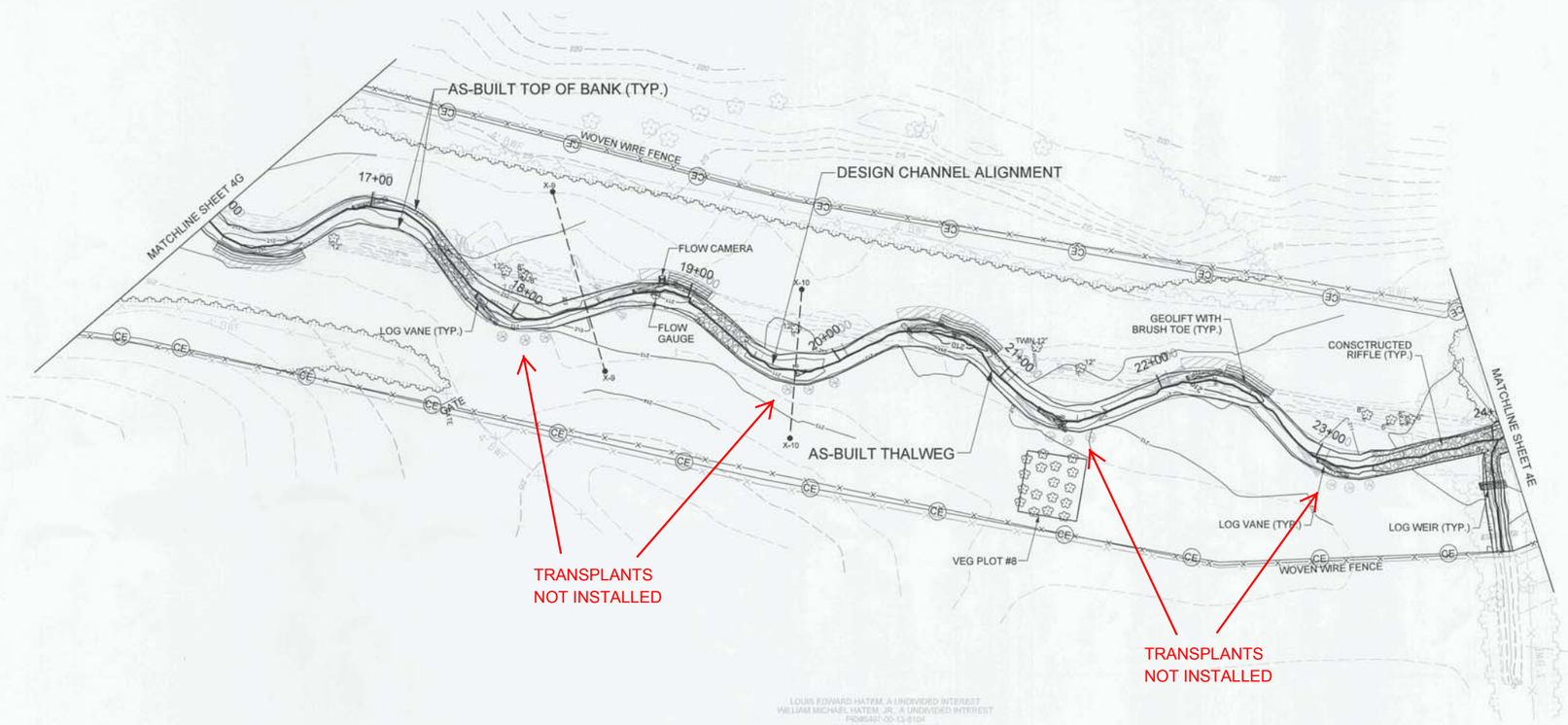

LOUIS EDWARD HATEM, A UNDIVIDED INTEREST
WILLIAM MICHAEL HATEM, JR., A UNDIVIDED INTEREST
PID#5497-00-13-8104
1632 PLEASANT GROVE ISH
DB 404 PG 8

RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/16/2016
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mcgray
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	4G

PROJECT ENGINEER

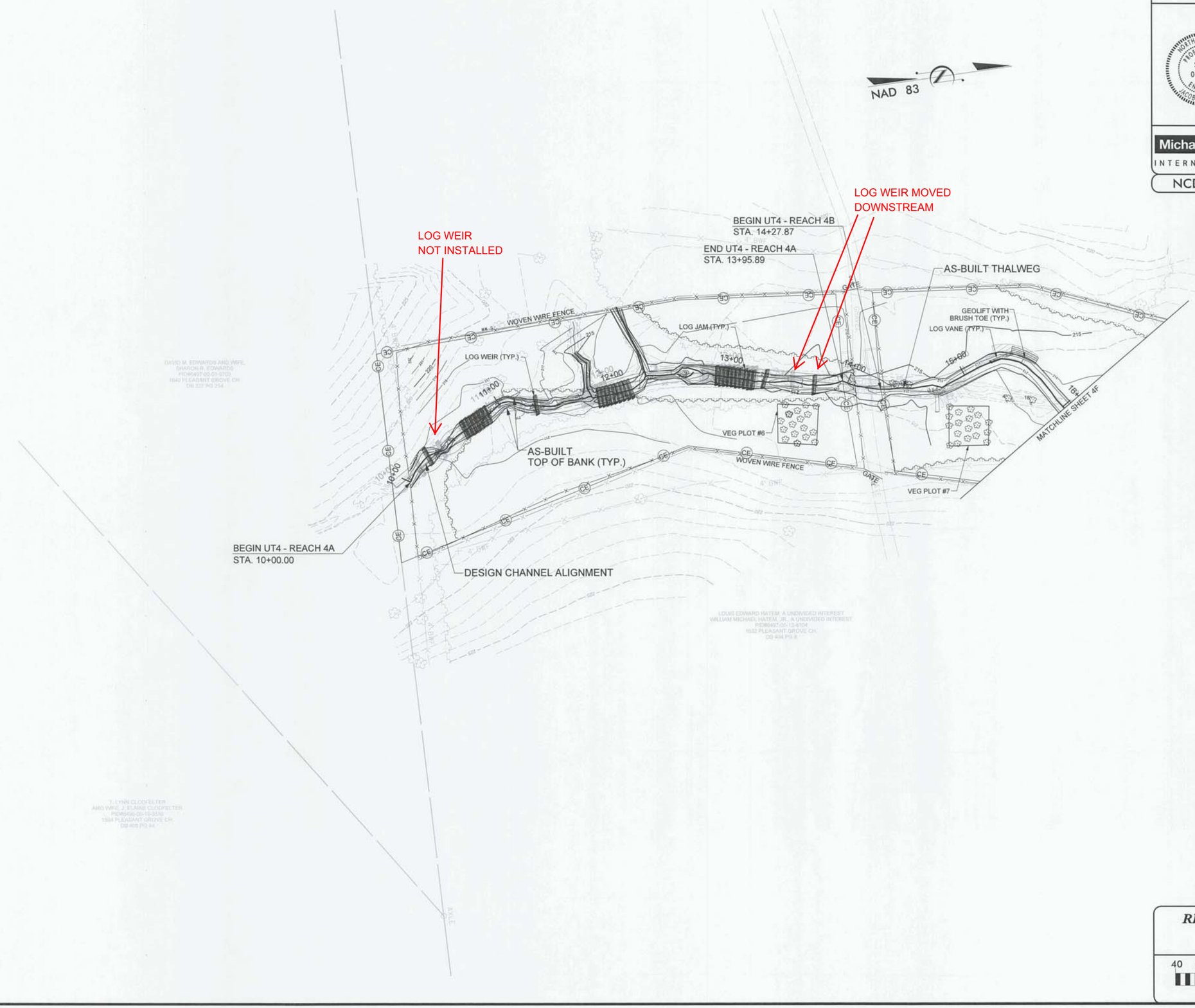
NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M BYERS

APPROVED BY:

4/10/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351



RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

2/26/03

11/9/2016
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128975	4H

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

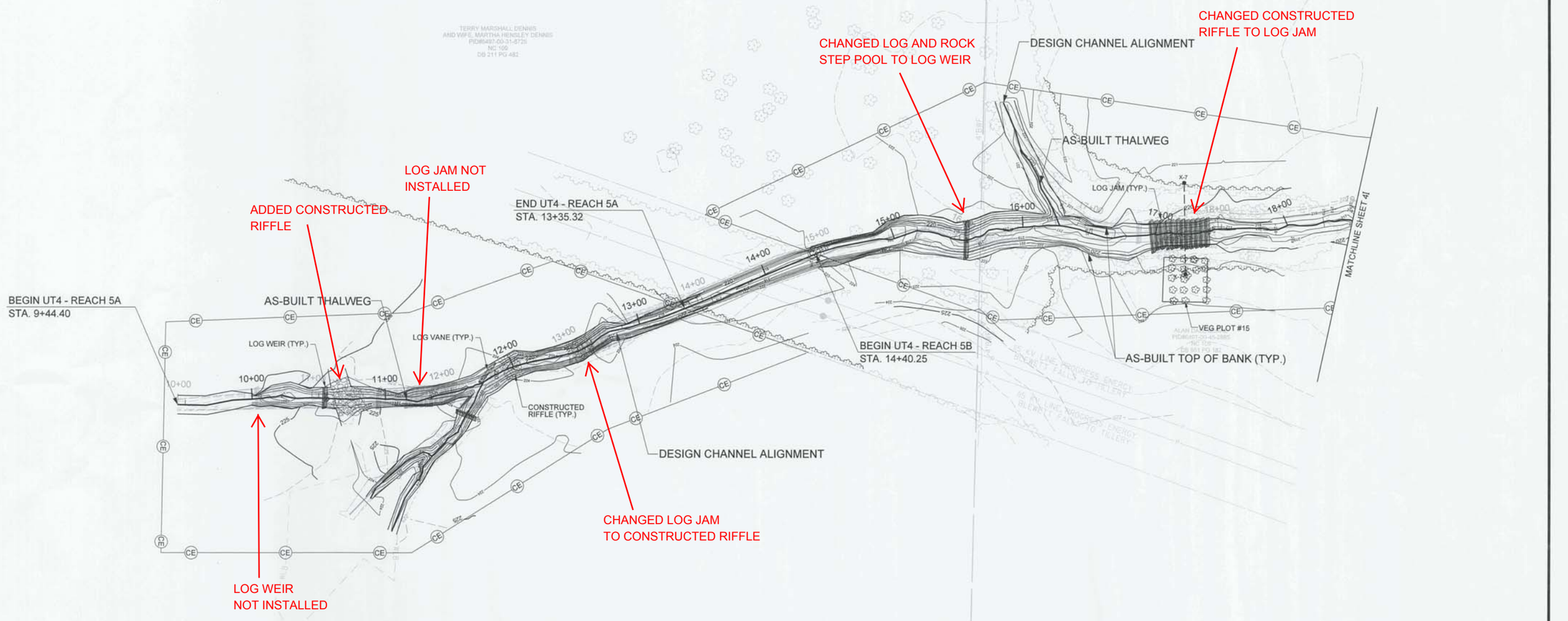
11/23/16

DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NAD 83



RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

11/16/2016
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BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	41

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

4/14/16
DATE:

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

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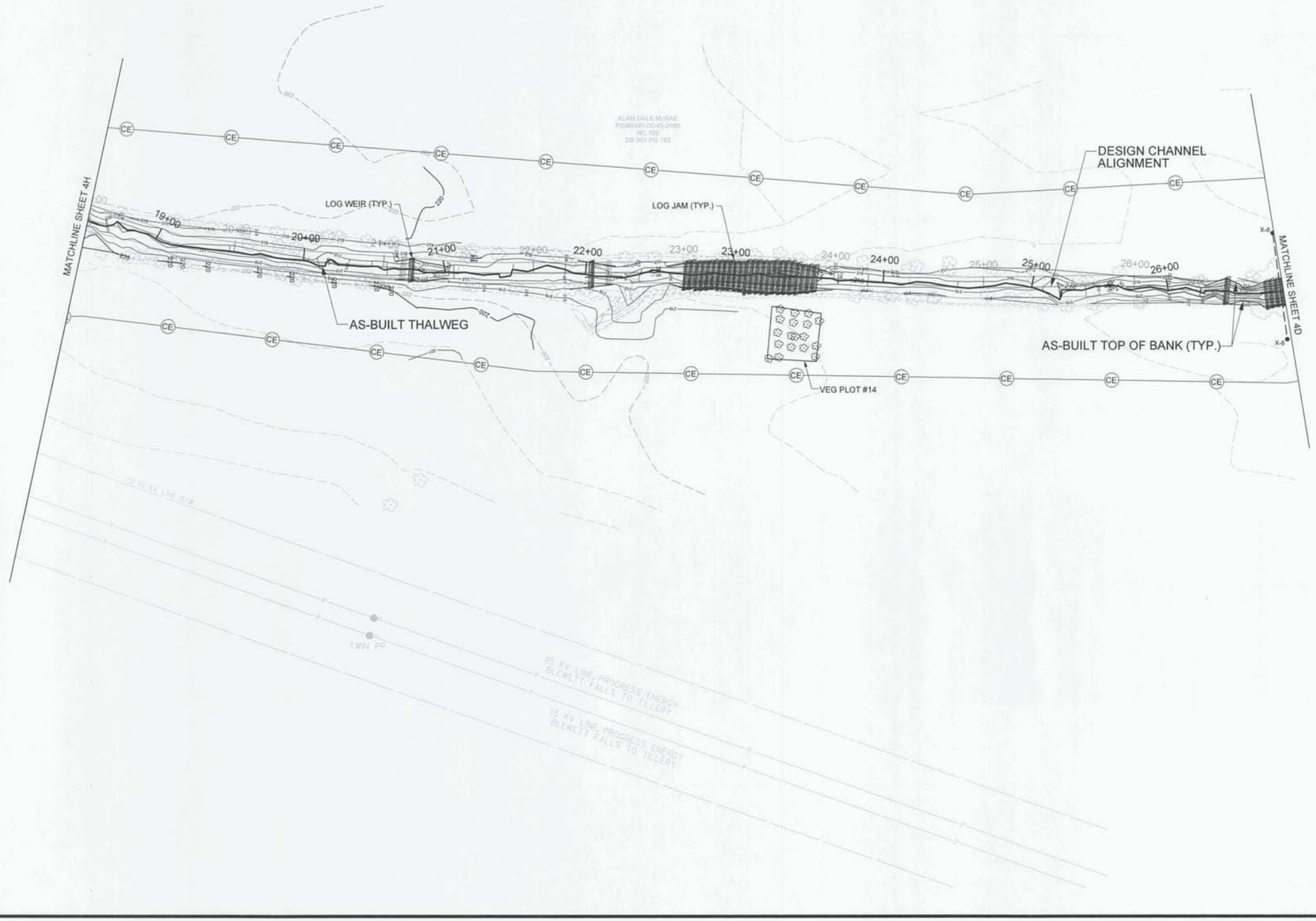

RECORD DRAWING
UT4
PLAN VIEW

40 20 0 40 80
SCALE (FT)

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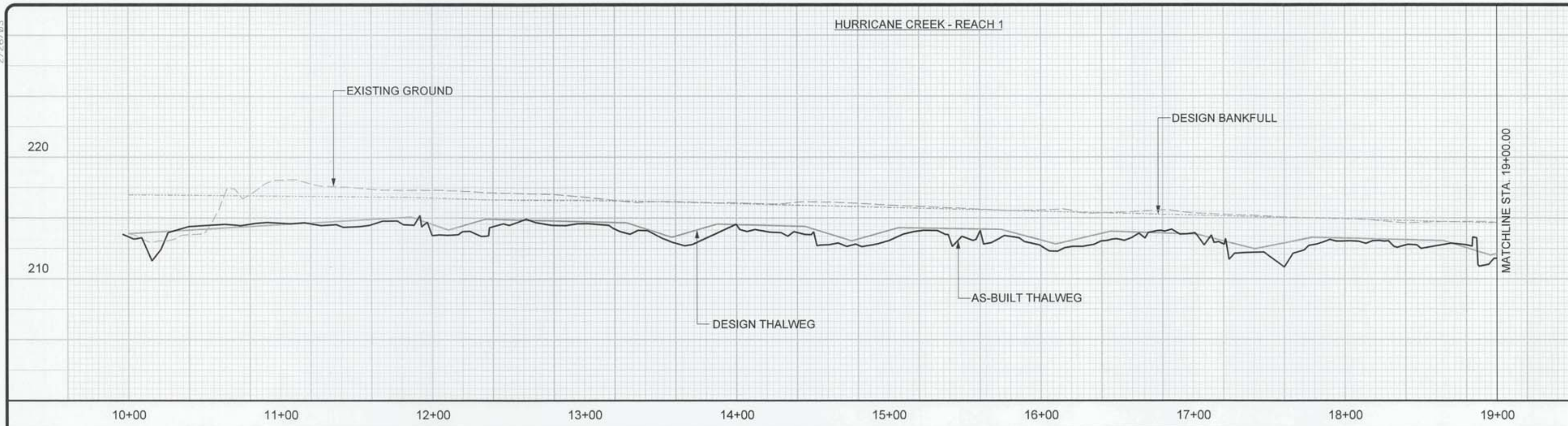
2/26/03



BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	5

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/16/16

DATE:

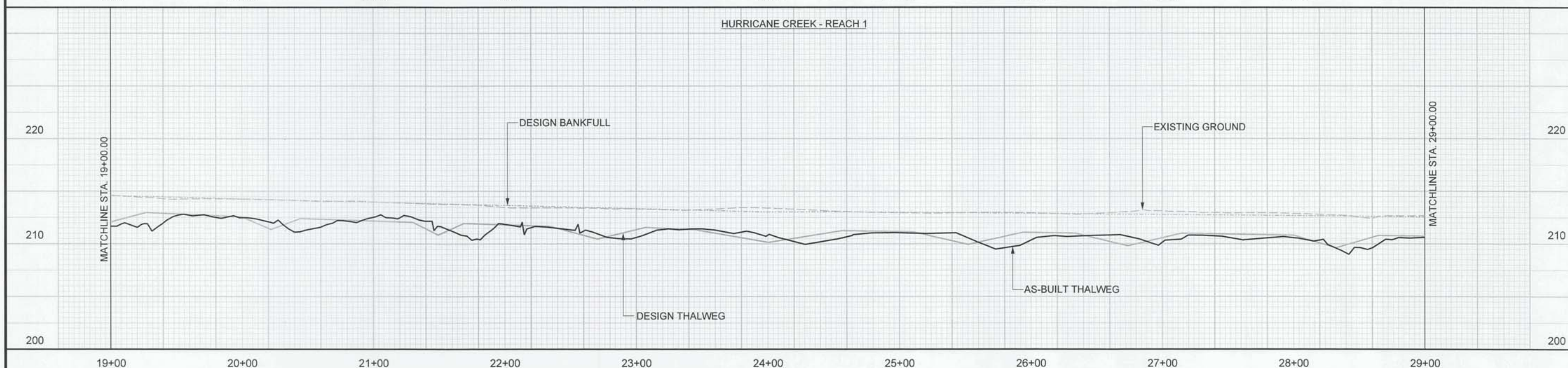
Michael Baker INTERNATIONAL

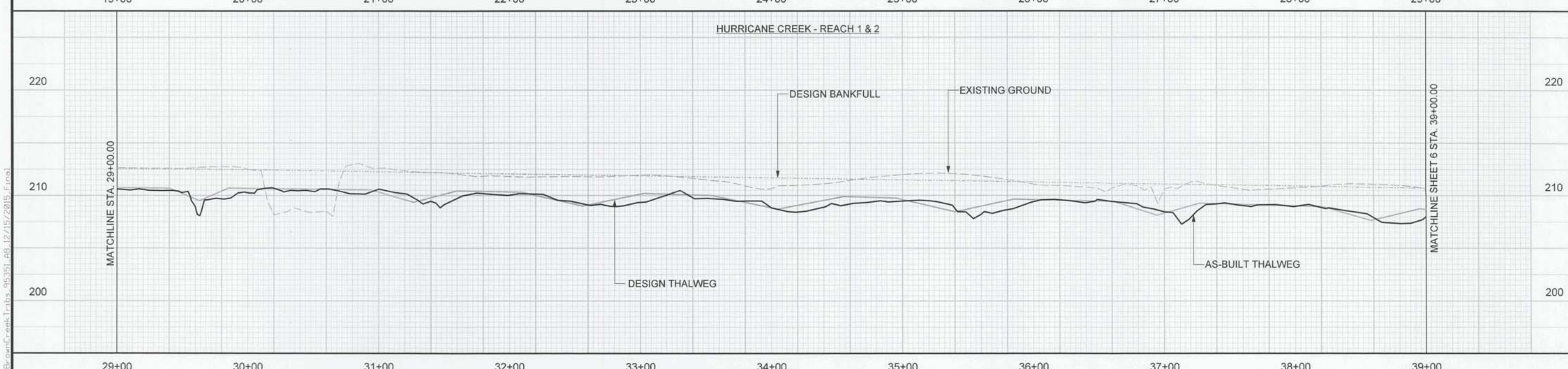
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEE II

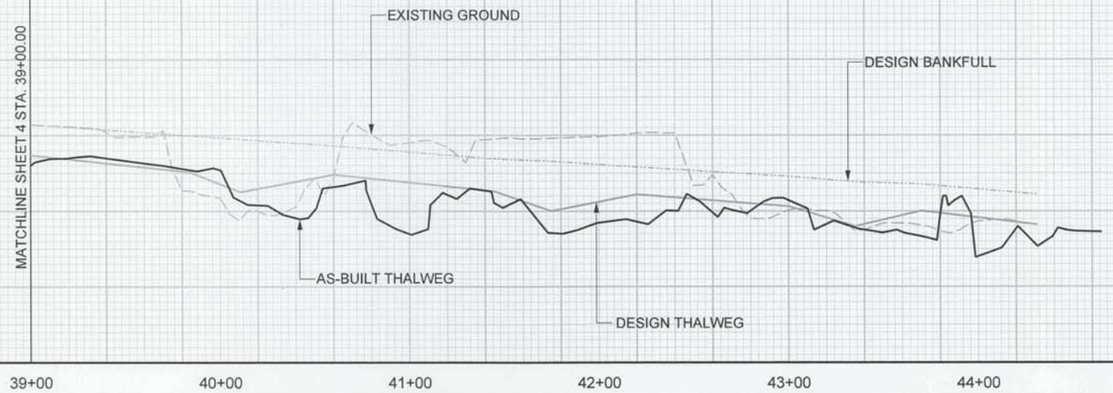
12-7-16





2/26/03

HURRICANE CREEK - REACH 2



BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	6

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/10/16
DATE:

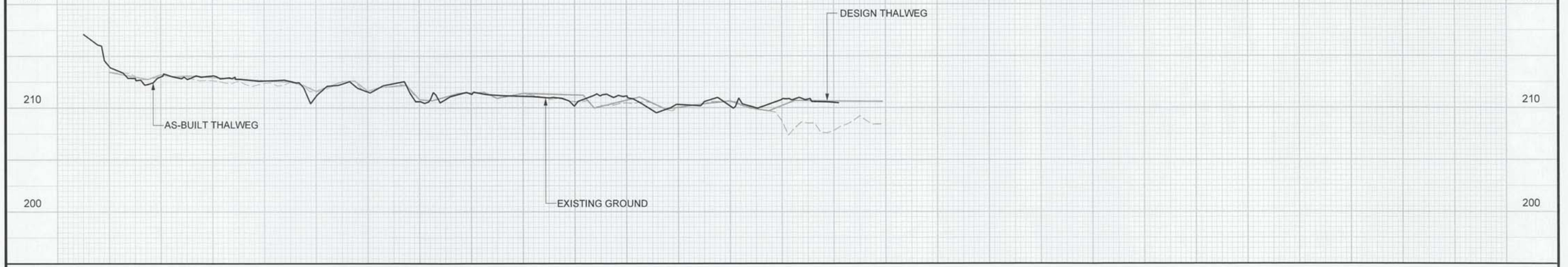
Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: P-1084

NCDMS ID NO. 95351

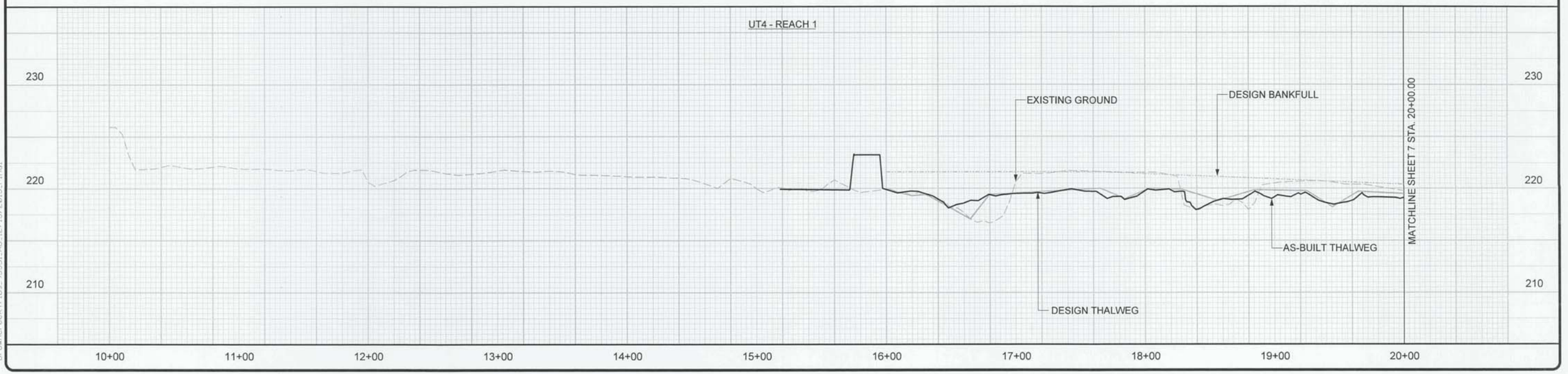
NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR DAVID LEER

12-7-16

HURRICANE CREEK - REACH 3



UT4 - REACH 1



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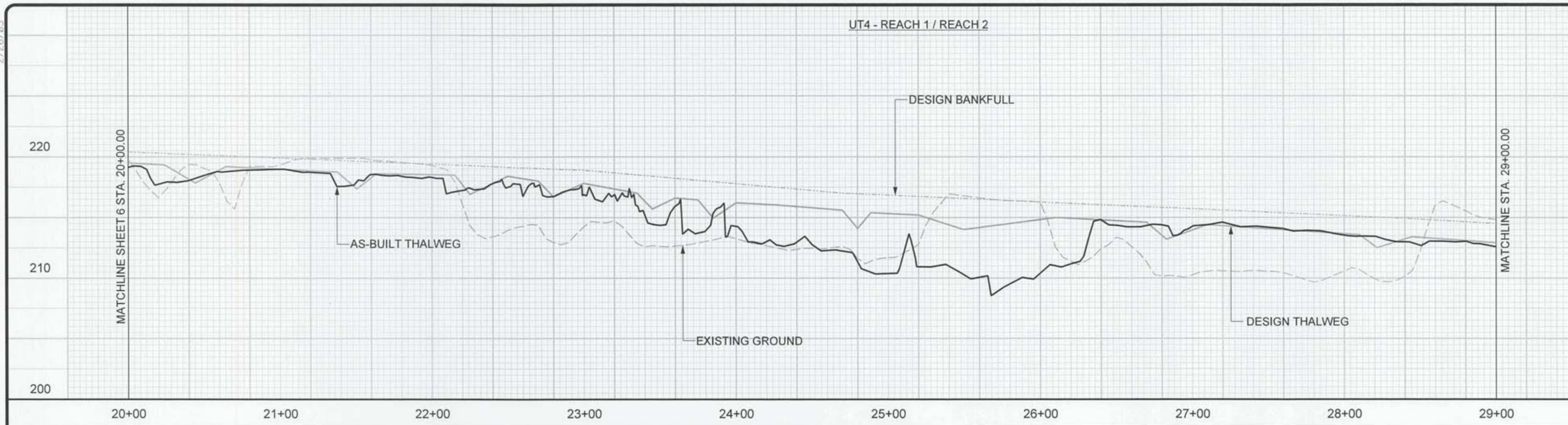

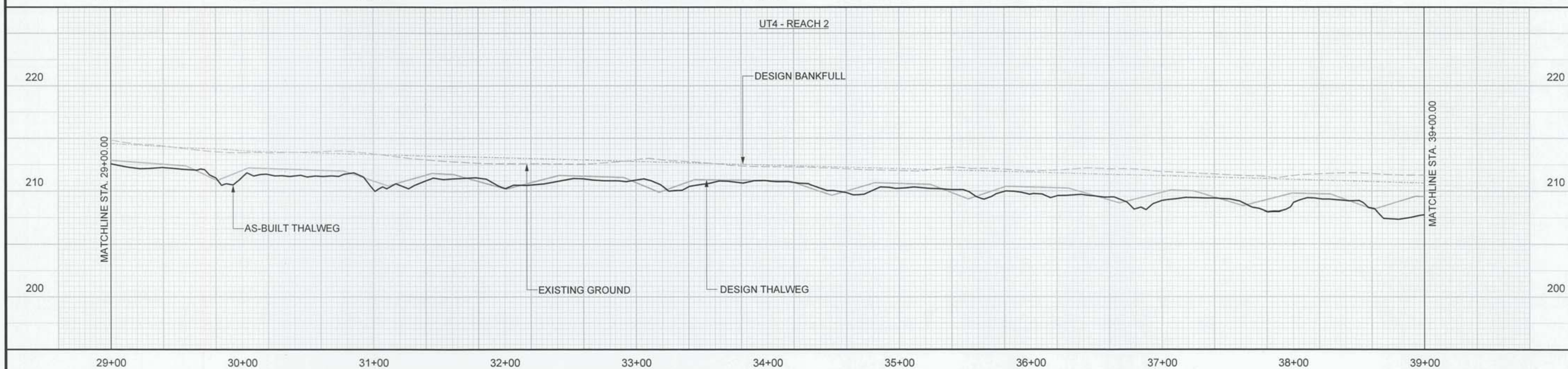

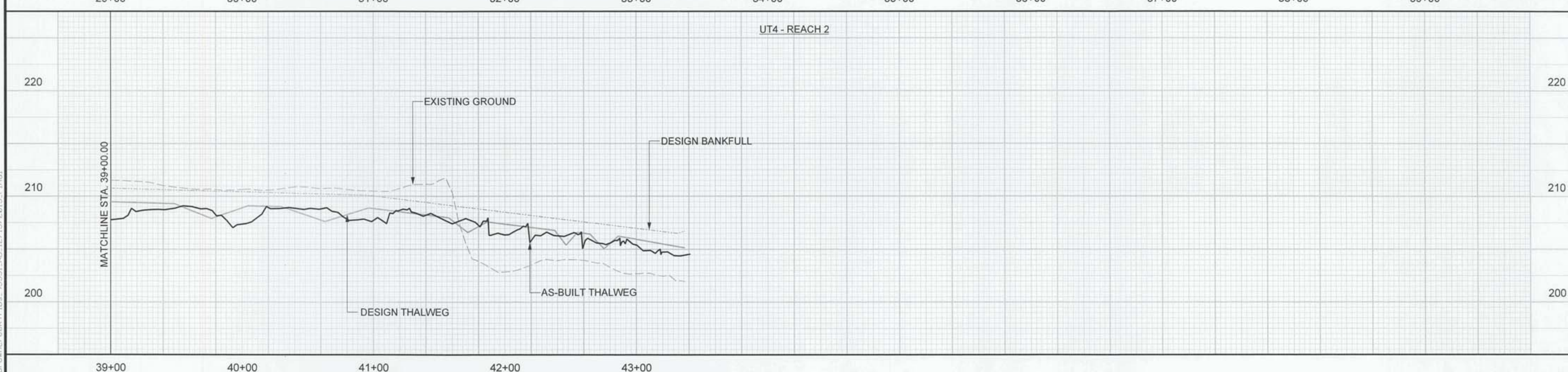

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	7

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039201 JACOB M. BYERS

APPROVED BY:

DATE: 8/10/16

Michael Baker INTERNATIONAL

Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4175 J. DAVID LEE II

12-7-16

8/9/2016
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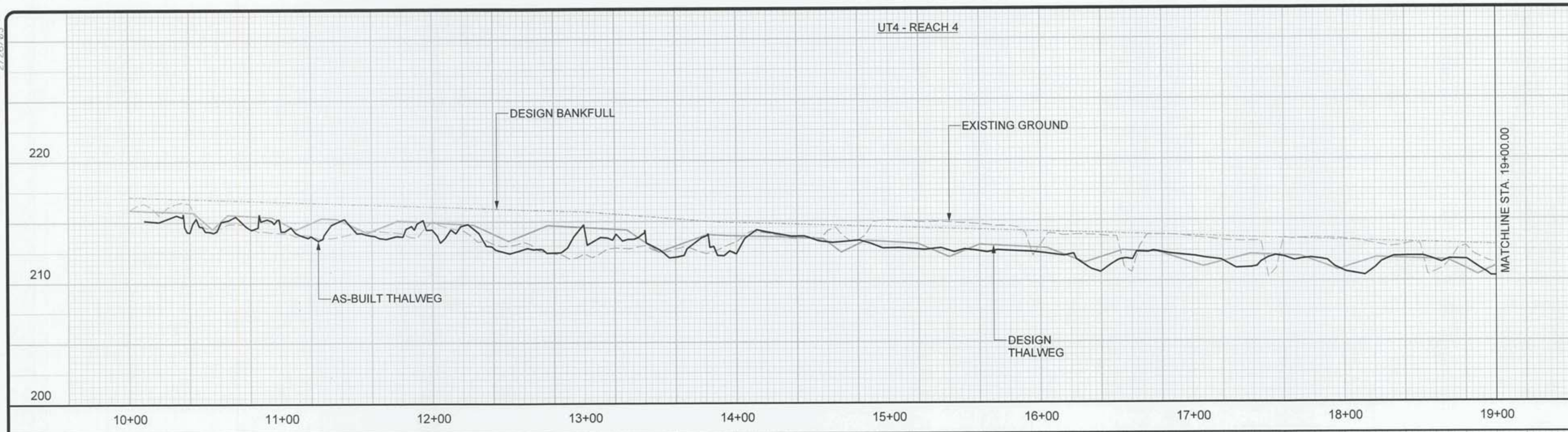

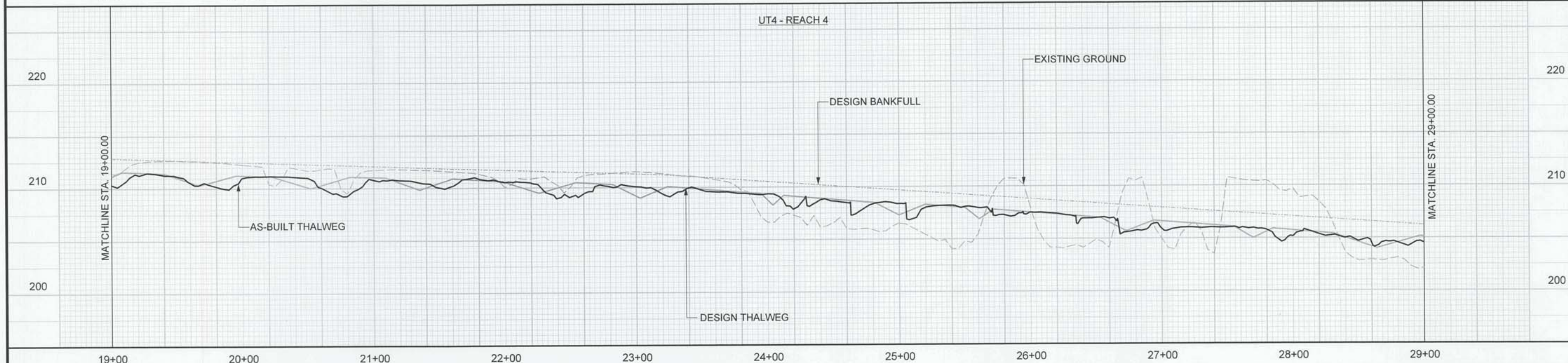

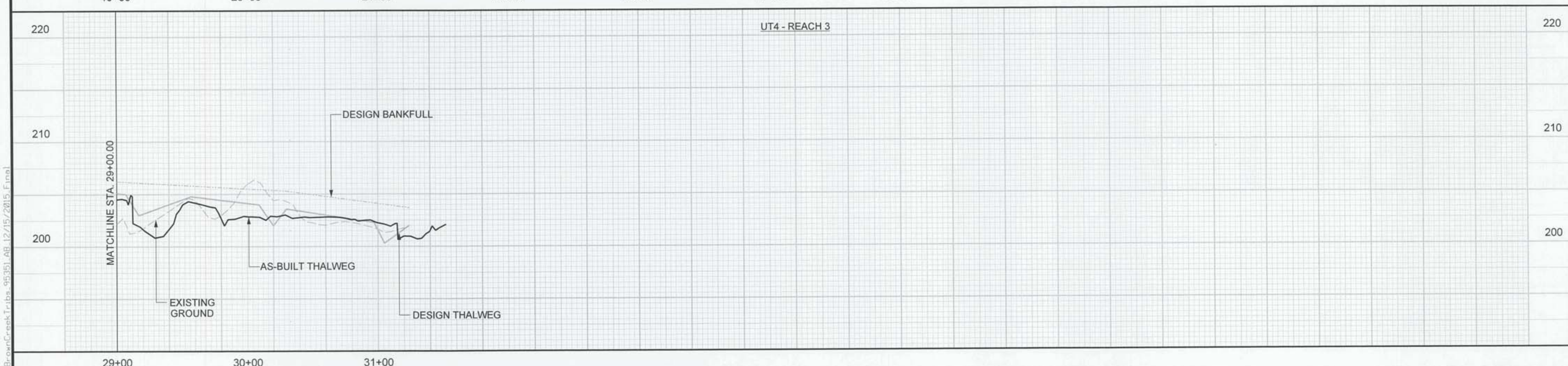

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	8

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/10/16
DATE:

Michael Baker INTERNATIONAL

Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

NCDMS ID NO. 95351

NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR J. DAVID LEE II

12-7-14

BAKER PROJECT REFERENCE NO.	SHEET NO.
128975	9

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039201 ENGINEER JACOB M. BYERS

APPROVED BY:

11/23/16

DATE:

Michael Baker INTERNATIONAL

Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5490
License #: F-1084

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NORTH CAROLINA PROFESSIONAL SEAL L-4175 LAND SURVEYOR J. DAVID LEE II

12-7-16