STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

May 22, 2012

Ms. Lori Beckwith
U.S Army Corps of Engineers
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

Subject: As-Built Report for Stream Restoration on B-4191 Jacktown Creek, McDowell County, TIP Project No. B-4191, USACE Action ID – SAW-2009-0707, WQC#'s 003688 & 003701, DWQ Project # 20090385

Dear Ms. Beckwith,

Please find enclosed the As-Built Report for the subject site, per special condition number 2 in the ACE permit and condition number 6 in the Water Quality Certification. The Division 13 Resident Engineer responsible for administering the contract has certified that the site was constructed according to construction plan sheets, with any exceptions noted in this As-Built Report.

The following information has been included as part of the As-Built Report: 1) As-Built Plan Sheets (with adjustments highlighted in yellow), 2) Photo Point Locations, and 3) Planting Plan and Restoration Detail Sheets. The site will be monitored as described in the approved mitigation plan and associated permit requirements.

If you should have any questions or require additional information, please do not hesitate to contact Mr. Randy Griffin at (919) 707-6121. Thank you once again for your continued support and cooperation.

Sincerely,

Philip S. Harris, III, P.E., CPM, Unit Head
PDEA- Natural Environment Section

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT SECTION
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-707-6000
FAX: 919-250-4224

WEBSITE: WWW.NCDOT.GOV

LOCATION:
PDEA – CENTURY CENTER BUILDING B
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4191	OSM-1	15

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33538.1.1		P.E.
33538.3.1		CONST.

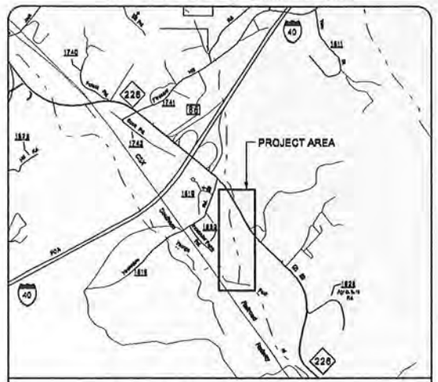
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

McDOWELL COUNTY

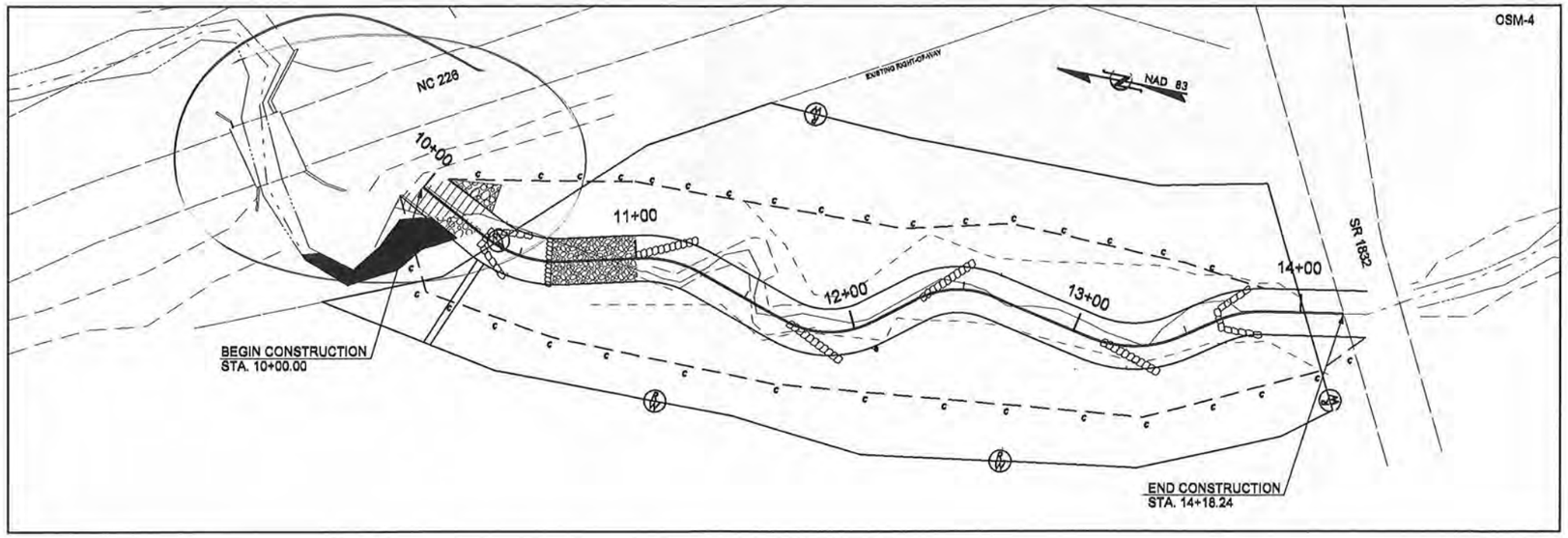
LOCATION: BRIDGE NO. 82 ON NC. 226 OVER JACKTOWN CREEK

TYPE OF WORK: ON-SITE MITIGATION

See Sheet 1-A For Index of Sheets



VICINITY MAP



TIP PROJECT: B-4191

CONTRACT:

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S:\Engineering\Project Files\B-4191 Jocktown Creek\As-Built\B4191_Rdy_TSH_OSMI.dgn
Jelliott AT PIDEA245970

09/28/99

GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

PROJECT LENGTH

EXISTING STREAM LENGTH = 450 FT
PROPOSED DESIGN STREAM LENGTH = 428 FT
(EXCLUDES CROSSINGS)

Prepared in the Office of:

Baker
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 600
Cary, NORTH CAROLINA 27518
Phone: 919.463.5488
Fax: 919.463.5493
License #: F-1084

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

WILLIAM SCOTT HUNT, III, PE
PROJECT ENGINEER

JAKE BYERS, EI
PROJECT SCIENTIST

PROJECT ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
B-4191	OSM-1A

PROJECT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22967 ENGINEER WILLIAM SCOTT HUNT 05-17-2017

PROJECT ENGINEER

Baker
Michael Baker Engineering Inc.
8000 Regency Parkway, Suite 200
Cary, NORTH CAROLINA 27518
Phone: 919 463 5488
Fax: 919 463 5490
License #: F-1084

REVISIONS

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR JOB SITE SAFETY.
2. SUBSURFACE PLANS ARE NOT AVAILABLE; THEREFORE, THE CONTRACTOR WILL BE REQUIRED TO LOCATE UTILITIES AND PROTECT FROM DAMAGE.
3. GRADING SHOULD INCLUDE SMOOTH TRANSITIONS.
4. CONTRACTOR WILL BE REQUIRED TO PUMP BASE STREAM FLOW AROUND AREA WHERE CONSTRUCTION WILL OCCUR IN THE ACTIVE STREAM CHANNEL.

MORPHOLOGICAL MEASUREMENTS TABLE

B-4191 Jacktown Creek	Existing Stream Values		Design Stream Values		Reference Data	
Parameter	**MIN**	**MAX**	**MIN**	**MAX**	**MIN**	**MAX**
Drainage Area, DA (sq mi)	1.28		1.28			
Stream Type (Rosgen)	B4c		C4		C/E4	
Bankfull Discharge, Qbkf (cfs)	105		105			
Bankfull Riffle XSEC Area, Abkf (sq ft)	25.4	25.5	25.0			
Bankfull Mean Velocity, Vbkf (ft/s)	4.1	4.1	4.2		3.50	5.00
Bankfull Riffle Width, Wbkf (ft)	13.2	17.0	17.3			
Bankfull Riffle Mean Depth, Dbkf (ft)	1.5	1.9	1.4			
Width to Depth Ratio, W/D (ft/ft)	6.9	11.3	12.0		10	14
Width Floodprone Area, Wfpa (ft)	20.3	24.9	52.0			
Entrenchment Ratio, Wfpa/Wbkf (ft/ft)	1.5	1.5	3.0			
Riffle Max Depth @ bkf, Dmax (ft)	2.0	2.7	1.5	1.8		
Riffle Max Depth Ratio, Dmax/Dbkf	1.3	1.4	1.1	1.3	1.1	1.3
Max Depth @ tob, Dmaxtob (ft)	6.1	7.9	1.5	2.0		
Bank Height Ratio, Dtob/Dmax (ft/ft)	2.9	3.2	1.0	1.1	1.0	1.1
Meander Length, Lm (ft)	30	105	128	145		
Meander Length Ratio, Lm/Wbkf	2	8	7	8	7	12
Radius of Curvature, Rc (ft)	10	25	45	65		
Rc Ratio, Rc/Wbkf *	0.6	1.9	3	4	2	4
Belt Width, Wblt (ft)	30	40	32	45		
Meander Width Ratio, Wblt/Wbkf **	1.8	3.0	1.8	2.6	3.5	8
Sinuosity, K**	1.17		1.10		1.20	1.60
Valley Slope, Sval (ft/ft)	0.0063		0.0063		0.005	0.015
Channel Slope, Schan (ft/ft)	0.0054		0.0040			
Slope Riffle, Srif (ft/ft)	0.034	0.072	0.0060	0.0080		
Riffle Slope Ratio, Srif/Schan	6.30	13.33	1.5	2.0	1.5	2
Slope Pool, Spool (ft/ft)	---		0.0000	0.0008		
Pool Slope Ratio, Spool/Schan	---		0.00	0.20	0	0.2
Pool Max Depth, Dmaxpool (ft)	3.0		3.9			
Pool Max Depth Ratio, Dmaxpool/Dbkf	1.6	2.0	2.8		2	3.5
Pool Width, Wpool (ft)	19.0	27.0	26.0			
Pool Width Ratio, Wpool/Wbkf	1.12	2.05	1.5		1.3	1.7
Pool-Pool Spacing, Lps (ft)	48	161	65.0	80.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	2.8	12.2	3.8	4.6	4	7

* RADIUS OF CURVATURE RATIO BASED ON OUTSIDE RADIUS OF MEANDER BENDS.

** DUE TO DESIGN CONSTRAINTS, DESIGN MEANDER WIDTH RATIOS AND SINUOSITY ARE LESS THAN THOSE PREDICTED BY REFERENCE DATA. IN-STREAM STRUCTURES ARE BEING USED TO PROVIDE APPROPRIATE POOL TO POOL SPACING AND STABILTY.

INDEX OF SHEETS

1	TITLE SHEET
1A	INDEX OF SHEETS STREAM CONVENTIONAL SYMBOLS GENERAL NOTES MORPHOLOGICAL MEASUREMENTS TABLE
1B	CONVENTIONAL PLAN SHEET SYMBOLS
2 TO 2B	STRUCTURE DETAILS
3	SUMMARY OF QUANTITIES, CONSTRUCTION SEQUENCE, AND STRUCTURE TABLE
3A	CURVE DATA
4	PLAN VIEW AND PROFILE OF EXISTING CONDITIONS AND PROPOSED STREAM DESIGN
X-1 TO X-4	CROSS SECTIONS
EC-1	EROSION CONTROL TITLE SHEET
EC-2	EROSION CONTROL PLAN SHEET

STREAM CONVENTIONAL SYMBOLS

SUPERCEDES SHEET 1B

- ROCK J-HOOK
- ROCK VANE
- OUTLET PROTECTION
- ROCK CROSS VANE
- DOUBLE DROP ROCK CROSS VANE
- SINGLE WING DEFLECTOR
- DOUBLE WING DEFLECTOR
- TEMPORARY SILT CHECK
- ROOT WAD
- LOG J-HOOK
- LOG VANE
- LOG WEIR
- LOG CROSS VANE
- CONSTRUCTED RIFFLE
- BOULDER CLUSTER
- ROCK STEP POOL
- LOG STEP POOL
- SAFETY FENCE
- TF — TAPE FENCE
- FP — 100 YEAR FLOOD PLAIN
- CE — 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

PROJECT REFERENCE NO.	SHEET NO.
B-4191	OSM-1B

3/15/06

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET 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
- 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 — 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
- 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 — ?UNL
- 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.

PROJECT REFERENCE NO.	SHEET NO.
B-4191	OSM-2

PROJECT ENGINEER

PROJECT ENGINEER

Baker

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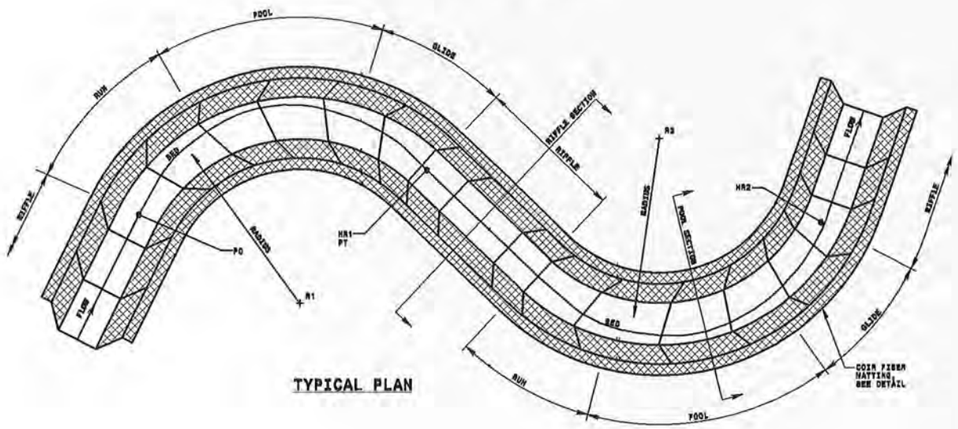
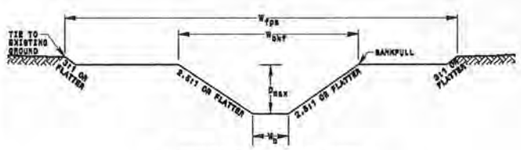
REVISIONS

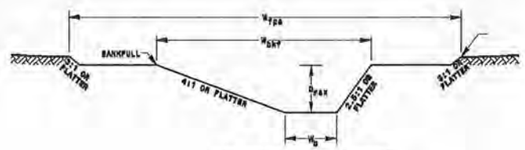
CHANNEL TYPICAL DETAIL
NOT TO SCALE



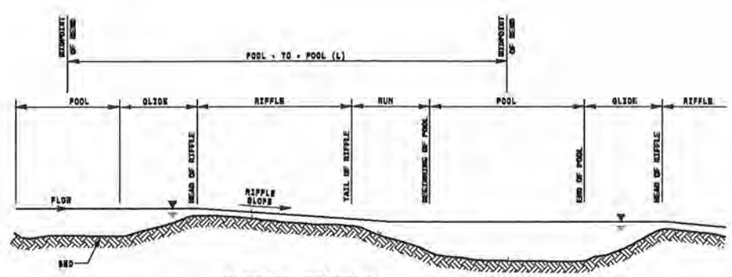
TYPICAL PLAN



TYPICAL RIFFLE WITH BANKFULL BENCH
(REACH M1)



TYPICAL POOL WITH BANKFULL BENCH



TYPICAL PROFILE

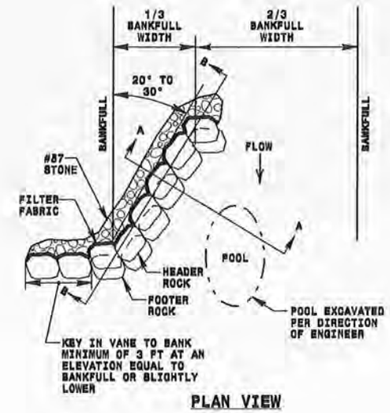
W_{bkf} = BANKFULL WIDTH
D_{max} = MAXIMUM DEPTH
W_b = BOTTOM WIDTH
W_{fpa} = FLOOD PRONE AREA WIDTH

NOTES:
1. THE COORDINATES FOR EACH CENTER OF RADIUS (EX. "R1","R2") ARE INDICATED ON THE PLAN SHEETS.

CROSS-SECTION DIMENSIONS (ft)

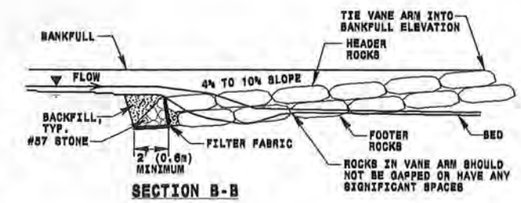
	RIFFLE				POOL				
REACH	W_{bkf}	D_{max}	W_b	W_{fpa}	W_{bkf}	D_{max}	W_b	W_{fpa}	Width/Depth Ratio
Sta. 10+00-14+18.24	17.3	1.7	8.8	52.0	26.0	3.9	3.3	52.0	12

ROCK VANE DETAIL
NOT TO SCALE

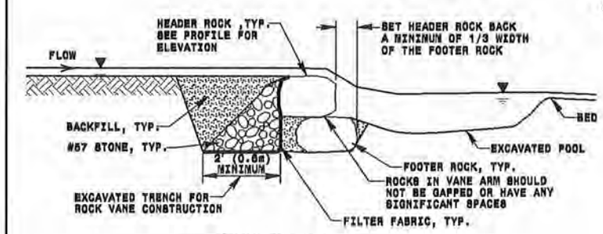


PLAN VIEW

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



SECTION B-B



SECTION A-A

	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
11+00	2	4	3
11+72	2	4	3
12+32	2	4	3
13+12	2	4	3

11-APR-2012 09:55
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Jelliott AT TDEA245970

B-4191	OSM-2A

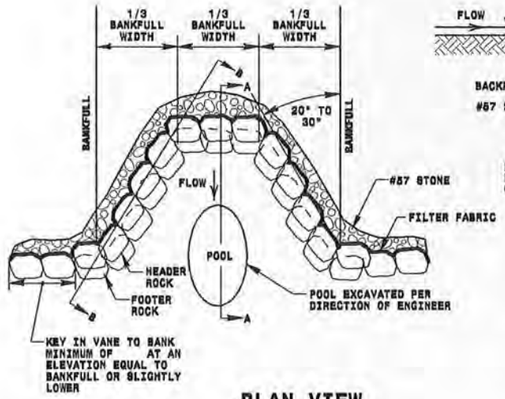
PROJECT ENGINEER

PROJECT ENGINEER

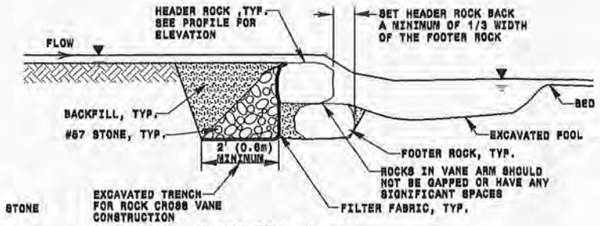
Baker — Michael Baker Engineering Inc. 8000 Regency Parkway Suite 200 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax 919.463.5490

ROCK CROSS VANE DETAIL

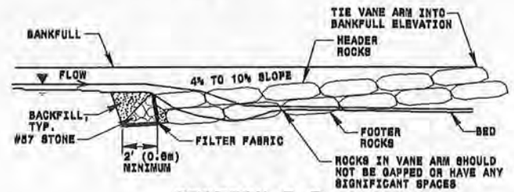
NOT TO SCALE



PLAN VIEW



SECTION A-A



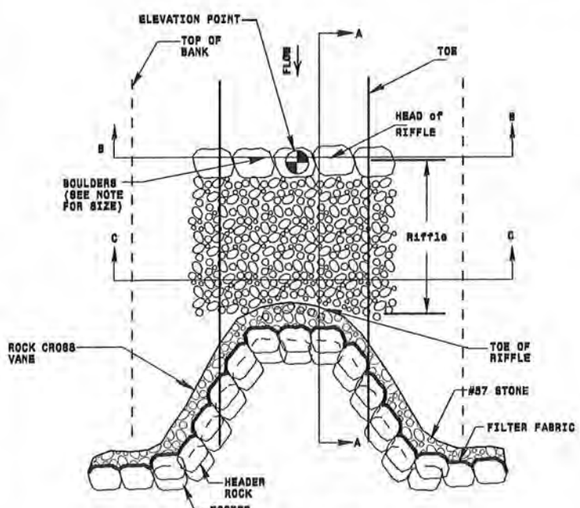
SECTION B-B

	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
10+34	2	4	3
13+65	2	4	3

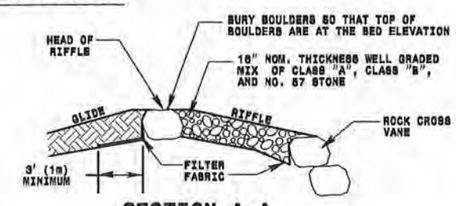
NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

CONSTRUCTED RIFFLE DETAIL

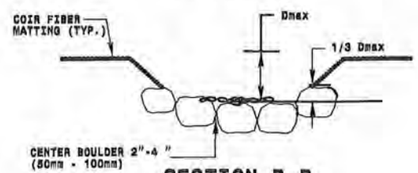
NOT TO SCALE



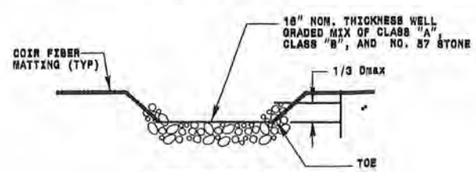
PLAN VIEW



SECTION A-A



SECTION B-B



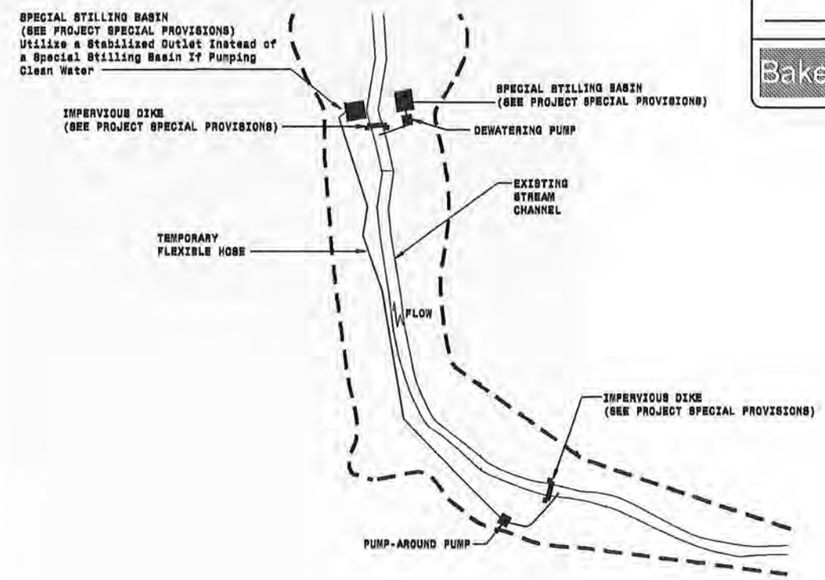
SECTION C-C

STA. 10+84 - 11+00	
Wbkf (ft)	17.3
Dmax (ft)	1.7

NOTE:
1. BOULDERS SHOULD BE NATIVE STONES OR SHOT ROCK, ANGULAR AND OBLONG, WITH AN AXIS APPROXIMATELY 4 L x 3 W x 2 D

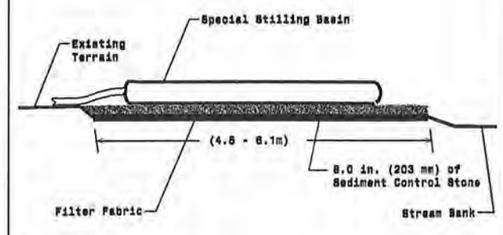
EXAMPLE OF PUMP-AROUND OPERATION

NOT TO SCALE



NOTES:
1) All excavation shall be performed in only dry or isolated sections of channel.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) All graded areas shall be stabilized within 24 hours.
4) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
5) Pumps and hoses shall be of sufficient size to dewater the work area.

SPECIAL STILLING BASIN WITH ROCK PAD



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Note: Provide Stabilized Outlet to Streambank

SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

1. INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
7. ALL GRADING AND STABILIZATION MUST BE COMPLETED IN ONE DAY WITHIN THE PUMP AROUND AREAS BETWEEN THE IMPERVIOUS DIKES. THE IMPERVIOUS DIKE LOCATIONS AS SHOWN ON THIS SHEET ONLY SHOW THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS DIKE(S) FOR EACH DAY'S WORK.
8. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL, STABILIZE DISTURBED AREA WITH SEED AND MULCH.

REVISIONS

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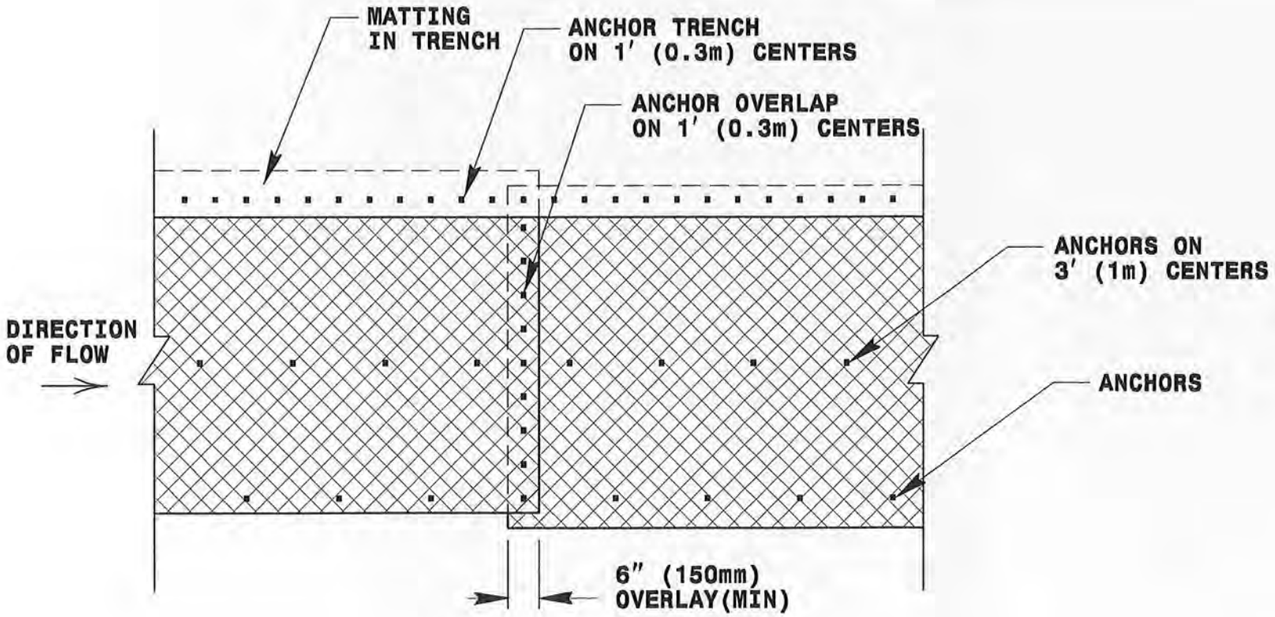
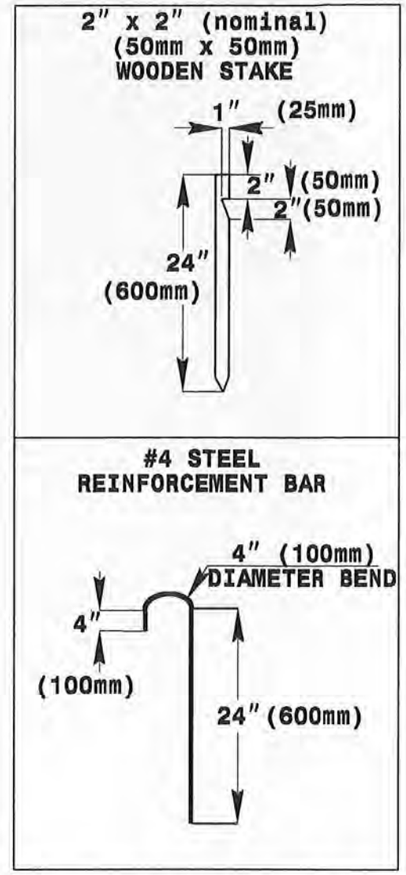
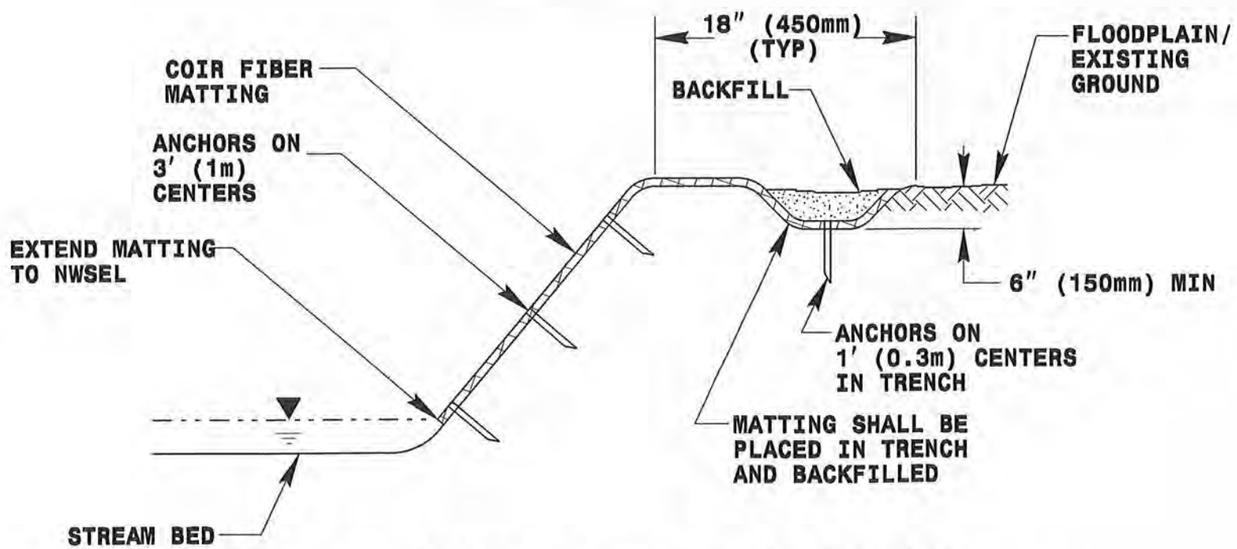


PLAN VIEW



ANCHOR OPTIONS



TYPICAL CROSS SECTION

COIR FIBER MATTING DETAIL

NOT TO SCALE

REVISIONS

B-4191 | OSM-2B

PROJECT ENGINEER

PROJECT ENGINEER

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REVISIONS

Construction Sequence

The Contractor is responsible for following the construction sequence in accordance with the plans and provisions, as directed by the Engineer. Construction shall proceed in the following manner unless otherwise directed by the Engineer.

1. The Contractor shall contact North Carolina "One Call" Center (1.800.632.4949) before any excavation begins.
2. The Contractor shall mobilize equipment and materials to the site using the construction entrance off of NC 226. Install the temporary construction entrance as directed by the Engineer.
3. The Contractor will store all equipment and materials in staging areas as directed by the Engineer.
4. The Contractor shall utilize the haul road as directed by the Engineer.
5. The Contractor shall layout the location of the new stream channel, construction limits of disturbance, and proposed slope stakes lines. The Engineer must inspect and approve all layout work before construction may begin.
6. The Contractor shall contact the local electric utilities provider and have them move the power pole at approximate station 12+00 to outside of the proposed slope stakes cut line.
7. Clear and grub all necessary vegetation to complete stream work. Clearing and grubbing shall be limited to the amount needed for grading.
8. The Contractor shall setup pump-around operations as shown in the details prior to any land-disturbing activity. The pump-around operation will continue 24 hours a day if for any reason the new section of stream has not been completed by the end of the day.
9. The Contractor shall only begin work on the length of stream that can be constructed and stabilized in one day.
10. The Contractor shall perform all grading and installation of in-stream structures as shown on the plans and details.
11. Immediately following grading activities, the slopes shall be seeded, mulched and matted with NC DOT specified erosion control matting.
12. Upon completion of all grading, all disturbed areas, including staging areas, and haul road, shall be seeded and mulched. All vegetation shall be planted in accordance with the NC DOT vegetation plan. Temporary seeding shall be applied to all areas susceptible to erosion (i.e. disturbed channel banks, terrace slopes and spoil areas) such that ground cover is established within 21 working days following completion of any grading. Permanent ground cover shall be established on all disturbed areas following completion of construction. Plant all vegetation at the designated time of year.
13. All areas should be seeded, mulched and stabilized before leaving the project. Remove all erosion control measures and waste material from the project site.

B-4191 Replacement of Bridge No. 82 on NC 266 over Jacktown Creek

Structure Table

Structure	Type	Station	Elevation	Bankfull Elevation
1	Cross Vane	10+34	1228.39	1230.09
2	Constructed Riffle	10+64	1227.89	1229.59
3	Rock Vane	11+00	1227.00	1228.64
4	Rock Vane	11+72	1226.60	1228.30
5	Rock Vane	12+32	1226.30	1228.06
6	Rock Vane	13+14	1225.96	1227.66
7	Cross Vane	13+65	1225.78	1227.48

NOTE:

1. STATION REFERS TO THE UPSTREAM END OF THE VANE ARM OR THE INVERT OF THE HEADER ROCK IN THE CENTER OF THE CHANNEL ON CROSS VANES.
2. ELEVATION REFERS TO THE STREAMBED PROFILE ELEVATION AT THE CORRESPONDING STATION. WHICH IS THE ELEVATION THAT THE VANE INTERSECTS THE STREAMBED.

SUMMARY OF QUANTITIES

SECTION	ITEM DESCRIPTION	Quantity	Unit
226	Grading (2,398 CY Waste)	1	LS
800	Mobilization	1	LS
801	Construction Surveying	1	LS
1005	#57 Stone	18	TON
1042	Rip Rap, Class A	20	TON
1042	Rip Rap, Class B	20	TON
1056	Filter Fabric for Drainage, Type 2	240	SY
1605	Temporary Silt Fence	1,300	LF
1610	Stone for Erosion Control, Class A	50	TON
1610	Stone for Erosion Control, Class B	25	TON
1610	Sediment Control Stone	40	TON
1615	Temporary Mulching	5	AC
1620	Seed for Temporary Seeding	200	LB
1620	Fertilizer for Temporary Seeding	0.75	TON
1630	Silt Excavation	15	CY
1631	Matting for Erosion Control	2,000	SY
1632	1/4" Hardware Cloth	100	LF
1660	Seeding & Mulching	0.5	AC
1661	Seed for Repair Seeding	100.0	LB
1661	Fertilizer for Repair Seeding	0.3	TON
1662	Seed for Supplemental Seeding	125.0	LB
1665	Fertilizer Topdressing	3.5	TON
SP	Boulder	100	TON
SP	Coir Fiber Mat	1,000	SY
SP	Safety Fence	500	LF
SP	Special Stilling Basin	2	EA
SP	Generic Erosion Control Item, Diversion Pumping	1	LS

EARTHWORK SUMMARY FOR MITIGATION

IN CUBIC YARDS

LINE	STATION TO STATION		MITIGATION EXCAVATION TOTAL UNCLASS.	MITIGATION EXCAVATION UNDERCUT	MITIGATION EMBANK + %	MITIGATION BORROW	MITIGATION TOTAL WASTE
JACKTOWN CREEK	10+50.00	14+00.00	2,508		110	0	2,398
	TOTAL		2,508		110	0	2,398
	Waste in lieu of borrow						
	GRAND TOTAL		2,508		110	0	2,398
	SAY		2,508		110	0	2,398

APPROXIMATE QUANTITITES ONLY, UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING AND CLEARING AND GRUBBING WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING". A SHRINKAGE FACTOR OF 1.1 WAS ASSUMED.

PROJECT ENGINEER

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REVISIONS

CURVE DATA

PR_JTC-1		
PI STA = 10+51.62	N = 706,721.2377	E = 1,120,932.3001
DELTA = 40^ 57' 33" (LT)		
DEGREE = 114^ 35' 30"		
TANGENT = 18.67		
LENGTH = 35.74		
RADIUS = 50.00		
PC STA = 10+32.94	N = 706,737.8349	E = 1,120,940.8588
PT STA = 10+68.69	N = 706,703.0935	E = 1,120,936.7166
CC	N = 706,714.9187	E = 1,120,985.2981
PR_JTC-2		
PI STA = 11+15.25	N = 706,657.8496	E = 1,120,947.7295
DELTA = 31^ 52' 26" (RT)		
DEGREE = 114^ 35' 30"		
TANGENT = 14.28		
LENGTH = 27.82		
RADIUS = 50.00		
PC STA = 11+00.97	N = 706,671.7222	E = 1,120,944.3527
PT STA = 11+28.79	N = 706,644.2856	E = 1,120,943.2716
CC	N = 706,659.8970	E = 1,120,895.7712
PR_JTC-3		
PI STA = 11+90.01	N = 706,586.1283	E = 1,120,924.1578
DELTA = 55^ 58' 47" (LT)		
DEGREE = 143^ 14' 22"		
TANGENT = 21.26		
LENGTH = 39.08		
RADIUS = 40.00		
PC STA = 11+68.75	N = 706,606.3249	E = 1,120,930.7955
PT STA = 12+07.83	N = 706,569.3270	E = 1,120,937.1838
CC	N = 706,593.8358	E = 1,120,968.7958
PR_JTC-4		
PI STA = 12+47.04	N = 706,538.3376	E = 1,120,961.2098
DELTA = 49^ 20' 16" (RT)		
DEGREE = 143^ 14' 22"		
TANGENT = 18.37		
LENGTH = 34.44		
RADIUS = 40.00		
PC STA = 12+28.67	N = 706,552.8568	E = 1,120,949.9531
PT STA = 12+63.11	N = 706,520.3381	E = 1,120,957.5309
CC	N = 706,528.3481	E = 1,120,918.3411
PR_JTC-5		
PI STA = 13+27.88	N = 706,456.8847	E = 1,120,944.5617
DELTA = 46^ 01' 19" (LT)		
DEGREE = 114^ 35' 30"		
TANGENT = 21.23		
LENGTH = 40.16		
RADIUS = 50.00		
PC STA = 13+06.64	N = 706,477.6896	E = 1,120,948.8140
PT STA = 13+46.81	N = 706,439.3782	E = 1,120,956.5803
CC	N = 706,467.6771	E = 1,120,997.8012
PR_JTC-6		
PI STA = 13+73.90	N = 706,417.0446	E = 1,120,971.9127
DELTA = 24^ 47' 37" (RT)		
DEGREE = 114^ 35' 30"		
TANGENT = 10.99		
LENGTH = 21.64		
RADIUS = 50.00		
PC STA = 13+62.91	N = 706,426.1052	E = 1,120,965.6924
PT STA = 13+84.54	N = 706,406.2106	E = 1,120,973.7600
CC	N = 706,397.8063	E = 1,120,924.4714

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jellott AT PDEA245970

B-4191	OSM-4
PROJECT ENGINEER	

GRAPHIC SCALE
20 10 0 20 40
PLANS

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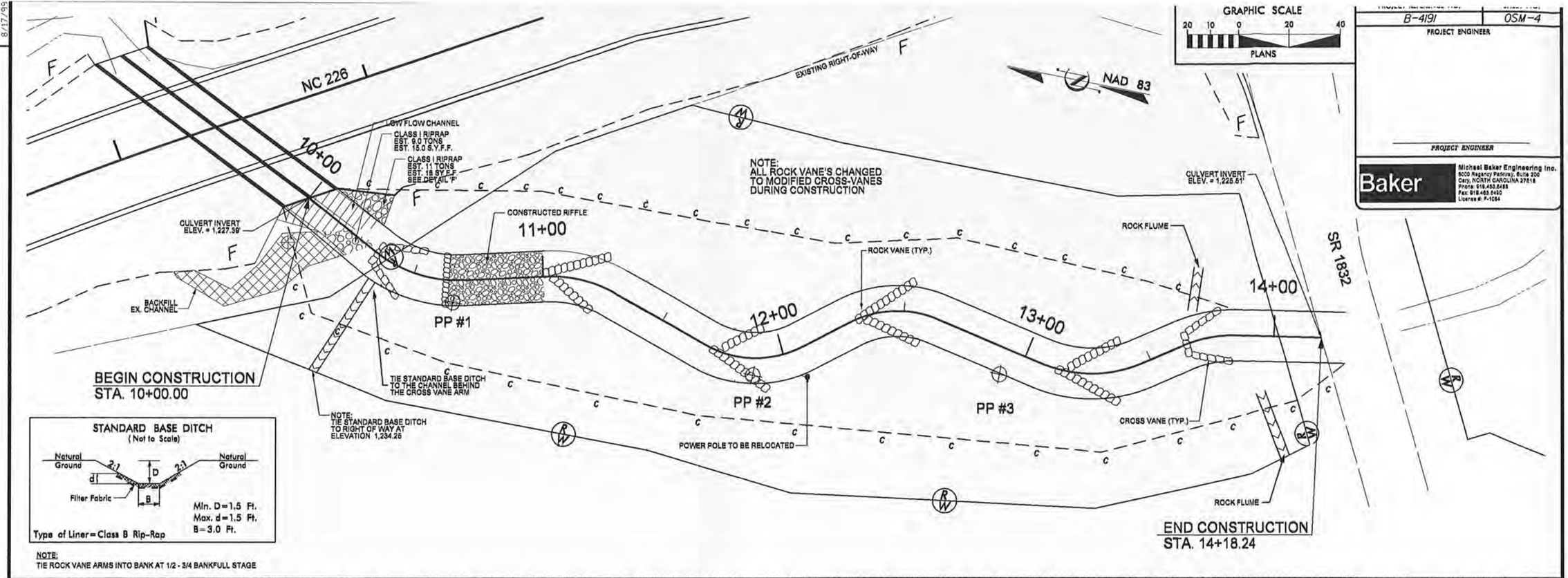
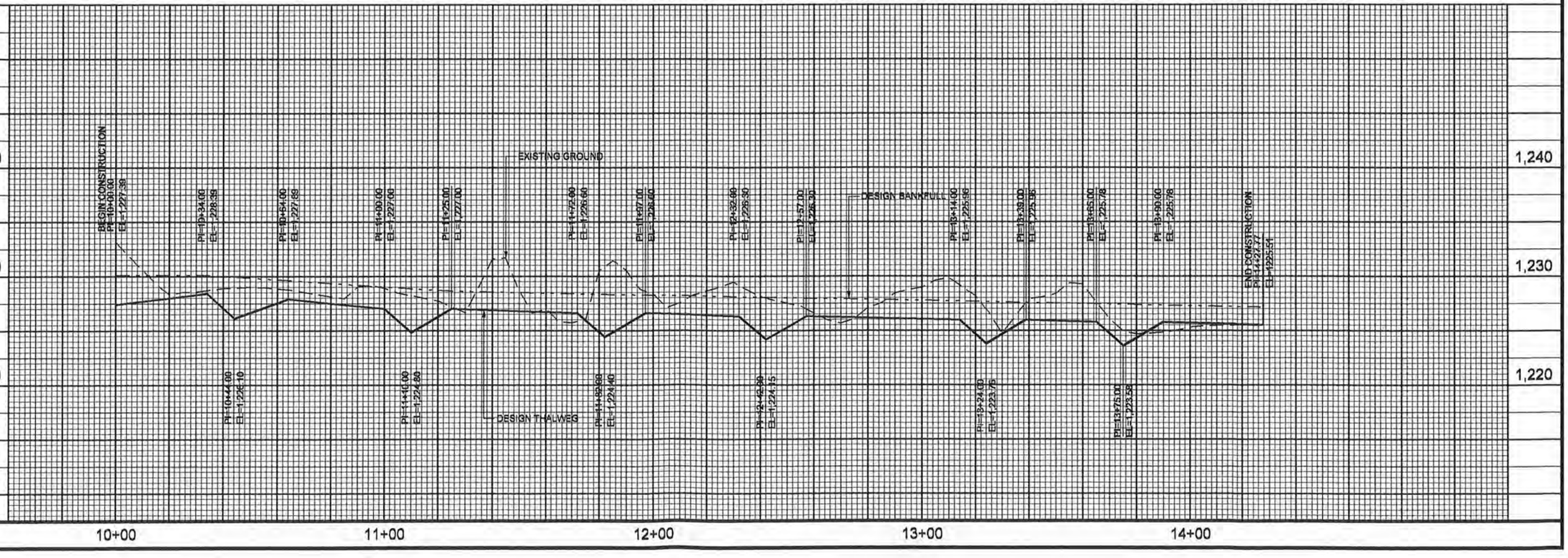
PROJECT ENGINEER





REVISIONS

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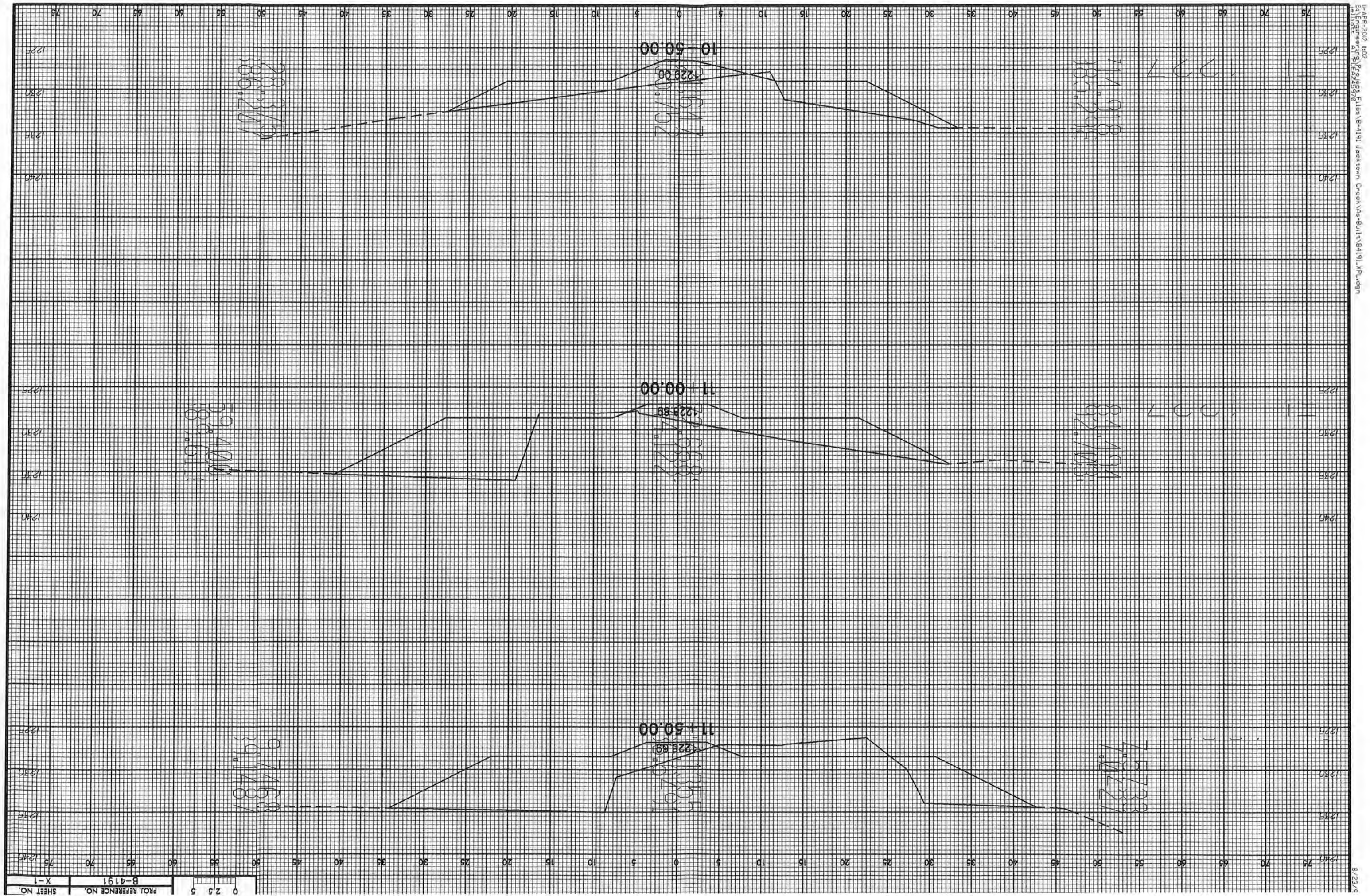

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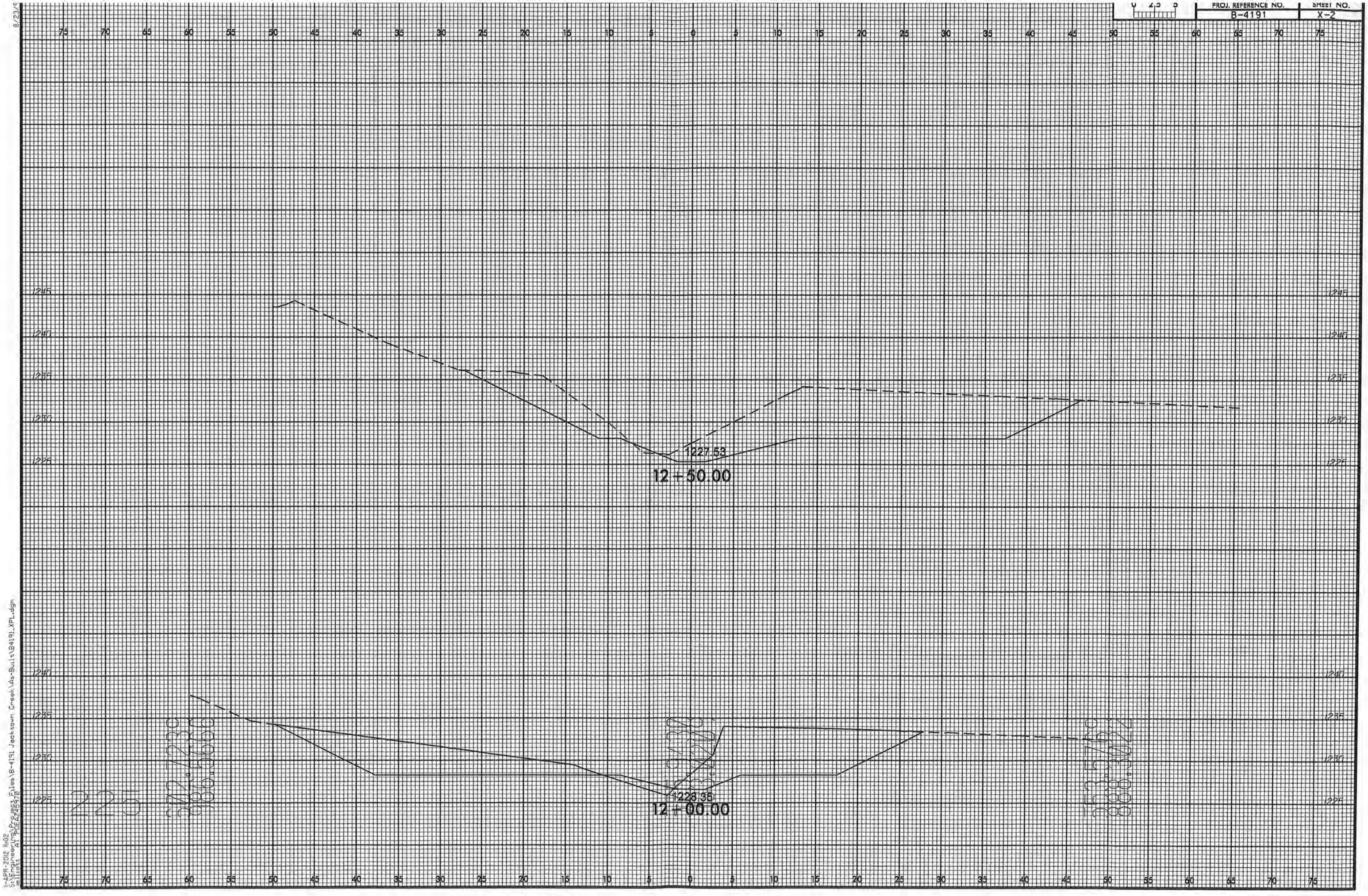
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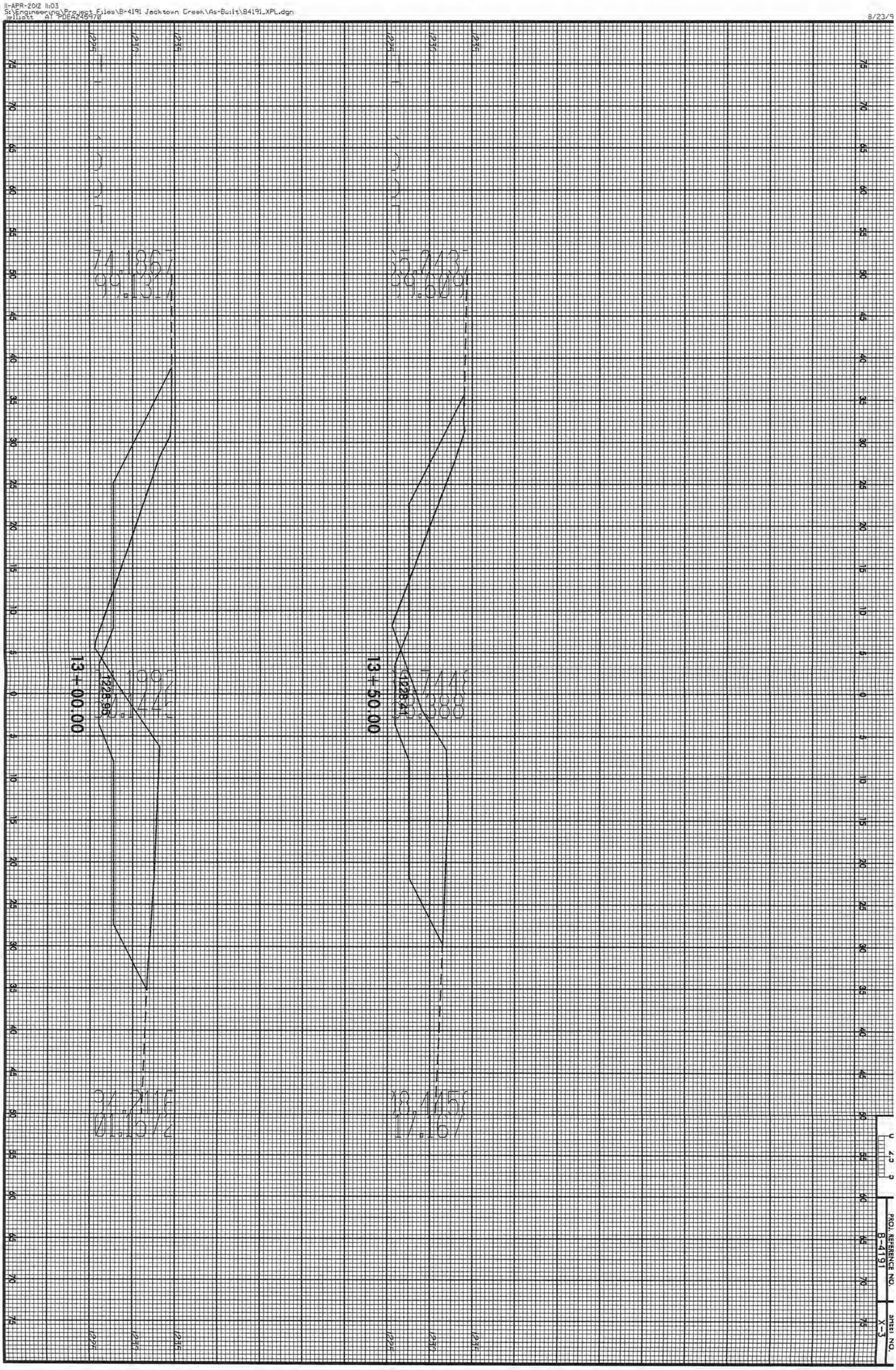

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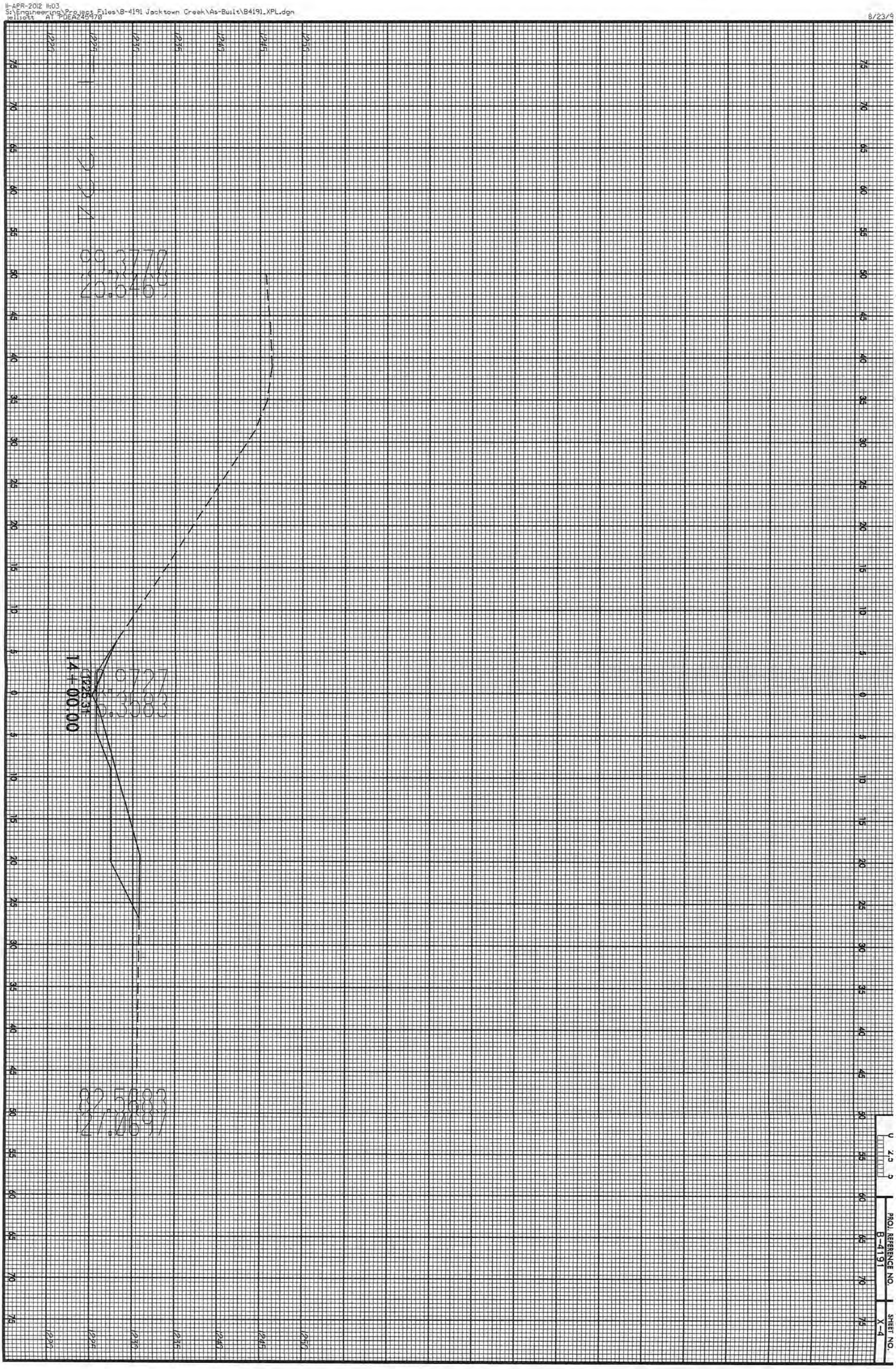


TIP PROJECT: B-4191

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4191	EC-1	2

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33538.1.1		P.E.
33538.3.1		CONST.

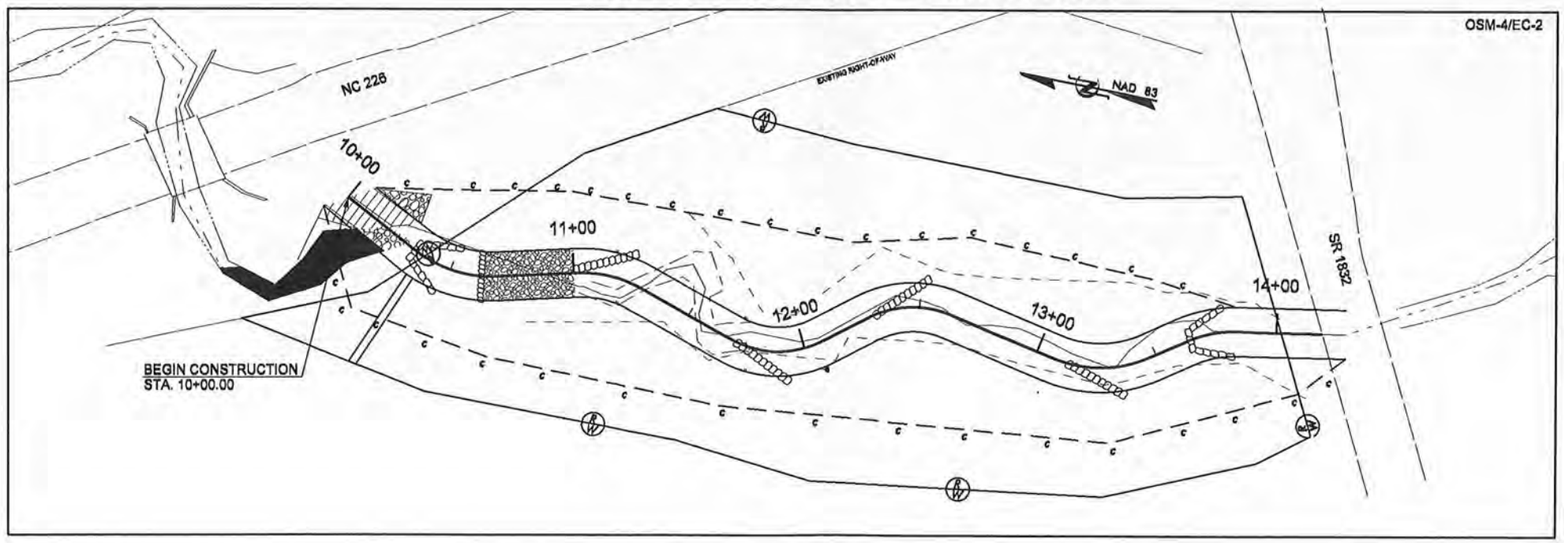
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

McDOWELL COUNTY

LOCATION: BRIDGE NO. 82 ON NC. 226 OVER JACKTOWN CREEK

TYPE OF WORK: ON-SITE MITIGATION



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
	Silt Basin Type B	
1635.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
	Temporary Rock Silt Check Type-B	
	Wattle/Coir Fiber Wattle	
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

GRAPHIC SCALE

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PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Prepared in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2006 STANDARD SPECIFICATIONS

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated July 18, 2006 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1605.01 Temporary Silt Fence
1606.01 Special Sediment Control Fence
1607.01 Gravel Construction Entrance
1630.06 Special Stilling Basin

PROJECT REFERENCE NO.	SHEET NO.
B-4191	EC-2

PROJECT ENGINEER

PROJECT ENGINEER

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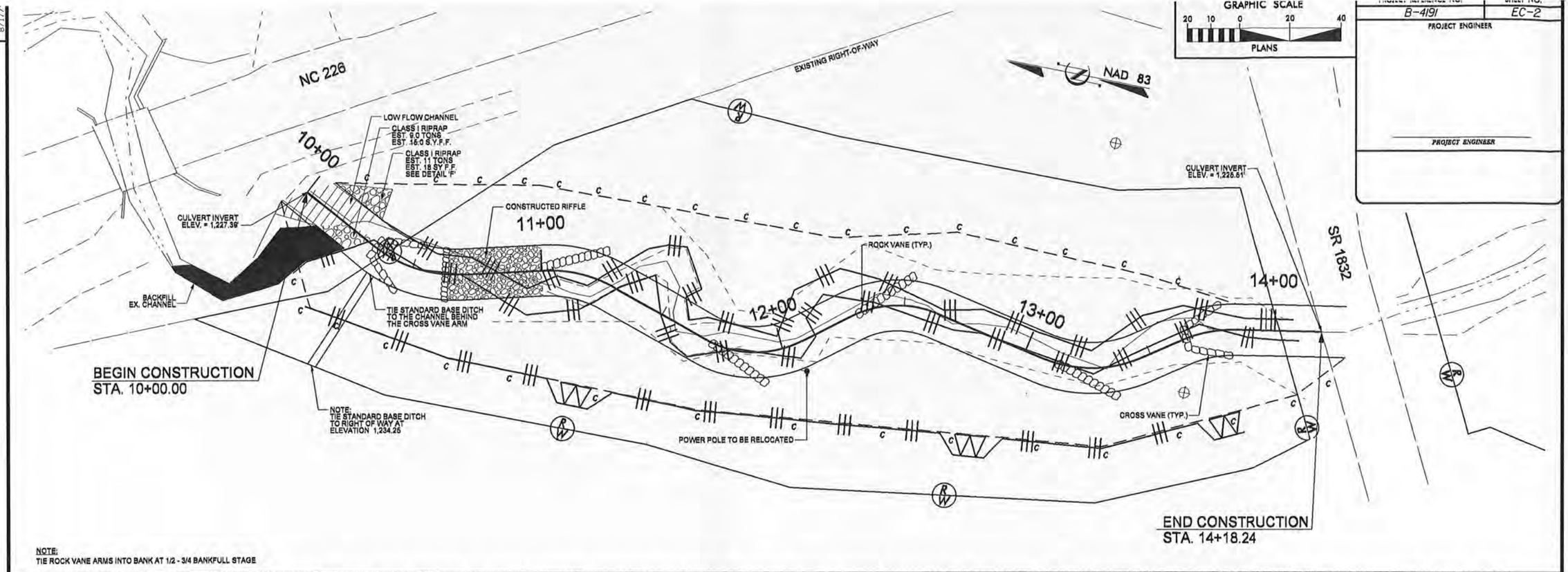
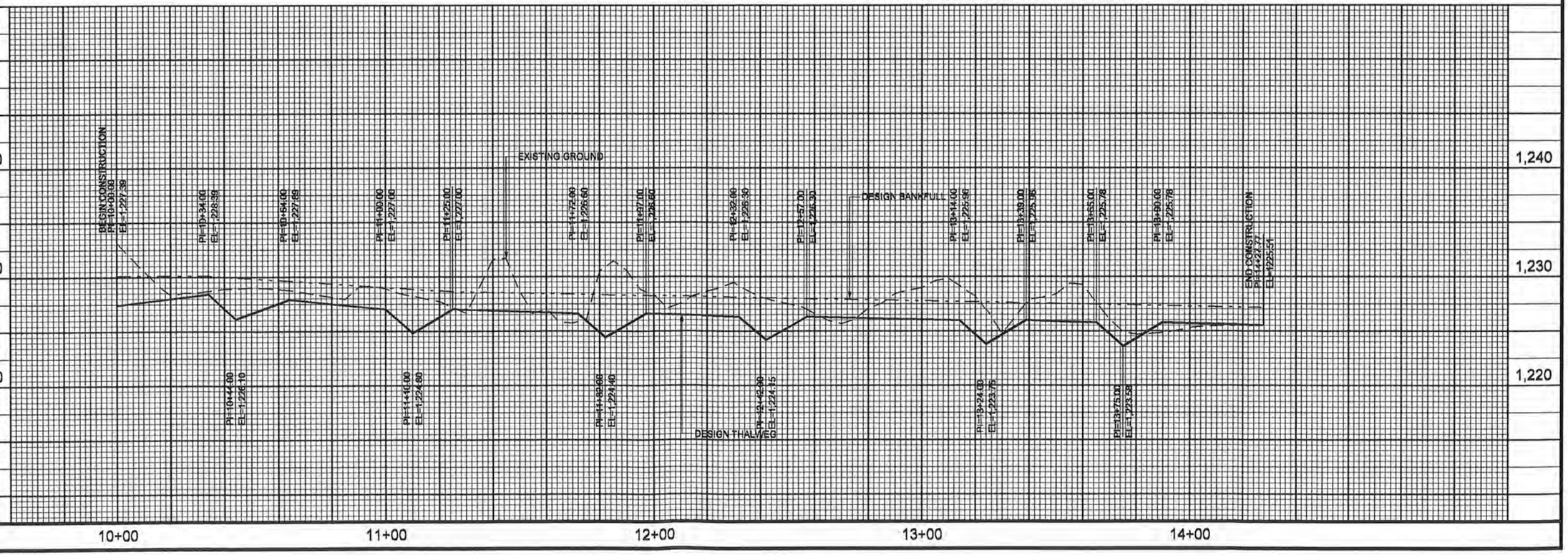


NOTE:
TIE ROCK VANE ARMS INTO BANK AT 1/2 - 3/4 BANKFULL STAGE



REVISIONS

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DESIGN ENGINEER	

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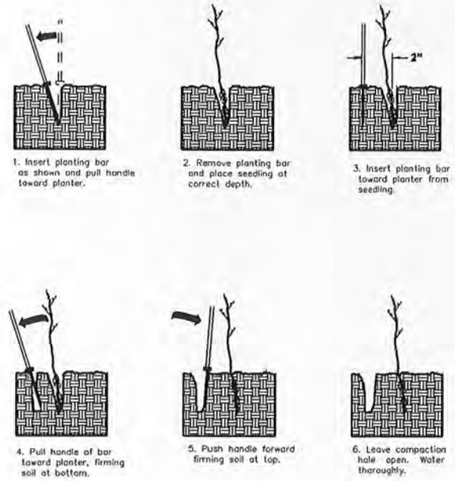
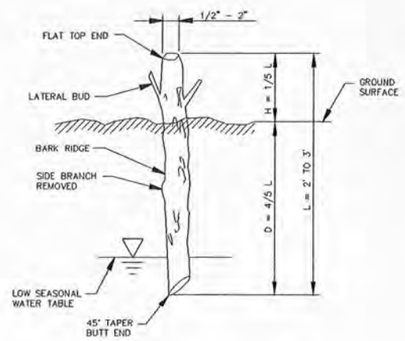
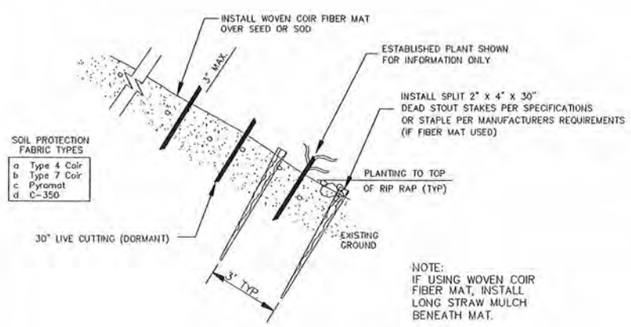
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2" toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.



LIVE STAKE DETAIL
NTS



LIVE STAKE (IN EARTH)
NTS

LIVE STAKE DETAIL
NTS

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12" long, 4" wide and 1" thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches (10") below the root collar.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

STREAMBANK:

CORNUS AMOMUM	SILKY DOGWOOD	LIVE STAKE
CEPHALANTHUS OCCIDENTALIS	BUTTON BUSH	LIVE STAKE

RIPARIAN BUFFER:

PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	BAREROOT SEEDLING
FRAXINUS PENNSYLVANICA	GREEN ASH	BAREROOT SEEDLING
QUERCUS RUBRA	NORTHERN RED OAK	BAREROOT SEEDLING
LIRIODENDRON TULIPIFERA	TUPIP POPLAR	BAREROOT SEEDLING

TREE REFORESTATION SHALL BE PLANTED 6' TO 10' ON CENTER, RANDOM SPACING, AVERAGING 8' ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

ZONE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

ZONE 2 BUFFER REFORESTATION SHALL BE PLANTED 6FT TO 10FT ON CENTER, RANDOM SPACING, AVERAGING 8FT ON CENTER, APPROXIMATLEY 680 PLANTS PER ACRE.

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