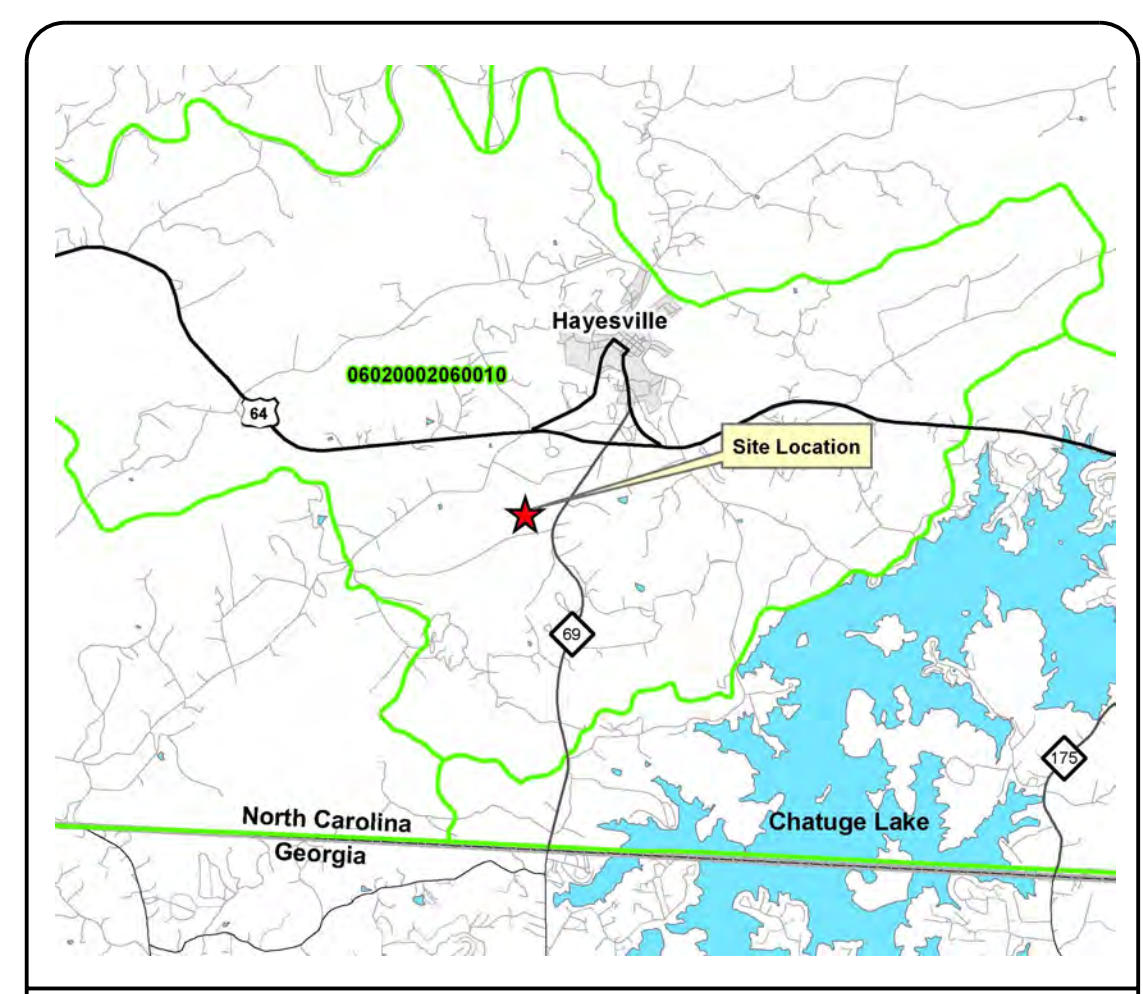


PROJECT: 166274 BLAIR CREEK

NORTH CAROLINA
DIVISION OF MITIGATION SERVICES
CLAY COUNTY

STATE	BAKER PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	166274	1	21



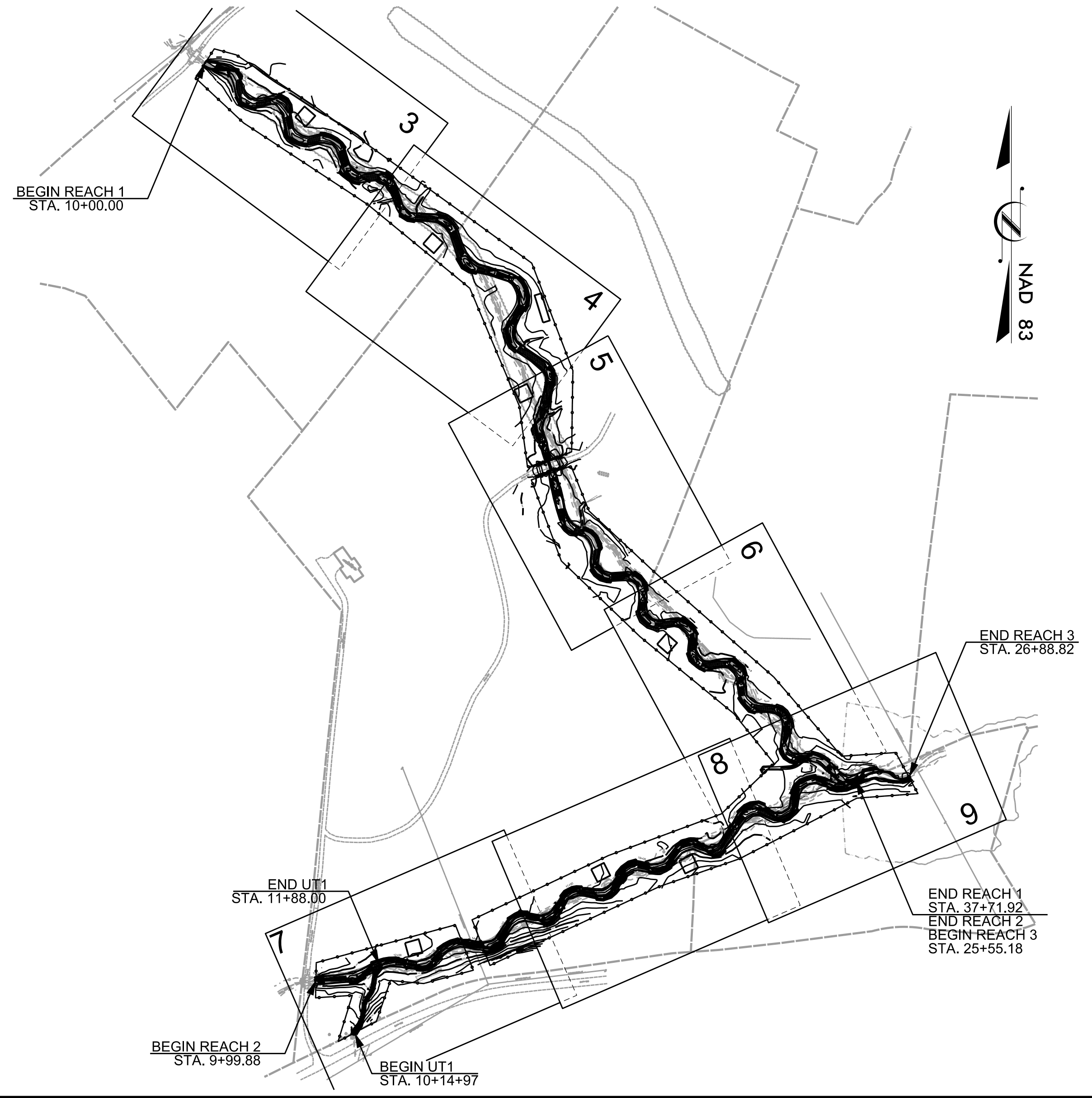
VICINITY MAP

INDEX OF SHEETS

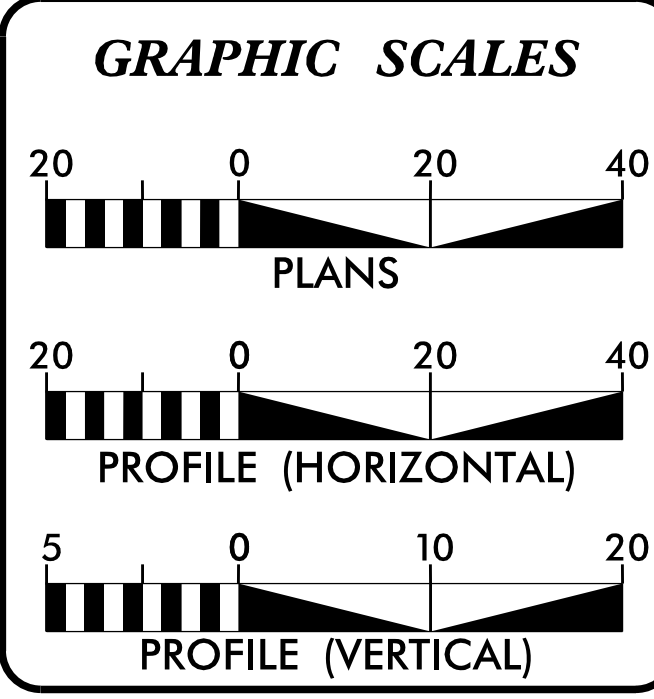
1	.....	TITLE SHEET
1-A	.....	STREAM CONVENTIONAL SYMBOLS GENERAL NOTES STANDARD SPECIFICATIONS VEGETATION SELECTION
1-B	.....	NCDOT CONVENTIONAL SYMBOLS
2 - 2F	.....	DETAILS
3 - 9	.....	PLAN VIEW
10 - 13	.....	PROFILES

**LOCATION: 0.15 MILE WEST OF CHERRY ROAD AND
 NC HIGHWAY 69 IN HAYESVILLE, NC**

TYPE OF WORK: AS - BUILT PLAN



NCDMS ID NO. 100047



MITIGATION SUMMARY

STREAMS:	REACH	STREAM RESTORATION (lf)	STREAM ENHANCEMENT (lf)
	Reach 1	2741.86	-
	Reach 2	1507.53	-
	Reach 3	133.64	-
	UT 1	-	173.03
	TOTAL	4383.03(lf)	173.03(lf)

WETLANDS:	APPROACH	AREA (ac)
	Restoration by Reestablishment	5.217
	Restoration by Rehabilitation	0.691
	Enhancement	0.178
	TOTAL	6.086(ac)

PREPARED FOR THE OFFICE OF:

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

CONTACT: MATTHEW REID
 PROJECT MANAGER

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

KATHLEEN M. MCKEITHAN, PE
 PROJECT ENGINEER

PROJECT ENGINEER

4/13/2022

DocuSigned by:
Kathleen M. McKeithan
 P.E.

STREAM CONVENTIONAL SYMBOLS SUPERCEDES SHEET 1-B

J-HOOK VANE GRADE CONTROL J-HOOK VANE ROCK VANE OUTLET PROTECTION ROCK CROSS VANE DOUBLE DROP ROCK CROSS VANE LOG AND ROCK STEP / POOL TEMPORARY ROCK DAM ROOT WAD LOG J-HOOK VANE GRADE CONTROL LOG J-HOOK VANE LOG VANE LOG STEP LOG CROSS VANE LOG ROLLER CONSTRUCTED RIFFLE BOULDER CLUSTER BOULDER STEP SAFETY FENCE TAPE FENCE JURISDICTIONAL WETLAND BOUNDARY	100 YEAR FLOOD PLAIN CONSERVATION EASEMENT EXISTING MAJOR CONTOUR EXISTING MINOR CONTOUR LIMITS OF DISTURBANCE PROPERTY LINE FOOT BRIDGE TEMPORARY STREAM CROSSING PERMANENT STREAM CROSSING TRANSPLANTED VEGETATION TREE REMOVAL TREE PROTECTION DITCH PLUG CHANNEL FILL SOD MAT WITH WOOD TOE GEOLIFT WITH BRUSH TOE ROOT WAD REVETMENT WITH LIVE BRUSH BOULDER TOE PROTECTION PROPOSED WETLAND RE-ESTABLISHMENT PROPOSED WETLAND ENHANCEMENT PROPOSED WETLAND REHABILITATION	MONITORING WELL RAIN GAUGE CREST GAUGE IN STREAM FLOW GAUGE
--	---	--

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

STANDARD SPECIFICATIONS

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

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

PROJECT REFERENCE NO. 166274	SHEET NO. 1-A
PROJECT ENGINEER	
DocuSigned by: Kathleen M. McKisken APPROVED BY: 4/13/2022 DATE:	
Michael Baker International Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5498 Fax: 919.463.5490 License #: F-1084	
NCDMS ID NO. 100047	

GENERAL NOTES

1. THE CONTRACTOR IS REQUIRED TO INSTALL IN-STREAM STRUCTURES USING A TRACK HOE WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS (3'x2'x2'), LOGS AND ROOTWADS.
2. WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PLAN. THE CONTRACTOR SHOULD MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING THE CONSTRUCTION WORK.
3. CONSTRUCTION IS SCHEDULED FOR THE SPRING OF 2021.
4. CONTRACTOR SHOULD CALL NORTH CAROLINA "ONE-CALL" BEFORE EXCAVATION STARTS. (1-800-632-4949)
5. BOULDER SIZES FOR IN-STREAM STRUCTURES SHALL BE A MINIMUM OF 3'x2'x1' AND CAN BE CHANGED PER STRUCTURE OR THE DIRECTION OF THE ENGINEER.
6. ALL ON-SITE ALLUVIUM SHALL BE HARVESTED AND STOCKPILED PRIOR TO FILLING ABANDONED CHANNELS.
7. TOPSOIL SHALL BE EXCAVATED TO A DEPTH OF 8" AND STOCKPILED SEPARATELY FROM UNDERCUT SOIL. 6" OF TOPSOIL SHALL BE PLACED ON ALL BANKFULL BENCHES AND AS DIRECTED BY THE ENGINEER.
8. ALL DISTURBED EMBANKMENTS SHALL BE MATTED WITH COIR FIBER MATTING OR AS DIRECTED BY THE ENGINEER.
9. ALL STREAM BANKS SHALL BE LIVE STAKED.
10. UNLESS THE ALIGNMENT IS BEING ALTERED, THE EXISTING CHANNEL DIMENSIONS ARE TO REMAIN UNLESS OTHERWISE NOTED.
11. CONTRACTOR WILL ENSURE THAT FENCING IS INSTALLED ON OR OUTSIDE THE CONSERVATION EASEMENT AS SHOWN ON THE PLANS BUT NO MORE THAN 1' OUTSIDE.
12. WHERE PROPOSED FENCE CROSSES EXISTING STREAMS, THE CONTRACTOR SHALL UTILIZE A SECTION OF BREAK AWAY FENCE, A FLOOD GATE, OR ELECTRIFIED CHAINS AS DIRECTED BY THE ENGINEER.

VEGETATION SELECTION

Proposed Bare-Root and Live Stake Species			
Botanical Name	Common Name	% Planted by Species	Wetland Tolerance
All Buffer Plantings at 680 stems/acre using 8' X 8' spacing			
General Riparian Zone – Overstory/Canopy Species			
<i>Betula nigra</i>	River Birch	10%	FACW
<i>Platanus occidentalis</i>	Sycamore	10%	FACW
<i>Liriodendron tulipifera</i>	Tulip Poplar	15%	FACU
<i>Betula alleghaniensis</i>	Yellow Birch	15%	FAC
<i>Quercus imbricaria</i>	Shingle Oak	10%	FAC
<i>Quercus lyrata</i>	Overcup Oak	10%	OBL
<i>Quercus phellos</i>	Willow Oak	2.5%	FAC
<i>Fraxinus pennsylvanica</i>	Green Ash	5%	FACW
<i>Diospyros virginiana</i>	Persimmon	2.5%	FAC
<i>Ulmus americana</i>	American Elm	5%	FACW
General Riparian Zone – Understory/Shrub Species			
<i>Rhododendron maximum</i>	Rosebay	0%	FAC
<i>Lindera benzoin</i>	Spicebush	5%	FAC
<i>Halesia carolina</i>	Carolina Silverbell	2.5%	FAC
<i>Ilex verticillata</i>	Winterberry	2.5%	FACW
<i>Carpinus caroliniana</i>	American Hornbeam	2.5%	FAC
<i>Sambucus canadensis</i>	Elderberry	2.5%	FAC
<i>Magnolia tripetala</i>	Umbrella Tree	0.0%	FACU

Proposed Bare-Root and Live Stake Species			
Botanical Name	Common Name	% Planted by Species	Wetland Tolerance
All Buffer Plantings at 680 stems/acre using 8' X 8' spacing			
Wetland Zone – Overstory/Canopy Species			
<i>Betula nigra</i>	River Birch	15%	FACW
<i>Platanus occidentalis</i>	Sycamore	15%	FACW
<i>Quercus lyrata</i>	Overcup Oak	7.5%	OBL
<i>Quercus pagoda</i>	Cherrybark Oak	7.5%	FACW
<i>Quercus machauxii</i>	Swamp Chestnut Oak	5%	FACW
<i>Acer saccharinum</i>	Silver Maple	7.5%	FACW
<i>Fraxinus pennsylvanica</i>	Green Ash	5%	FACW
<i>Ulmus americana</i>	American Elm	7.5%	FACW
Wetland Zone – Understory/Shrub Species			
<i>Alnus serrulata</i>	Tag Alder	7.5%	OBL
<i>Ilex verticillata</i>	Winterberry	5%	FACW
<i>Acer negundo</i>	Box Elder	5%	FAC
<i>Cephalanthus occidentalis</i>	Buttonbush	2.5%	OBL
<i>Cornus amomum</i>	Silky Dogwood	5.0%	FACW
<i>Xanthorhiza simplicissima</i>	Yellow-root	2.5%	FACW
<i>Aronia arbutifolia</i>	Red Chokeberry	2.5%	FACW
Streambank Live Stake Plantings			
<i>Salix sericea</i>	Silky Willow	25%	OBL
<i>Sambucus canadensis</i>	Elderberry	20%	FACW
<i>Cephalanthus occidentalis</i>	Buttonbush	10%	OBL
<i>Cornus amomum</i>	Silky Dogwood	25%	FACW
<i>Salix nigra</i>	Black Willow	20%	OBL

Proposed Permanent Seed Mixture				
Botanical Name	Common Name	% Planted by Species	Density (lbs/ac)	Wetland Tolerance
<i>Agrostis perennans</i>	Autumn Bentgrass	10%	1.5	FACU
<i>Elymus virginicus</i>	Virginia Wildrye	15%	2.25	FACW
<i>Panicum virgatum</i>	Switchgrass	15%	2.25	FAC
<i>Tripsacum dactyloides</i>	Eastern Gamma Grass	5%	0.75	FACW
<i>Polygonum pennsylvanicum</i>	Pennsylvania Smartweed	5%	0.75	FACW
<i>Schizachyrium scoparium</i>	Little Blue Stem	5%	0.75	FACU
<i>Juncus effusus</i>	Soft Rush	5%	0.75	FACW
<i>Bidens frondosa (or aristosa)</i>	Beggars Tick	5%	0.75	FACW
<i>Coreopsis lanceolata</i>	Lance-Leaved Tick Seed	10%	1.5	FACU
<i>Dichanthelium clandestinum</i>	Tioga Deer Tongue	15%	2.25	FAC
<i>Andropogon gerardii</i>	Big Blue Stem	5%	0.75	FAC
<i>Sorghastrum nutans</i>	Indian Grass	5%	0.75	FACU
Total		100%	15	

VEGETATION SELECTION ITEMS SHOWN IN RED REPRESENT AS-BUILT ADJUSTMENTS IN PLANTING

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

Seal of Kathleen M. McKelhan, Professional Engineer, No. 028432, State of North Carolina.

APPROVED BY: _____
DATE: 4/13/2022

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	②③
Existing Fence Line	-x-x-x-
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	-----
False Sump	▽

RAILROADS:

Standard Gauge	-----
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	○ R W
Proposed Right of Way Line with Concrete or Granite Marker	○ R W
Existing Control of Access	○ C A
Proposed Control of Access	○ C A
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	□ PH
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	□
Telephone Cell Tower	□
U/G Telephone Cable Hand Hole	□ PH
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	□
TV Tower	⊗
U/G TV Cable Hand Hole	□ PH
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-

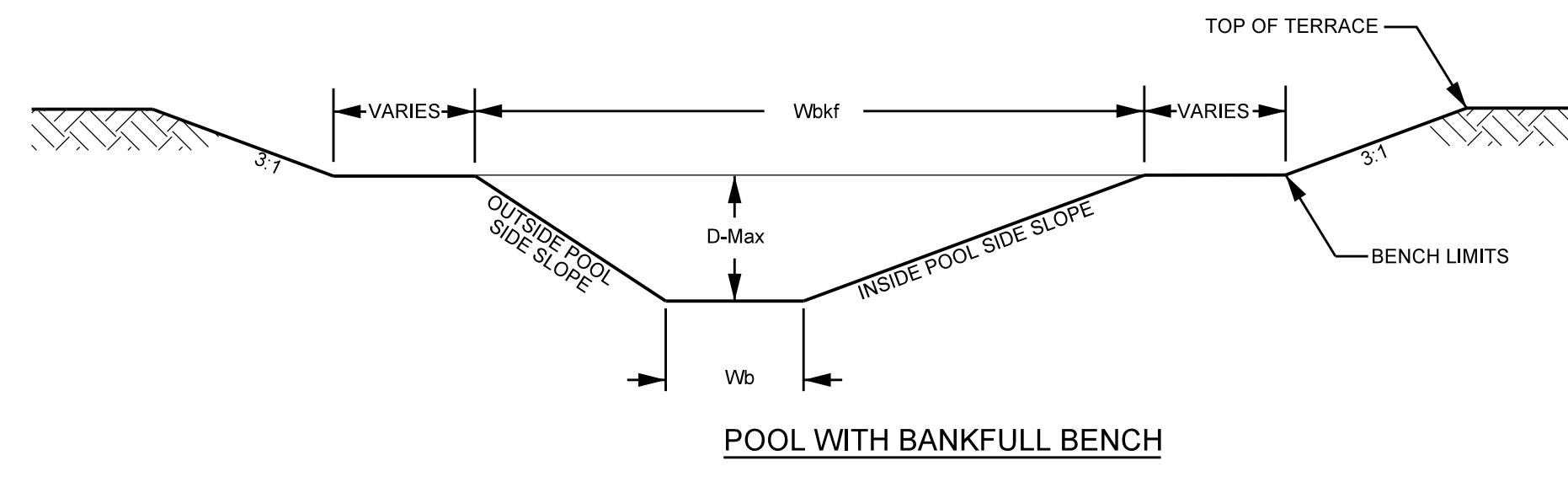
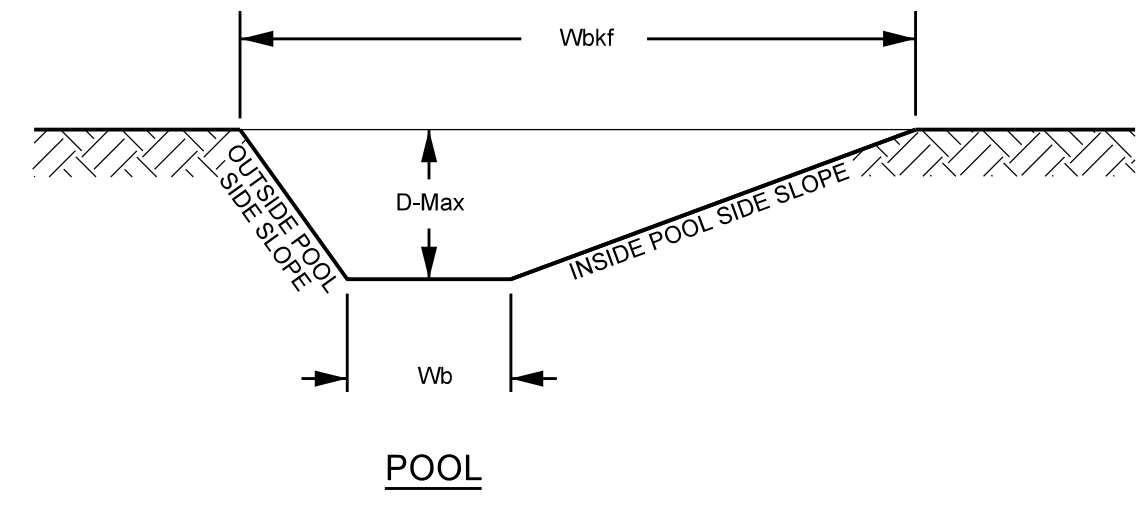
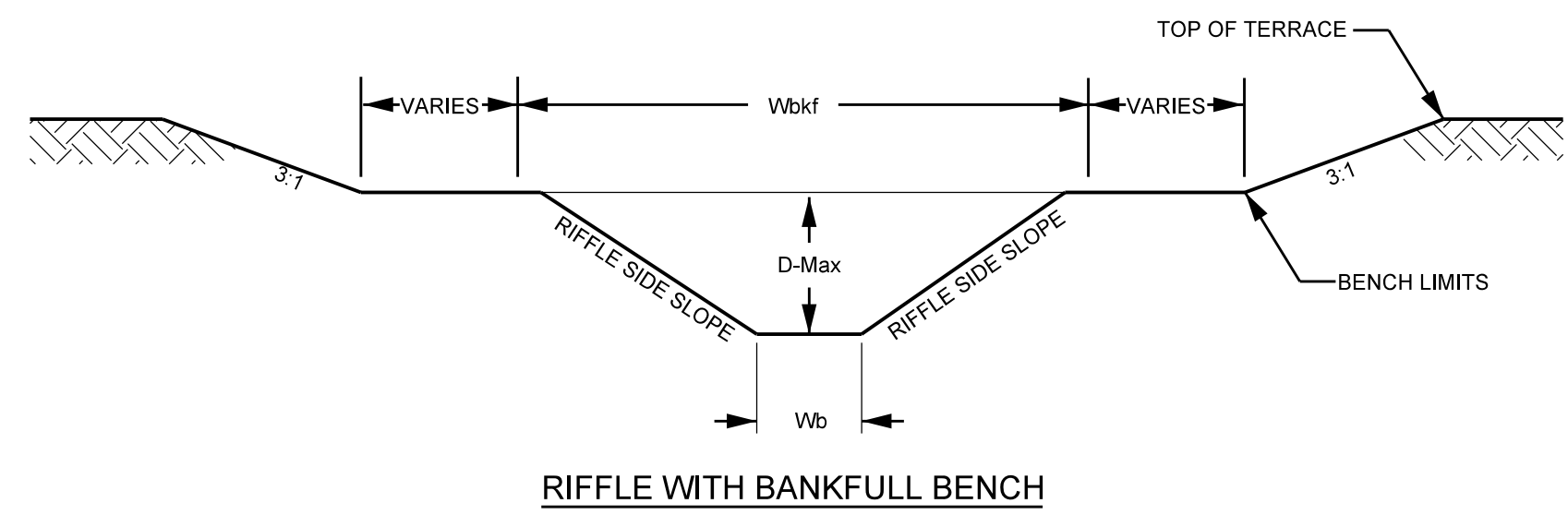
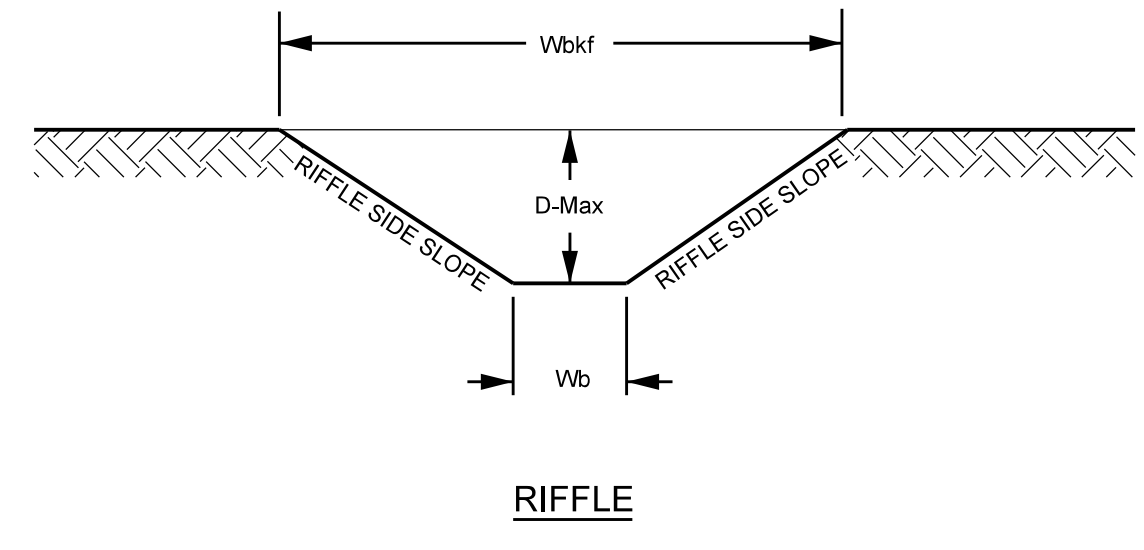
SANITARY SEWER:

Sanitary Sewer Manhole	○ S
Sanitary Sewer Cleanout	○ S
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	□
Utility Unknown U/G Line	-TUTL-
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.

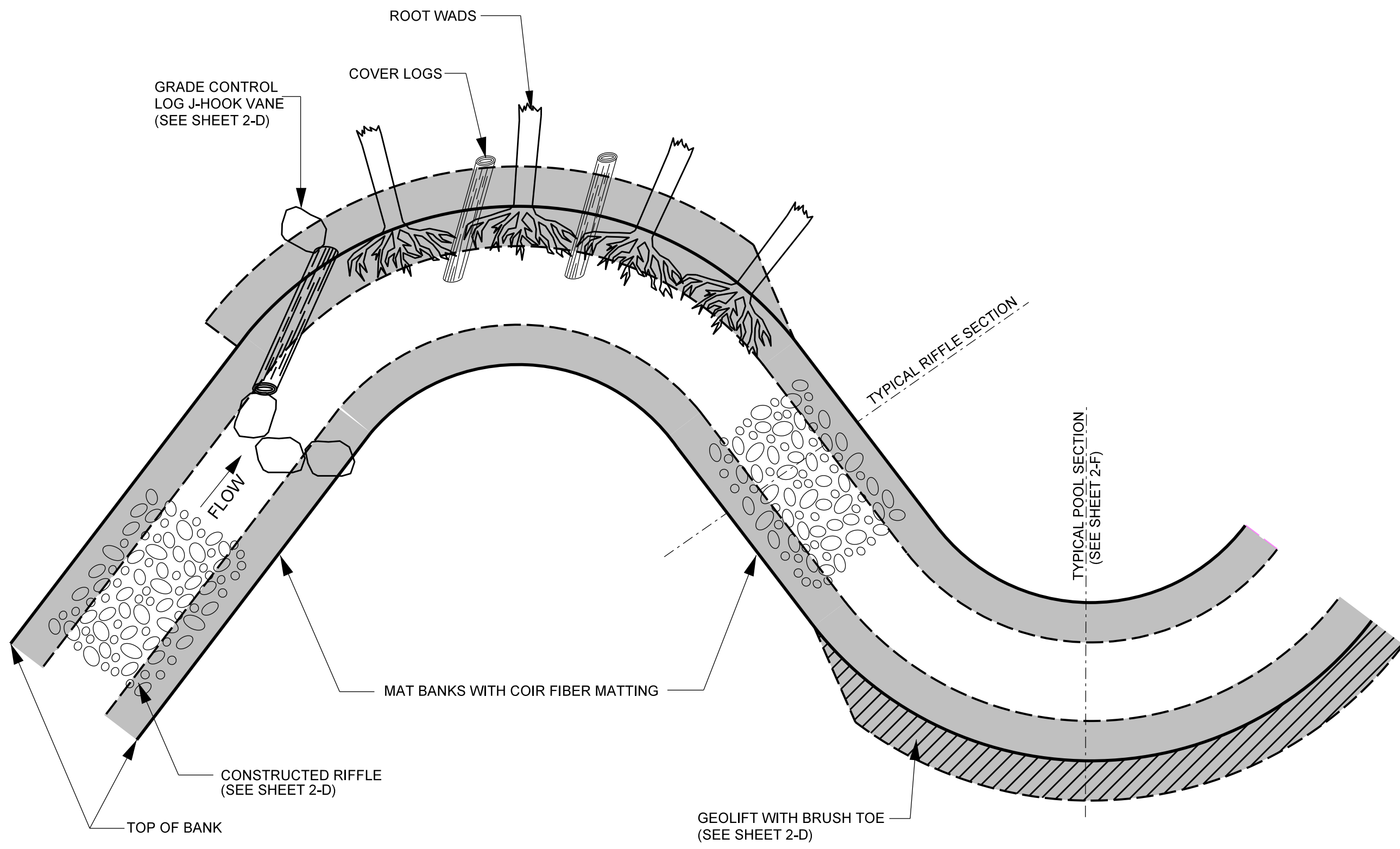
TYPICAL RIFFLE, POOL, AND BANKFULL BENCH CROSS SECTIONS



PROJECT REFERENCE NO. 166274	SHEET NO. 2
PROJECT ENGINEER <i>Kathleen M. McKeithan</i>	
APPROVED BY: 4/13/2022	
DATE:	
Michael Baker International	
Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5486 Fax: 919.463.5490 License #: F-1084	
NCDSMS ID NO. 100047	

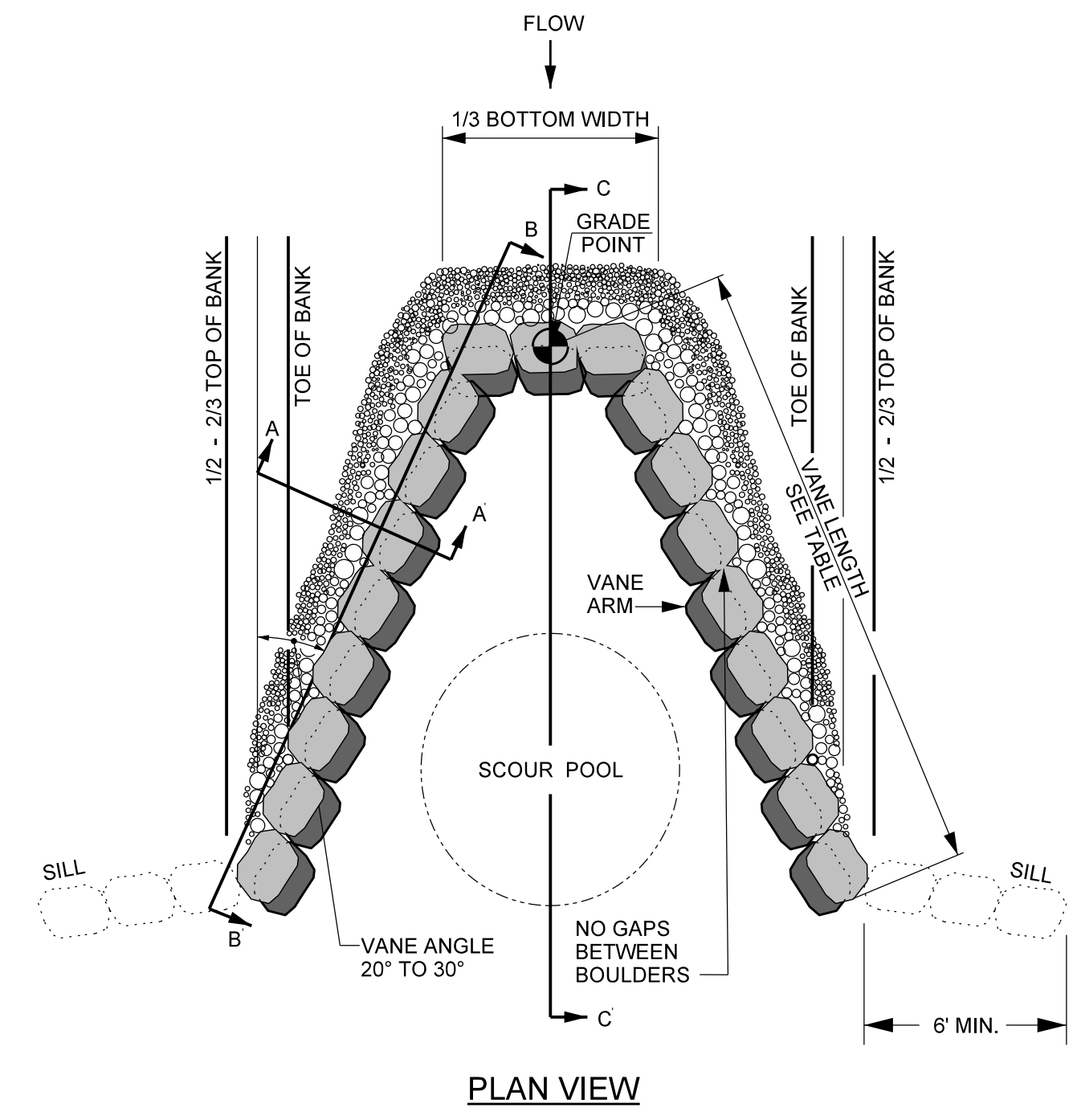
	North Fork Blair REACH 1 Upstream of Farm Road		North Fork Blair REACH 1 Downstream of Farm Road		South Fork Blair REACH 2		Blair Creek REACH 3		UT1	
	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL
WIDTH OF BANKFULL (Wbkf)	16.5	23.0	17.0	24.0	17.0	23.0	22.5	32.0	4.7	7.25
MAXIMUM DEPTH (Dmax)	1.3	2.5	1.4	2.5	1.4	2.5	1.8	4.0	0.5	1.0
W/D (Wbkf/Dmax)	15.0	14.2	14.2	14.5	14.2	14.2	15.0	13.5	12.5	12.4
BANKFULL AREA (Abkf)	18.2	37.2	20.4	39.7	20.4	37.2	33.8	75.0	1.8	4.3
BOTTOM WIDTH (Wb)	11.3	6.8	11.2	7.8	11.2	6.8	15.4	6.0	2.8	1.3
RIFFLE SIDE SLOPE (X:1)	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-
INSIDE POOL SIDE SLOPE	5.0	-	5.0	-	5.0	-	5.0	-	3.0	-
OUTSIDE POOL SIDE SLOPE	1.5	-	1.5	-	1.5	-	1.5	-	3.0	-

TYPICAL STRUCTURE PLACEMENT



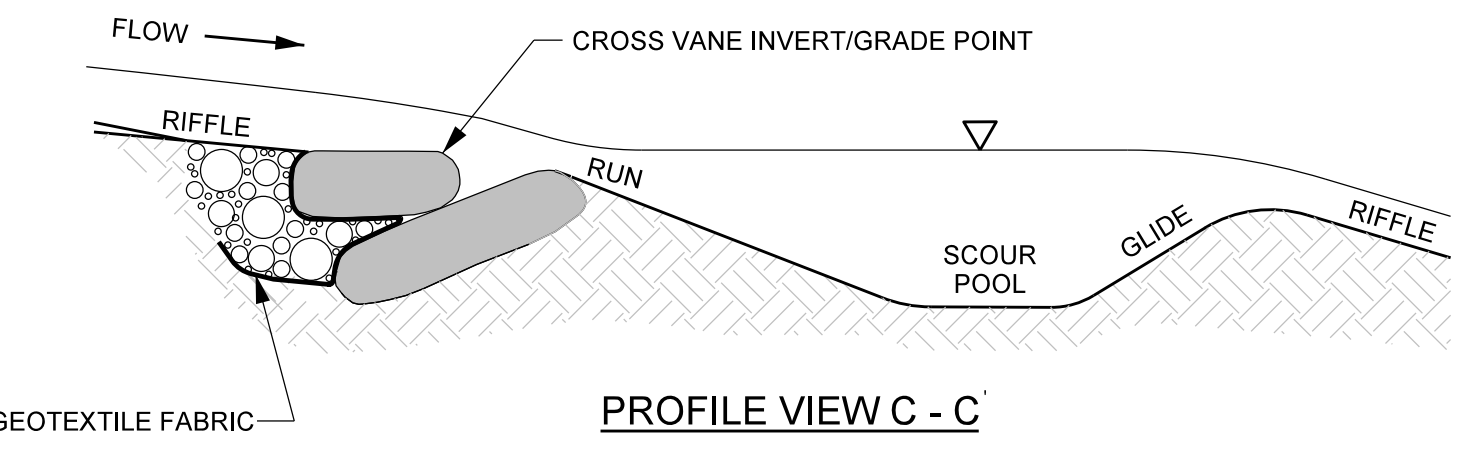
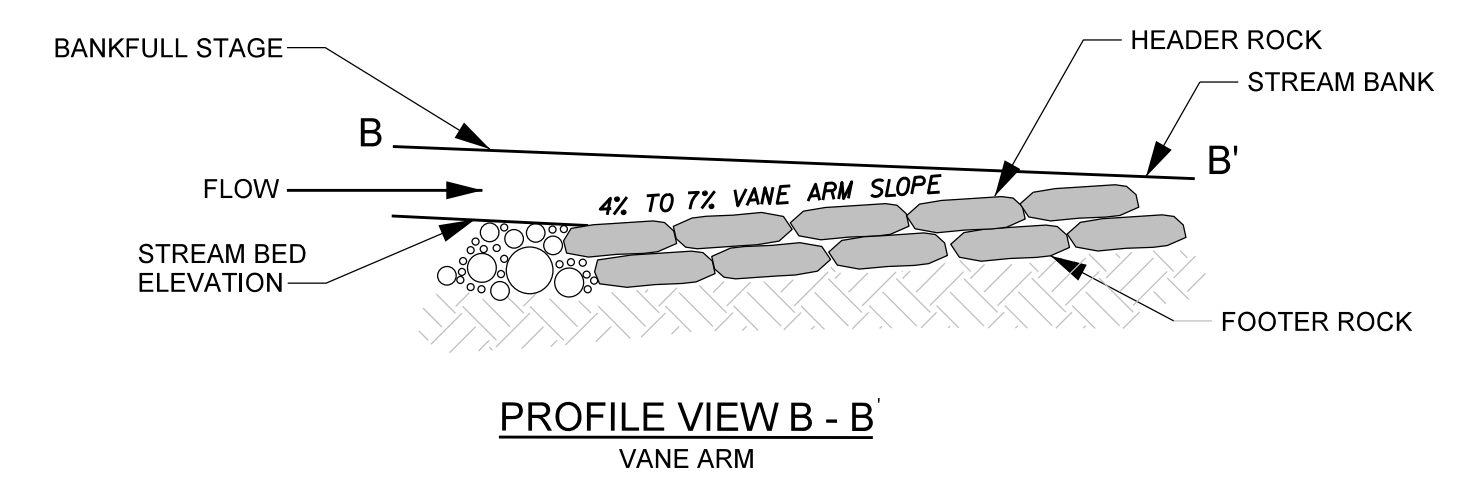
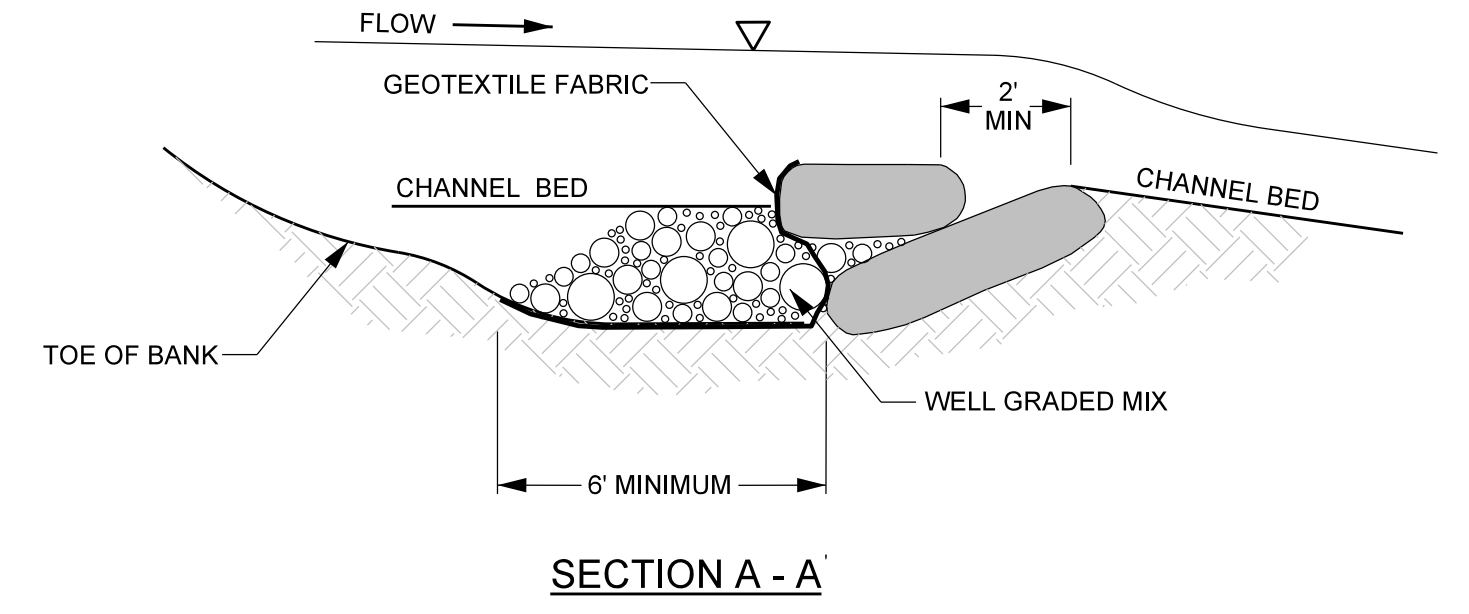
- STRUCTURE NOTES:**
- GENERALLY CONSTRUCTED RIFFLES, ROOT WADS, LOG VANES AND COIR FIBER MATTING WILL BE INSTALLED IN THE LOCATION AND SEQUENCE AS SHOWN.
 - ANY CHANGES TO NUMBER OR LOCATION OF STRUCTURES DURING CONSTRUCTION MUST BE APPROVED BY THE DESIGN ENGINEER.
 - COIR FIBER MATTING TO BE INSTALLED ON ALL RESTORED STREAMBANKS, FLOODPLAIN BENCHING, AND TERRACE SLOPES AS DESCRIBED IN THE TECHNICAL SPECIFICATIONS.
 - ROOTWADS MAY BE REPLACED WITH GEOLIFT.

ROCK CROSS VANE



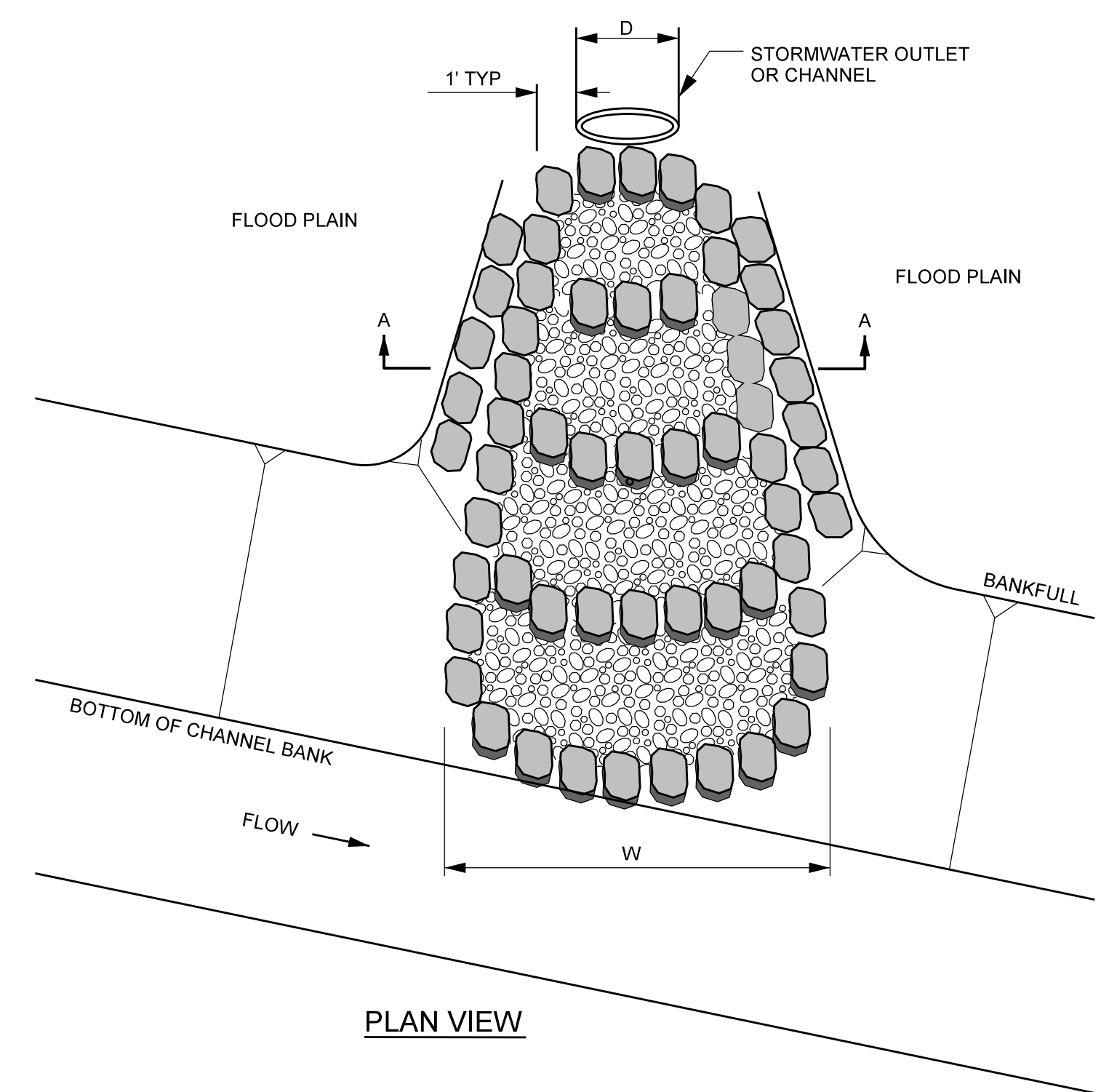
REACH	VANE LENGTH	BOULDER SIZE
REACH 1	15'	2'x3'x4'
REACH 2	15'	2'x3'x4'
REACH 3	21'	2'x3'x4'

- NOTES FOR ALL VANE STRUCTURES:**
- INSTALL FILTER FABRIC FOR DRAINAGE BEGINNING AT THE MIDDLE OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF SIX FEET.
 - DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
 - CONSTRUCT ANGLE AND SLOPE SPECIFICATIONS AS SHOWN.
 - BACKFILL VANE ARMS AND INVERT WITH A WELL GRADED MIX OF CLASS B, A, AND #57 STONE.
 - ON-SITE ALLUVIUM SHALL BE INCORPORATED INTO THE STONE BACKFILL WHERE AVAILABLE.
 - BOULDER SILL MUST BE A MINIMUM OF 6' AND WILL INCLUDE FOOTER ROCKS.

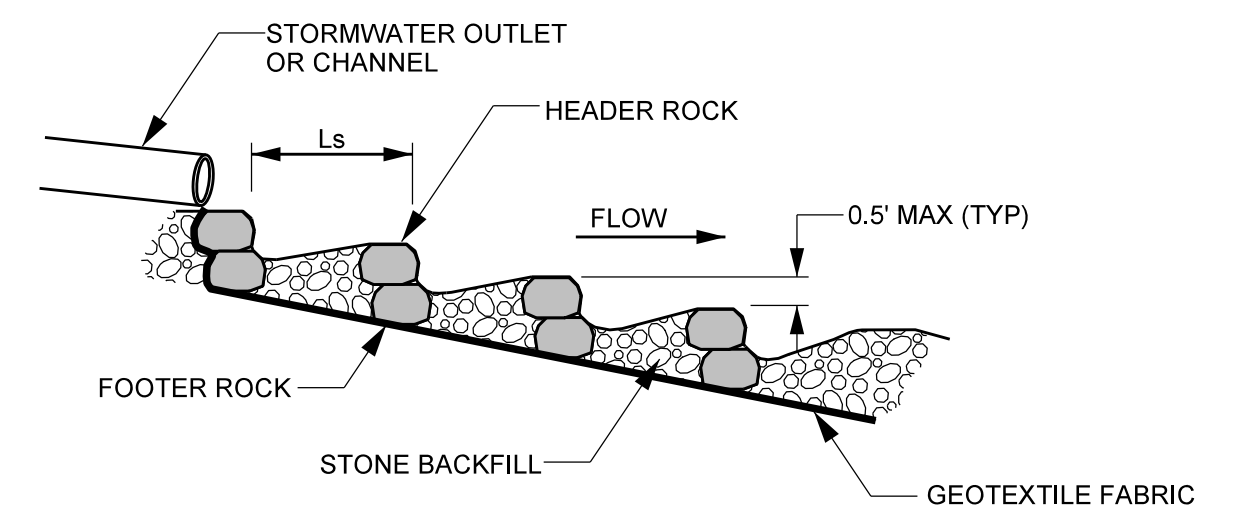


2/26/2023

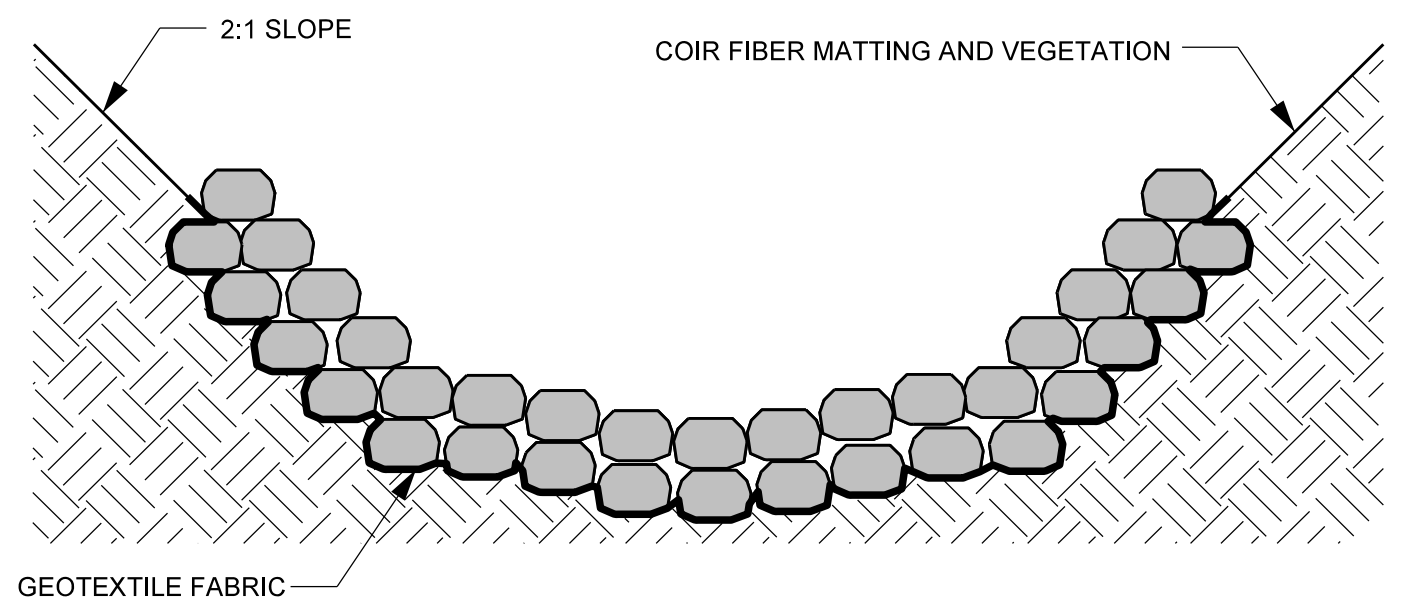
OUTLET PROTECTION



PLAN VIEW

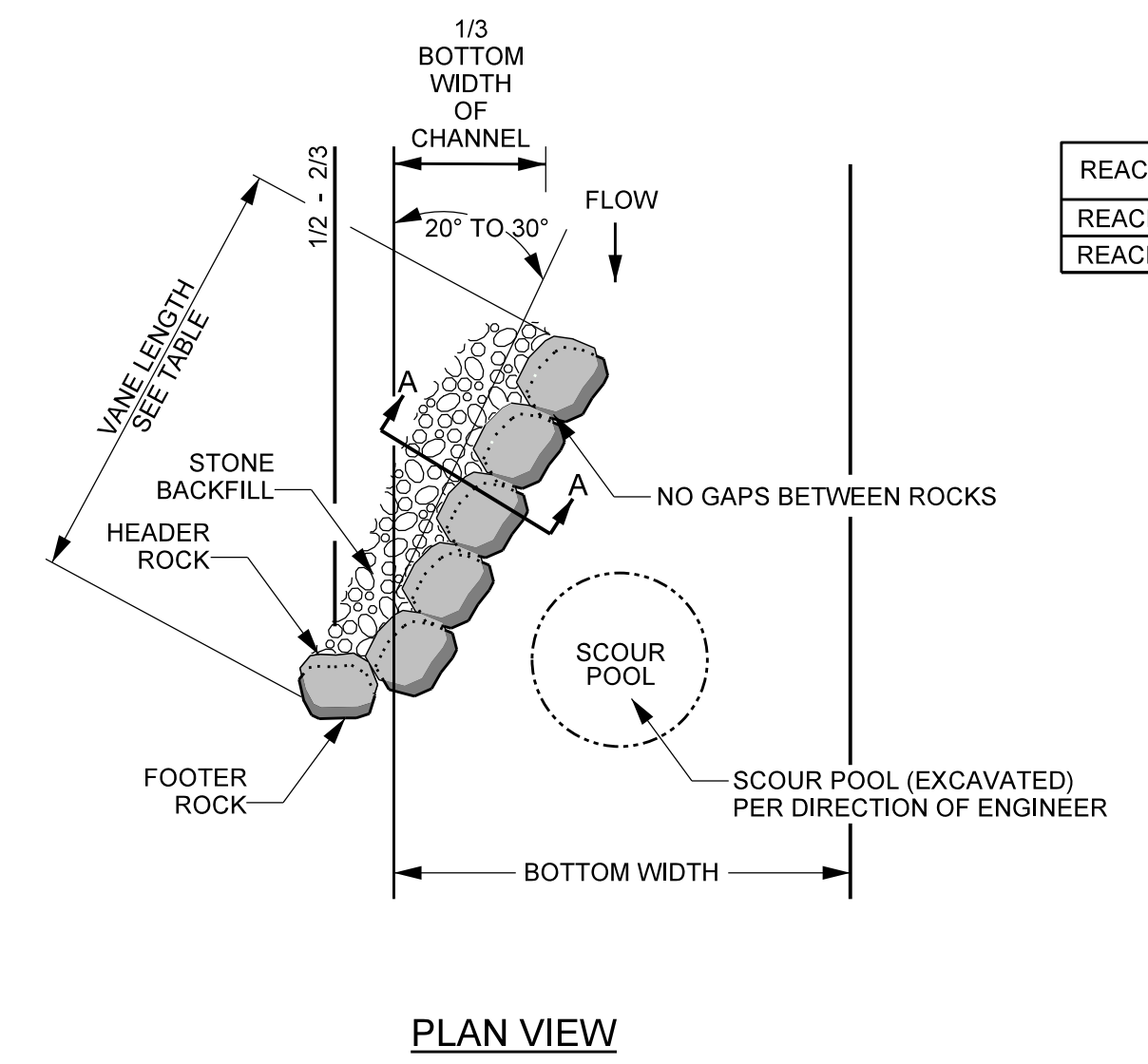


PROFILE VIEW



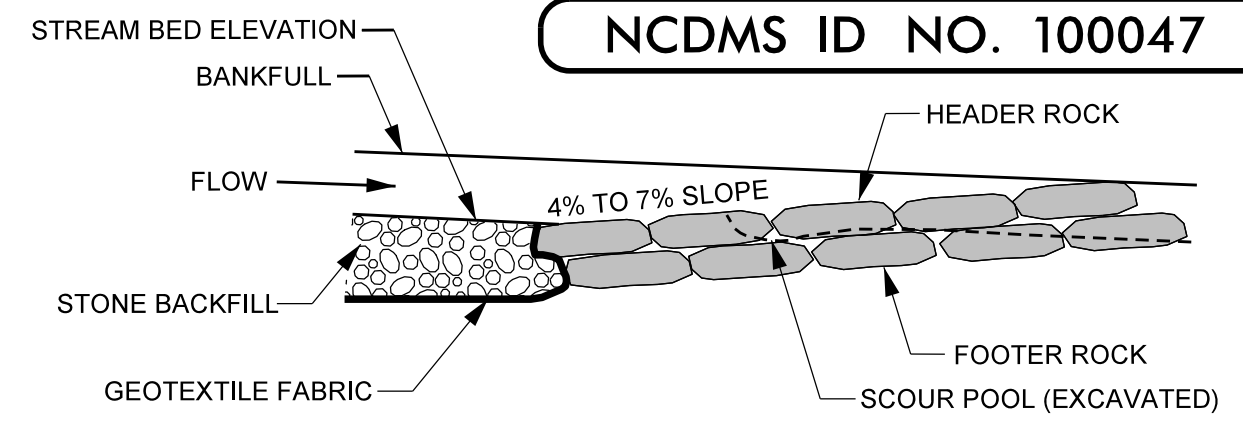
CROSS SECTION A - A

ROCK VANE

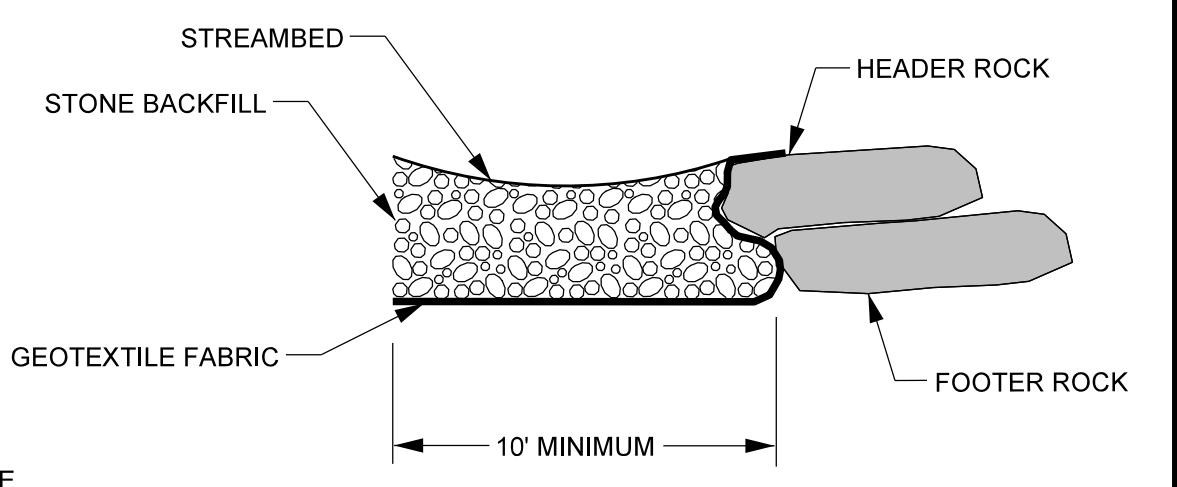


PLAN VIEW

REACH	VANE LENGTH	BOULDER SIZE
REACH 1	15'	2'x3'x4'
REACH 2	15'	2'x3'x4'



PROFILE VIEW



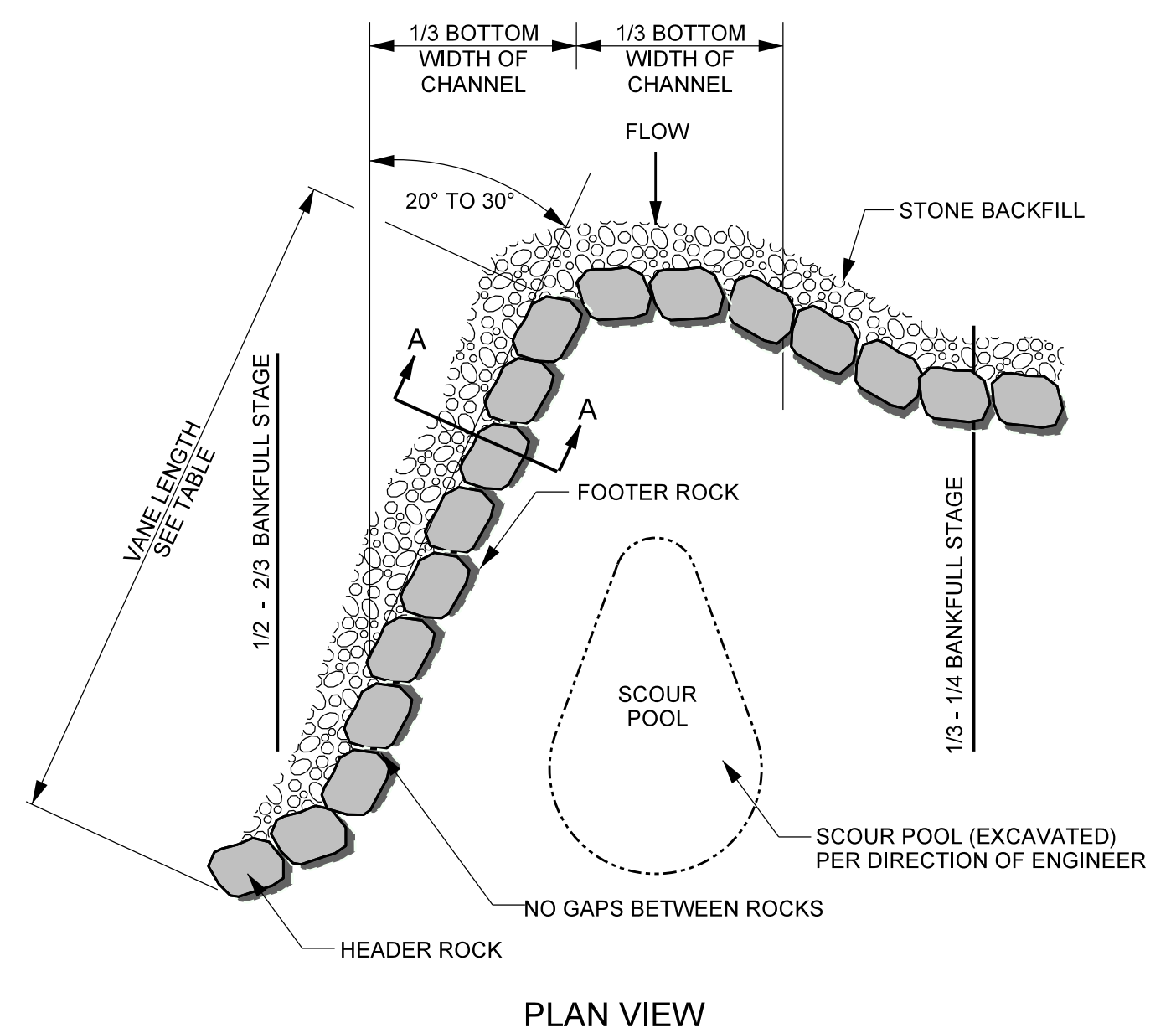
SECTION A - A

NOTES FOR ALL VANE STRUCTURES:

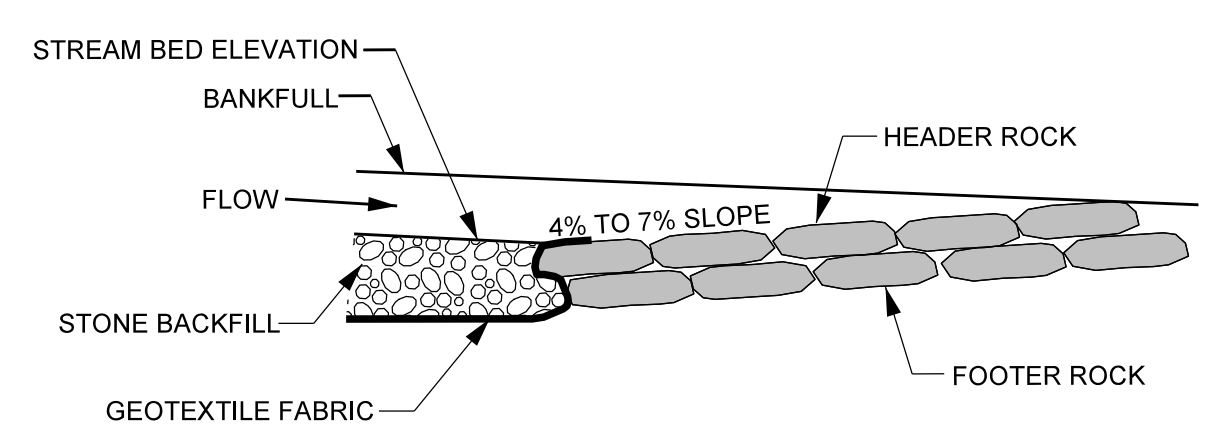
1. INSTALL GEOTEXTILE FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
2. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
3. 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 WELL GRADED MIX OF CLASS B, CLASS A, & #57 STONE TO THE ELEVATION OF THE TOP OF THE HEADER ROCK. INCORPORATE ON-SITE ALLUVIUM WHERE AVAILABLE.
8. START SLOPE AT 2/3 TO 3/4 TIMES THE BANKFULL STAGE.

PROJECT REFERENCE NO. 166274	SHEET NO. 2A
PROJECT ENGINEER Michael Baker Engineering Inc.	
APPROVED BY: Kathleen M. McKeithan	
DATE: 4/13/2022	
NCDMS ID NO. 100047	

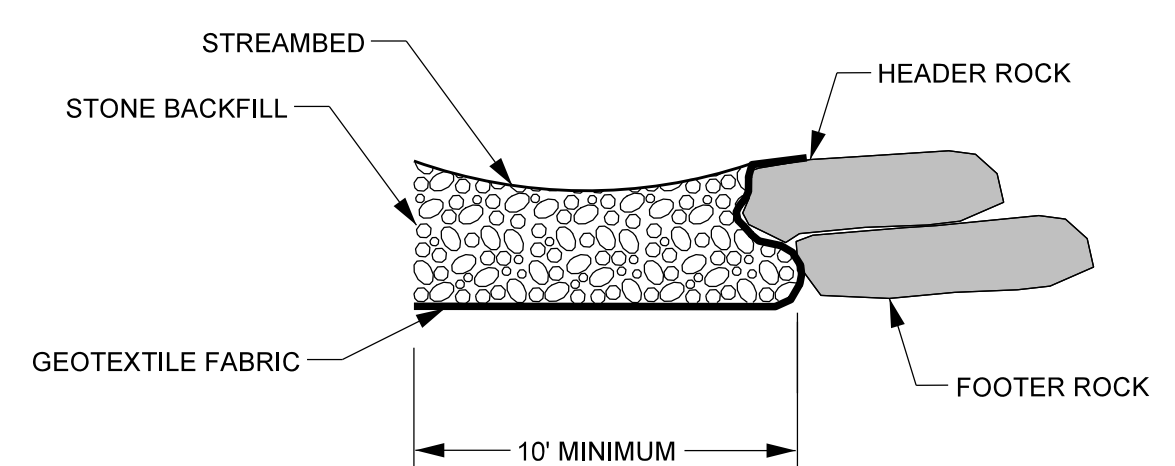
GRADE CONTROL J-HOOK VANE



PLAN VIEW



PROFILE VIEW



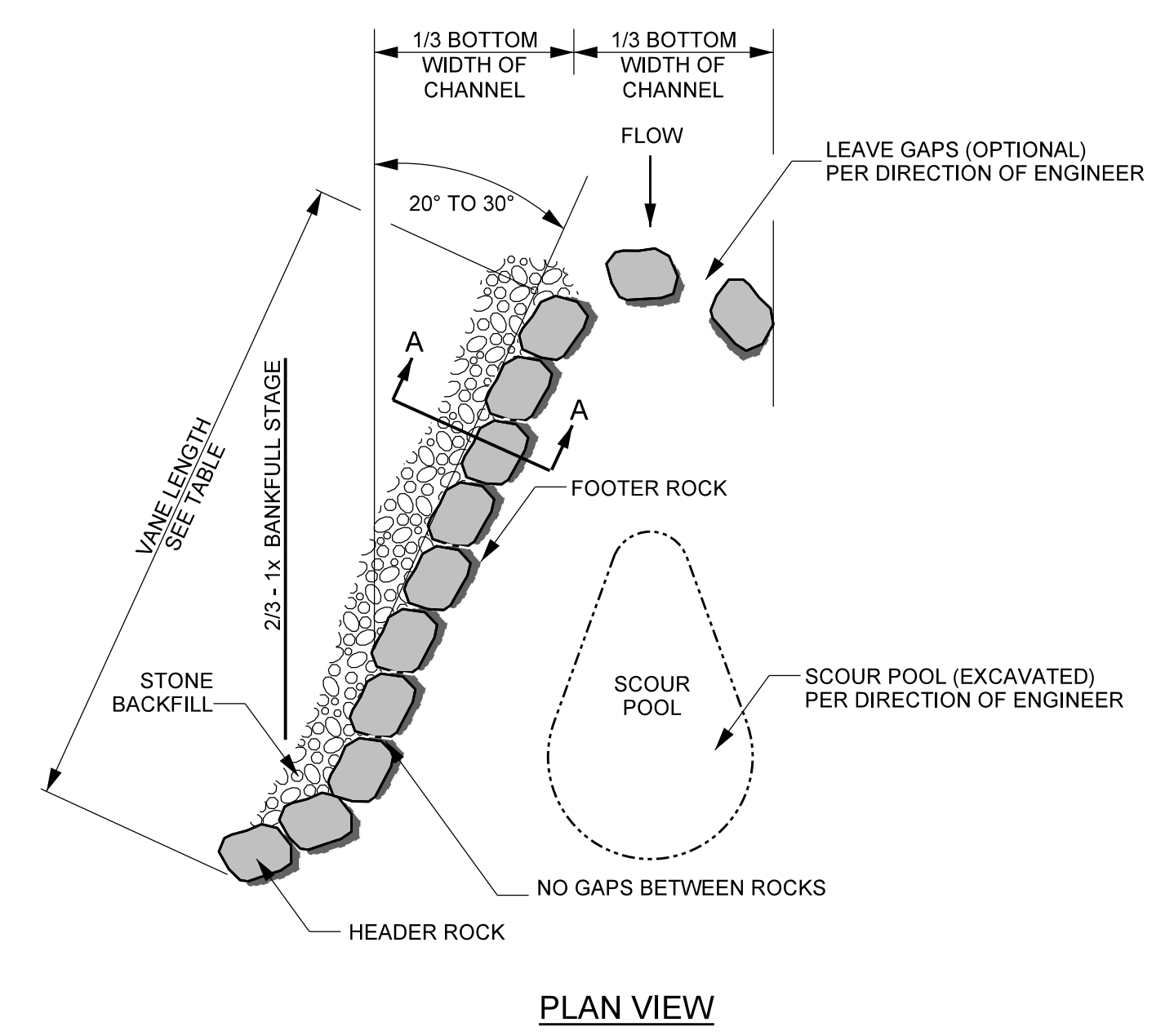
SECTION A - A

NOTES FOR ALL VANE STRUCTURES:

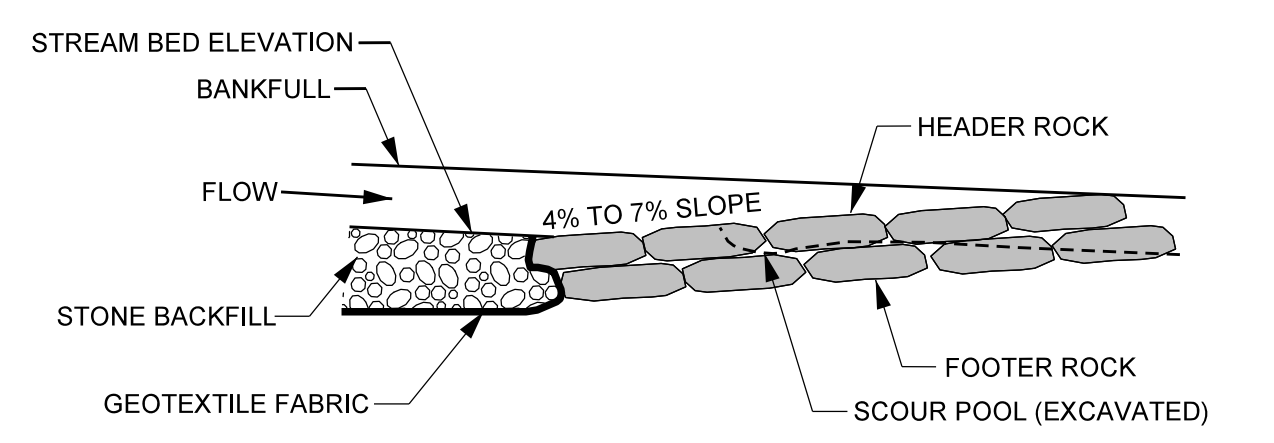
1. INSTALL FILTER FABRIC FOR DRAINAGE BEGINNING AT THE MIDDLE OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF SIX FEET.
2. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
3. CONSTRUCT ANGLE AND SLOPE SPECIFICATIONS AS SHOWN.
4. BACKFILL VANE ARMS AND INVERT WITH A WELL GRADED MIX OF CLASS B, A, AND #57 STONE.
5. ON-SITE ALLUVIUM SHALL BE INCORPORATED INTO THE STONE BACKFILL WHERE AVAILABLE.
6. BOULDER SILL MUST BE A MINIMUM OF 6'.

REACH	VANE LENGTH	BOULDER SIZE
REACH 1	15'	2'x3'x4'
REACH 2	15'	2'x3'x4'

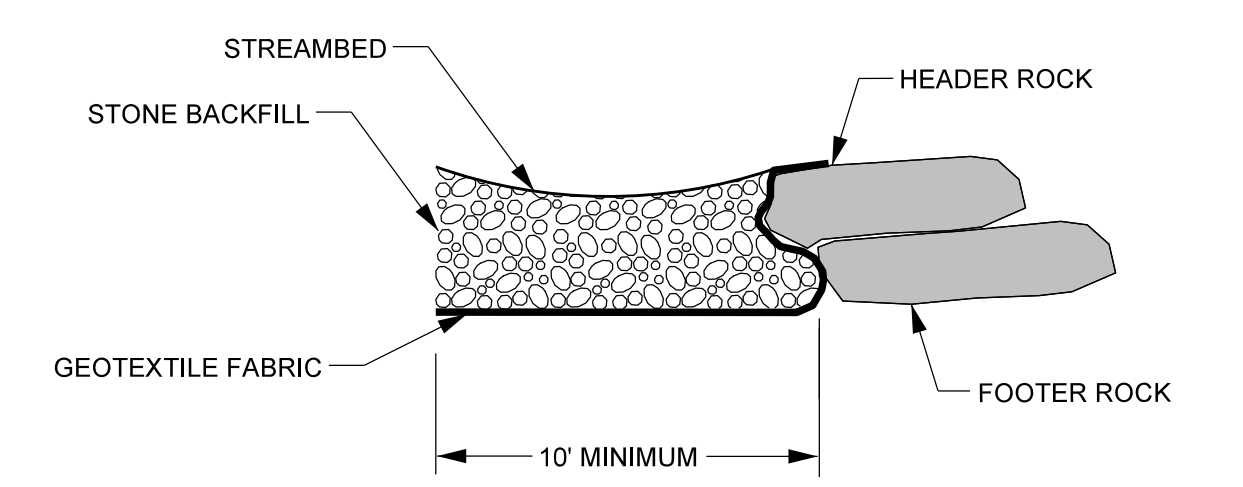
J-HOOK VANE



PLAN VIEW



PROFILE VIEW



SECTION A - A

REACH	VANE LENGTH	BOULDER SIZE
REACH 1	15'	2'x3'x4'
REACH 2	15'	2'x3'x4'

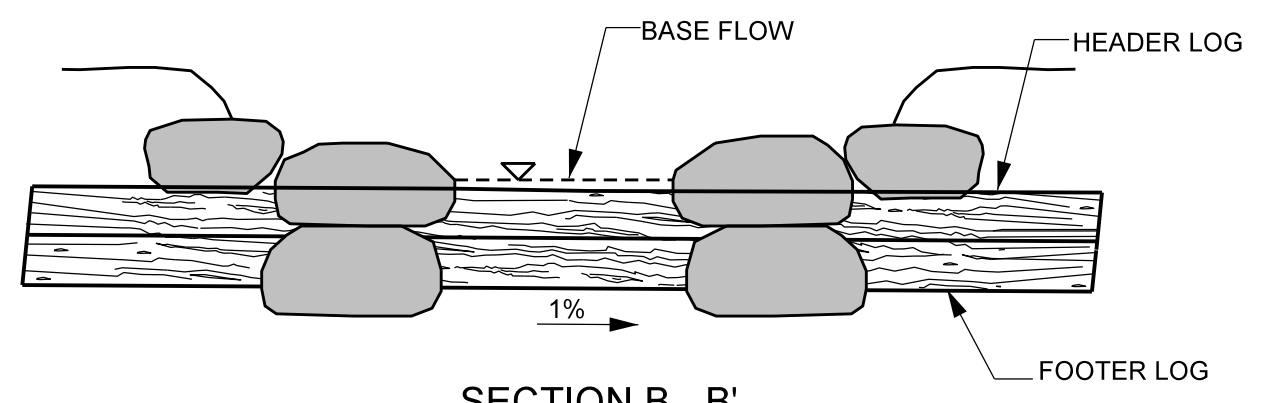
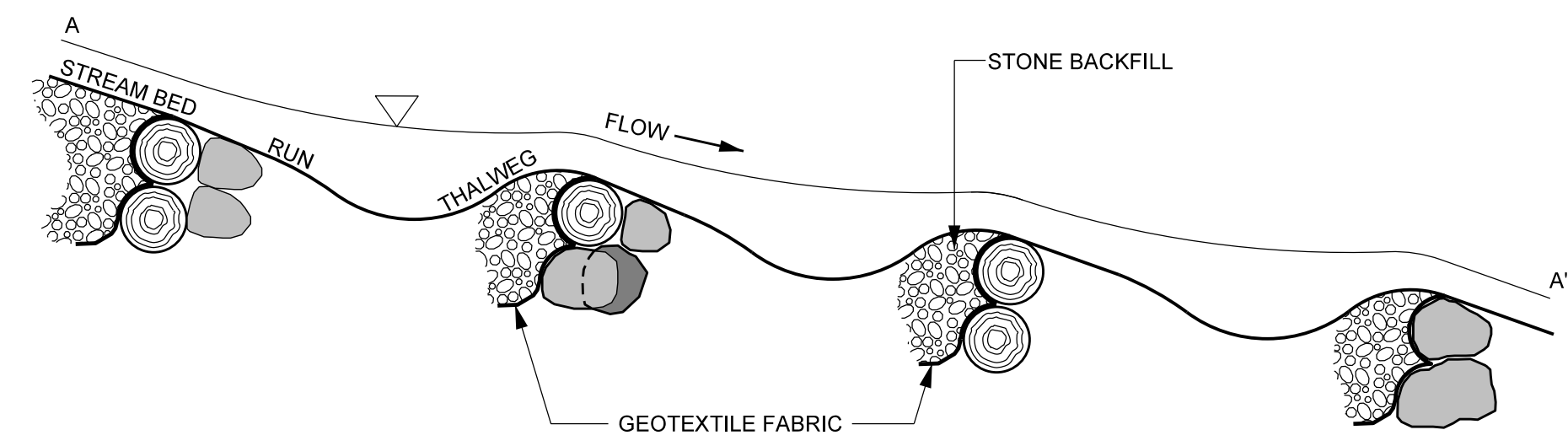
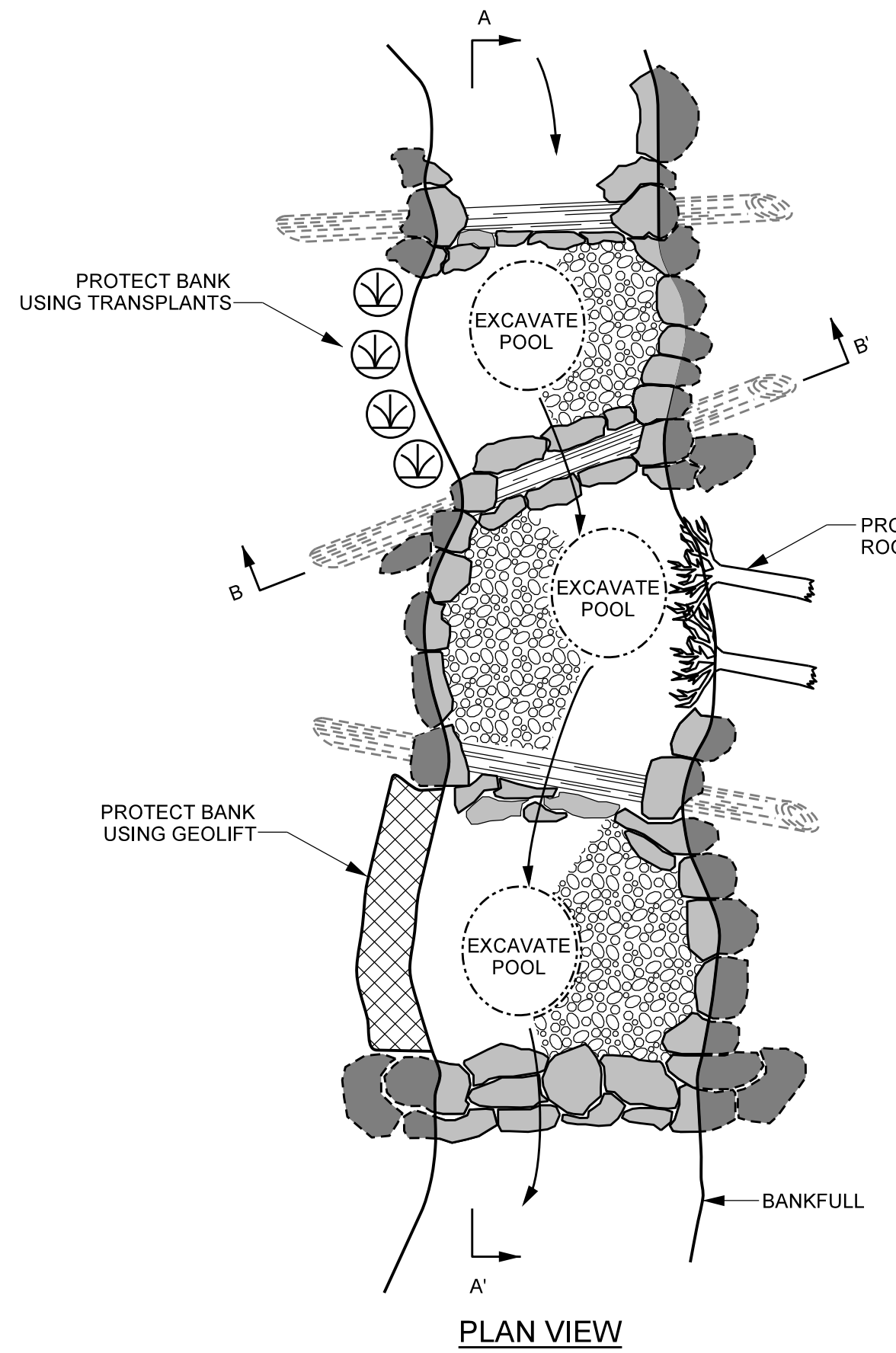
NOTES FOR ALL VANE STRUCTURES:

1. INSTALL GEOTEXTILE FABRIC 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.

R:\166274_166274_Bldg-Creek_Design\As-Built\PLANS\166274_AB-PSH-02A.dgn

2/26/2023

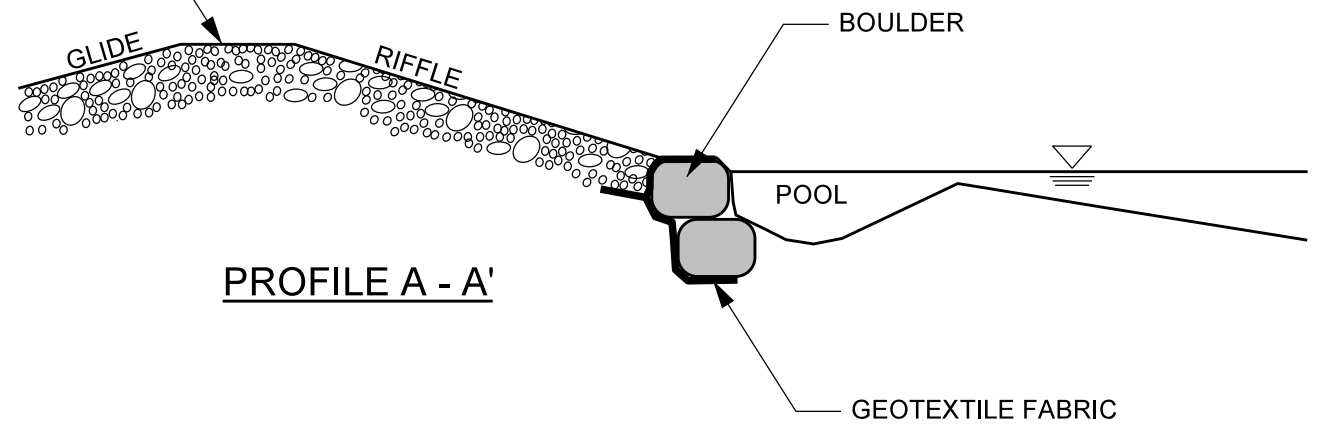
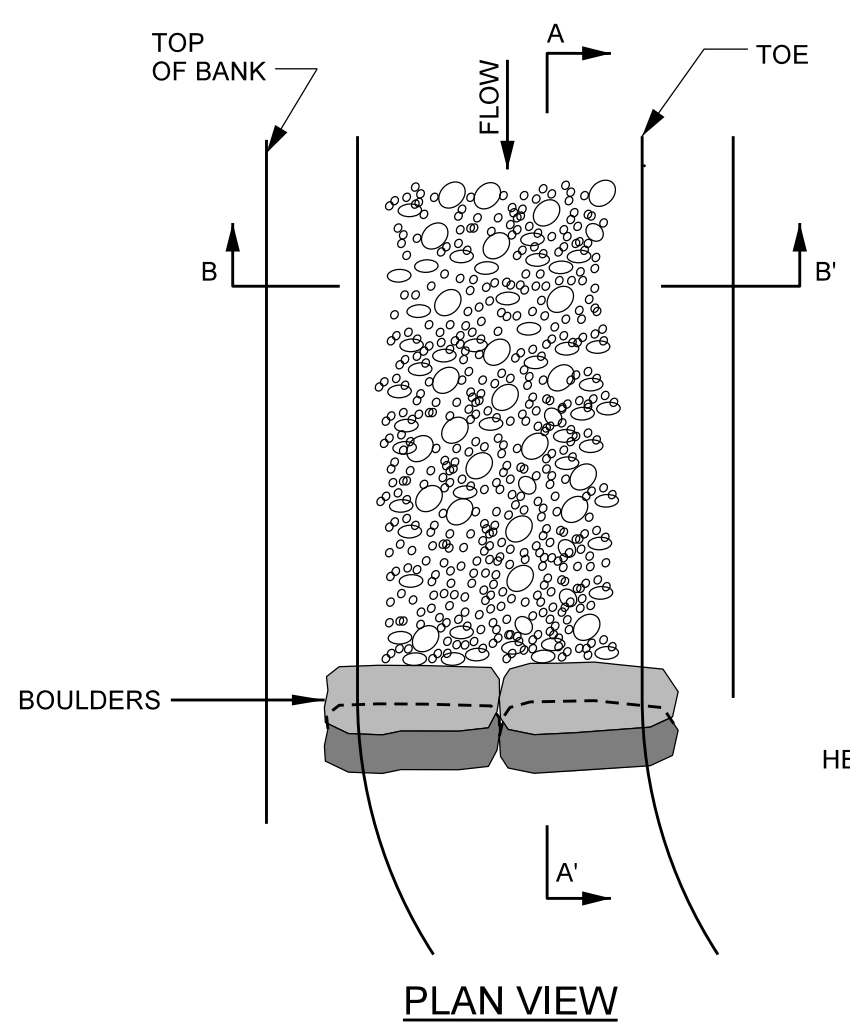
LOG AND ROCK STEP / POOL



REACH	BOULDER SIZE
REACH 1	2'x3'x4'
REACH 2	2'x3'x4'

- NOTES:**
- LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED AND EXTENDING INTO THE BANK 5' ON EACH SIDE.
 - SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.
 - GEOTEXTILE FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL.
 - BOULDERS SHOULD BE PLACED ON TOP OF HEADER LOG FOR ANCHORING.
 - TRANSPLANTS CAN BE USED INSTEAD OF BOULDERS, PER DIRECTION OF ENGINEER.
 - AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH WELL GRADED MIX OF CLASS B, CLASS A, & #57 STONE TO THE ELEVATION OF THE TOP OF THE HEADER ROCK. INCORPORATE ON-SITE ALLUVIUM WHERE AVAILABLE.

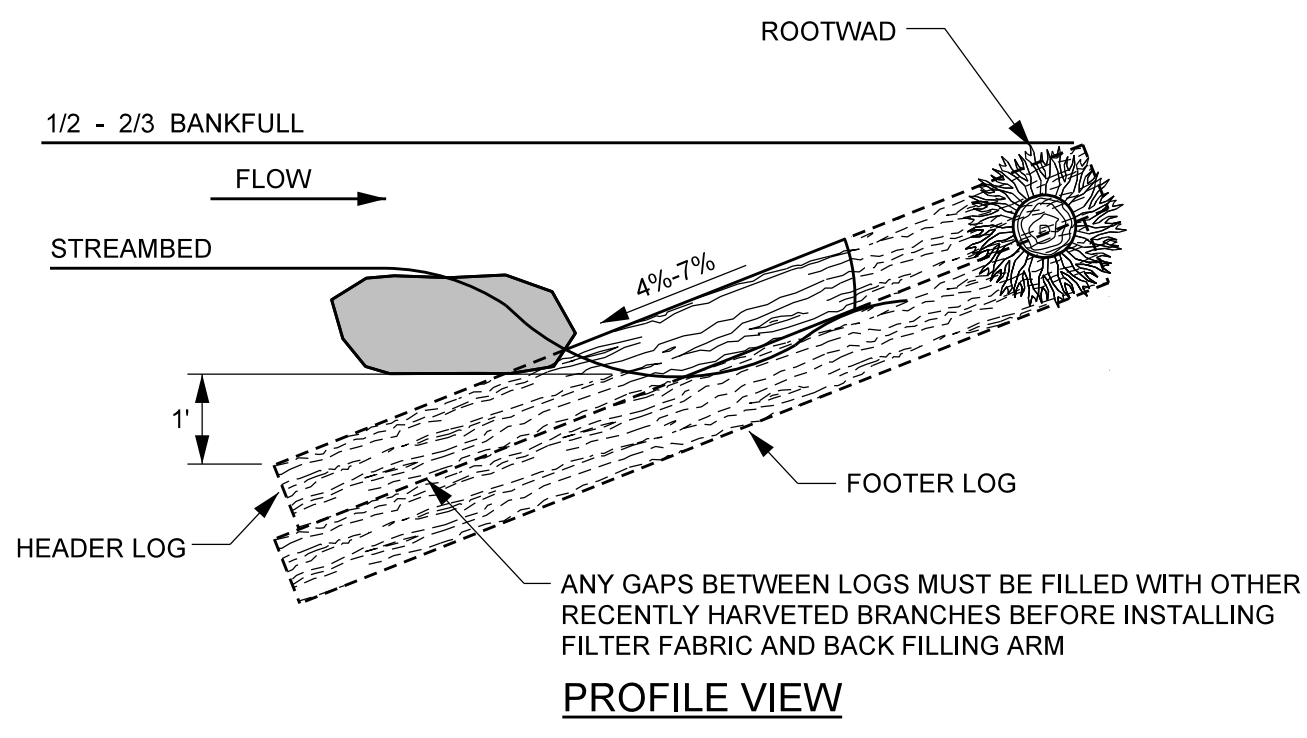
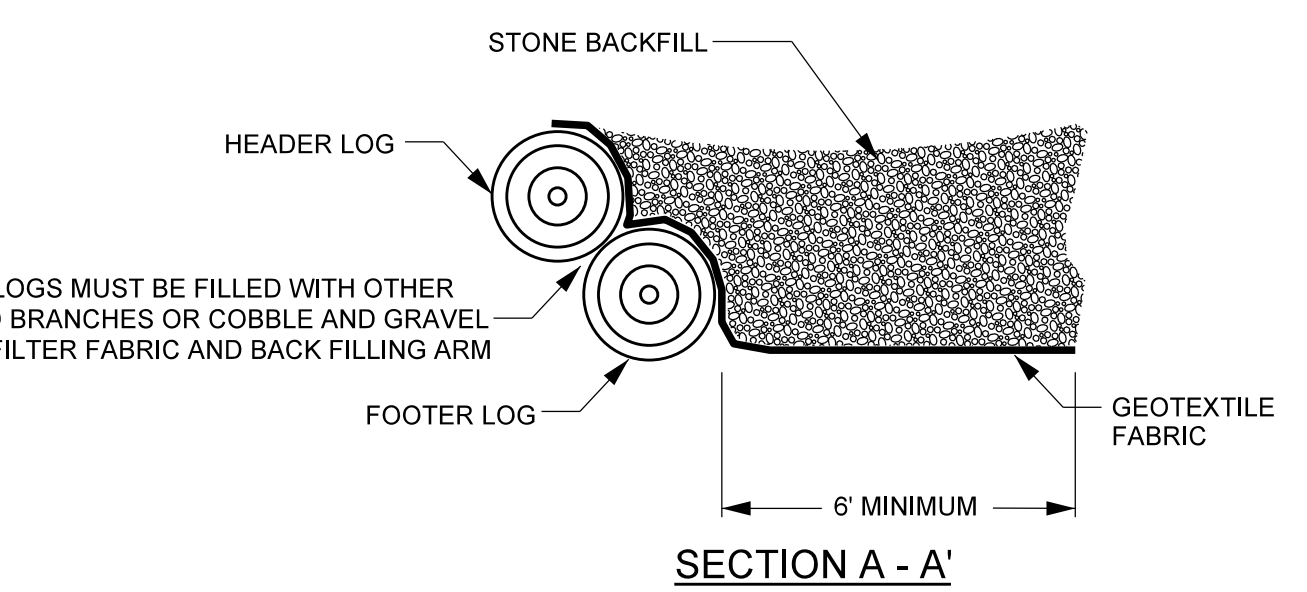
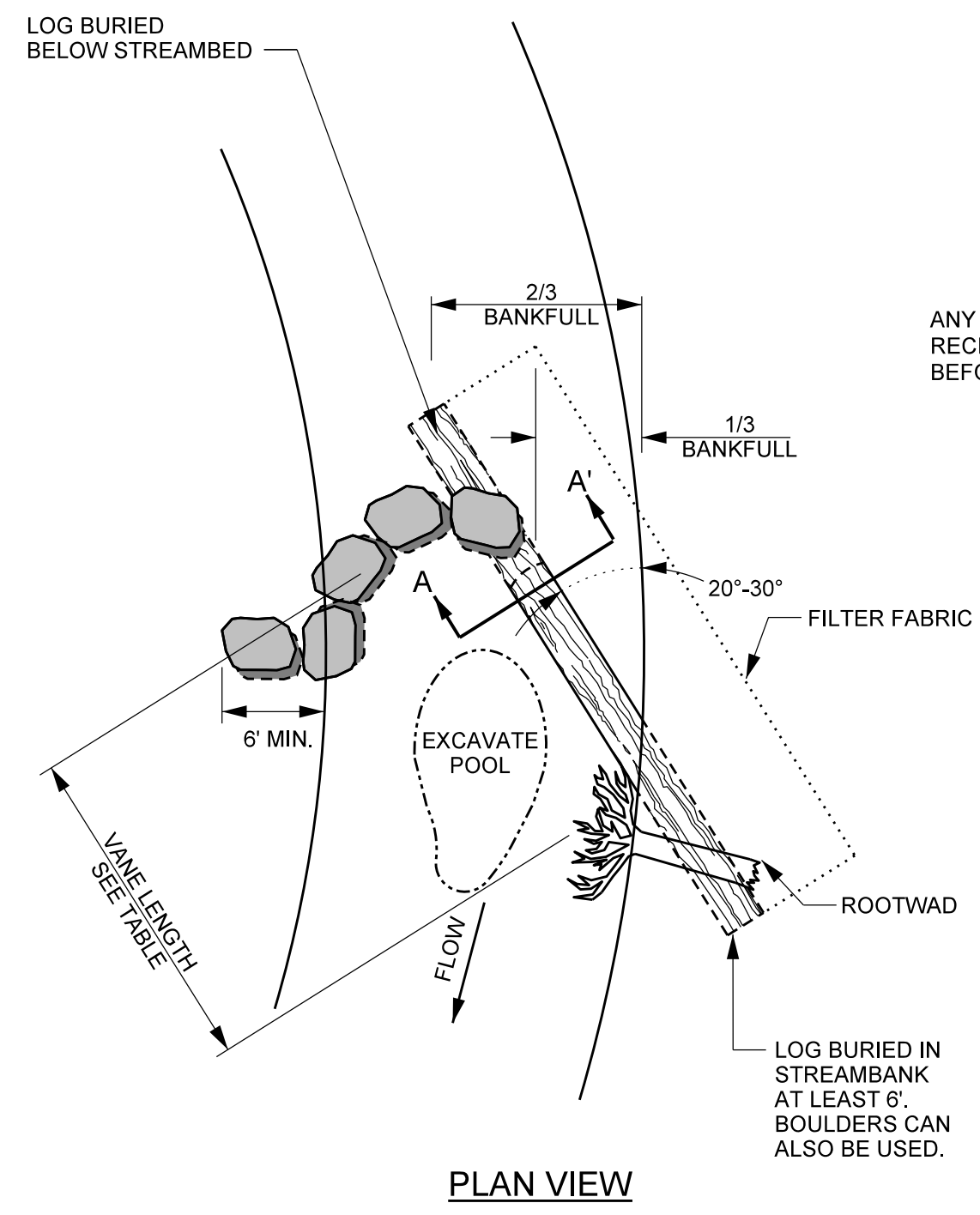
BOULDER STEP



REACH	BOULDER SIZE
REACH 1	2'x3'x4'
REACH 2	2'x3'x4'
UT 1	1'x2'x3'

- NOTES:**
- FOOTERS SHALL BE INSTALLED SUCH THAT 1/4 TO 1/3 OF THE LENGTH IS DOWNSTREAM OF THE HEADER.
 - SOIL SHALL BE WELL COMPACTED AROUND BURIED PORTION OF FOOTERS WITH THE BUCKET OF EXCAVATOR.
 - INSTALL NON-WOVEN FILTER FABRIC UNDERNEATH FOOTER BOULDERS.
 - UNDERCUT THE RIFFLE ELEVATION 12 INCHES TO ALLOW FOR A LAYER OF STONE.
 - 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.
 - FILL TRENCH WITH GRADED MIX OF CLASS A, CLASS B, AND #57 STONE TO THE BED ELEVATION OF THE CHANNEL.
 - BOULDER STEPS MUST BE EXTENDED TO A MINIMUM OF 2' INTO THE BANK. USE SILL BOULDERS IF NECESSARY.
 - THALWEG AND STEP INVERT WILL BE CONCAVE AND SHAPED PER DIRECTION OF THE DESIGNER.

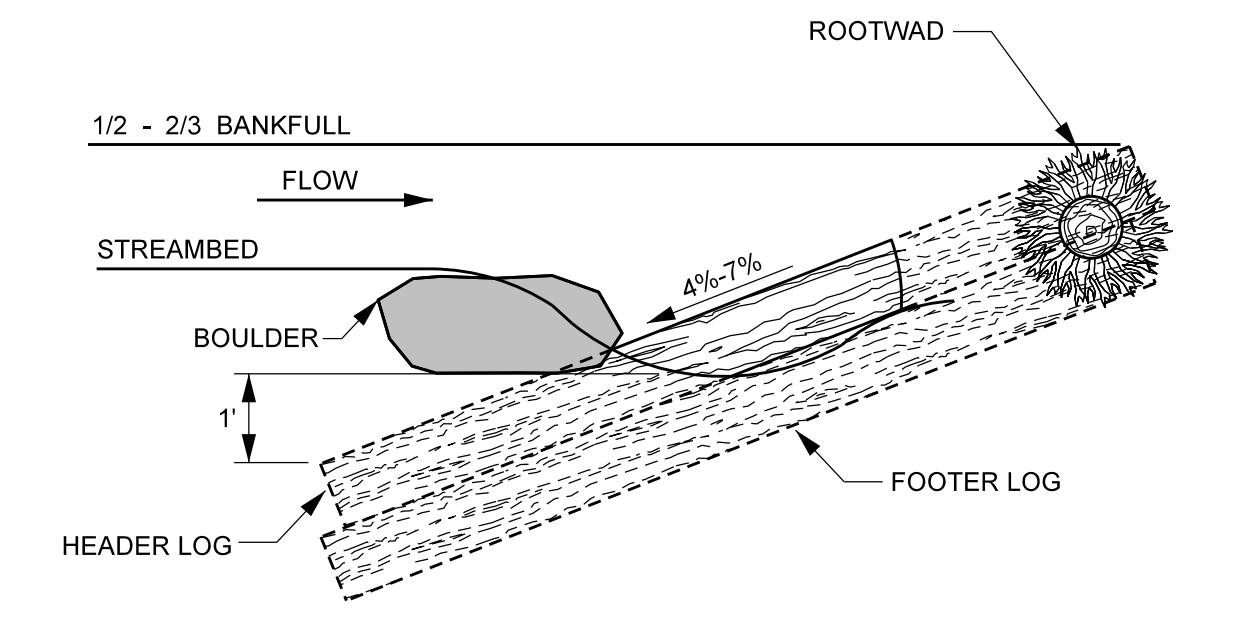
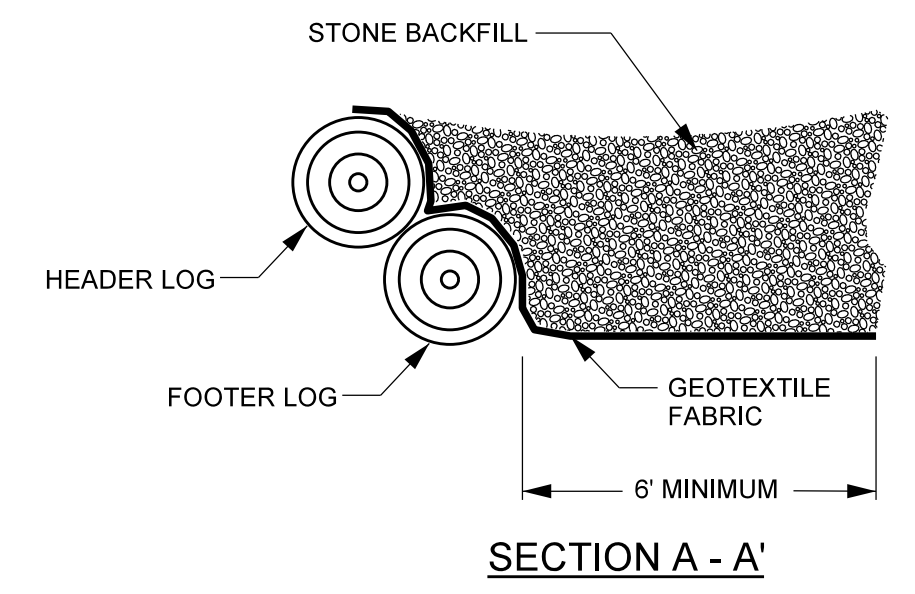
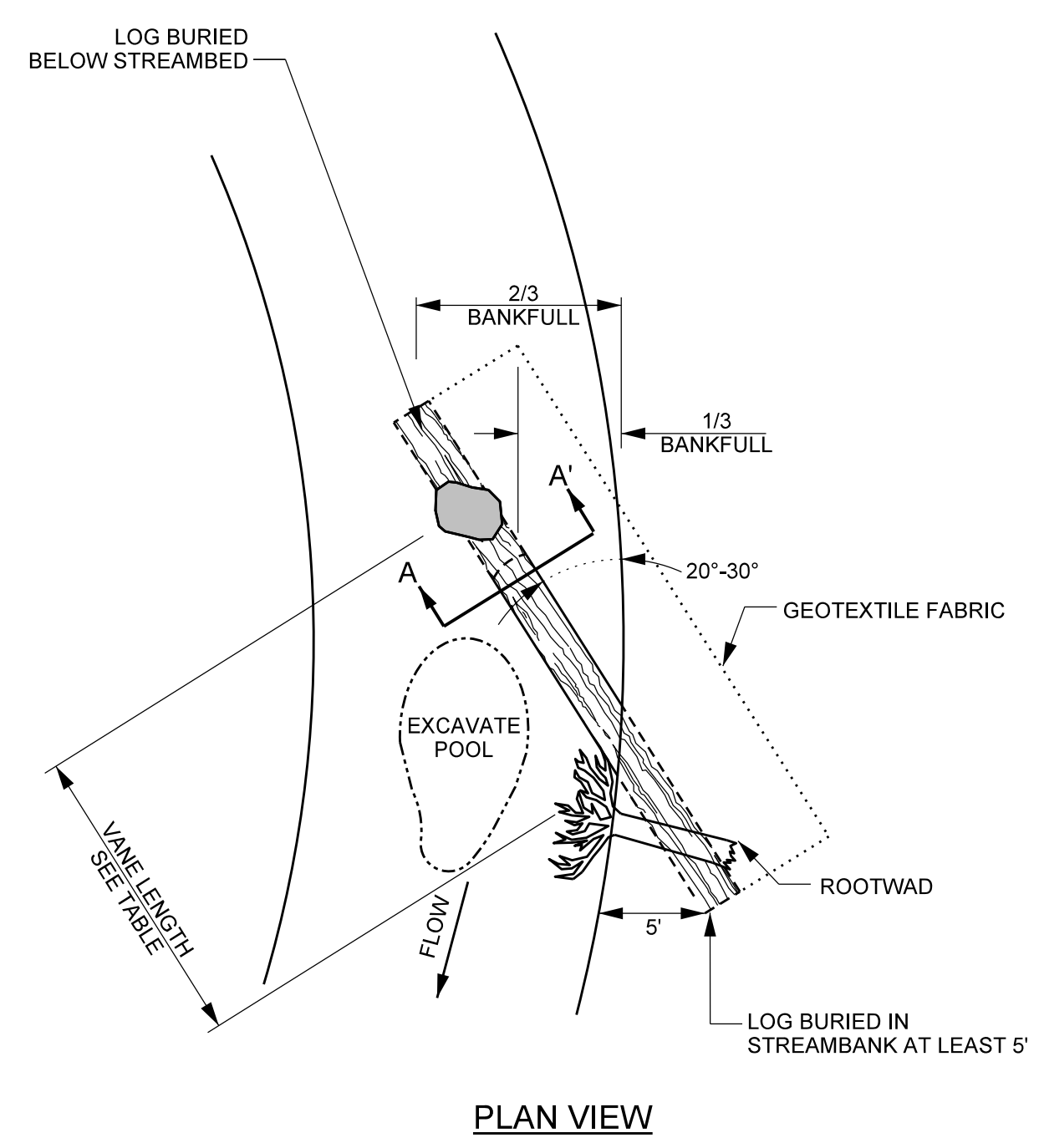
GRADE CONTROL LOG J-HOOK VANE



REACH	VANE LENGTH	BOULDER SIZE
REACH 1	15'	2'x3'x4'
REACH 2	15'	2'x3'x4'

- NOTES:**
- LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, RECENTLY HARVESTED, AND FOOTERED.
 - BOULDERS MUST BE OF SUFFICIENT SIZE TO ANCHOR LOGS.
 - SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.
 - ROOTWADS SHOULD BE PLACED BENEATH THE HEADER LOG AND PLACED SO THAT IT LOCKS THE HEADER LOG INTO THE BANK. SEE ROOTWAD DETAIL.
 - BOULDERS SHOULD BE PLACED ON TOP OF HEADER LOG FOR ANCHORING.
 - HEADER BOULDERS TO BE PLACED 0.5 TO 0.75 FEET APART.
 - FILTER FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL.
 - TRANSPLANTS OR BOULDERS CAN BE USED INSTEAD OF ROOTWADS, PER DIRECTION OF ENGINEER.
 - BOULDER SILL MUST BE A MINIMUM OF 6'.
 - AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH WELL GRADED MIX OF CLASS B, CLASS A, & #57 STONE TO THE ELEVATION OF THE TOP OF THE HEADER ROCK. INCORPORATE ON-SITE ALLUVIUM WHERE AVAILABLE.

LOG VANE



REACH	VANE LENGTH	BOULDER SIZE
REACH 1	15'	2'x3'x4'
REACH 2	15'	2'x3'x4'

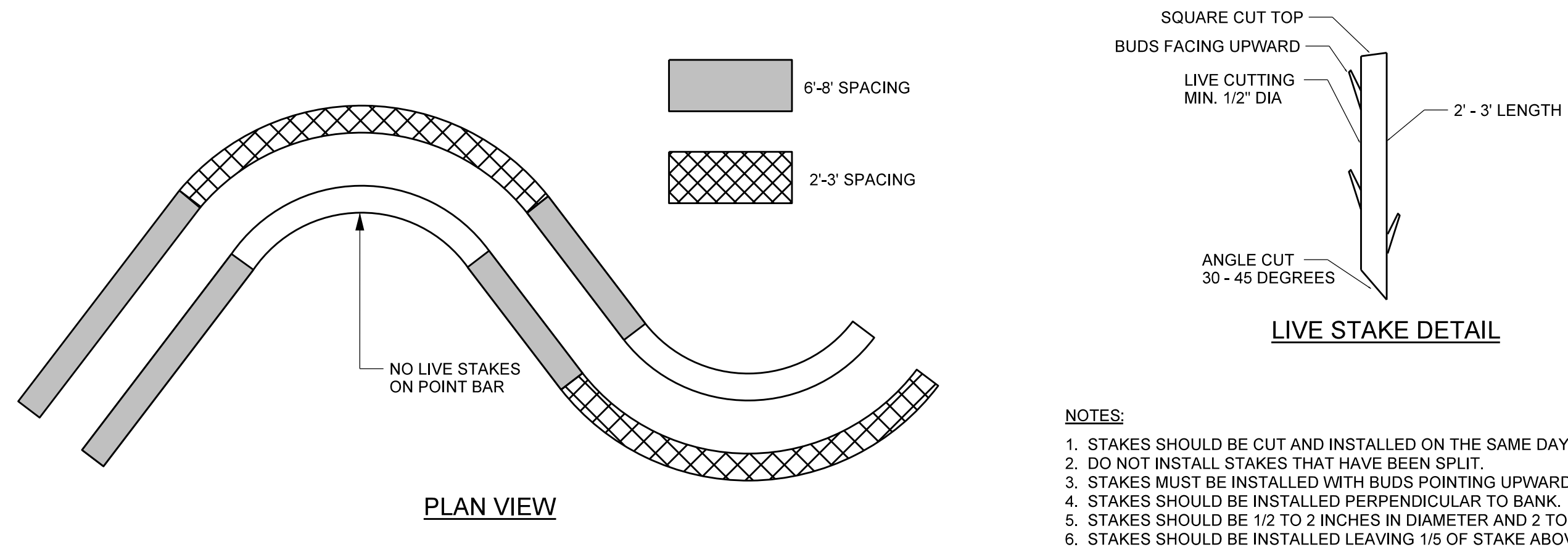
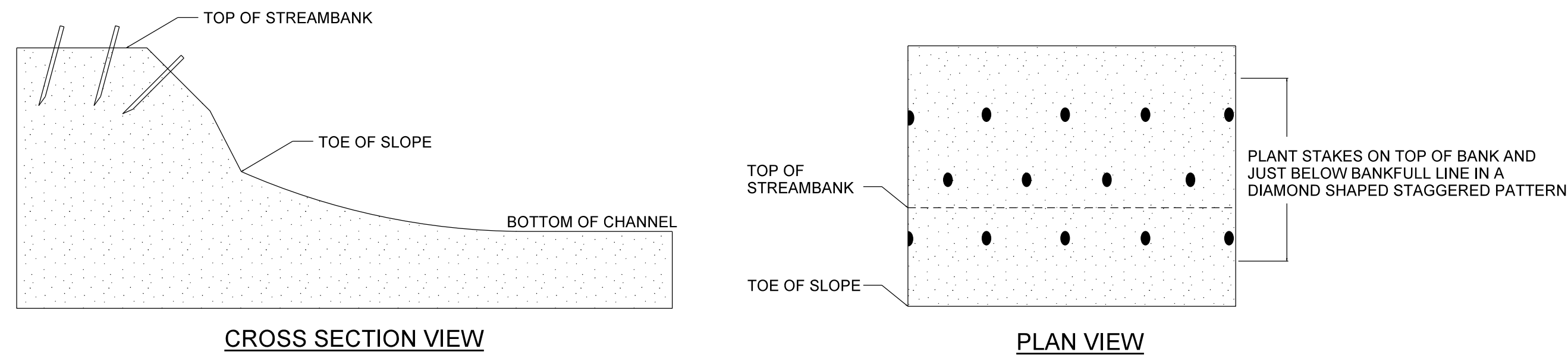
- NOTES:**
- LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
 - BOULDERS MUST BE OF SUFFICIENT SIZE TO ANCHOR LOGS.
 - SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOGS.
 - ROOTWADS SHOULD BE PLACED BENEATH THE HEADER LOG AND PLACED SO THAT IT LOCKS THE HEADER LOG INTO THE BANK. SEE ROOTWAD DETAIL.
 - BOULDER SHOULD BE PLACED ON TOP OF HEADER LOG FOR ANCHORING.
 - GEOTEXTILE FABRIC SHOULD BE NAILED TO THE LOG BELOW THE BACKFILL.
 - TRANSPLANTS CAN BE USED INSTEAD OF ROOTWADS, PER DIRECTION OF ENGINEER.
 - AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH WELL GRADED MIX OF CLASS B, CLASS A, & #57 STONE TO THE ELEVATION OF THE TOP OF THE HEADER ROCK. INCORPORATE ON-SITE ALLUVIUM WHERE AVAILABLE.

PROJECT REFERENCE NO. 166274	SHEET NO. 2B
PROJECT ENGINEER	
Design by: Kathleen M. McKeithen APPROVED BY: DATE: 4/13/2022	
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	
NC DMS ID NO. 100047	

R:\166274_Bldg-Creek\Design\As-Built\PLANS\166274_AB-PSH-02B.dgn
 4/13/2022 10:02 AM

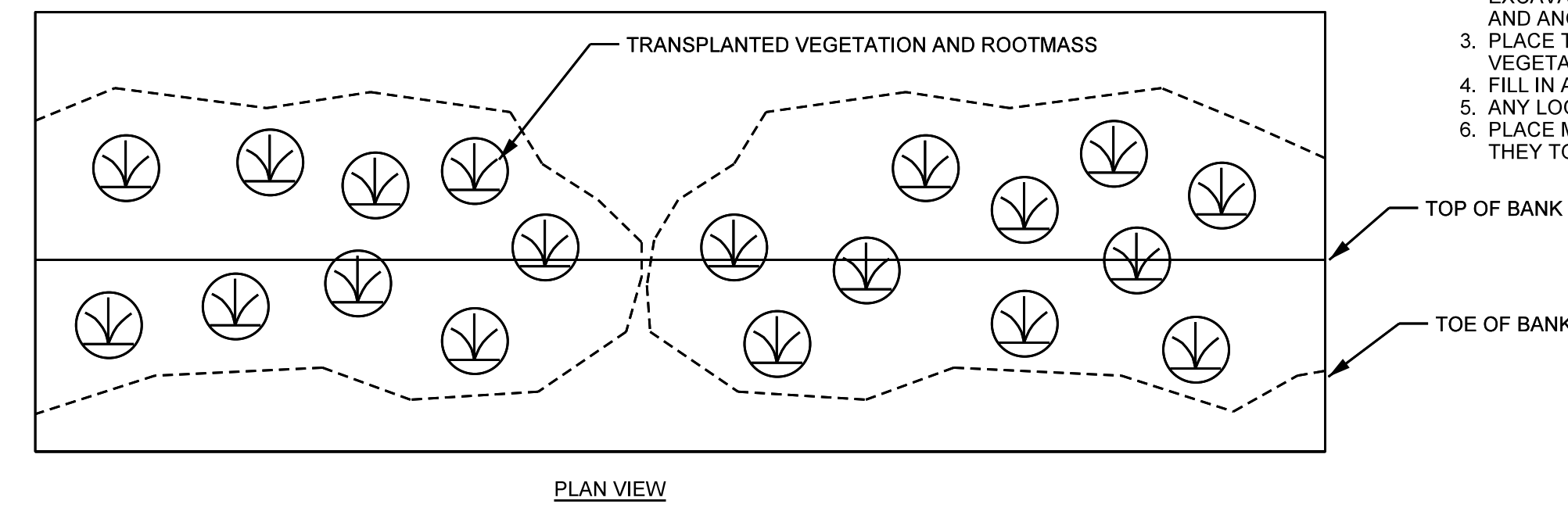
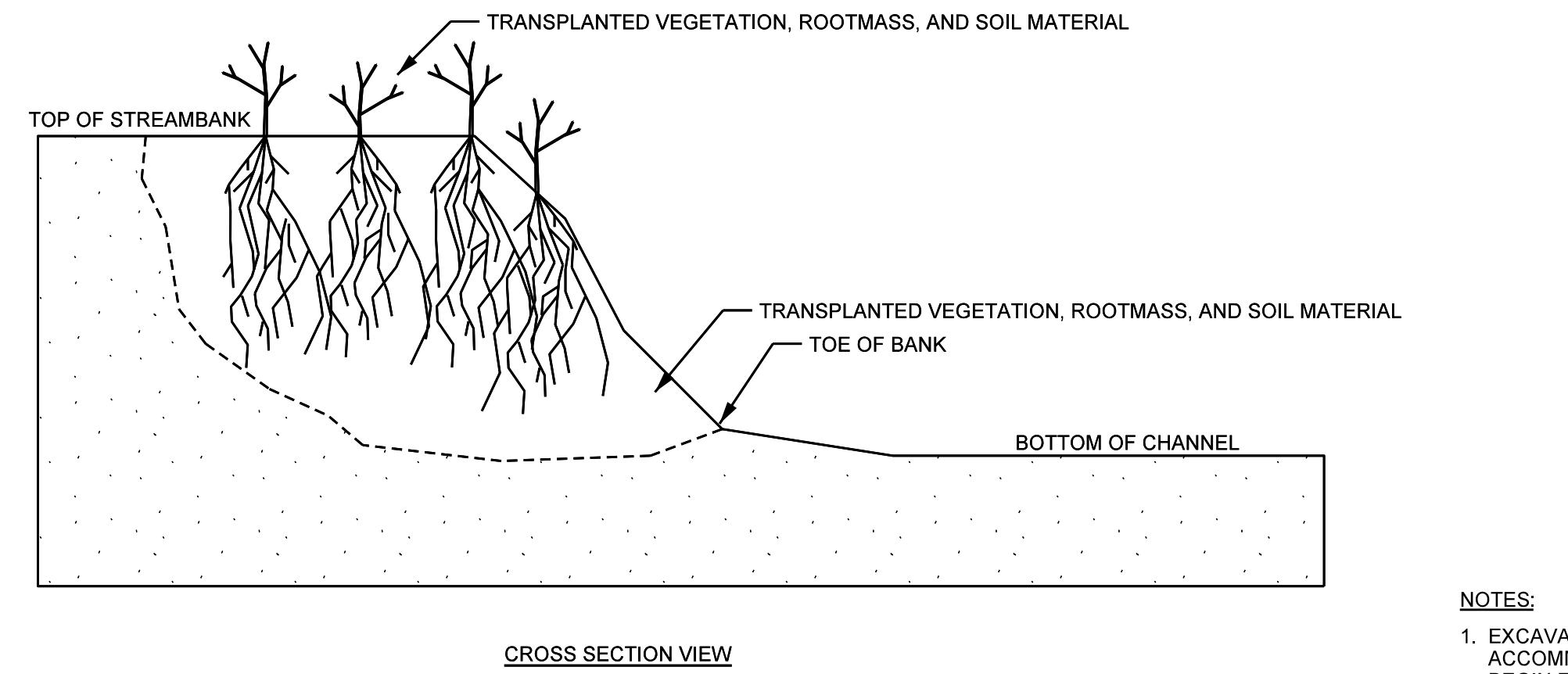
2/26/2023

LIVE STAKING



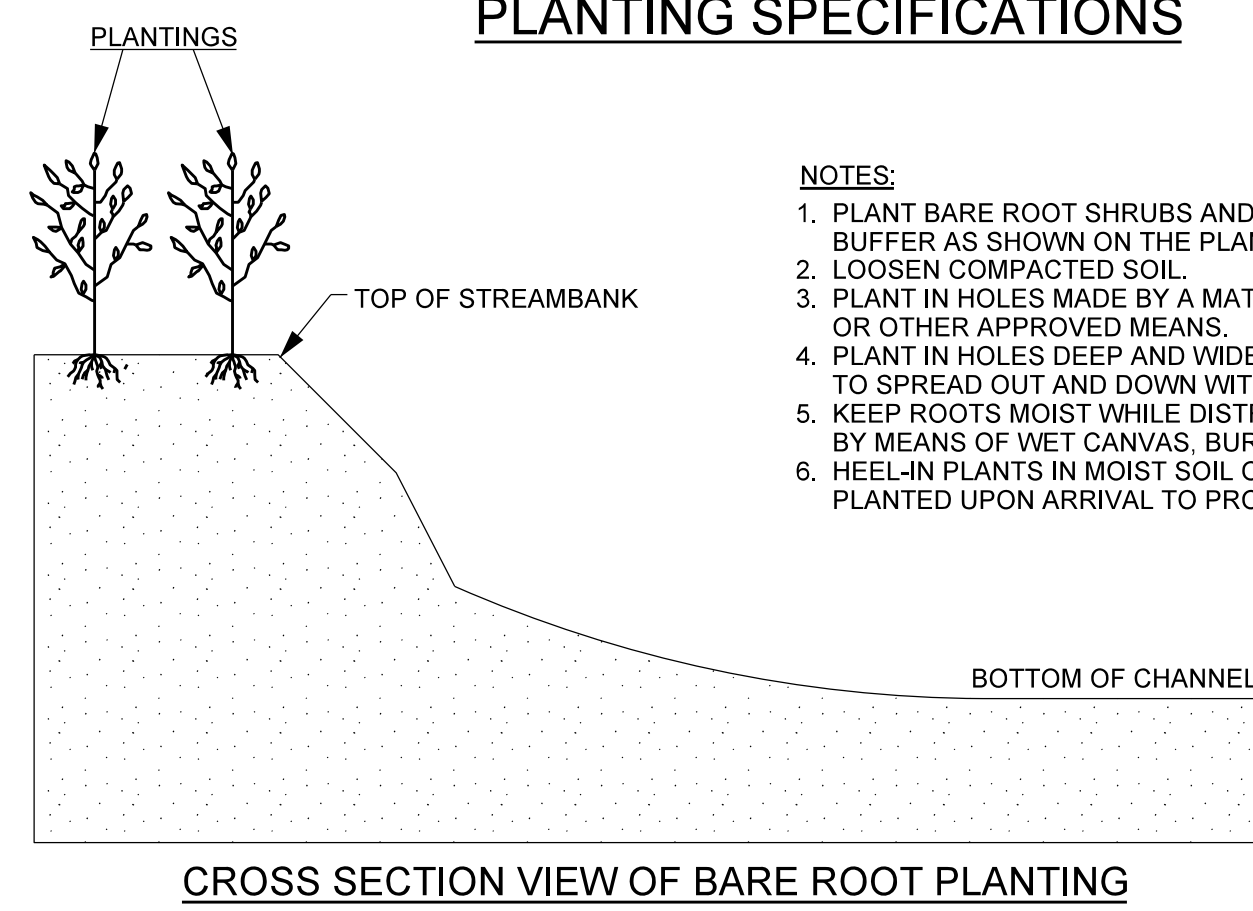
- NOTES:**
1. STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
 2. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
 3. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
 4. STAKES SHOULD BE INSTALLED PERPENDICULAR TO BANK.
 5. STAKES SHOULD BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
 6. STAKES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

TRANSPLANTED VEGETATION

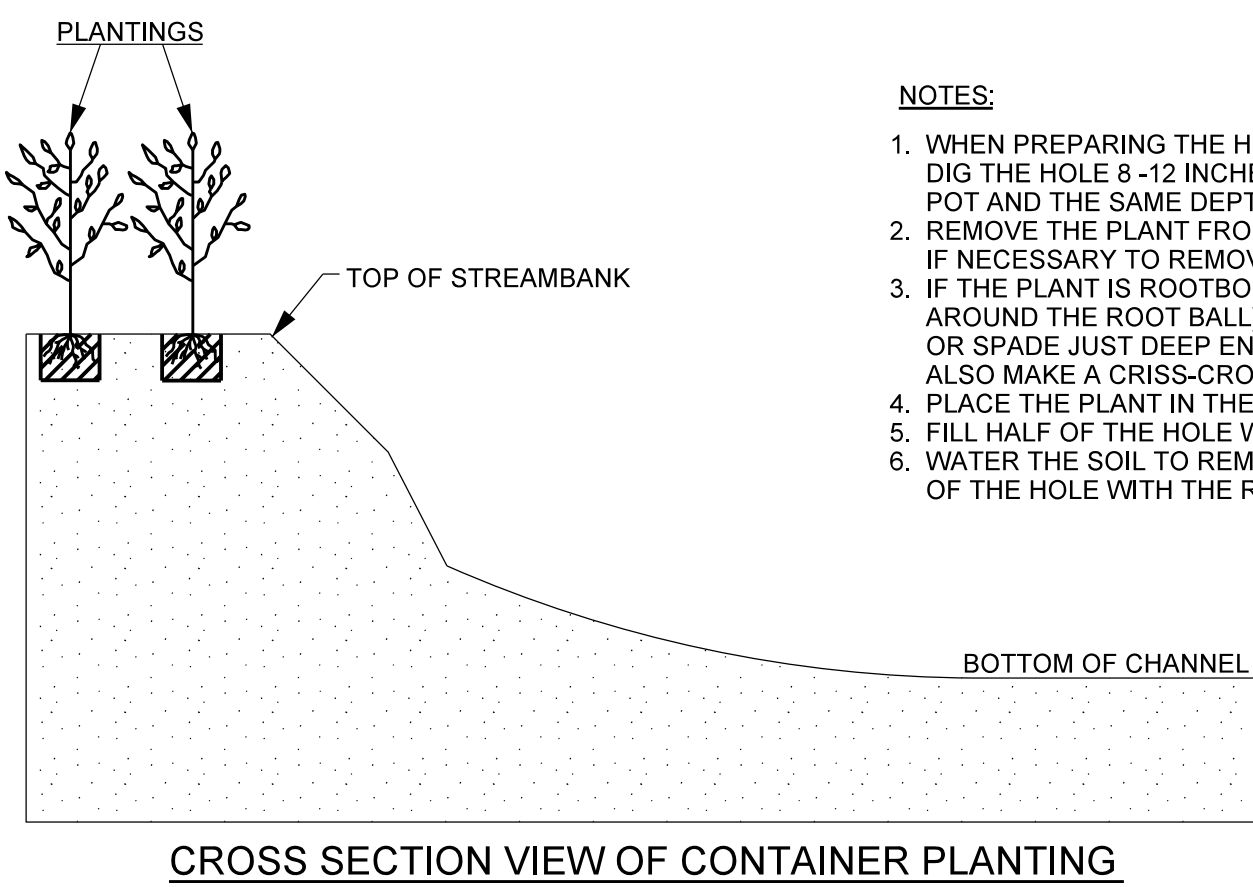


- NOTES:**
1. EXCAVATE A HOLE IN THE BANK TO BE STABILIZED THAT WILL ACCOMMODATE THE SIZE OF TRANSPLANT TO BE PLACED. BEGIN EXCAVATION AT THE TOE OF THE BANK.
 2. EXCAVATE TRANSPLANT USING A FRONT END LOADER. EXCAVATE THE ENTIRE ROOT MASS AND AS MUCH ADDITIONAL SOIL MATERIAL AS POSSIBLE. IF ENTIRE ROOT 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.

PLANTING SPECIFICATIONS

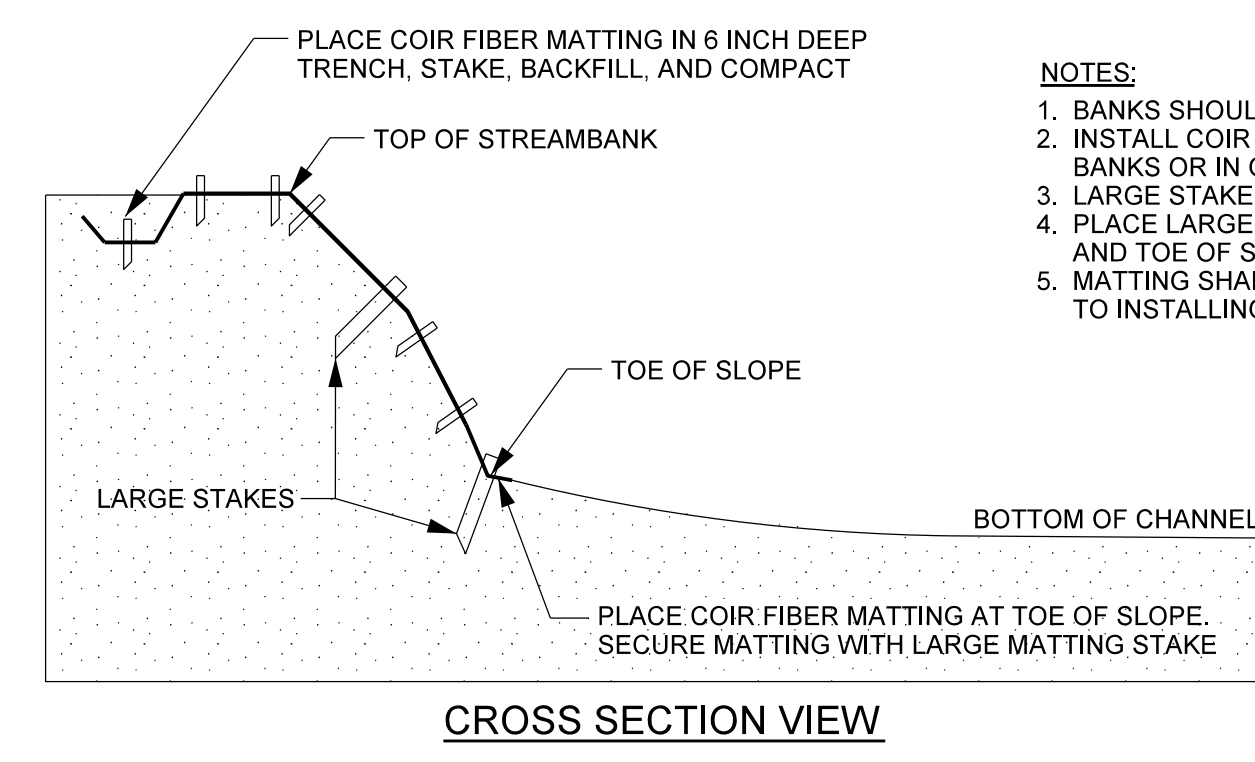


- NOTES:**
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER AS SHOWN ON THE PLANS.
 2. LOOSEN COMPACTED SOIL.
 3. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
 4. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.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

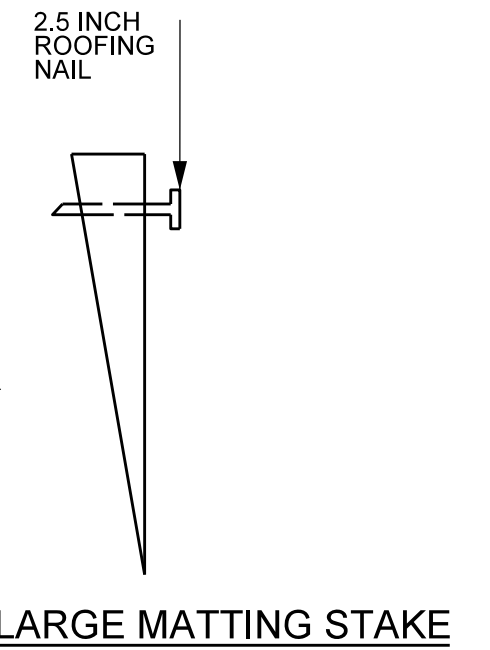


- NOTES:**
1. WHEN PREPARING THE HOLE FOR A POTTED PLANT OR SHRUB DIG THE HOLE 8 - 12 INCHES LARGER THAN THE DIAMETER OF THE POT AND THE SAME DEPTH AS THE POT.
 2. REMOVE THE PLANT FROM THE POT. LAY THE PLANT ON ITS SIDE IF NECESSARY TO REMOVE THE POT.
 3. IF THE PLANT IS ROOTBOUND (ROOTS GROWING IN A SPIRAL AROUND THE ROOT BALL), MAKE VERTICAL CUTS WITH A KNIFE OR SPADE JUST DEEP ENOUGH TO CUT THE NET OF ROOTS. ALSO MAKE A CRISS-CROSS CUT ACROSS THE BOTTOM OF THE BALL.
 4. PLACE THE PLANT IN THE HOLE.
 5. FILL HALF OF THE HOLE WITH SOIL (SAME SOIL REMOVED FOR BACKFILL).
 6. WATER THE SOIL TO REMOVE AIR POCKETS AND FILL THE REST OF THE HOLE WITH THE REMAINING SOIL.

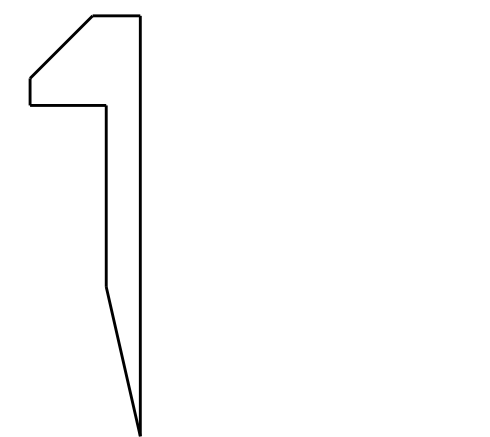
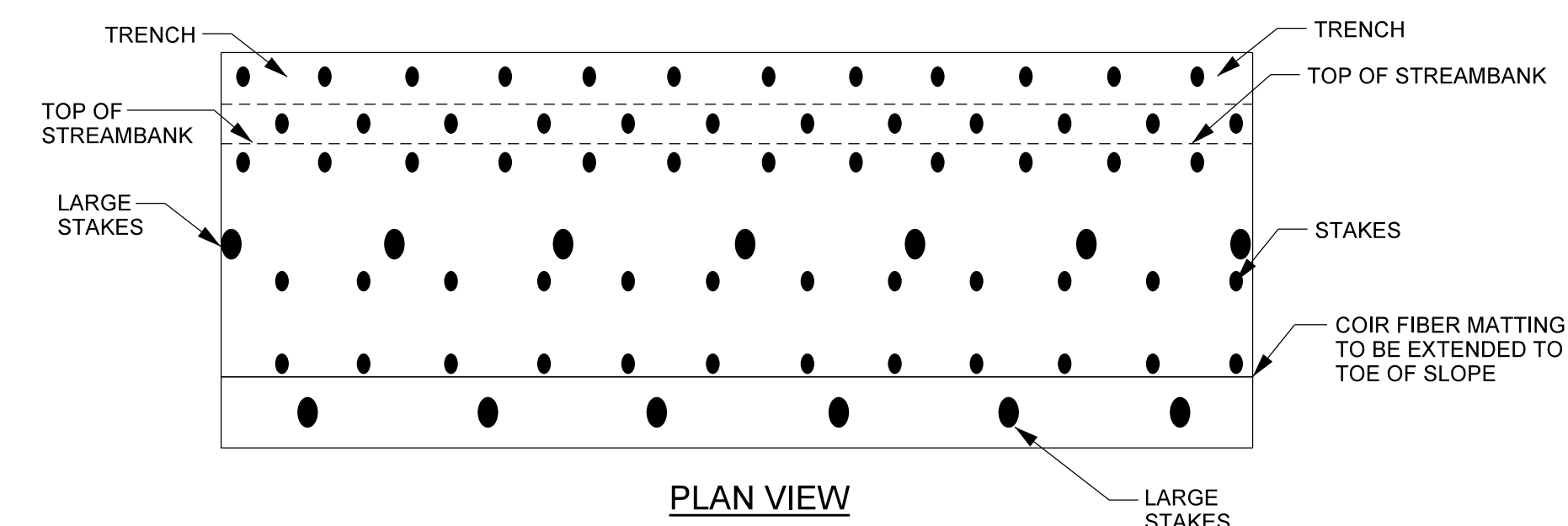
COIR FIBER MATTING



- NOTES:**
1. BANKS SHOULD BE SEEDED PRIOR TO PLACEMENT OF MATTING.
 2. INSTALL COIR FIBER MATTING PER SPECIFICATIONS ALONG STREAM BANKS OR IN OTHERS LOCATIONS SPECIFIED BY ENGINEER.
 3. LARGE STAKES SHOULD NOT BE SPACED FURTHER THAN 36" APART.
 4. PLACE LARGE STAKES ALONG ALL SEAMS, IN THE CENTER OF BANK, AND TOE OF SLOPE.
 5. MATTING SHALL BE PLACED ON BANKS, STAKED, AND TRENCHED PRIOR TO INSTALLING CONSTRUCTED RIFFLE MATERIAL.



LEG LENGTH	17.00 IN (43.18 CM) (TAPERED TO POINT)
WIDTH	1.5 IN (3.81 CM)
THICKNESS	1.5 IN (3.81 CM)



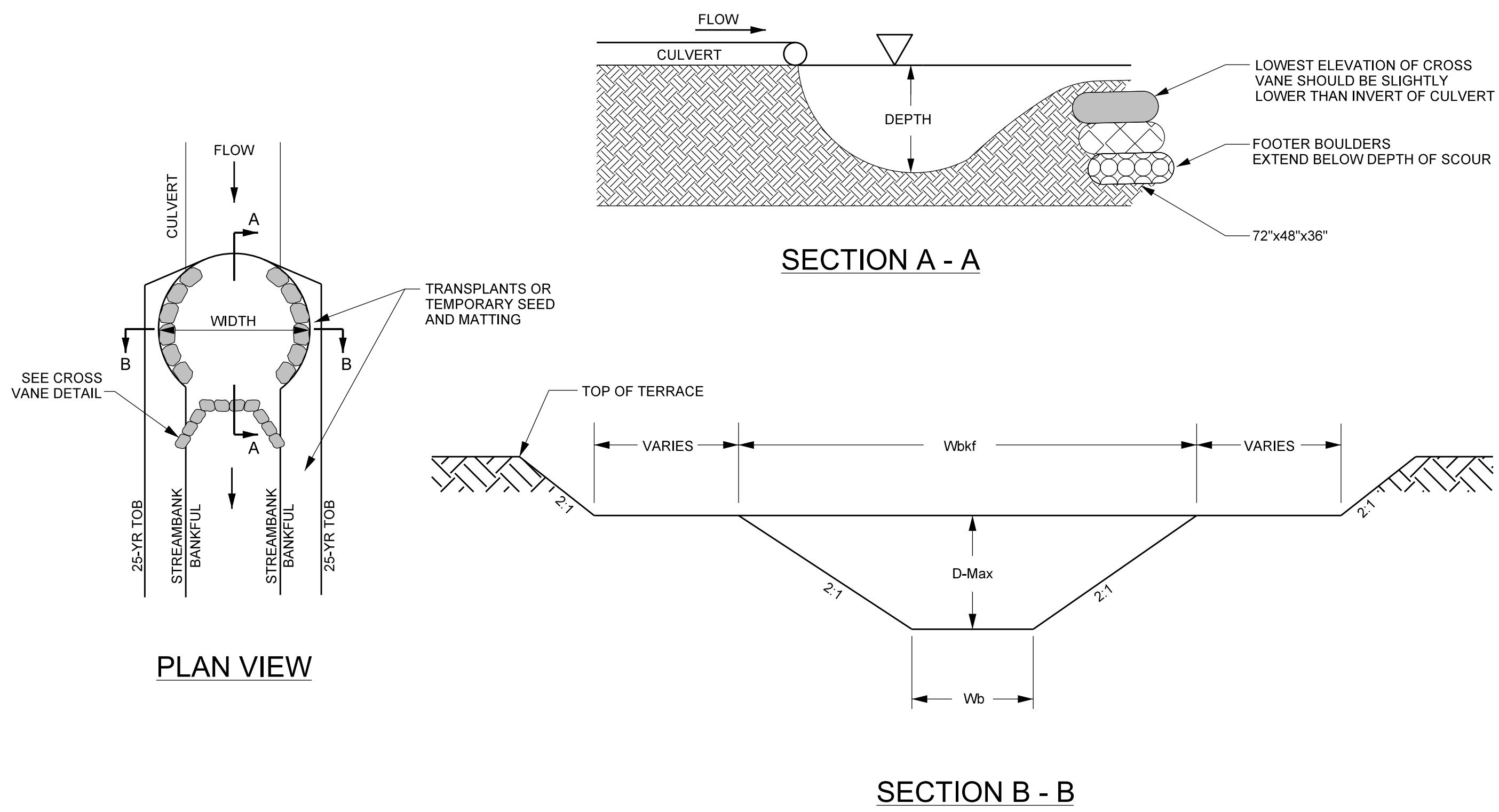
LEG LENGTH	11.00 IN (27.94 CM)
HEAD WIDTH	1.25 IN (3.18 CM)
HEAD THICKNESS	0.40 IN (1.02 CM)
LEG WIDTH	0.60 IN (1.52 CM) (TAPERED TO POINT)
LEG THICKNESS	0.40 IN (1.02 CM)
TOTAL LENGTH	12.00 IN (30.48 CM)

PROJECT REFERENCE NO. 166274	SHEET NO. 2C
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKeithan</i> 24784024181473	
APPROVED BY:	
4/13/2022	
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. 100047	

R:\166274\166274_Bior-Creek\Design\As-Built\PLANS\166274_AB-PSH-02C.dgn
 4/13/2022 10:16:54 AM

2/26/2023

PLUNGE POOL



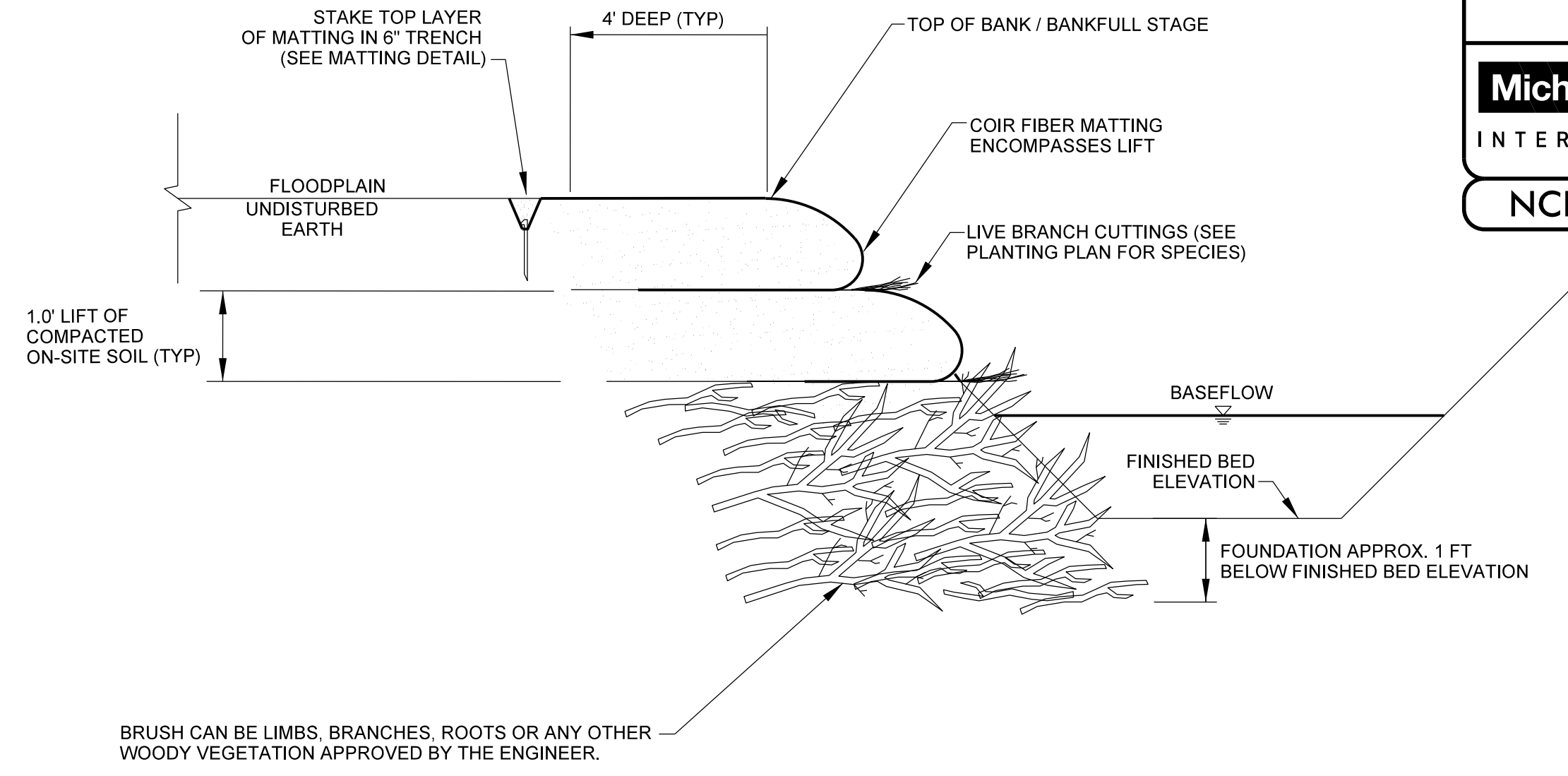
PLAN VIEW

SECTION A - A

SECTION B - B

GEOLIFT WITH BRUSH TOE

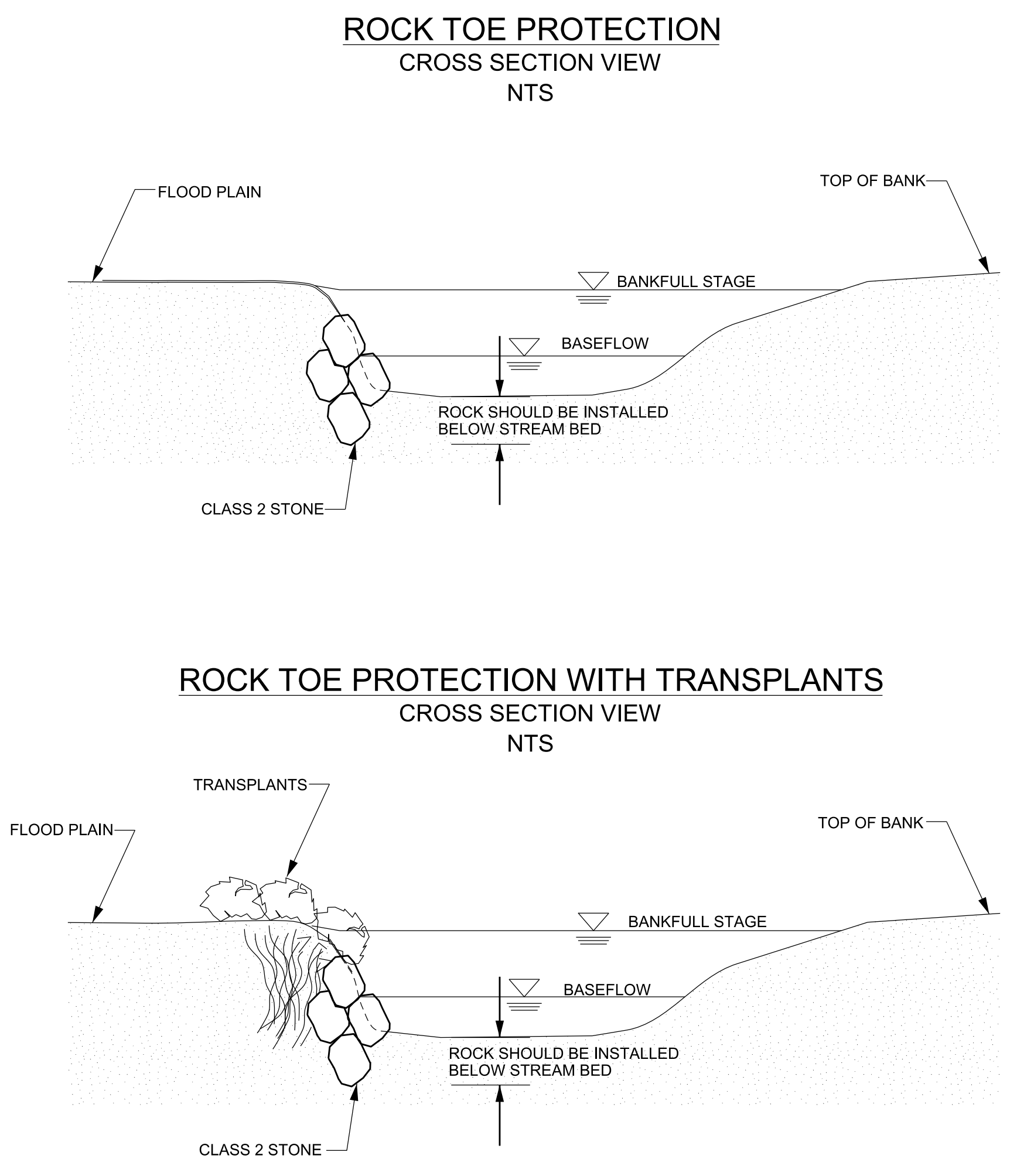
- NOTES:
1. LIVE BRANCH CUTTINGS SHALL BE THE SAME SPECIES AS THE LIVE STAKES AND SHALL BE INSTALLED DURING VEGETATION DORMANCY. IF CONSTRUCTION OCCURS OUTSIDE OF DORMANT SEASON, CONTRACTOR SHALL CONSULT WITH DESIGNER.
 2. LIVE BRANCH CUTTINGS SHALL BE INSTALLED AT A DENSITY OF 20-30 CUTTINGS PER LINEAR 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. WHEN GEOLIFTS ARE BUILT ABOVE ROOTWAD CLUSTER, USE LARGE STONE BACKFILL BEHIND ROOT MASS TO BUILT FOUNDATION.
 5. CLASS 1 STONE MAY BE USED AT THE DIRECTION OF THE ENGINEER TO BUILD THE FOUNDATION IN LIEU OF BRUSH MATERIAL.



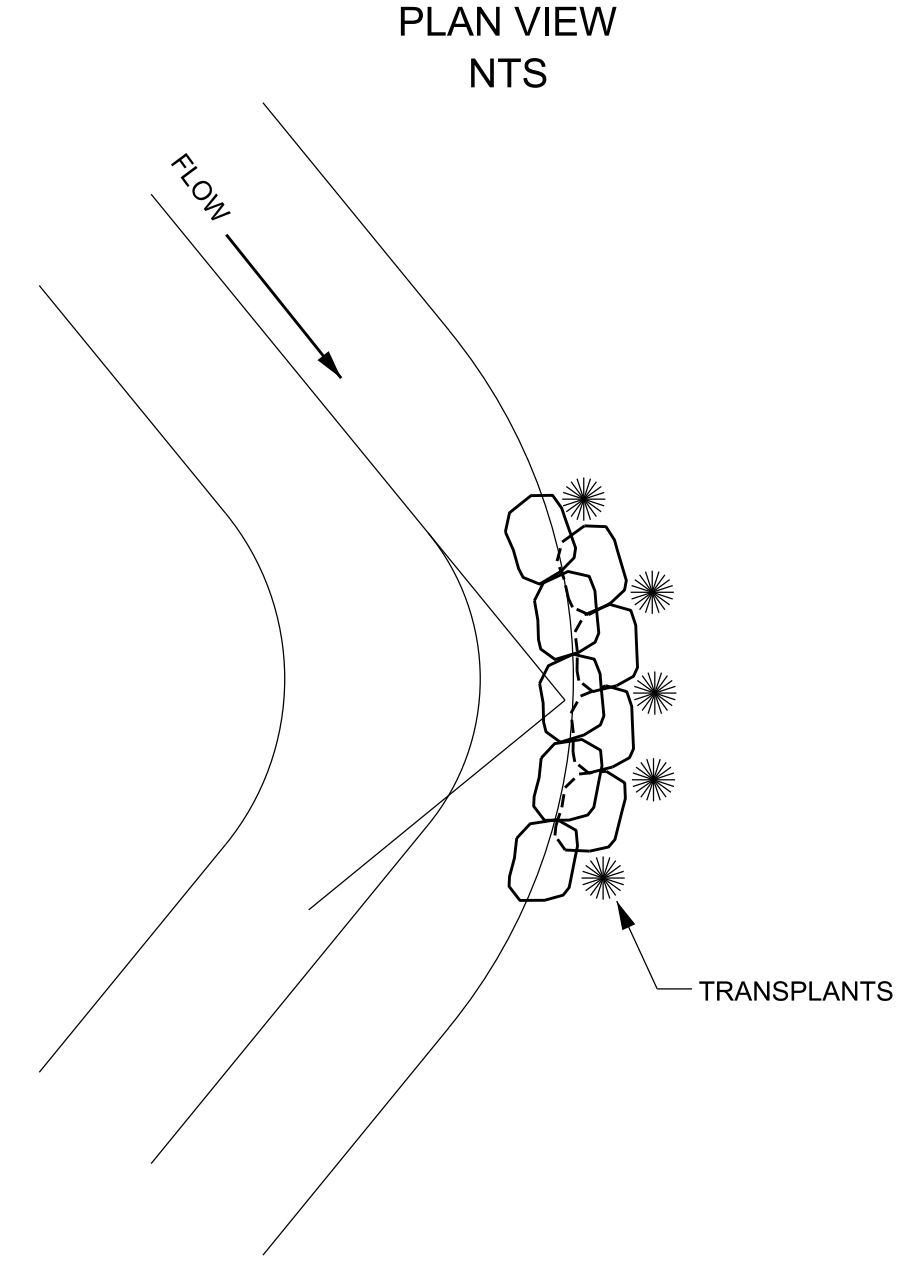
BRUSH CAN BE LIMBS, BRANCHES, ROOTS OR ANY OTHER WOODY VEGETATION APPROVED BY THE ENGINEER.

PROJECT REFERENCE NO. 166274	SHEET NO. 2D
PROJECT ENGINEER	
DocuSigned by: Kathleen M. McKeithan 31256101484423	
APPROVED BY:	
4/13/2022	
DATE:	
Michael Baker International Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5486 Fax: 919.463.5490 License #: F-1084	
NCDMS ID NO. 100047	

ROCK TOE PROTECTION

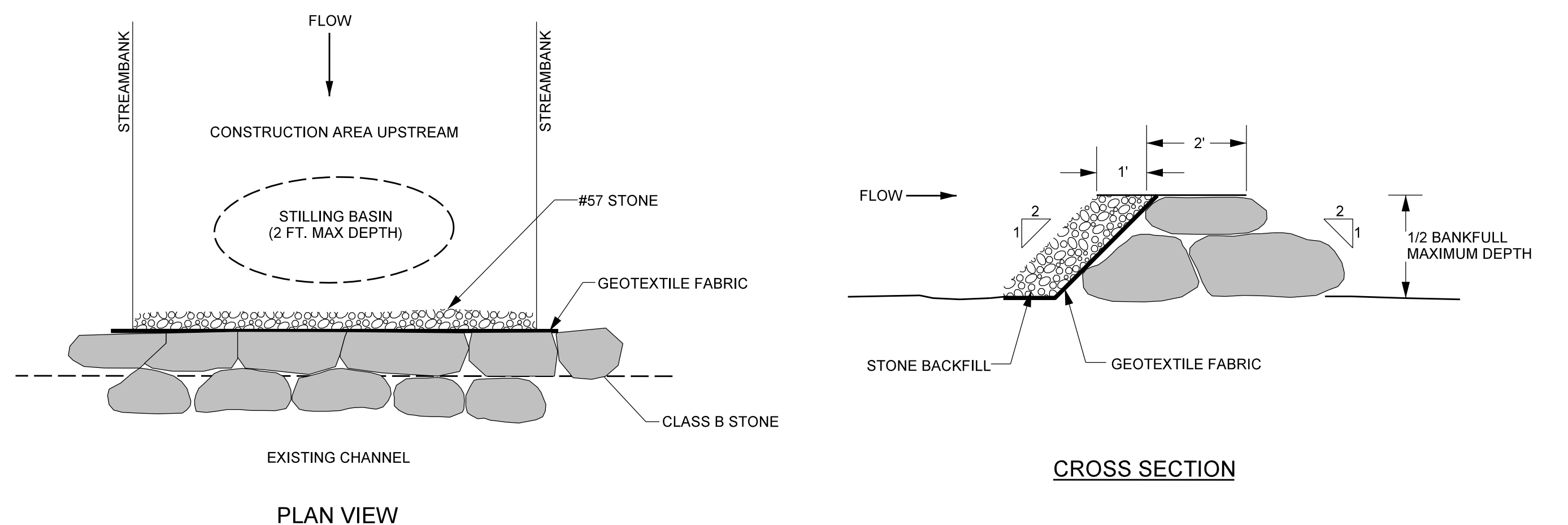


ROCK TOE PROTECTION



- NOTES:
- TRENCHING METHOD:
IF THE CLASS 2 CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE CLASS 2. ONE-THIRD OF THE CLASS 2 SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.
- NOTES:
DRIVEN METHOD:
CLASS 2 SHOULD BE LAIN IN THE STREAMBED AND THEN DRIVEN INTO THE BANK WITH A HORIZONTAL AND DOWNWARD FORCE.

ROCK DAM

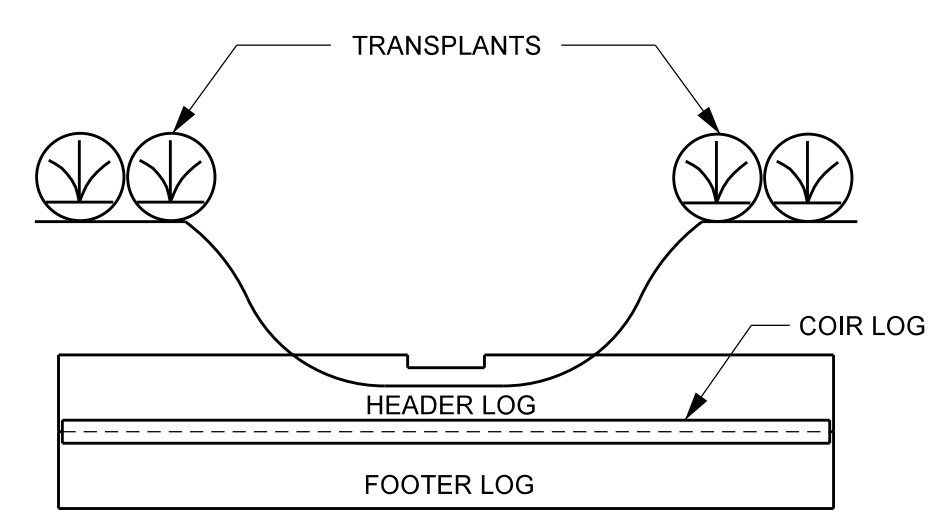
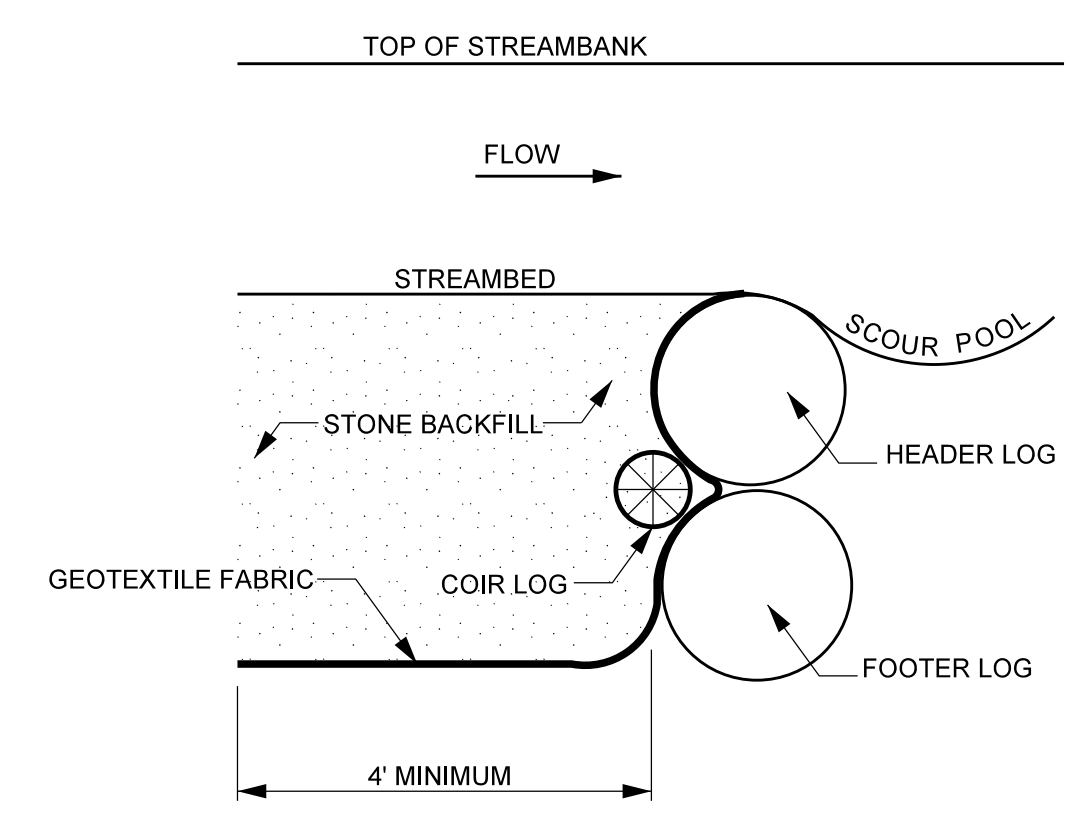
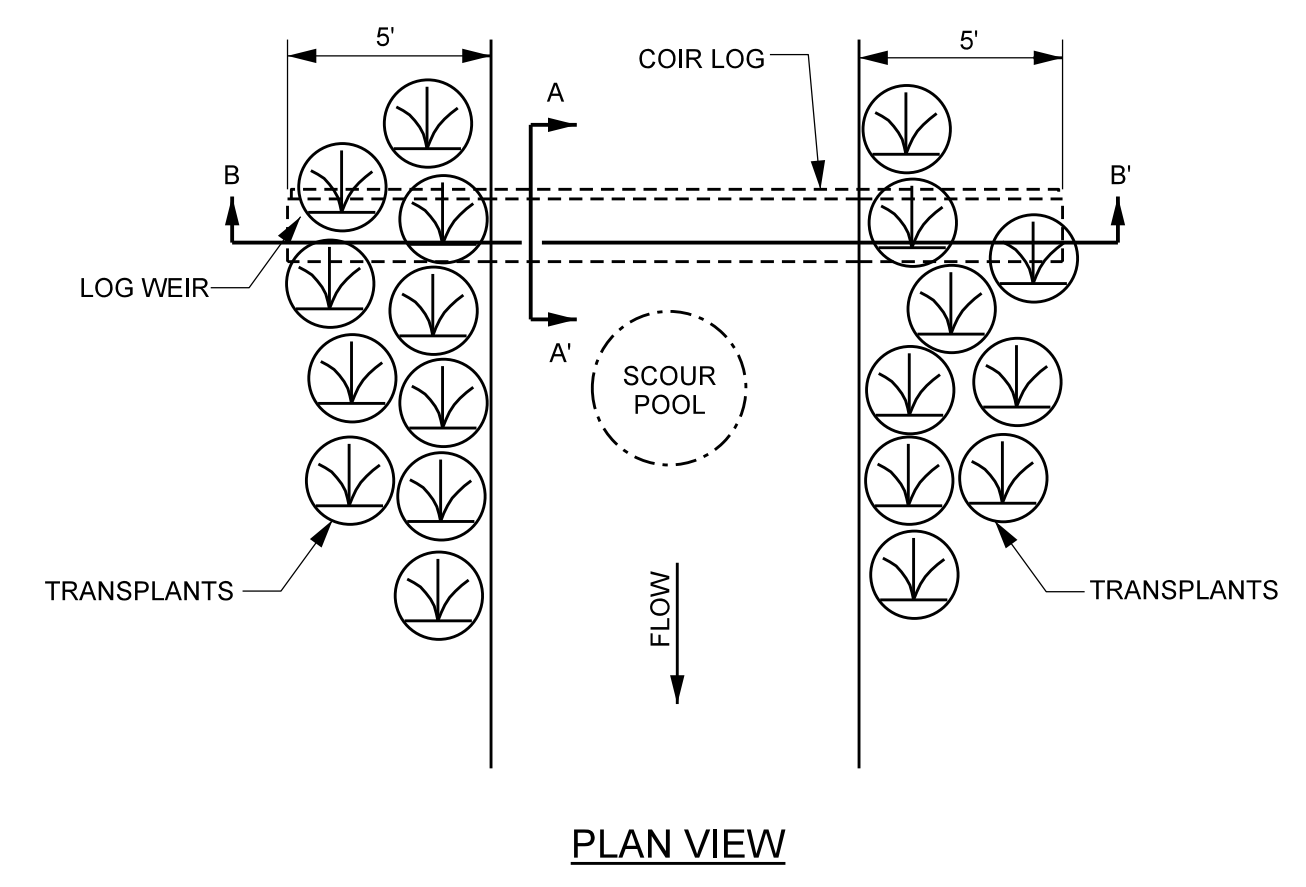


- NOTES:
CLEAN OUT STILLING BASIN OF TRAPPED SEDIMENT PRIOR TO REMOVAL.

4/13/2022 16:27:41 Blair-Creek\Design\As-Built\PLANS\166274_AB-PSH-02D.dgn

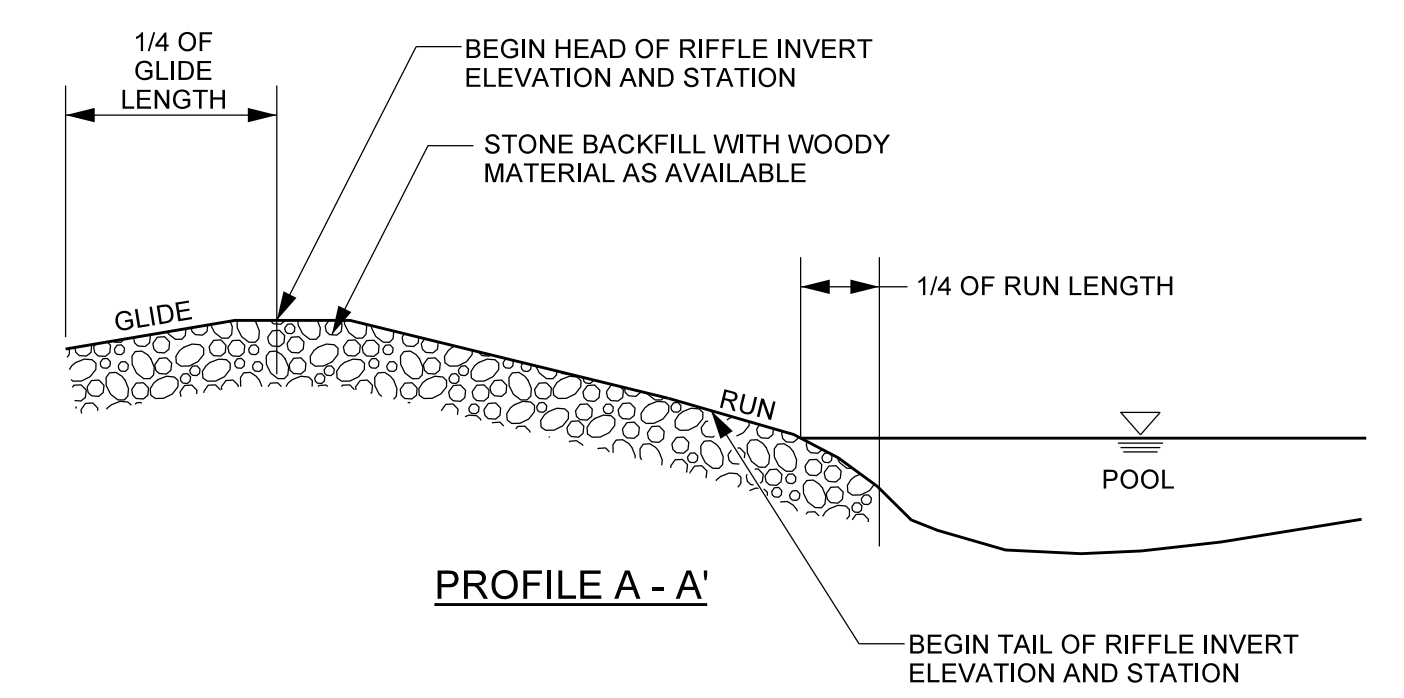
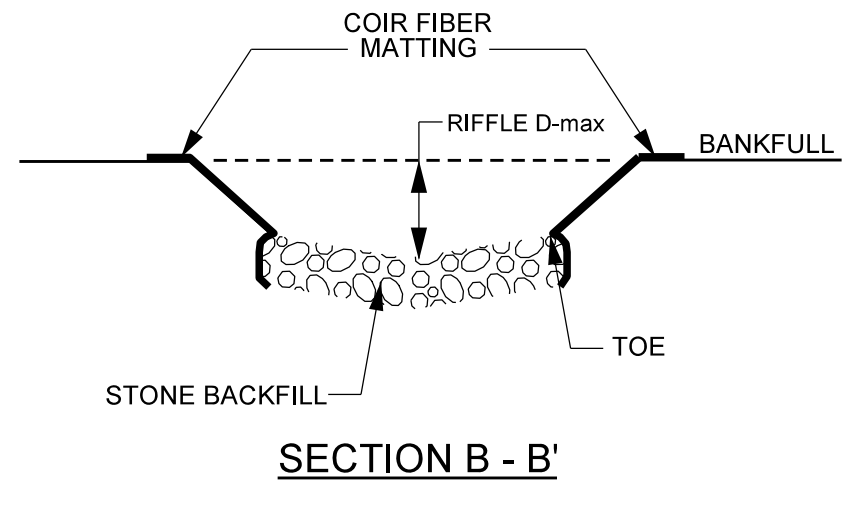
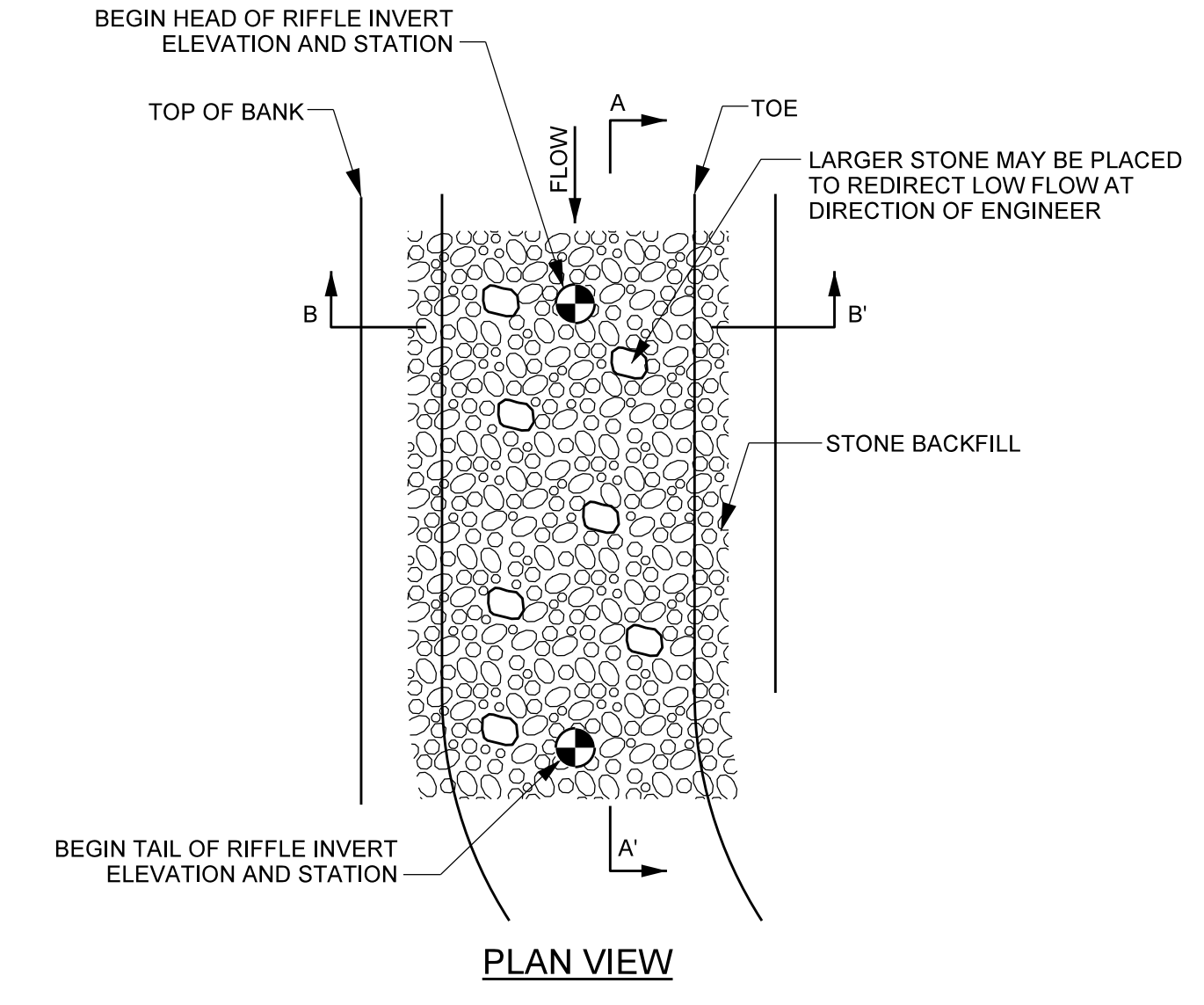
2/26/2022

LOG STEP



- NOTES:**
- LOGS SHOULD BE AT LEAST 10 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
 - TOP OF HEADER LOG SHOULD BE SET AT SAME ELEVATION AS THE STREAMBED.
 - DIAMETER OF COIR LOG SHOULD BE APPROXIMATELY 1/2 DIAMETER OF LOGS.
 - USE GEOTEXTILE FABRIC WITH COIR LOGS TO SEAL GAPS BETWEEN LOGS.
 - PLACE TRANSPLANTS ALONG BANKS TO PROTECT AGAINST BANK EROSION.
 - THE HEADER LOG SHOULD BE NOTCHED 2 - 3 INCHES DEEP IN THE CENTER AND FOR 20 - 30% OF THE CHANNEL WIDTH.

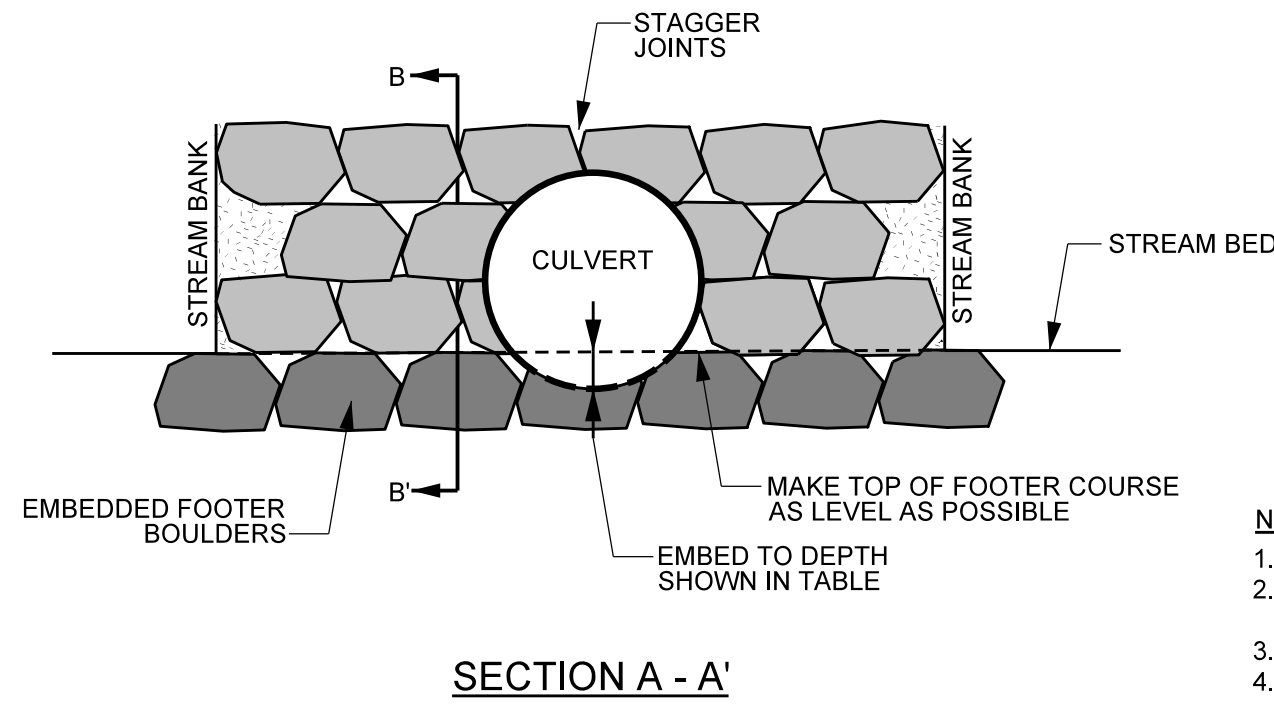
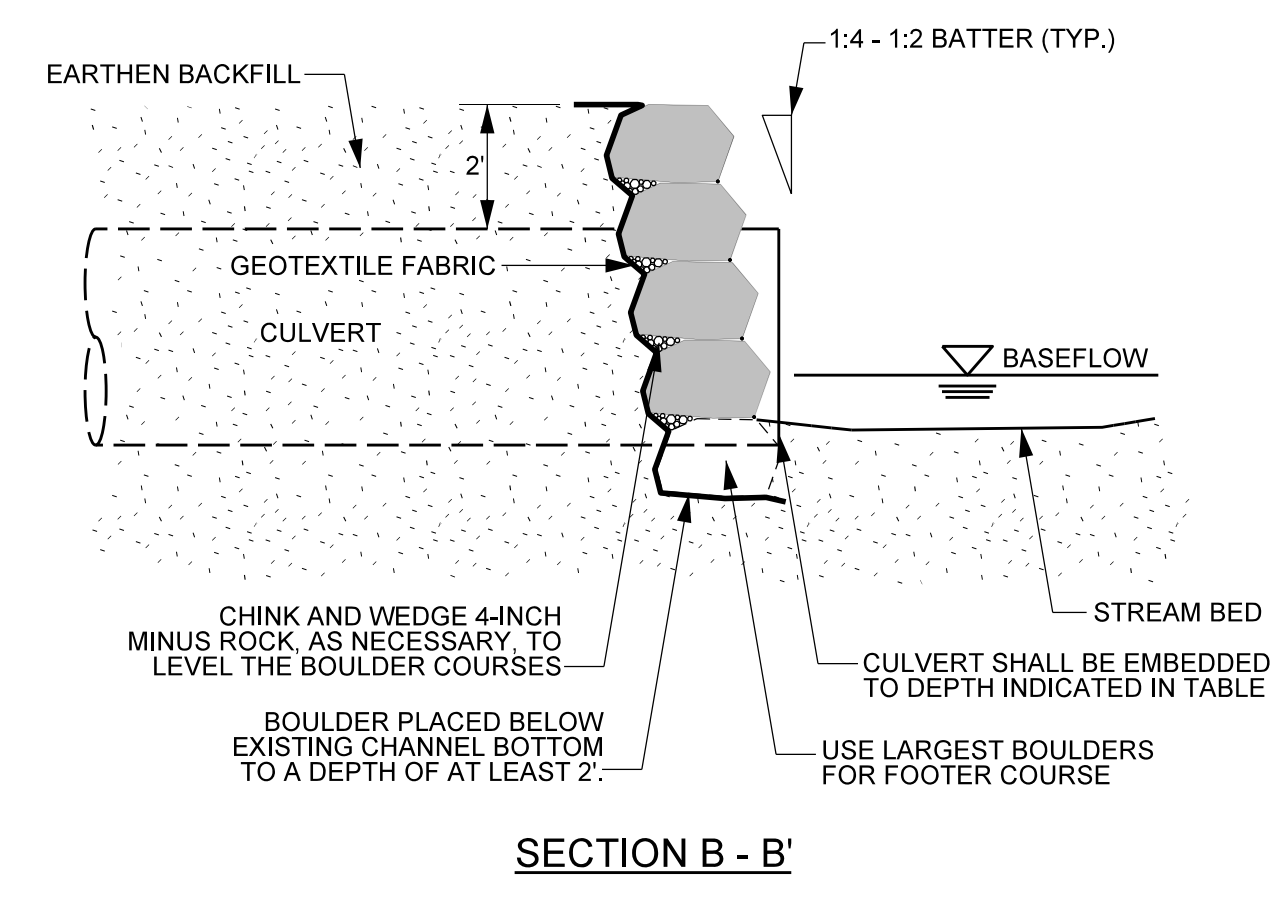
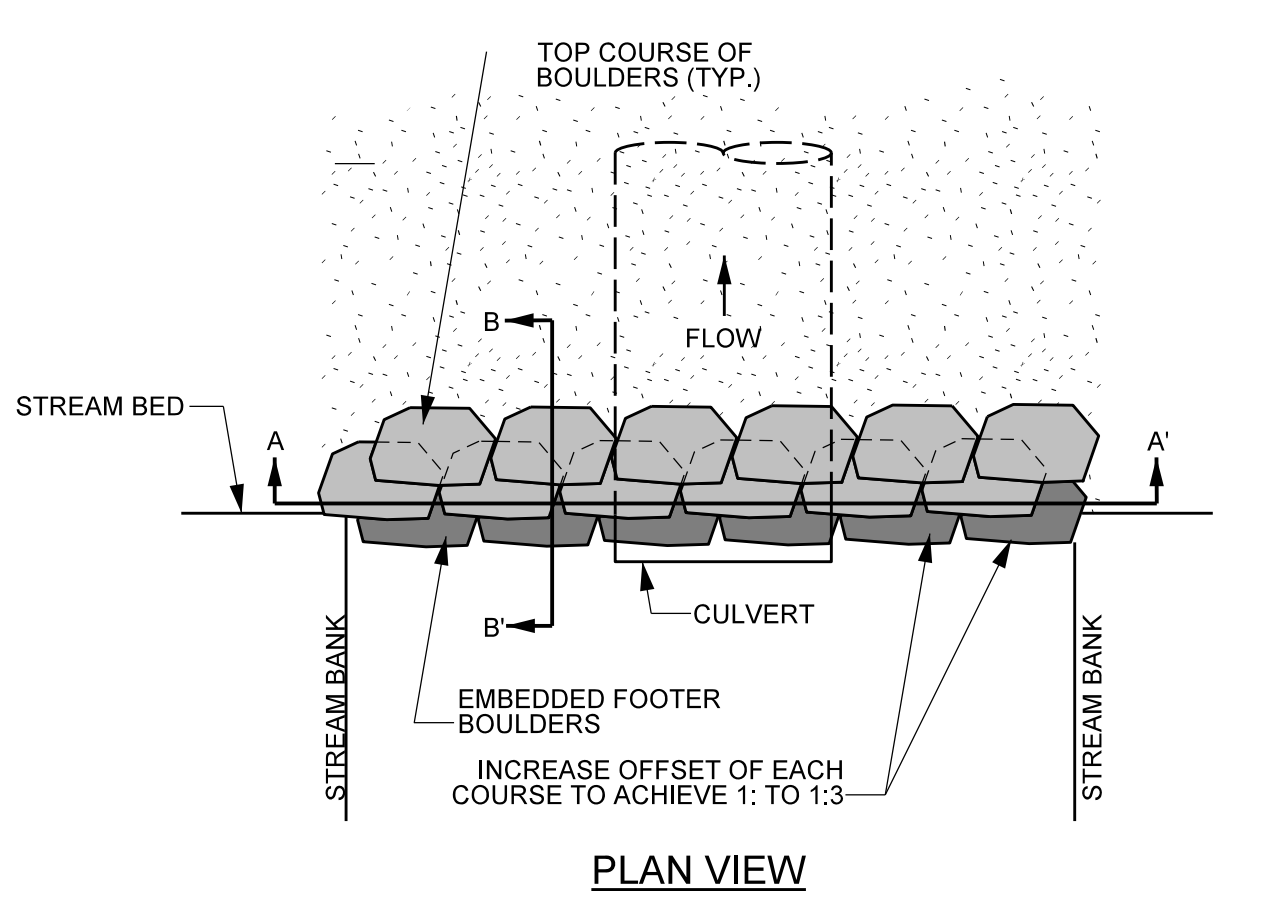
CONSTRUCTED RIFFLE



- NOTES: NATURAL ALLUVIUM RIFFLE**
- STOCK PILE NATURAL ALLUVIUM FROM SECTIONS OF CHANNEL THAT ARE BEING ABANDONED AND FILLED.
 - APPLY NATURAL ALLUVIUM BED MATERIAL IN THOSE RIFFLES WHERE STONE IS NOT INDICATED.
 - ANY WATER LOGGED WOODY MATERIAL COLLECTED SHOULD BE INSTALLED WITH BED MATERIAL.
- NOTES: STONE CONSTRUCTED RIFFLE**
- UNDERCUT CHANNEL BED ELEVATION AS NEEDED TO ALLOW FOR LAYERS OF STONE TO ACHIEVE FINAL GRADE.
 - INSTALL COIR FIBER MATTING ALONG COMPLETED BANKS SUCH THAT THE EROSION CONTROL MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.
 - INSTALL STONE BACKFILL, COMPACTED TO GRADE.
 - 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.
 - CONSTRUCTED RIFFLES SHALL BE 12" THICK.
 - CHANNEL BED SHALL INCLUDE WOODY MATERIAL AS AVAILABLE ON-SITE LAYERED IN WITH STONE BACKFILL.

REACH	STONE BACKFILL MIX
APPLIES TO ALL REACHES	10% CLASS I RIPRAP 20% CLASS B RIPRAP 40% CLASS A RIPRAP 30% ON-SITE ALLUVIUM

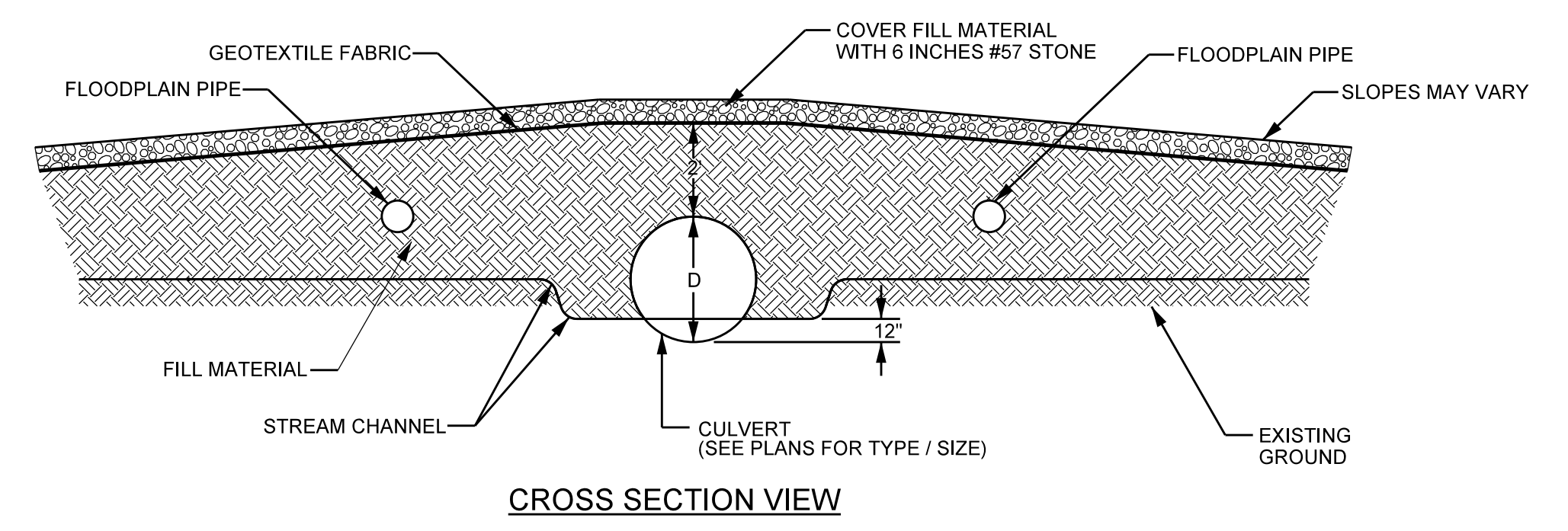
BOULDER HEADWALL / ENDWALL



REACH	BOULDER SIZE	CULVERT SIZE	EMBEDMENT
REACH 1	2'x3'x4'	24 LF x 79" x 117" CMP (*SEE BELOW)	12"

- NOTES:**
- BOULDERS SHALL BE TOUCHING SO THAT VOID SPACE IS MINIMAL.
 - BOULDERS SHOULD EXTEND BELOW SCOUR DEPTH. FOOTER BOULDERS SHALL BE AT LEAST 2' BELOW THE EXISTING BED
 - GEOTEXTILE MATTING SHOULD BE PLACED BETWEEN BOULDERS AND SOIL.
 - BOULDERS SHOULD BE BACKFILLED AND COMPACTED. VOID SPACE BETWEEN FABRIC AND BOULDER OR ROCK FILL MATERIAL, SHOULD BE MINIMIZED.
 - BOULDERS SHOULD NOT BE HIGHER THAN THE TOP OF CROSSING ELEVATION.
 - FILTER FABRIC SHOULD BE PLACED BEHIND BOULDERS, BURIED BELOW BOULDER DEPTH, AND EXTEND INTO THE BANK.

PERMANENT STREAM CROSSING



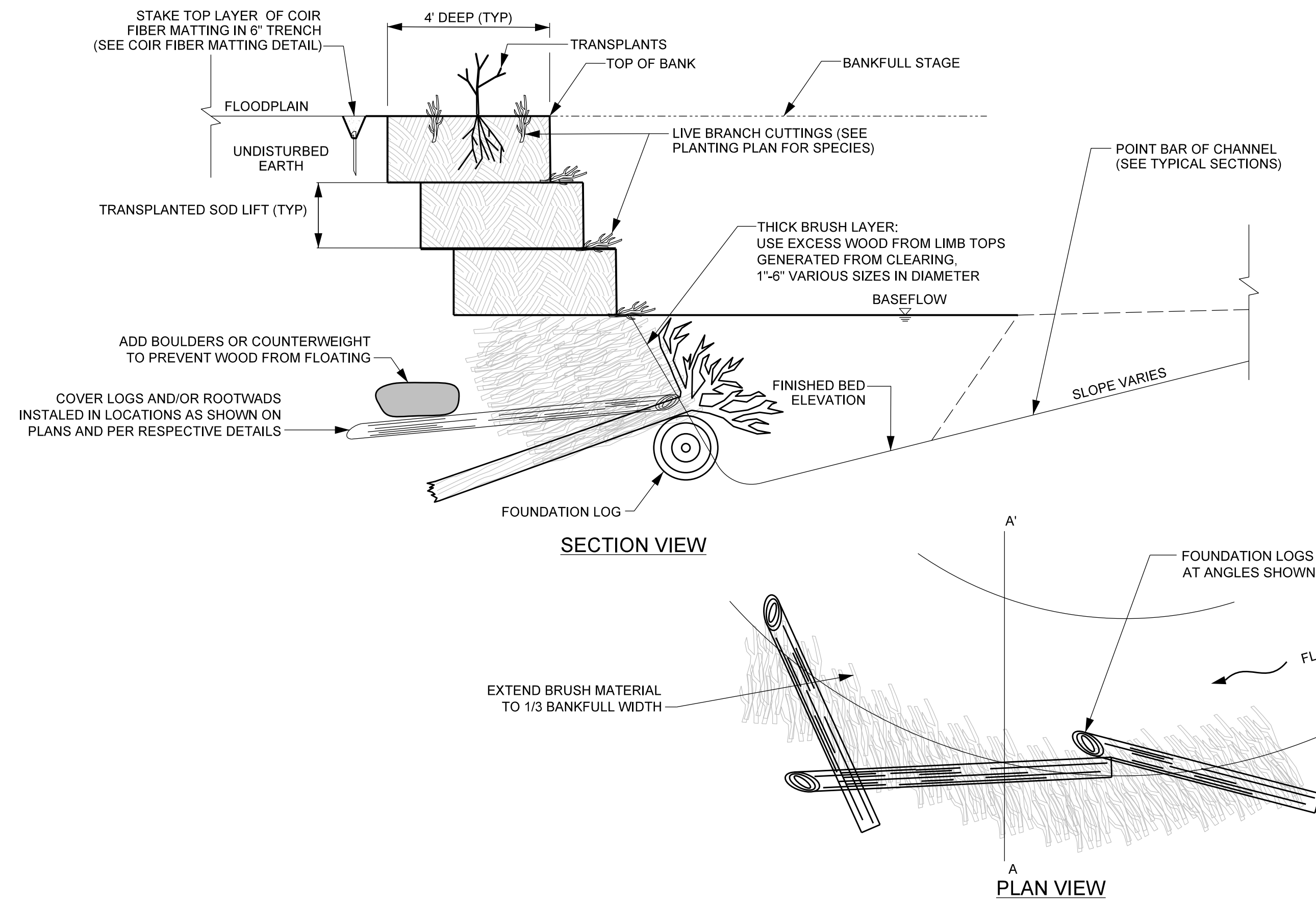
- NOTES:**
- SIZE DIMENSIONS SHOWN ON PLANS.
 - APPLY SUFFICIENT FILL (2' MIN) OVER CULVERT TO PREVENT COLLAPSE.
 - STABILIZE SIDE SLOPES WITH EROSION CONTROL MATTING AND FILL AROUND CULVERTS WITH CLASS II STONE.
 - INSTALL HEADWALLS AND ENDWALLS AS SHOWN ON THE PLANS.

PROJECT REFERENCE NO. 162039	SHEET NO. 2E
PROJECT ENGINEER	
DocuSigned by: Kathleen M. McKeithen APPROVED BY: DATE: 4/13/2022	
Michael Baker International Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5486 Fax: 919.463.5490 License #: F-1084	
NC DMS ID NO. 100020	

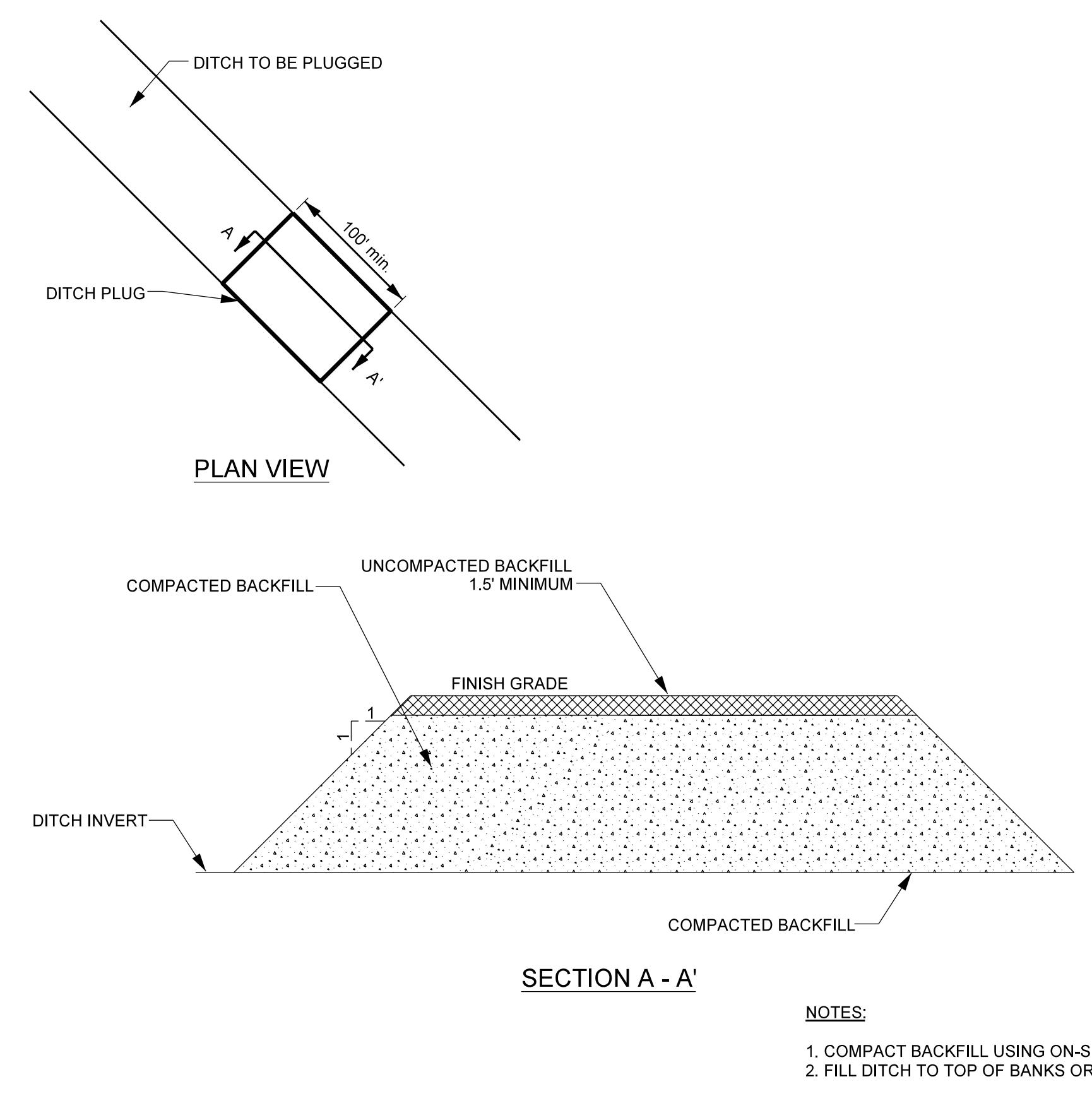
A:\166874_Bioar-Creek_Design\As-Built\PLANS\166274_AB-PSH-02E.dgn
 4/13/2022 10:16:54 AM

2/26/2023

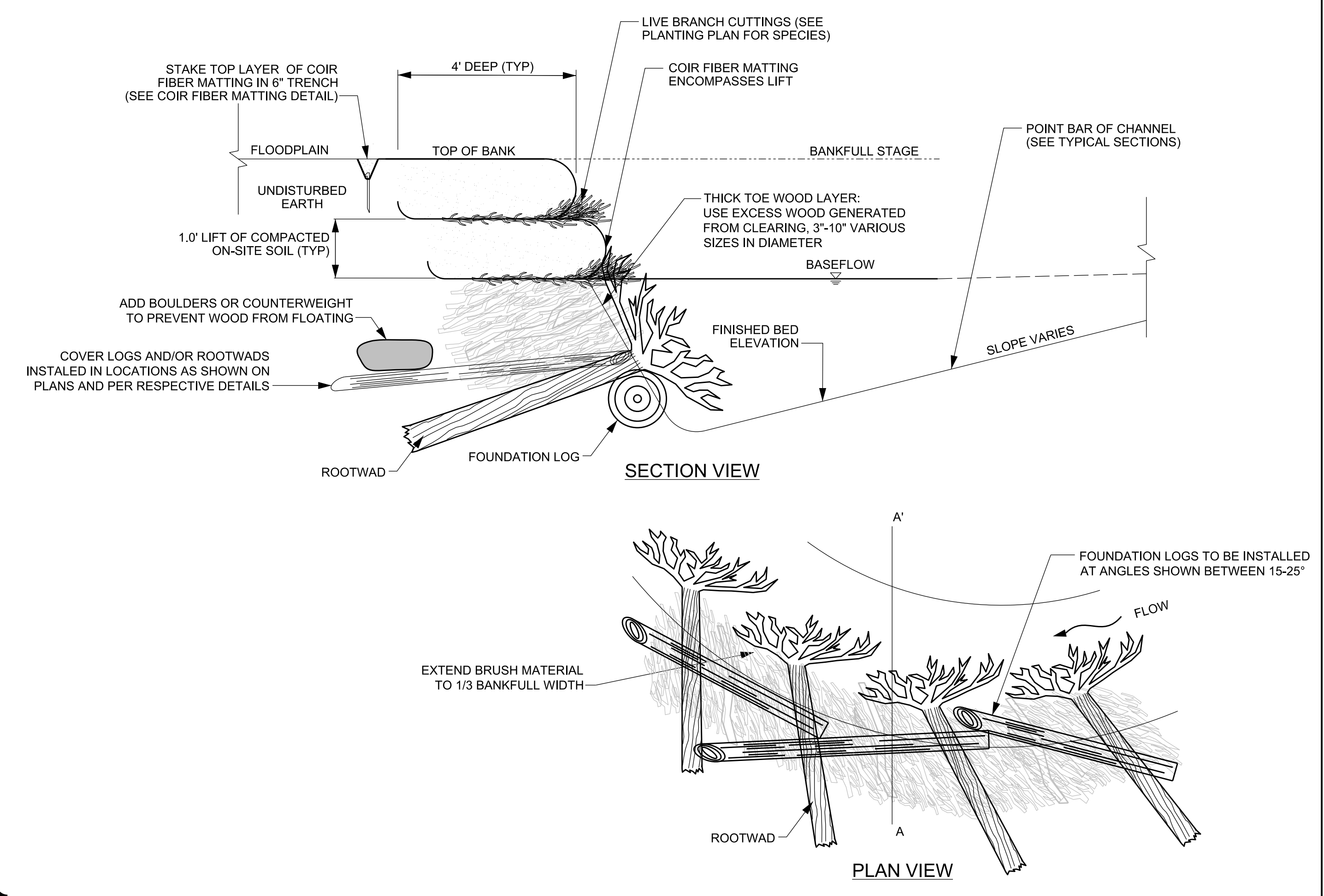
SOD MAT WITH WOOD TOE



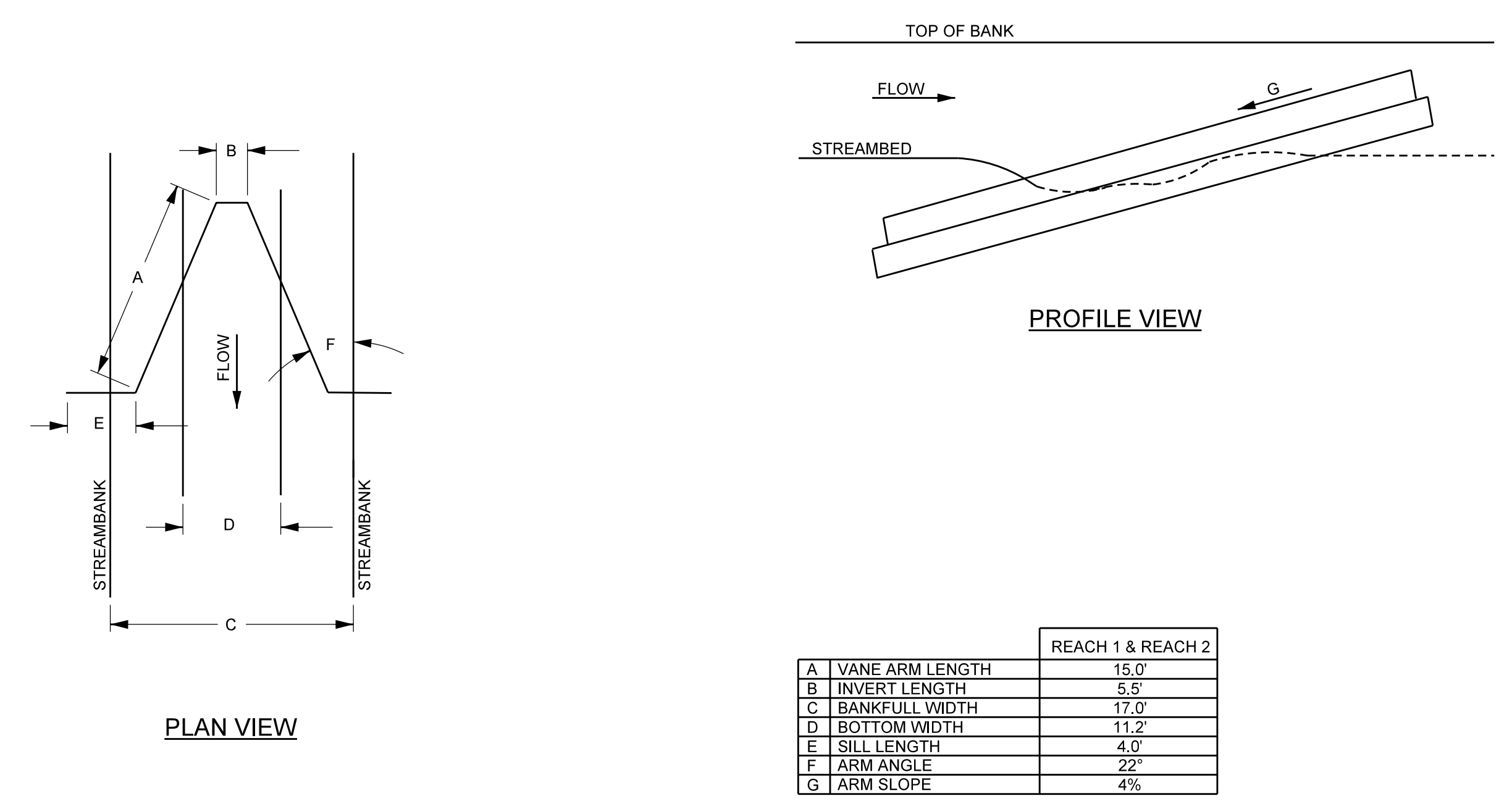
DITCH PLUG



ROOTWAD REVETMENT WITH LIVE BRUSH



LOG CROSS VANE TYPICAL



PROJECT REFERENCE NO. 162039	SHEET NO. 2F
PROJECT ENGINEER	
DocuSigned by: Kathleen M. McKeithen	
APPROVED BY:	
4/13/2022	
DATE:	
Michael Baker International	
NCDMS ID NO. 100020	

4/13/2022
R:\162039\162039-1\Bior-Creek\Design\As-Built\PLANS\166274_AB-PSH-02F.dgn

2/26/2023

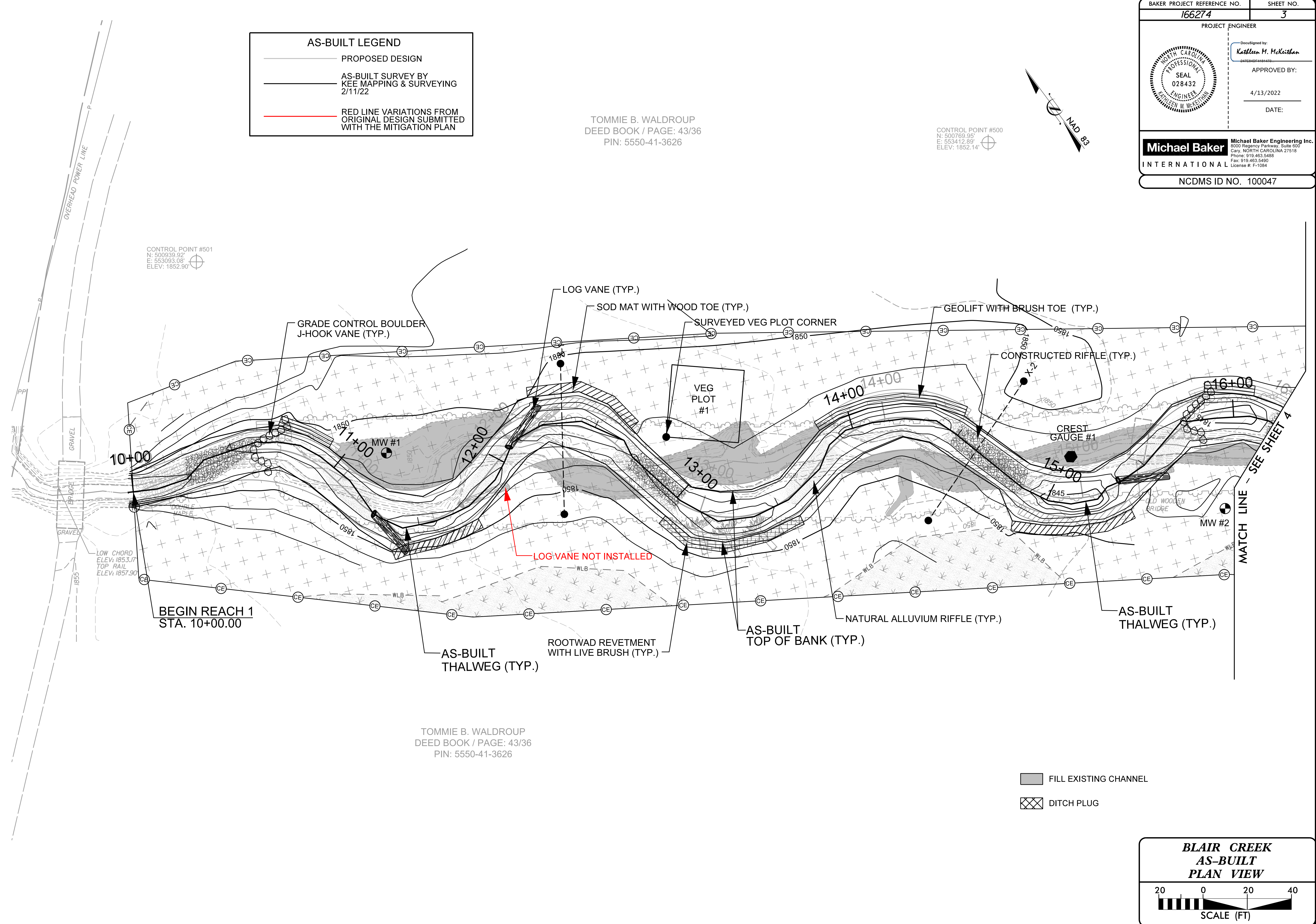
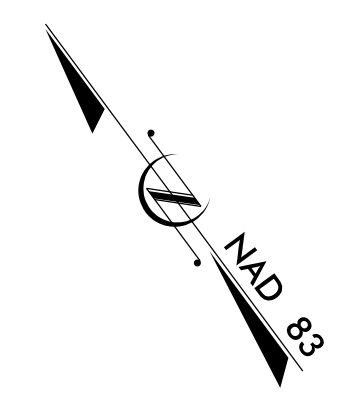
BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 3
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKeithan</i> 028432 APPROVED BY: 4/13/2022 DATE:	
	
Michael Baker International Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100047	

AS-BUILT LEGEND

- PROPOSED DESIGN
- AS-BUILT SURVEY BY KEE MAPPING & SURVEYING 2/11/22
- RED LINE VARIATIONS FROM ORIGINAL DESIGN SUBMITTED WITH THE MITIGATION PLAN

TOMMIE B. WALDROUP
 DEED BOOK / PAGE: 43/36
 PIN: 5550-41-3626

CONTROL POINT #500
 N: 500769.95'
 E: 553412.89'
 ELEV: 1852.14'



TOMMIE B. WALDROUP
 DEED BOOK / PAGE: 43/36
 PIN: 5550-41-3626

**BLAIR CREEK
 AS-BUILT
 PLAN VIEW**

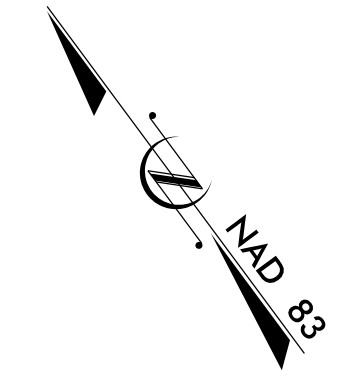


4/13/2022
 R:\166274\Blair-Creek\Design\As-Built\PLANS\166274_AB_PSH-03.dgn
 2/26/2023

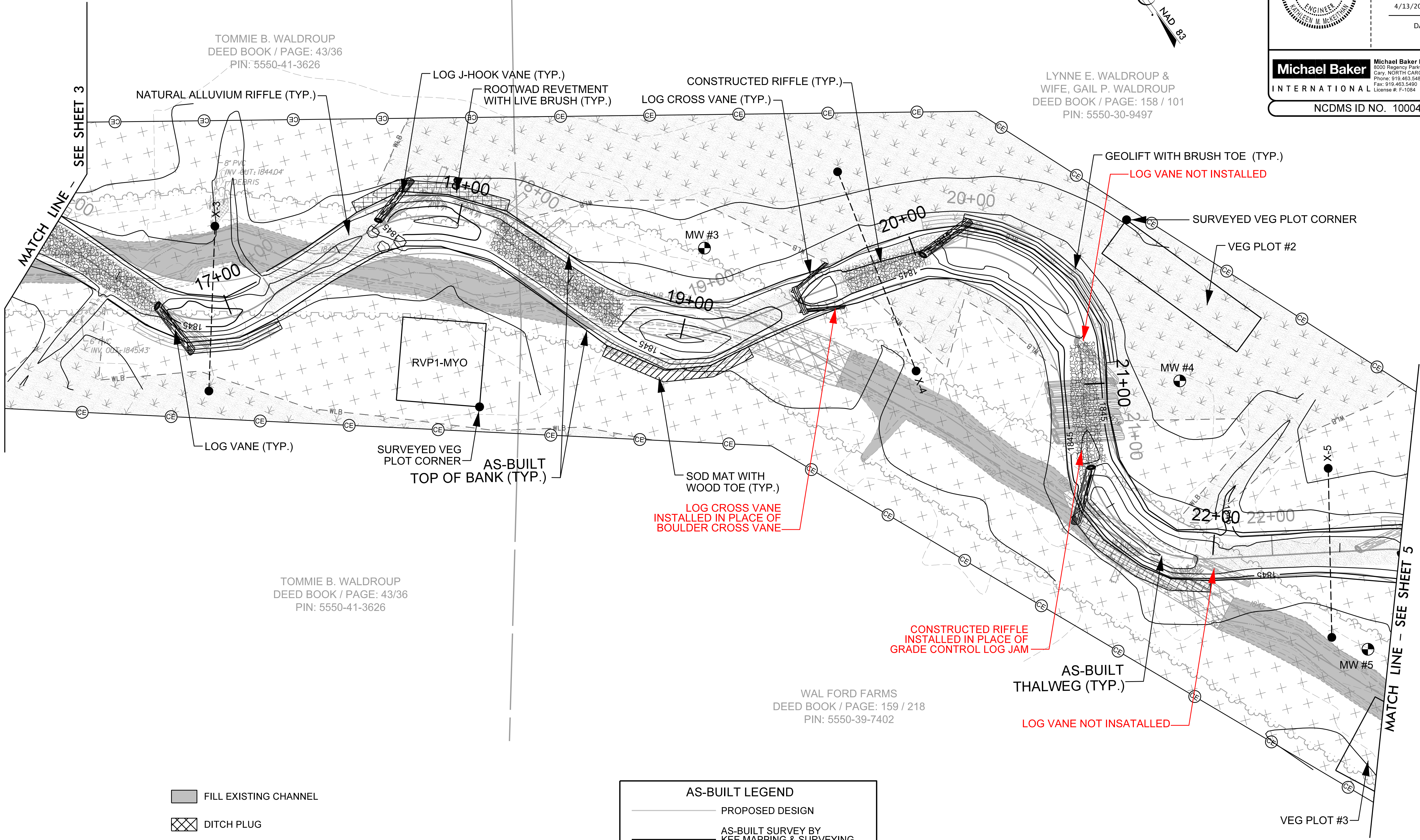
2/26/2023

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 4
PROJECT ENGINEER Kathleen M. McKeithen APPROVED BY: 4/13/2022 DATE:	
	
Michael Baker International Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100047	

CONTROL POINT #307
 N: 500320.88'
 E: 553376.86'
 ELEV: 1861.59'





LYNNE E. WALDROUP &
 WIFE, GAIL P. WALDROUP
 DEED BOOK / PAGE: 158 / 101
 PIN: 5550-30-9497






TOMMIE B. WALDROUP
 DEED BOOK / PAGE: 43/36
 PIN: 5550-41-3626

TOMMIE B. WALDROUP
 DEED BOOK / PAGE: 43/36
 PIN: 5550-41-3626


WAL FORD FARMS
 DEED BOOK / PAGE: 159 / 218
 PIN: 5550-39-7402

-  FILL EXISTING CHANNEL
-  DITCH PLUG

- AS-BUILT LEGEND**
-  PROPOSED DESIGN
 -  AS-BUILT SURVEY BY
KEE MAPPING & SURVEYING
2/11/22
 -  RED LINE VARIATIONS FROM
ORIGINAL DESIGN SUBMITTED
WITH THE MITIGATION PLAN


CONTROL POINT #307
 N: 500320.88'
 E: 553376.86'
 ELEV: 1861.59'

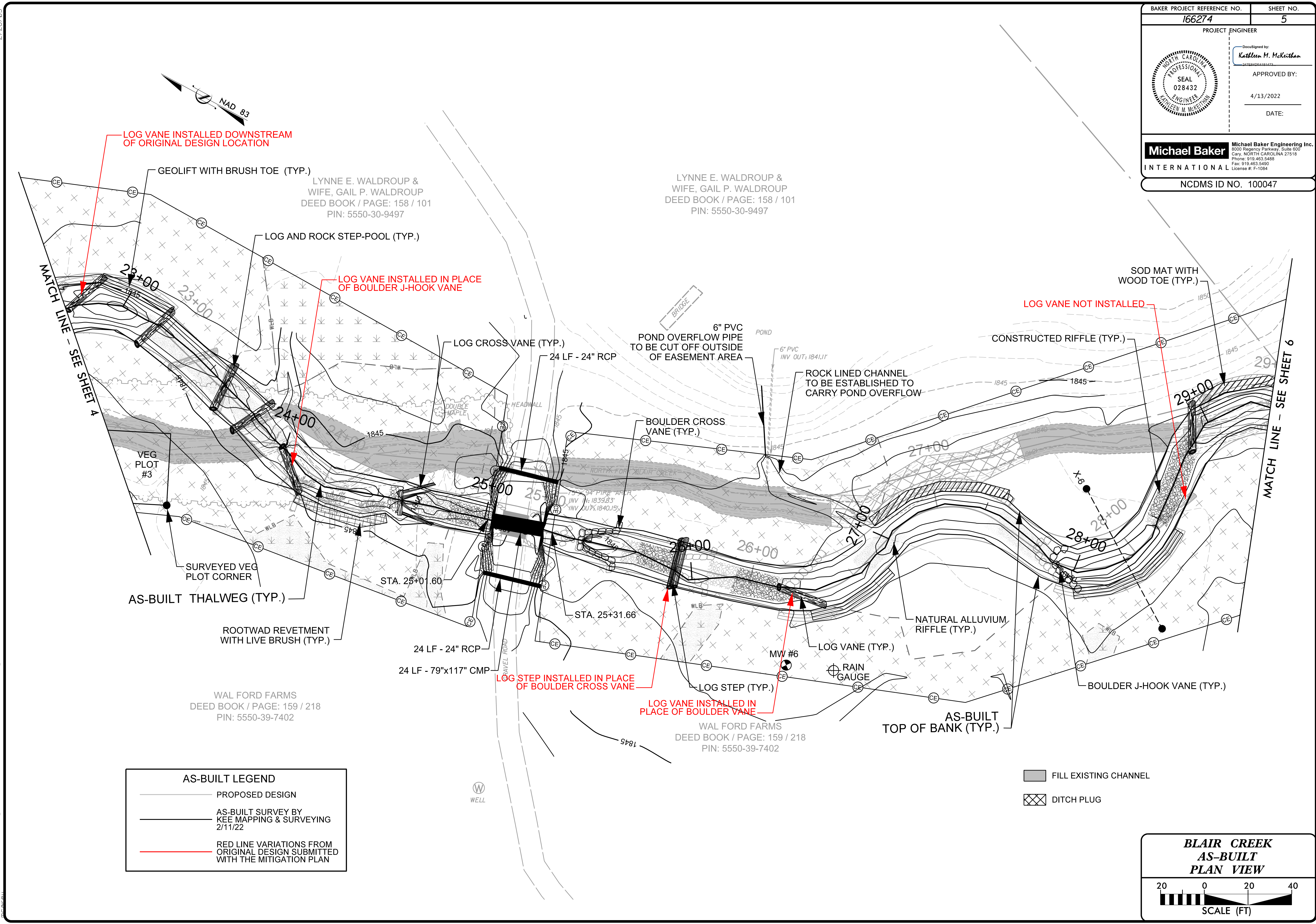
**BLAIR CREEK
 AS-BUILT
 PLAN VIEW**






SCALE (FT)



4/17/2022
 R:\166274\Blair-Creek\Design\As-Built\PLANS\166274_AB_PSH-04.dgn

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 5
PROJECT ENGINEER	
DocuSigned by:  Kathleen M. McKeithen 2476004848423	
APPROVED BY:	
4/13/2022	
DATE:	
	
Michael Baker International Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100047	




AS-BUILT LEGEND

-  PROPOSED DESIGN
-  AS-BUILT SURVEY BY KEE MAPPING & SURVEYING 2/11/22
-  RED LINE VARIATIONS FROM ORIGINAL DESIGN SUBMITTED WITH THE MITIGATION PLAN

-  FILL EXISTING CHANNEL
-  DITCH PLUG

**BLAIR CREEK
AS-BUILT
PLAN VIEW**



SCALE (FT)

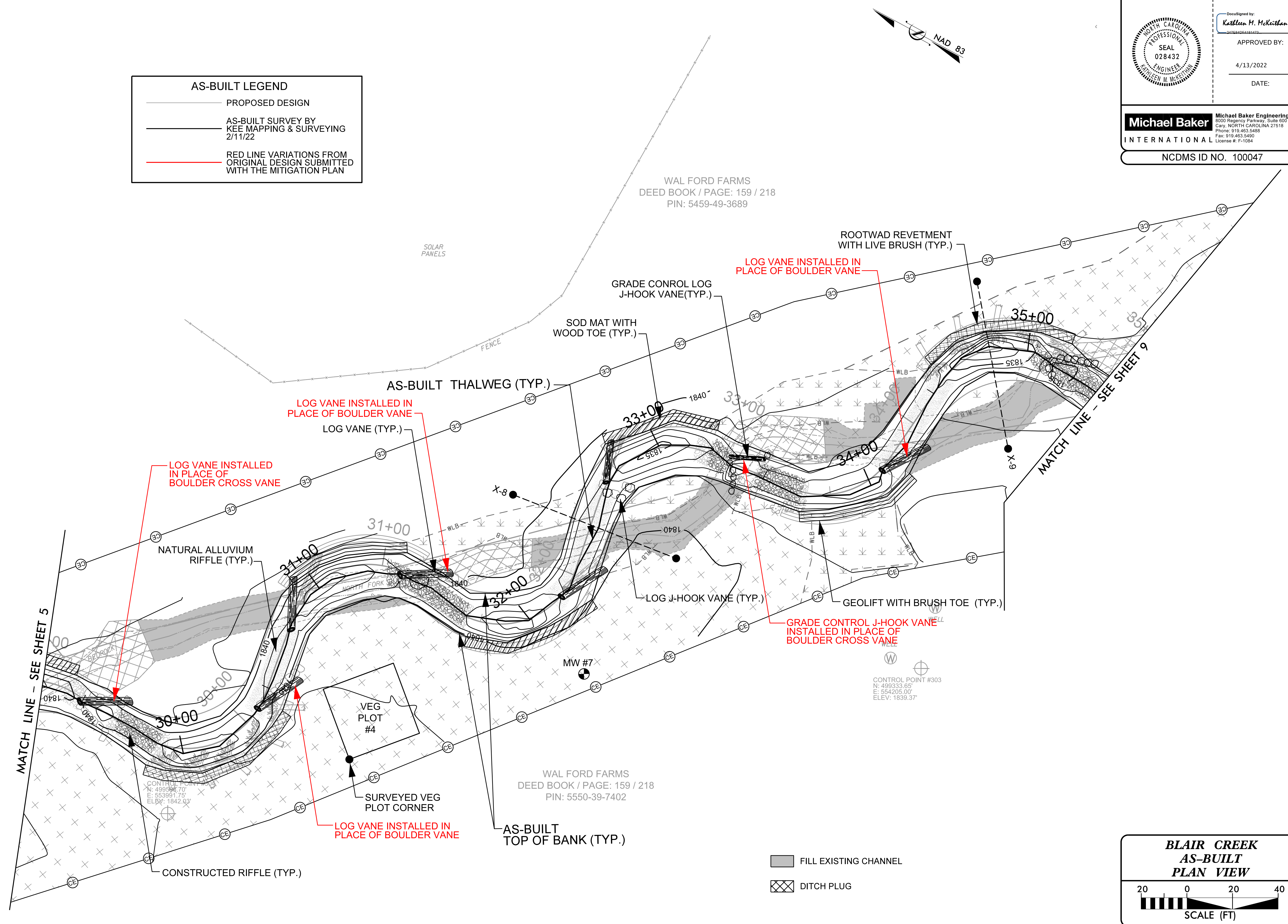
4/17/2022 4:17:16 PM C:\Users\michael.baker\Desktop\Blair-Creek\Design\As-Built\PLANS\166274_AB_PSH-05.dgn

2/26/2023

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 6
PROJECT ENGINEER DocuSigned by: <i>Kaitleen M. McKeithan</i> 24269064848483	
APPROVED BY: 4/13/2022	
DATE:	
Michael Baker International	
Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 800 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100047	

AS-BUILT LEGEND

- PROPOSED DESIGN
- AS-BUILT SURVEY BY KEE MAPPING & SURVEYING 2/11/22
- RED LINE VARIATIONS FROM ORIGINAL DESIGN SUBMITTED WITH THE MITIGATION PLAN



**BLAIR CREEK
AS-BUILT
PLAN VIEW**

20 0 20 40
SCALE (FT)

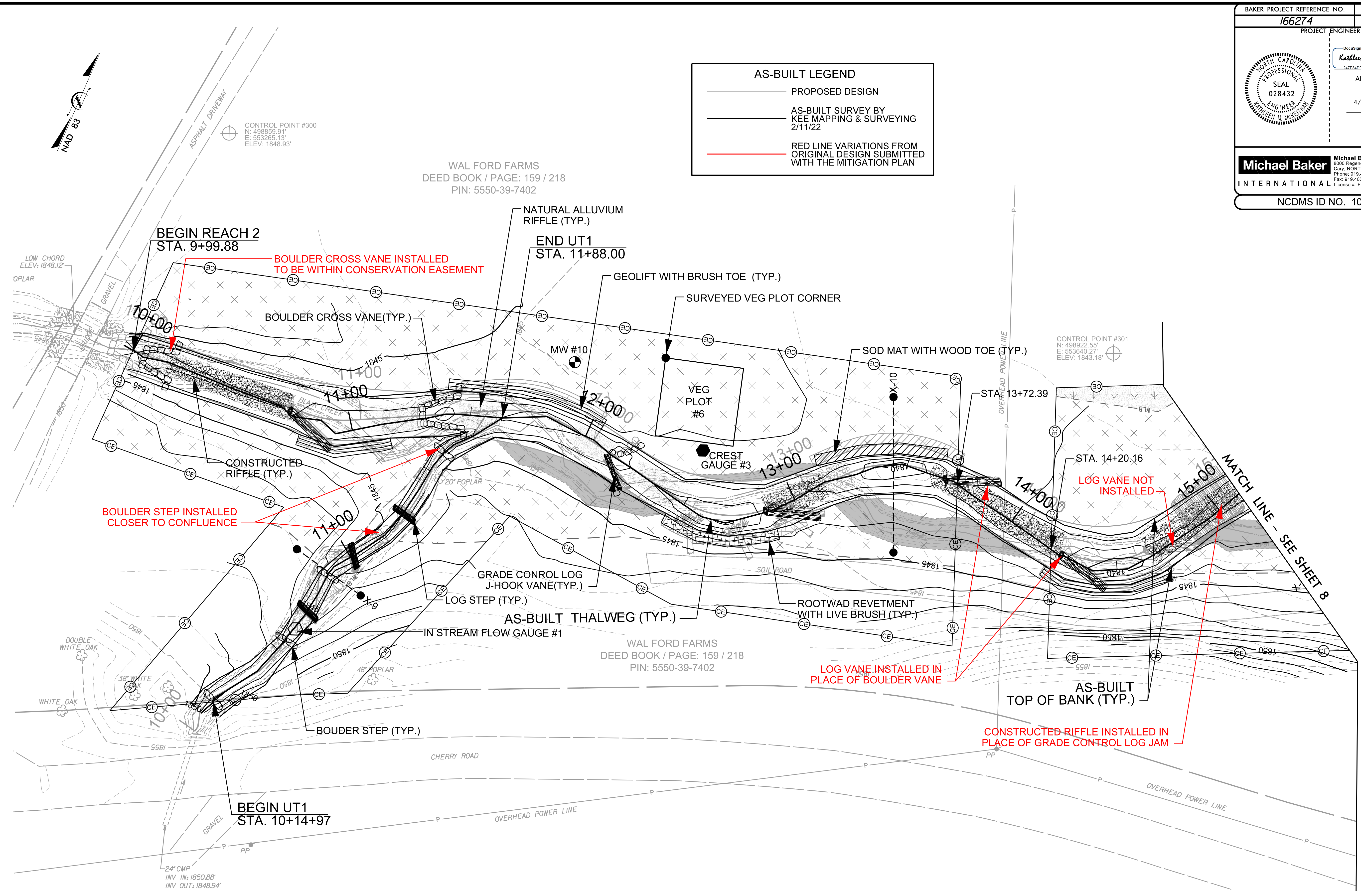
4/13/2022
Blair-Creek-Design\As-Built\PLANS\166274_AB-PSH-06.dgn

2/26/2023

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 7
PROJECT ENGINEER Kathleen M. McKeithan PROFESSIONAL SEAL 028432 NORTH CAROLINA ENGINEER KATHLEEN M. MCKEITHAN	
APPROVED BY: DATE: 4/13/2022	
Michael Baker International Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100047	

AS-BUILT LEGEND

- PROPOSED DESIGN
- AS-BUILT SURVEY BY
KEE MAPPING & SURVEYING
2/11/22
- RED LINE VARIATIONS FROM
ORIGINAL DESIGN SUBMITTED
WITH THE MITIGATION PLAN



BEGIN REACH 2
STA. 9+99.88

END UT1
STA. 11+88.00

BOULDER CROSS VANE INSTALLED TO BE WITHIN CONSERVATION EASEMENT

BOULDER STEP INSTALLED CLOSER TO CONFLUENCE

LOG VANE NOT INSTALLED

LOG VANE INSTALLED IN PLACE OF BOULDER VANE

CONSTRUCTED RIFFLE INSTALLED IN PLACE OF GRADE CONTROL LOG JAM


- FILL EXISTING CHANNEL
- DITCH PLUG

BLAIR CREEK AS-BUILT PLAN VIEW

SCALE (FT)

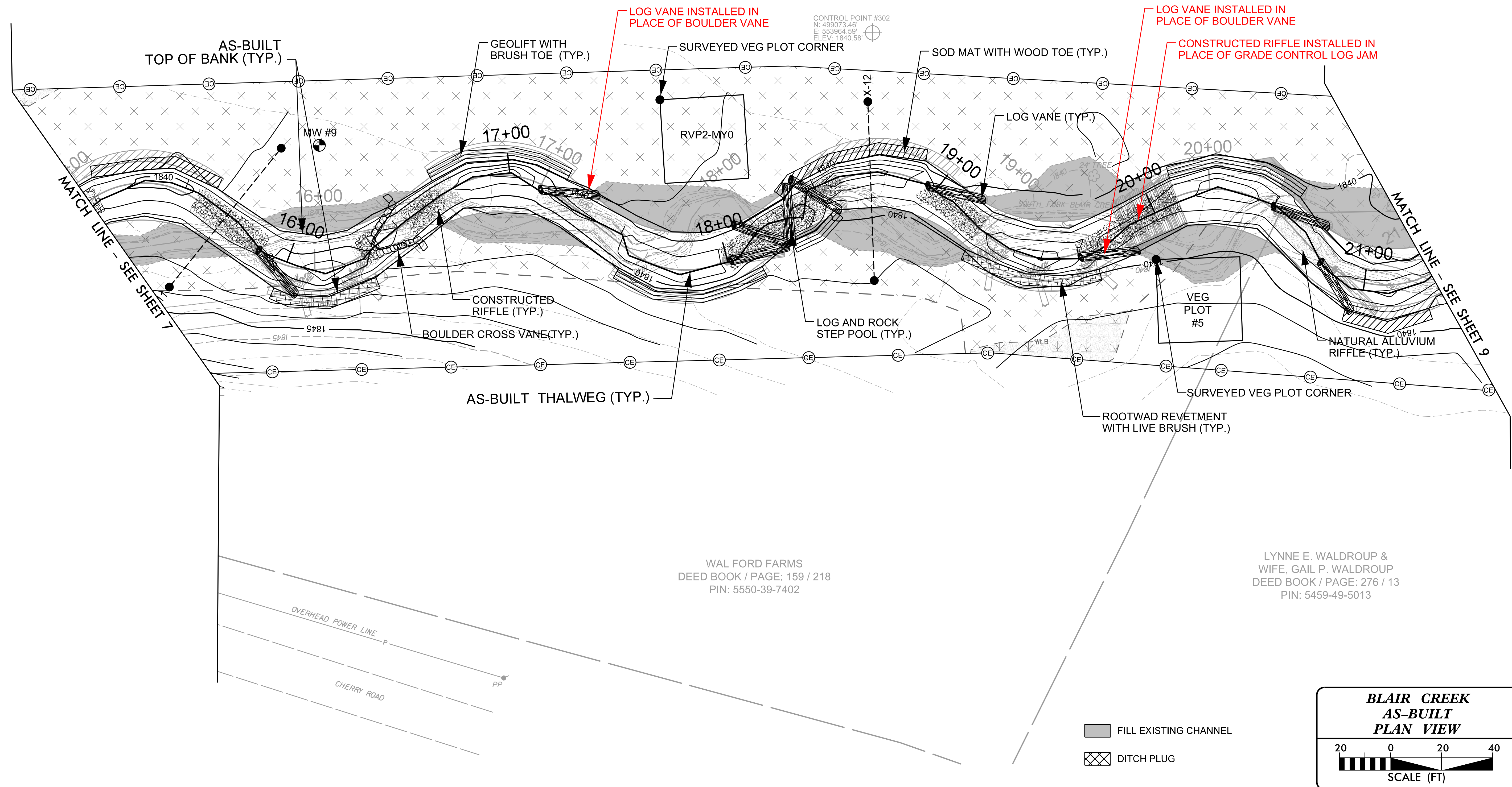
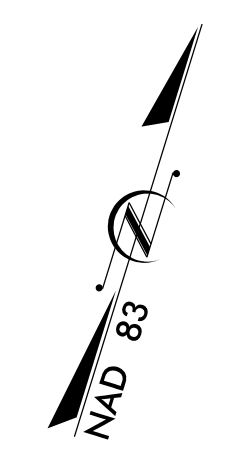
4/13/2022
 R:\166274\Blair-Creek\Design\As-Built\PLANS\166274_AB_PSH-07.dgn
 Michael Baker International

2/26/2023

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 8
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKelthan</i> <small>WATER/DEVELOPMENT</small>	
APPROVED BY:	
4/13/2022	
DATE:	
	
Michael Baker International Michael Baker Engineering Inc. <small>5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084</small>	
NCDMS ID NO. 100047	

AS-BUILT LEGEND

- PROPOSED DESIGN
- AS-BUILT SURVEY BY KEE MAPPING & SURVEYING 2/11/22
- RED LINE VARIATIONS FROM ORIGINAL DESIGN SUBMITTED WITH THE MITIGATION PLAN



4/13/2022 166274 Blair Creek As-Built PLANS\166274_AB_PSH-08.dgn

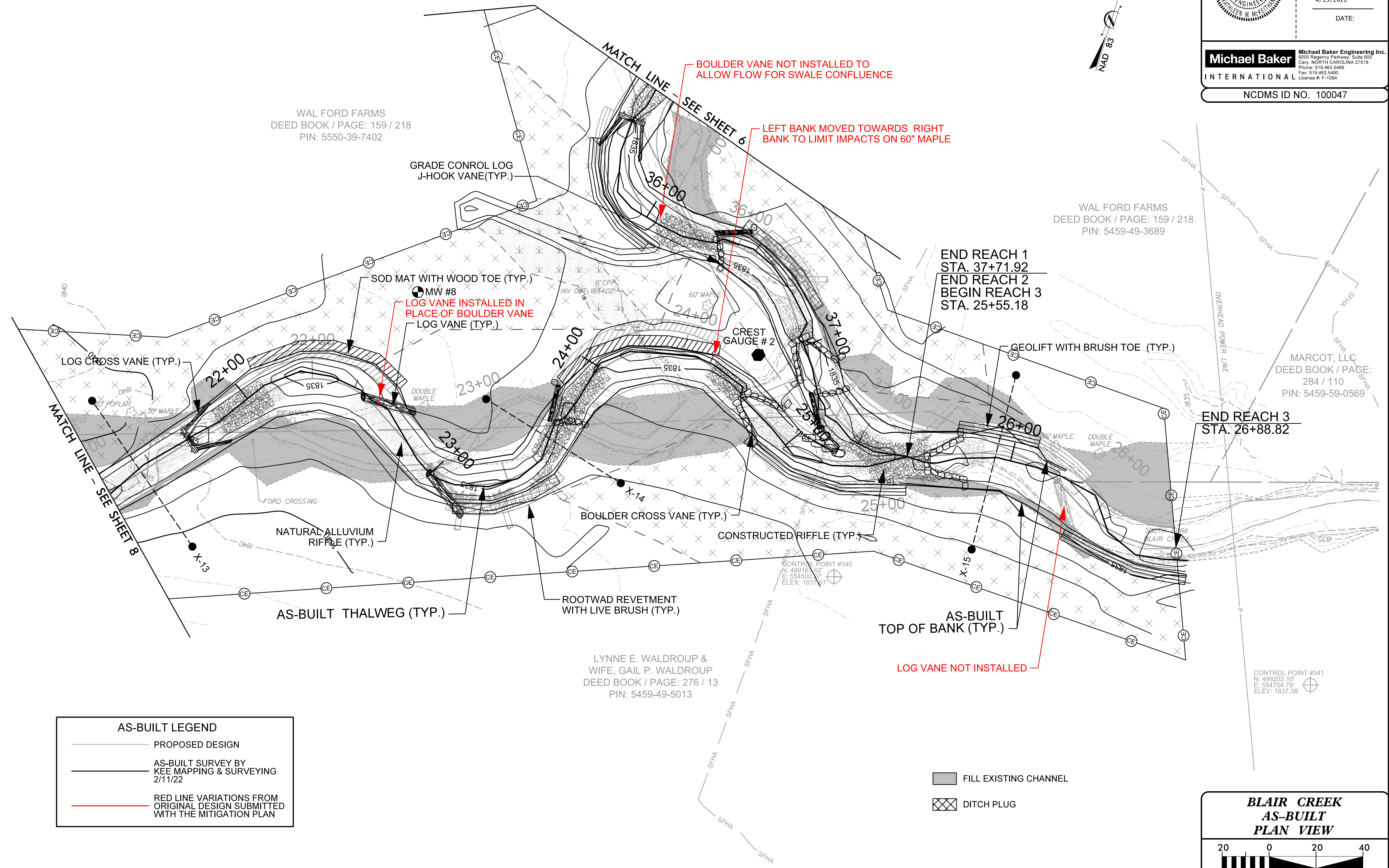
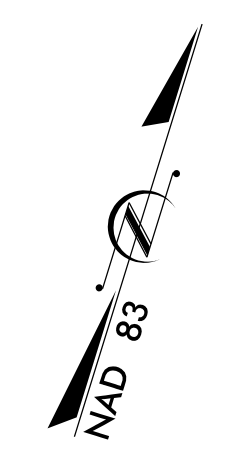
BLAIR CREEK AS-BUILT PLAN VIEW




20 0 20 40
SCALE (FT)



- FILL EXISTING CHANNEL
- DITCH PLUG

2/26/2023


BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 9
PROJECT ENGINEER	
DocuSigned by:  Kathleen M. McKeithan APPROVED BY: 4/13/2022 DATE:	
	
Michael Baker International Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 800 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100047	



AS-BUILT LEGEND	
	PROPOSED DESIGN
	AS-BUILT SURVEY BY KEE MAPPING & SURVEYING 2/11/22
	RED LINE VARIATIONS FROM ORIGINAL DESIGN SUBMITTED WITH THE MITIGATION PLAN

	FILL EXISTING CHANNEL
	DITCH PLUG

**BLAIR CREEK
AS-BUILT
PLAN VIEW**

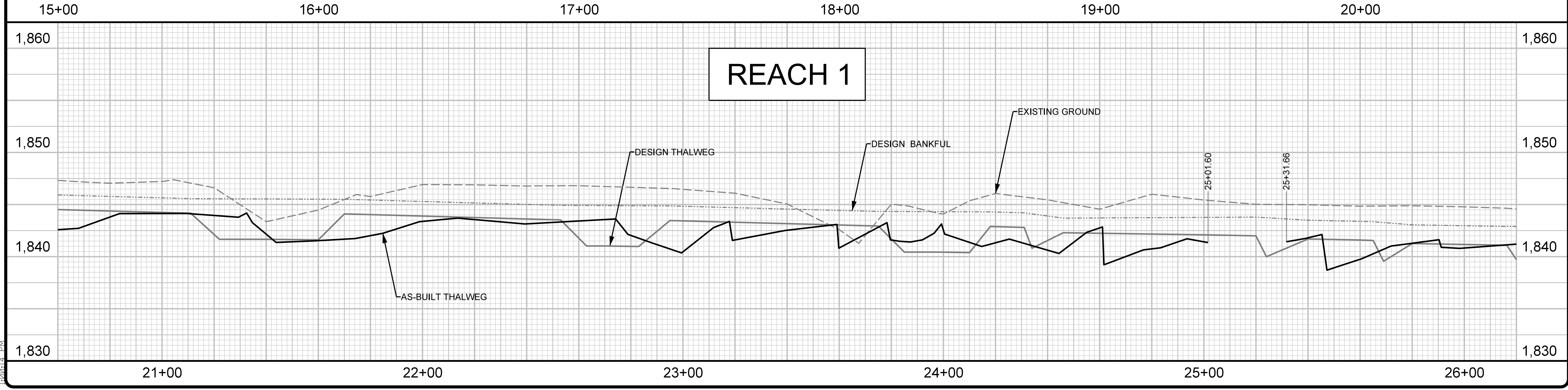
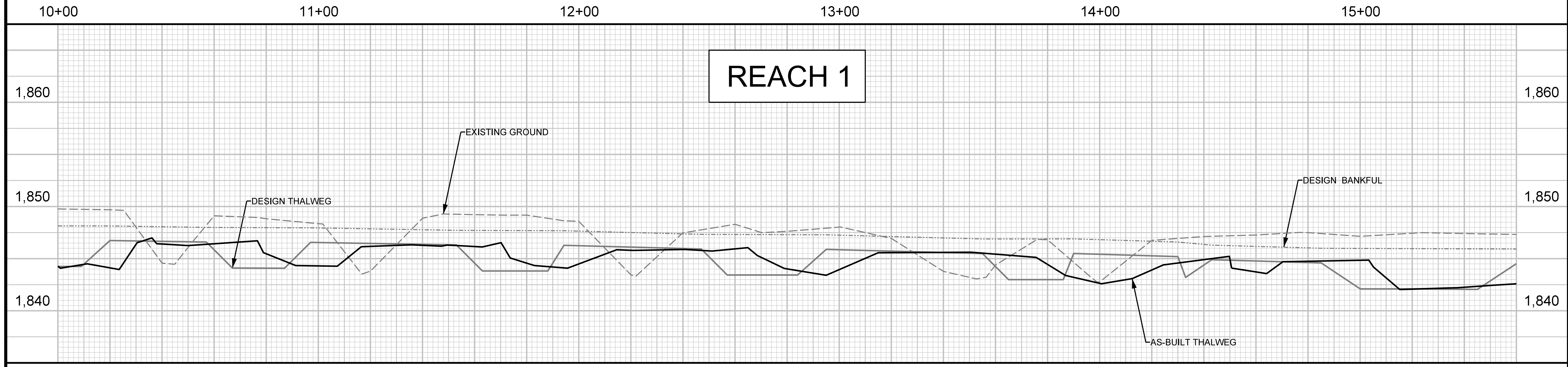
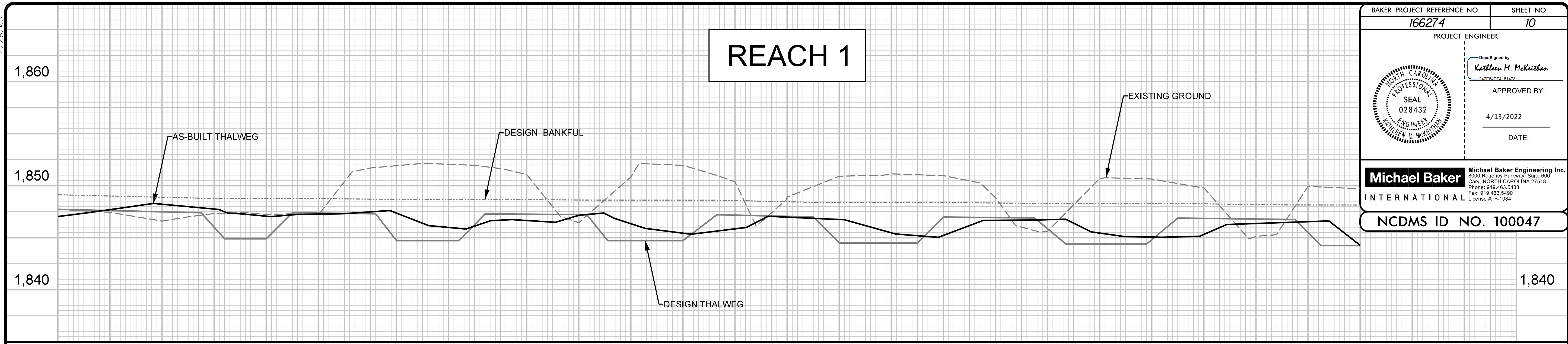


SCALE (FT)

A:\166274\166274_Blaire-Creek\Design\As-Built\PLANS\166274_AB_PSH-09.dgn

2/26/03

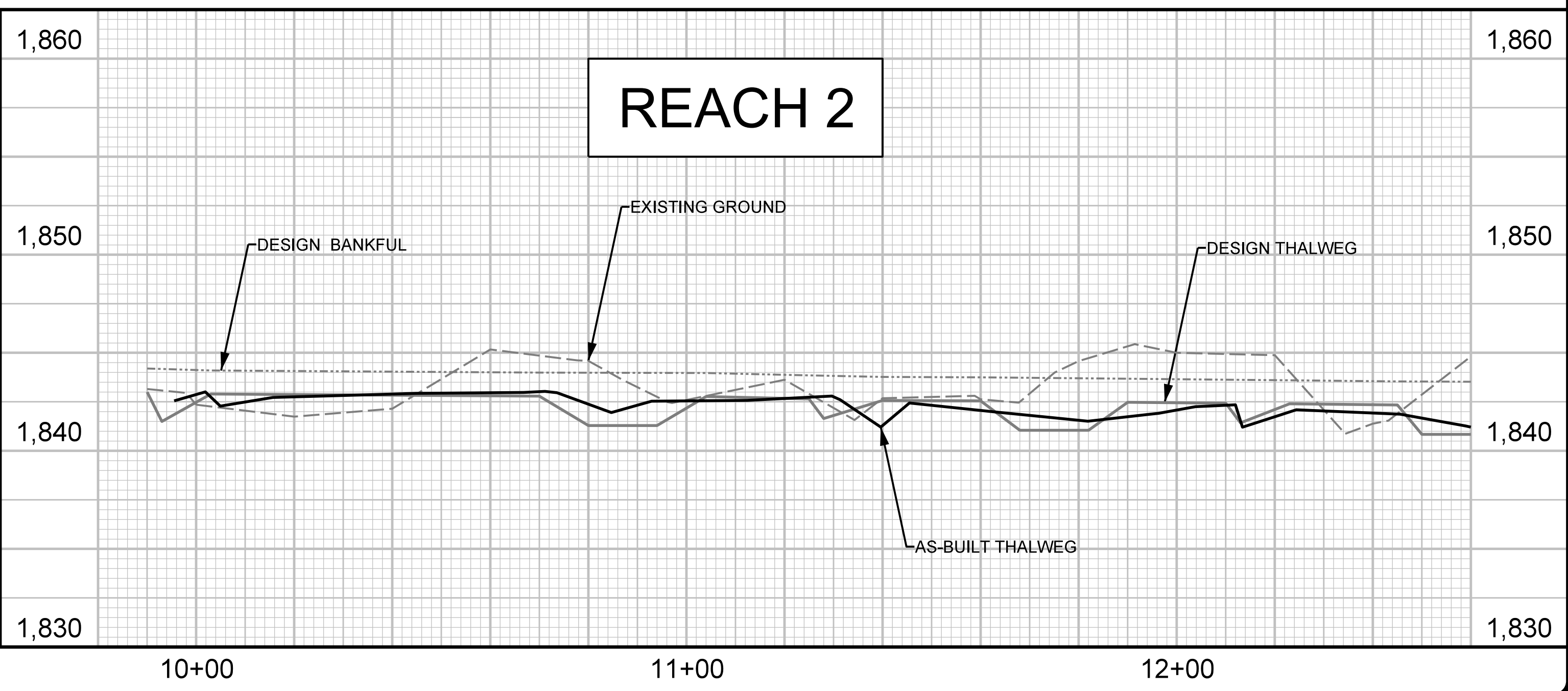
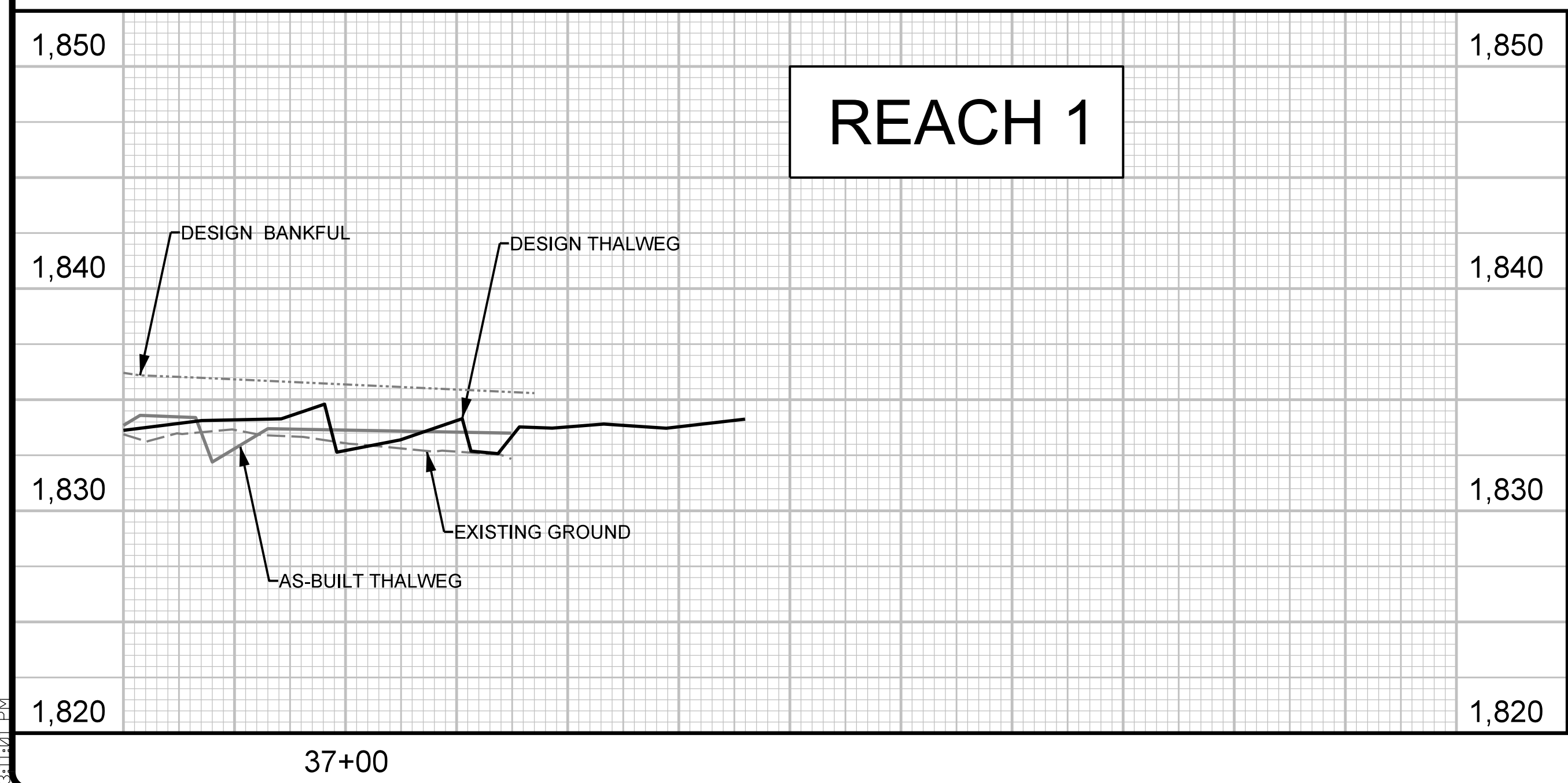
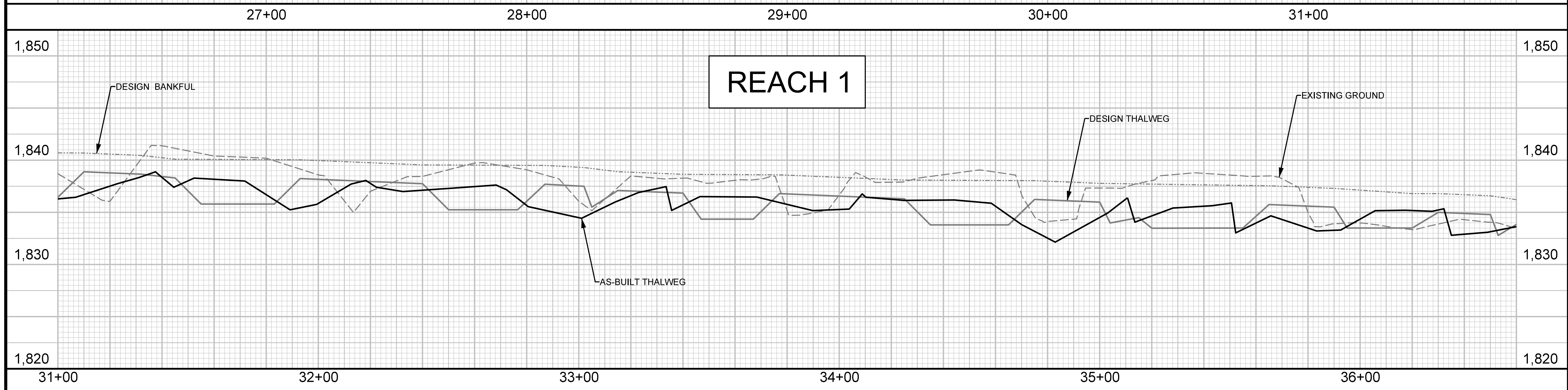
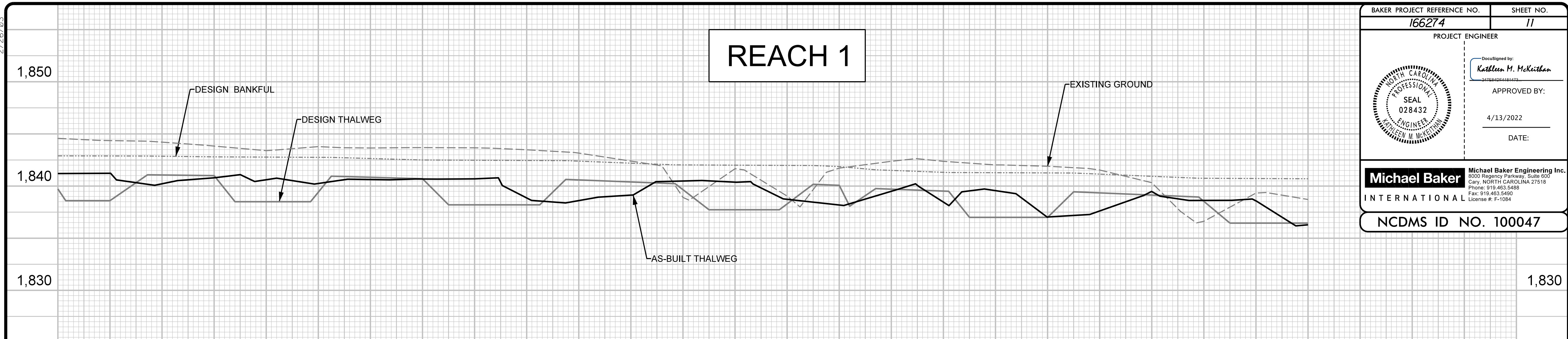
BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 10
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKeithen</i> SAFEBRANDS	
APPROVED BY: 4/13/2022	
DATE:	
	
Michael Baker International Michael Baker Engineering Inc. <small>3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.6488 Fax: 919.463.6489 License #: F-1084</small>	
NCDMS ID NO. 100047	



4/13/2022 4:10:12 PM F:\166274\BlairCreek\Design\As-Built\PLANS\166274_PFL_AB-10.dgn

2/26/03

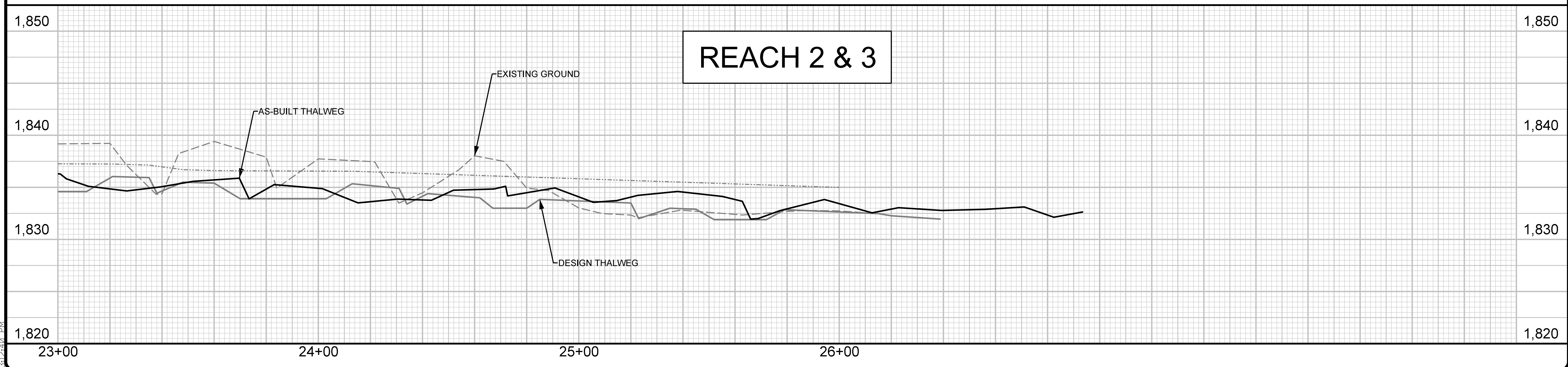
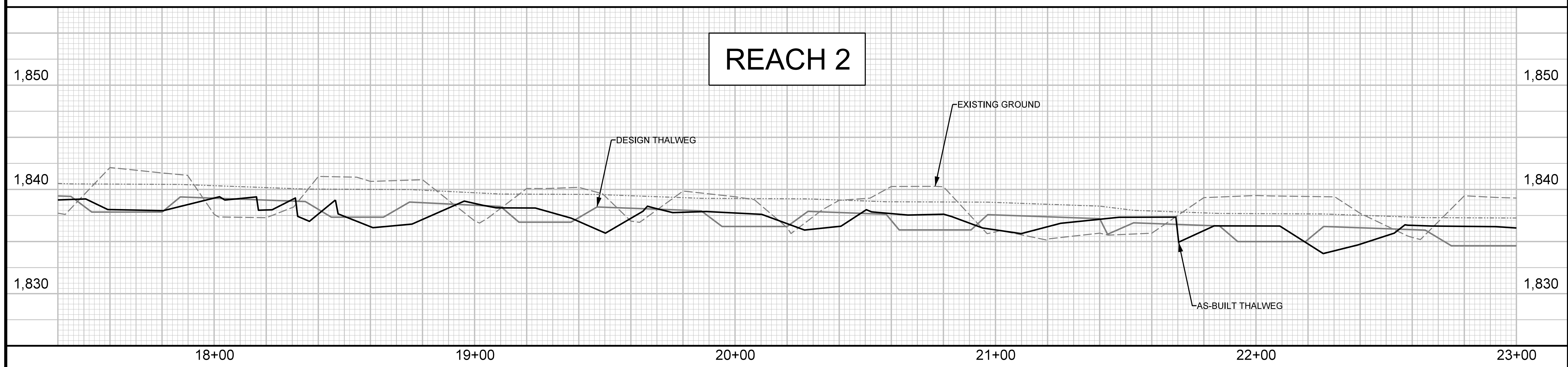
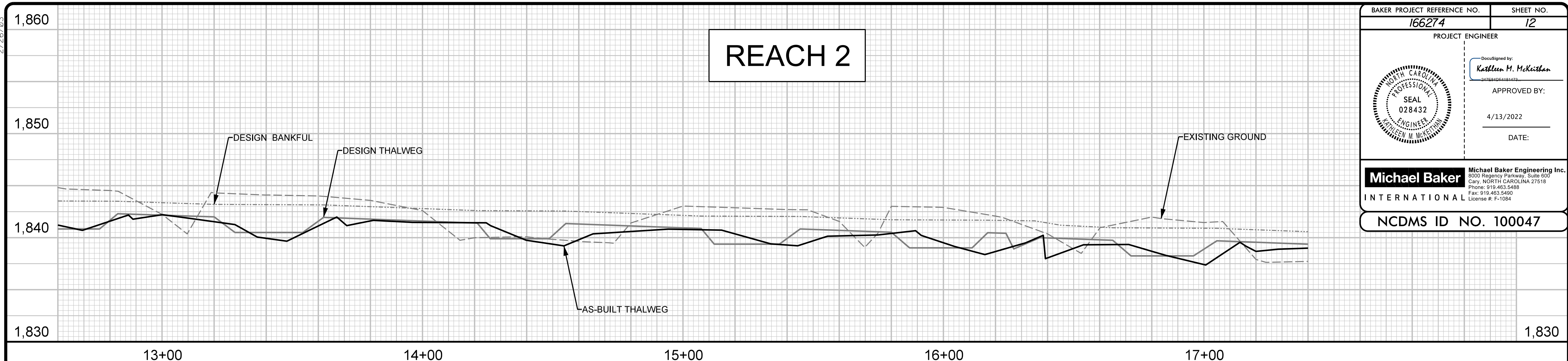
BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 11
PROJECT ENGINEER	
Designed by: <i>Kathleen M. McKeithan</i> <small>30264048423</small>	
APPROVED BY:	
4/13/2022	
DATE:	
	
Michael Baker International Michael Baker Engineering Inc. <small>3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5480 License #: F-1084</small>	
NCDMS ID NO. 100047	



4/13/2022 3:11:01 PM C:\Users\kmcKeithan\Documents\166274_PEL_AB-11.dgn

2/26/03

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 12
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKeithan</i> <small>2438904848423</small>	
APPROVED BY:	
4/13/2022	
DATE:	
	
Michael Baker International Michael Baker Engineering Inc. <small>3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5480 License #: F-1084</small>	
NCDMS ID NO. 100047	

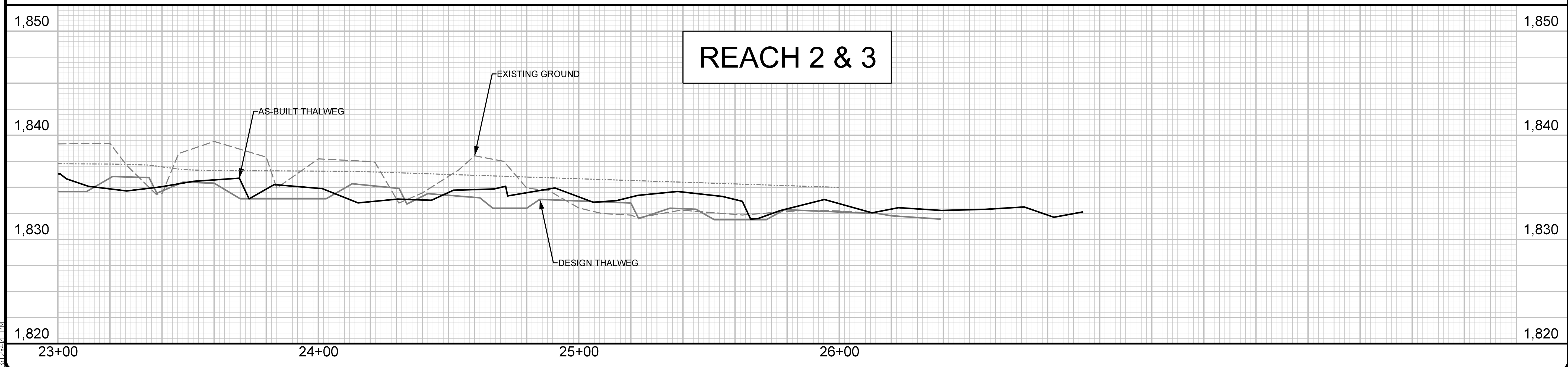
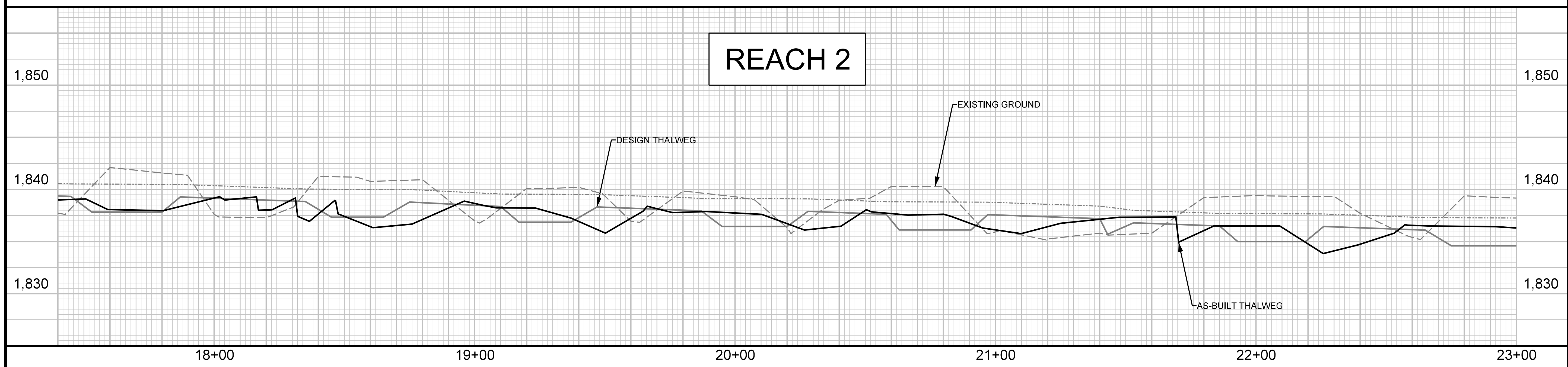
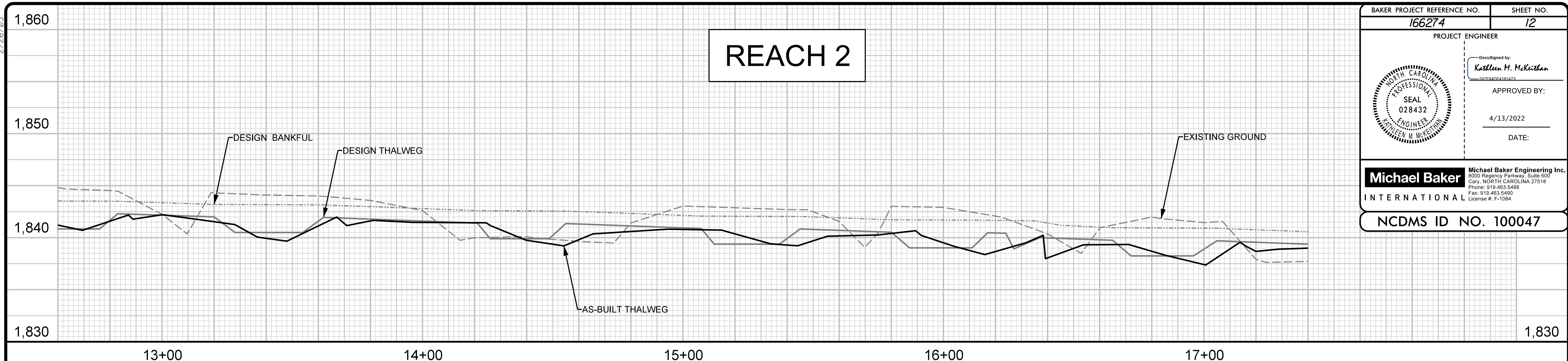


A:\166274\BlairCreek\Design\As-Built\PLANS\166274_PFL_AB-12.dgn 3/12/2022 10:32 AM

EG

2/26/03

BAKER PROJECT REFERENCE NO. 166274	SHEET NO. 12
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKeithen</i> <small>SAFEBYSAFEWAY</small>	
APPROVED BY:	
4/13/2022	
DATE:	
	
Michael Baker International Michael Baker Engineering Inc. <small>3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5489 License #: F-1084</small>	
NCDMS ID NO. 100047	



4/13/2022 10:32:47 AM C:\Users\kmcKeithen\Documents\166274_PFL_AB-12.dgn