

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	00532601	1	7

STATE OF NORTH CAROLINA
WETLANDS RESTORATION PROGRAM

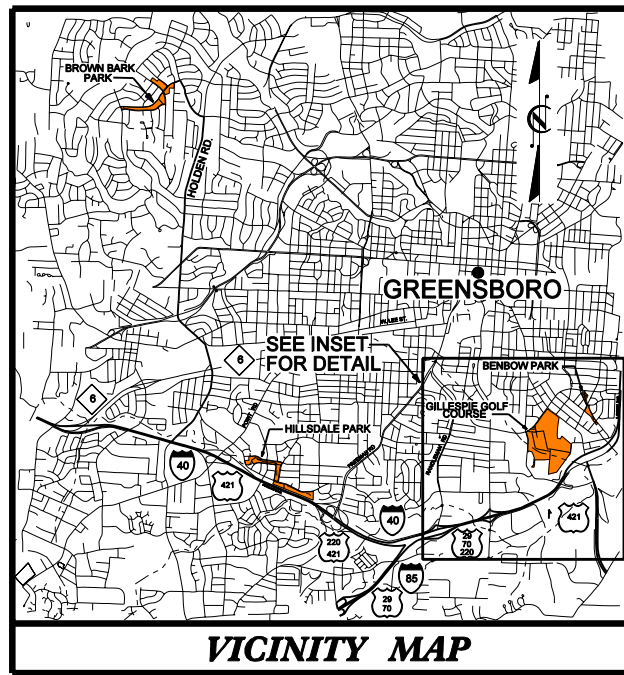
GUILFORD COUNTY

LOCATION: GILLESPIE GOLF COURSE
MILE RUN CREEK
GREENSBORO, NORTH CAROLINA

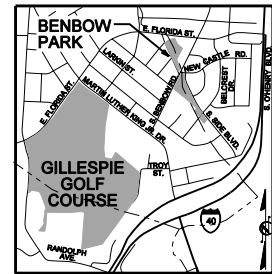
TYPE OF WORK: AS-BUILT PLANS



063



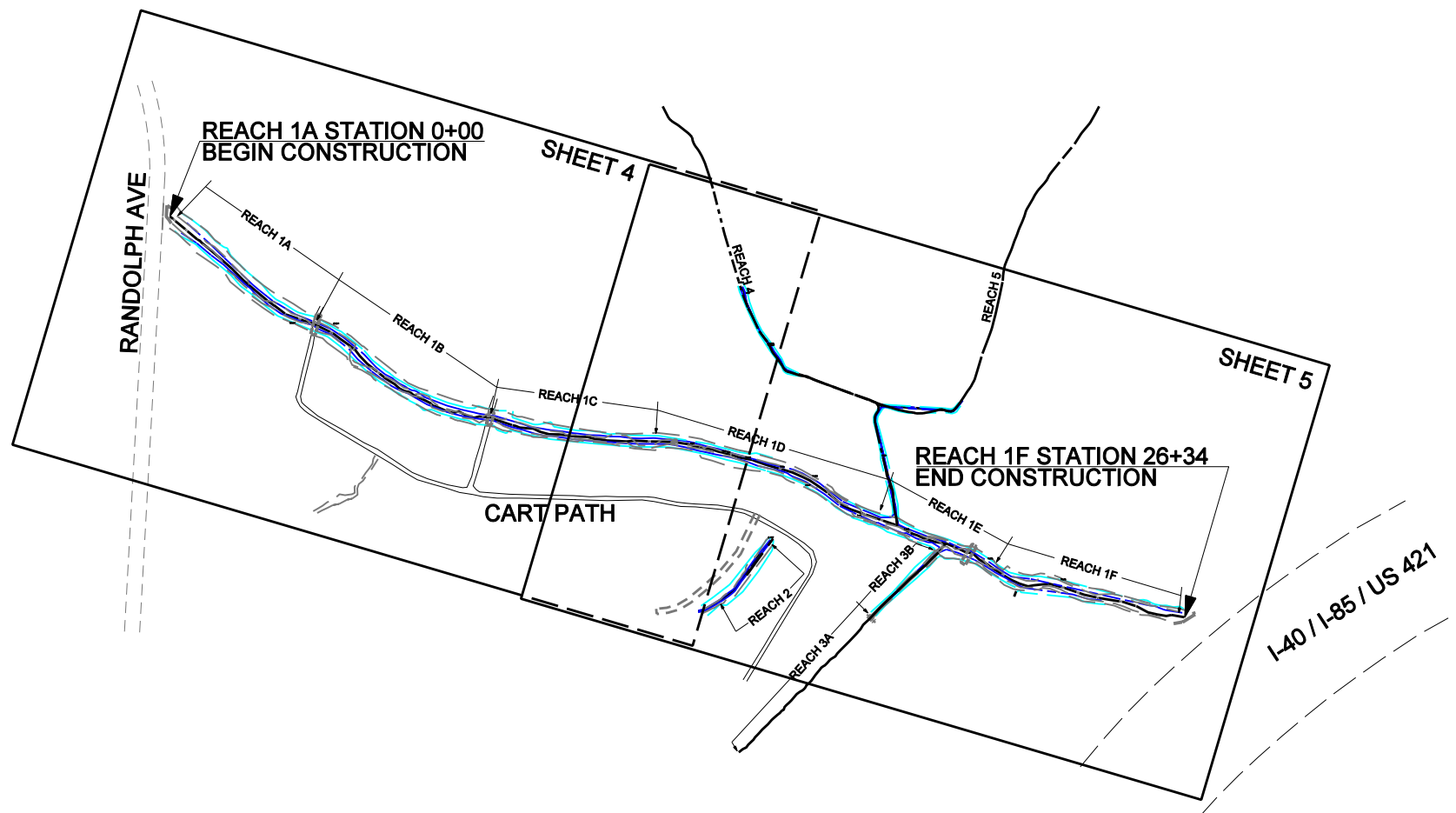
VICINITY MAP



INSET

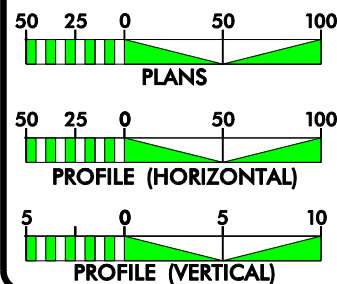
INDEX OF SHEETS:

- 1 TITLE SHEET
- 1-A SYMBOLOGY - BUCK ENGINEERING
- 1-B SYMBOLOGY - NCDOT
- 2 TO 2-A TYPICAL POOL AND RIFFLE CROSS SECTIONS, STRUCTURE DETAILS,
- 4-5 PLAN VIEW OF AS-BUILT



PROJECT: 000532601

GRAPHIC SCALES



DESIGN DATA

	REACH 1
DESIGN STREAM TYPE	E5
DESIGN LENGTH	3427
BANKFULL XSEC AREA(Ft ²)	74
BANKFULL WIDTH(FT)	27
BANKFULL DEPTH(FT)	2.7
WD RATIO(FT)	10

PROJECT LENGTH

EXISTING STREAM LENGTH	= 3427 FEET
AS-BUILT STREAM LENGTH	= 3427 FEET

CONTACT: JEFF JUREK
WRP PROJECT MANAGER

Prepared In the Office of:

BUCK ENGINEERING
8000 REGENCY PARKWAY
SUITE 200
CARY, NC 27511
919-463-5488

LETTING DATE:

WILL HARMAN, PG
PROJECT MANAGER

ANDREW BICK, PE
PROJECT ENGINEER

PROJECT ENGINEER

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WILLIAM KENT
L-3708
DECEMBER 20, 2005

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SIGNATURE:

P.E.

STREAM CONVENTIONAL SYMBOLS
SUPERCEDES SHEET 1B

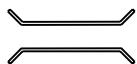
- | | |
|--------------------------------|-------------------------------------|
| — — — — TOP OF BANK (EXISTING) | ———— CENTERLINE /THALWEG (PROPOSED) |
| — — — — THALWEG (EXISTING) | Ⓣ PLAYGROUND EQUIPMENT |
| — — — — MINOR CONTOUR LINE | —●— CONSERVATION EASEMENT |
| — — — — MAJOR CONTOUR LINE | —SF— SILT FENCE |



Silt Check



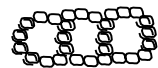
Double Wing Deflector



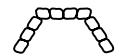
Temporary Ford Stream Crossing



Root Wad



Step Pool



Cross Vane

GENERAL NOTES

PROJECT REFERENCE NO. 000532601	SHEET NO. 1-A
PROJECT ENGINEER	
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BUCK INCORPORATED	8000 REGENCY PARKWAY SUITE 200 CARY, NC 27511 919-463-5488

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

*S.U.E = SUBSURFACE UTILITY ENGINEER

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

Edge of Pavement	----
Curb	-----
Prop. Slope Stakes Cut	---C---
Prop. Slope Stakes Fill	---F---
Prop. Woven Wire Fence	○-----○
Prop. Chain Link Fence	□-----□
Prop. Barbed Wire Fence	◇-----◇
Prop. Wheelchair Ramp	WCR
Curb Cut for Future Wheelchair Ramp	CCFR
Exist. Guardrail	-----
Prop. Guardrail	-----
Equality Symbol	⊕
Pavement Removal	XXXXXX

RIGHT OF WAY

Baseline Control Point	◆
Existing Right of Way Marker	△
Exist. Right of Way Line w/Marker	---△---
Prop. Right of Way Line with Proposed	-----
R/W Marker (Iron Pin & Cap)	▲
Prop. Right of Way Line with Proposed	-----
(Concrete or Granite) R/W Marker	⊙
Exist. Control of Access Line	⊙
Prop. Control of Access Line	⊙
Exist. Easement Line	---E---
Prop. Temp. Construction Easement Line	---E---
Prop. Temp. Drainage Easement Line	---TDE---
Prop. Perm. Drainage Easement Line	---PDE---

HYDROLOGY

Stream or Body of Water	~~~~~
River Basin Buffer	---RBB---
Flow Arrow	→
Disappearing Stream	--->---
Spring	○
Swamp Marsh	⌵
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

STRUCTURES

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

MINOR

Head & End Wall	CONC HW
Pipe Culvert	=====
Footbridge	>-----<
Drainage Boxes	□ CB
Paved Ditch Gutter	-----

UTILITIES

Exist. Pole	•
Exist. Power Pole	⊙
Prop. Power Pole	⊙
Exist. Telephone Pole	⊙
Prop. Telephone Pole	⊙
Exist. Joint Use Pole	⊙
Prop. Joint Use Pole	⊙
Telephone Pedestal	⊕
UG Telephone Cable Hand Hold	⊕
Cable TV Pedestal	⊕
UG TV Cable Hand Hold	⊕
UG Power Cable Hand Hold	⊕
Hydrant	⊕
Satellite Dish	⊕
Exist. Water Valve	⊕
Sewer Clean Out	⊕
Power Manhole	⊕
Telephone Booth	⊕
Cellular Telephone Tower	⊕
Water Manhole	⊕
Light Pole	⊕
H-Frame Pole	⊕
Power Line Tower	⊕
Pole with Base	⊕
Gas Valve	⊕
Gas Meter	⊕
Telephone Manhole	⊕
Power Transformer	⊕
Sanitary Sewer Manhole	⊕
Storm Sewer Manhole	⊕
Tank; Water, Gas, Oil	⊕
Water Tank With Legs	⊕
Traffic Signal Junction Box	⊕
Fiber Optic Splice Box	⊕
Television or Radio Tower	⊕
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	---TS---

Recorded Water Line	-----
Designated Water Line (S.U.E.*)	-----
Sanitary Sewer	---SS---
Recorded Sanitary Sewer Force Main	---FSS---
Designated Sanitary Sewer Force Main(S.U.E.*)	---FSS---
Recorded Gas Line	---G---
Designated Gas Line (S.U.E.*)	---G---
Storm Sewer	---S---
Recorded Power Line	---P---
Designated Power Line (S.U.E.*)	---P---
Recorded Telephone Cable	---T---
Designated Telephone Cable (S.U.E.*)	---T---
Recorded U/G Telephone Conduit	---TC---
Designated U/G Telephone Conduit (S.U.E.*)	---TC---
Unknown Utility (S.U.E.*)	---UTL---
Recorded Television Cable	---TV---
Designated Television Cable (S.U.E.*)	---TV---
Recorded Fiber Optics Cable	---FO---
Designated Fiber Optics Cable (S.U.E.*)	---FO---
Exist. Water Meter	⊕
UG Test Hole (S.U.E.*)	⊕
Abandoned According to U/G Record	ATTUR
End of Information	E.O.I.

BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	PL
Exist. Iron Pin	⊕
Property Corner	⊕
Property Monument	⊕
Property Number	123
Parcel Number	6
Fence Line	---X---
Existing Wetland Boundaries	---WW & ISBW---
High Quality Wetland Boundary	---WLB---
Medium Quality Wetland Boundaries	---HO WLB---
Low Quality Wetland Boundaries	---MO WLB---
Proposed Wetland Boundaries	---LO WLB---
Existing Endangered Animal Boundaries	---EAB---
Existing Endangered Plant Boundaries	---EPB---

BUILDINGS & OTHER CULTURE

Buildings	⊕
Foundations	⊕
Area Outline	⊕
Gate	⊕
Gas Pump Vent or UG Tank Cap	⊕
Church	⊕
School	⊕
Park	⊕
Cemetery	⊕
Dam	⊕
Sign	⊕
Well	⊕
Small Mine	⊕
Swimming Pool	⊕

TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	R/W
Guard Post	⊕ GP
Paved Walk	-----
Bridge	⊕
Box Culvert or Tunnel	⊕
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	⊕

VEGETATION

Single Tree	⊕
Single Shrub	⊕
Hedge	-----
Woods Line	-----
Orchard	⊕
Vineyard	VINEYARD

RAILROADS

Standard Gauge	-----
RR Signal Milepost	⊕ MILEPOST 35
Switch	⊕ SWITCH

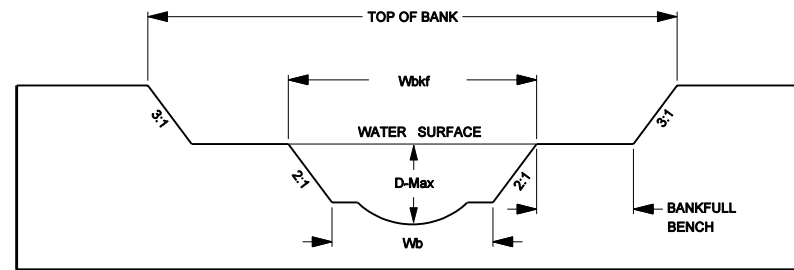
TYPICAL RIFFLE, POOL AND BANKFULL BENCH FOR GILLESPIE GOLF COURSE

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RIFFLE & POOL WITH BANKFULL BENCH



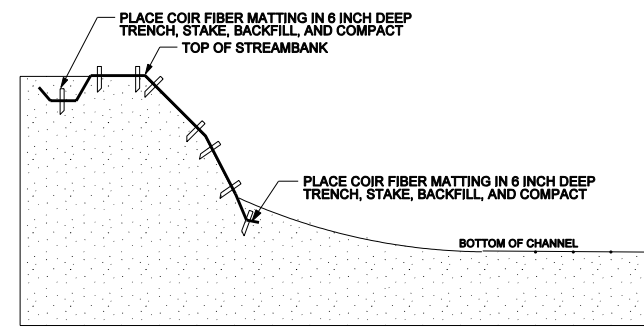
REACH 1

	RIFFLE	POOL
WIDTH OF BANKFULL (Wbkf) - ft	27	32
AVERAGE DEPTH - ft	2.7	2.7
MAXIMUM DEPTH (D-max) - ft	3.2	4.1
WIDTH TO DEPTH RATIO (bkfl W/D)	10	12
BANKFULL AREA - ft ²	75	85
BOTTOM WIDTH (Wb) - ft	14.2	7.4
BANKFULL BENCH WIDTH - ft	5-10	5-10

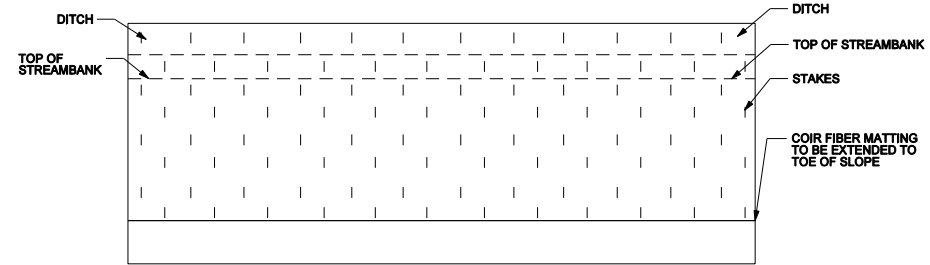
NOTES:

1. BANKFULL BENCH WIDTH WILL VARY.
2. BANKFULL BENCH WILL NOT ALWAYS BE ON BOTH SIDES (SEE PLANS)
3. THE SHAPE OF THE POOL X-SECTION WILL BE SIMILAR TO THE RIFFLE X-SECTION IN THAT THE THALWEG WILL BE COINCIDENT WITH THE CENTERLINE.

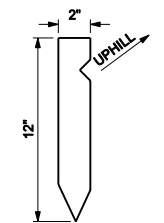
EROSION CONTROL MATTING



CROSS SECTION VIEW



PLAN VIEW



TYPICAL MATTING STAKE

- NOTES:
1. BANKS SHOULD BE SEEDED PRIOR TO PLACEMENT OF MATTING.
 2. PLACE COIR FIBER MATTING ACCORDING TO MANUFACTURER RECOMMENDATIONS.
 3. MATTING STAKES SHOULD BE PLACED IN A DIAMOND SHAPE PATTERN.

REVISIONS

PROJECT ENGINEER

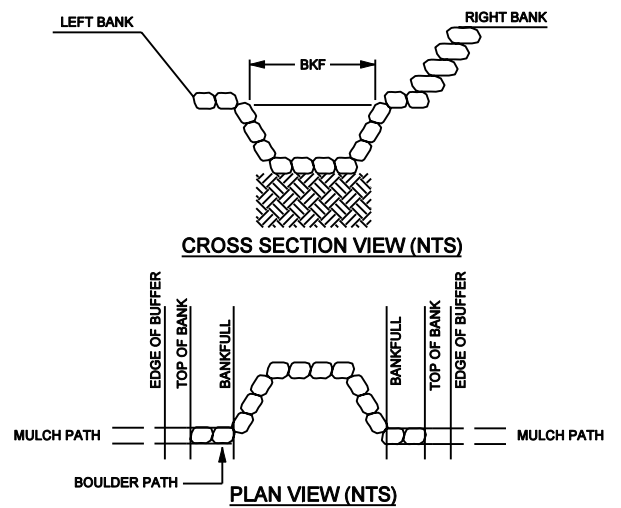
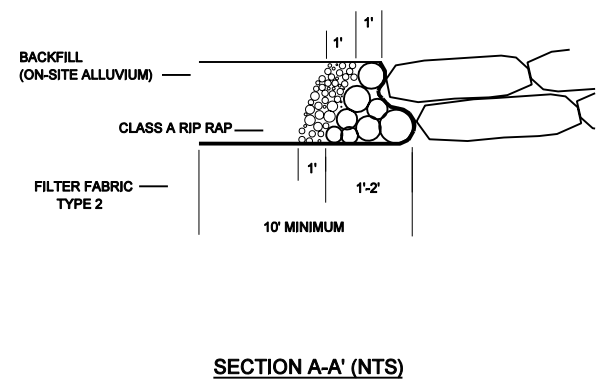
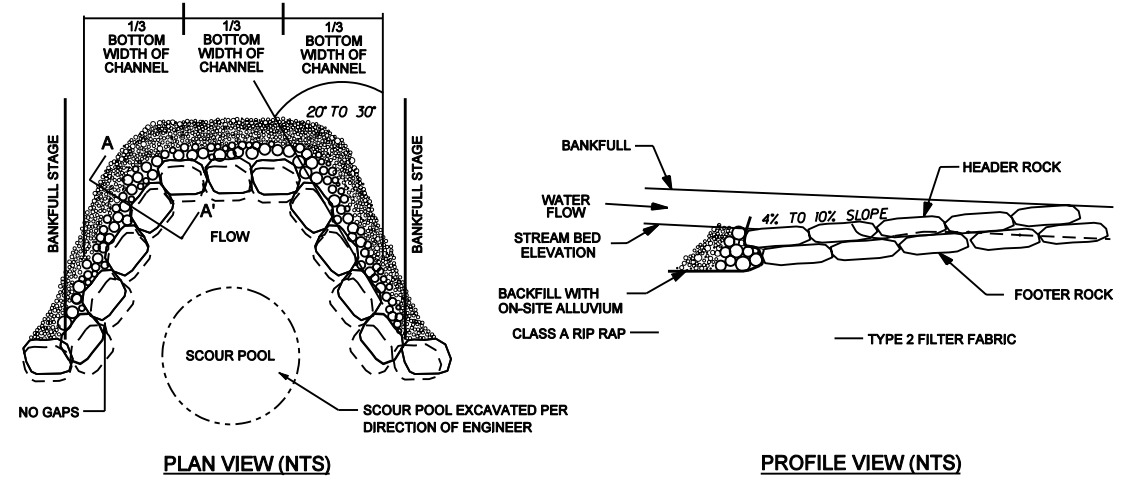
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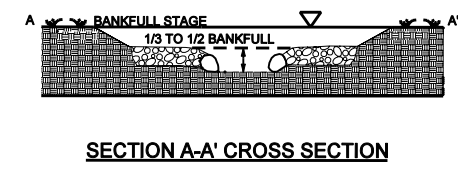
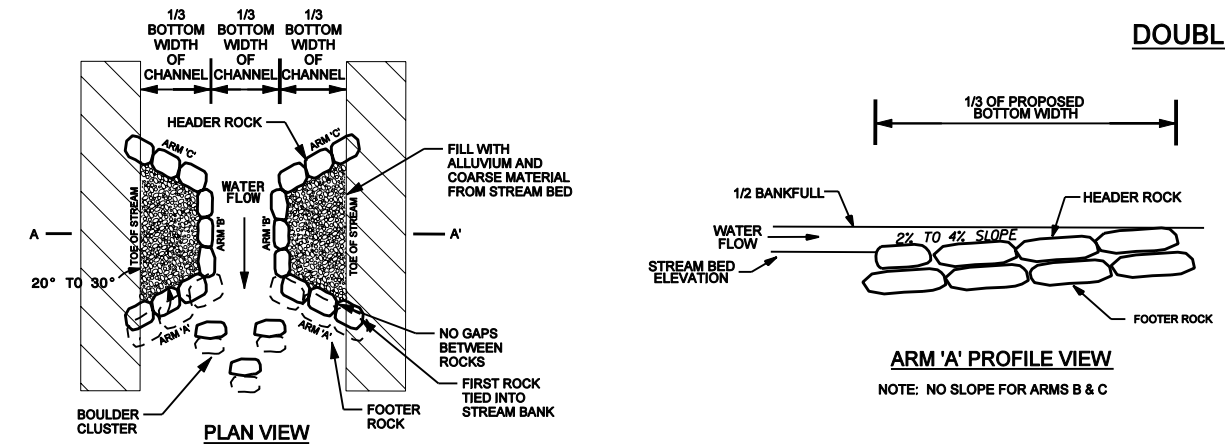
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ROCK CROSS VANE



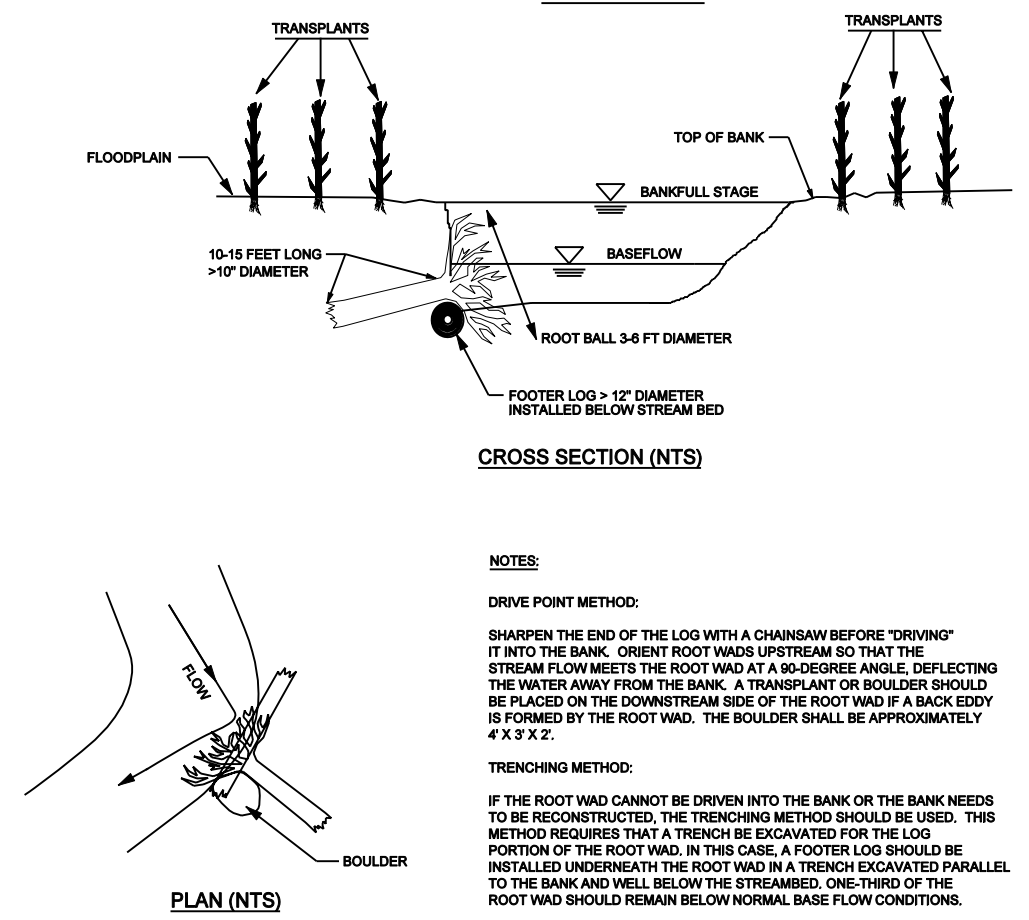
DOUBLE WING DEFLECTOR



NOTES FOR ALL VANE STRUCTURES:

- BOULDERS MUST BE AT LEAST 4' x 3' x 2'. 6' x 4' x 3' BOULDERS ARE PREFERRED.
- INSTALL FILTER FABRIC BEGINNING AT THE MIDDLE OF THE HEADER ROCKS ON THE UPSTREAM SIDE AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
- DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAM BANK.
- START AT BANKFULL AND PLACE FOOTER ROCKS FIRST AND THEN HEADER ROCKS.
- CONTINUE WITH STRUCTURE, FOLLOWING ANGLE AND SLOPE SPECIFICATIONS.
- AN EXTRA BOULDER CAN BE PLACED IN SCOUR POOL FOR HABITAT IMPROVEMENT.
- USE CLASS A RIP RAP TO FILL GAPS ON UPSTREAM SIDE OF BOULDERS.
- AFTER ALL STONE HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH SOIL TO THE ELEVATION OF THE TOP OF THE HEADER ROCKS.

ROOT WADS



NOTES:

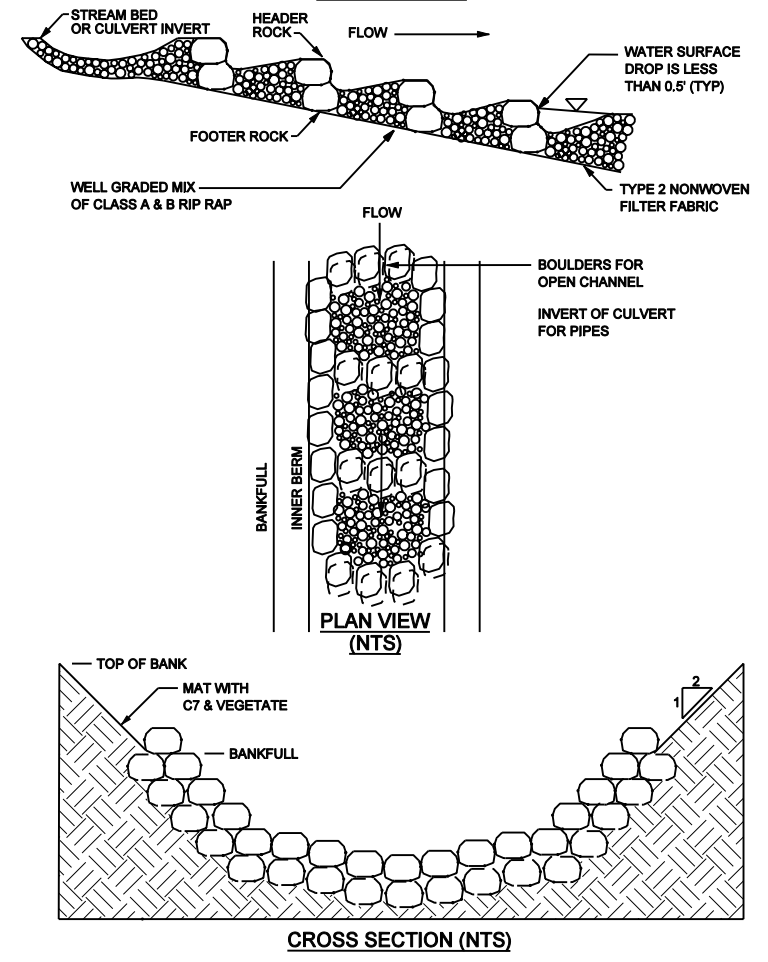
DRIVE POINT METHOD:

SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS UPSTREAM SO THAT THE STREAM FLOW MEETS THE ROOT WAD AT A 90-DEGREE ANGLE, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT OR BOULDER SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY IS FORMED BY THE ROOT WAD. THE BOULDER SHALL BE APPROXIMATELY 4' X 3' X 2'.

TRENCHING METHOD:

IF THE ROOT WAD 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 LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

STEP POOL



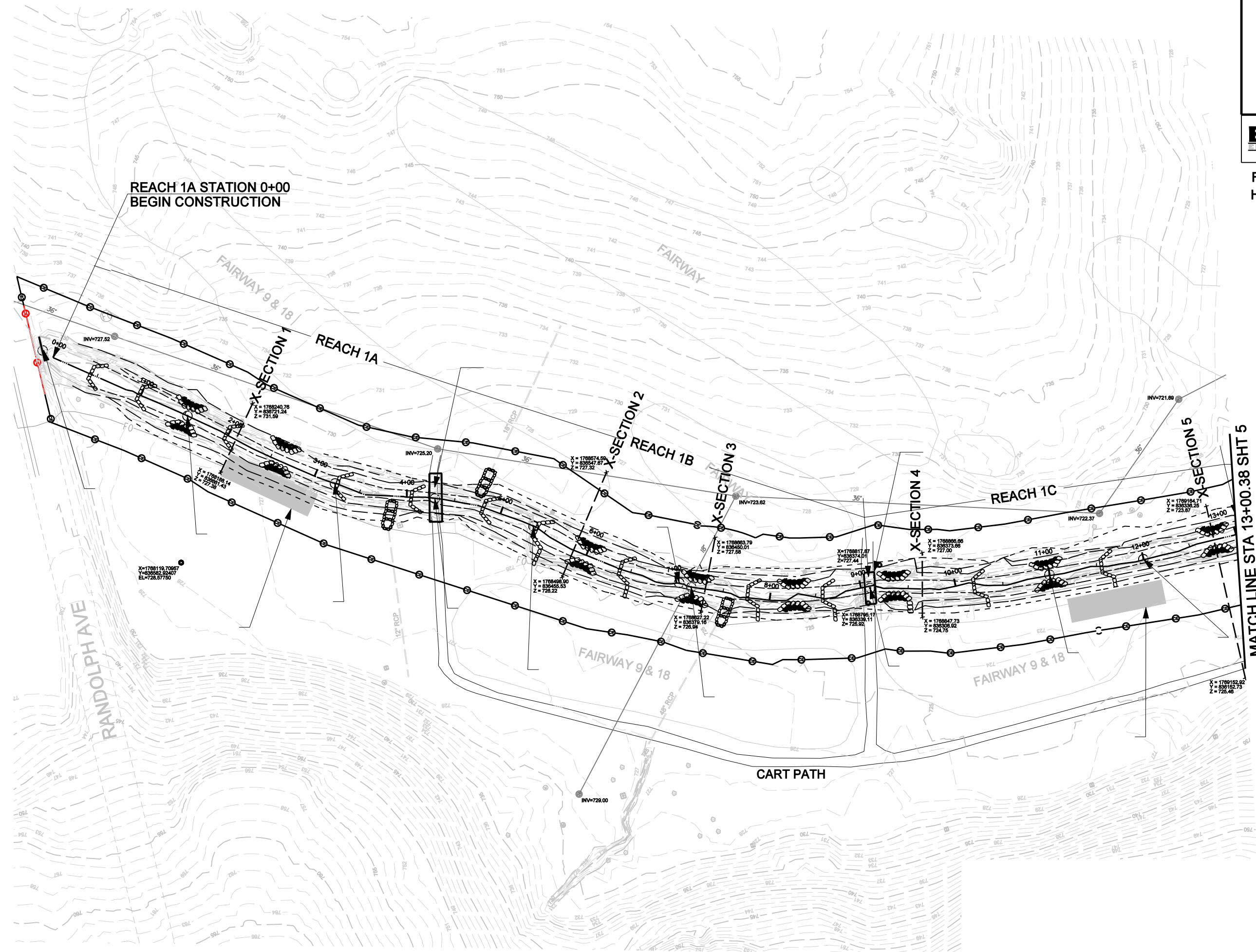
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FULL SIZE SCALE: 1"= 50'
HALF SIZE SCALE: 1"= 100'

REVISIONS



REACH 1A STATION 0+00
BEGIN CONSTRUCTION

MATCH LINE STA 13+00.38 SHT 5

X = 1789152.52
Y = 839152.73
Z = 725.46

X = 1789184.71
Y = 839335.25
Z = 723.87

X = 1789965.80
Y = 839373.99
Z = 727.00

X = 1788817.87
Y = 839374.09
Z = 727.44

X = 1788795.17
Y = 839359.11
Z = 725.92

X = 1789495.90
Y = 839455.93
Z = 726.22

X = 1788574.59
Y = 839547.87
Z = 727.32

X = 1789181.14
Y = 839517.43
Z = 727.26

X = 1789116.70957
Y = 839582.92407
Elev = 726.57760

RANDOLPHAVE

FAIRWAY

FAIRWAY 9 & 18

FAIRWAY 9 & 18

FAIRWAY 9 & 18

CART PATH

REACH 1A

REACH 1B

REACH 1C

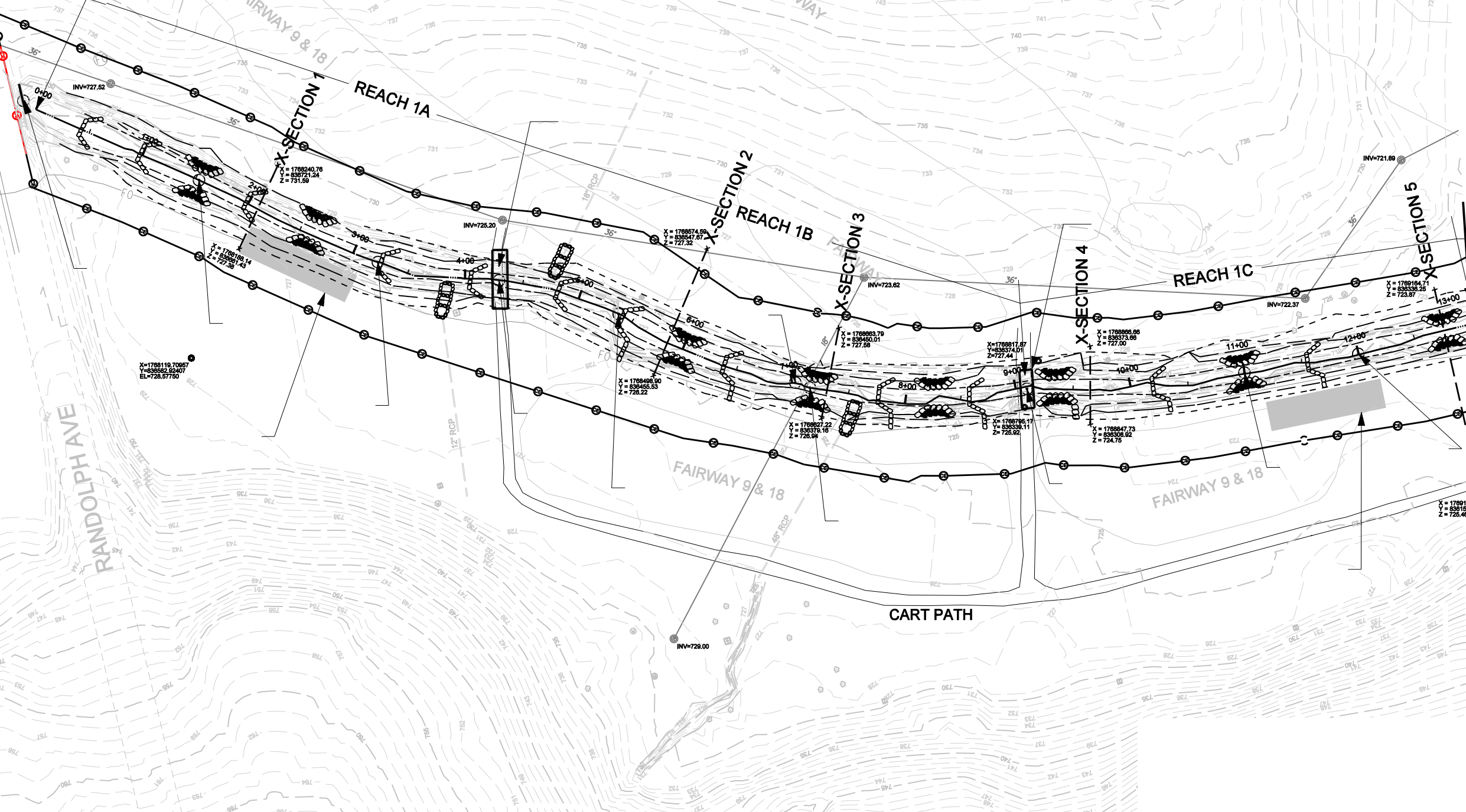
X-SECTION 1

X-SECTION 2

X-SECTION 3

X-SECTION 4

X-SECTION 5



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