063

PROJECT: 000532601

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	000532601	1	9

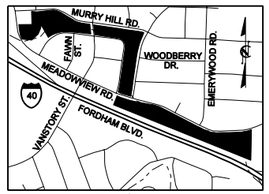
STATE OF NORTH CAROLINA
WETLANDS RESTORATION PROGRAM

GUILFORD COUNTY

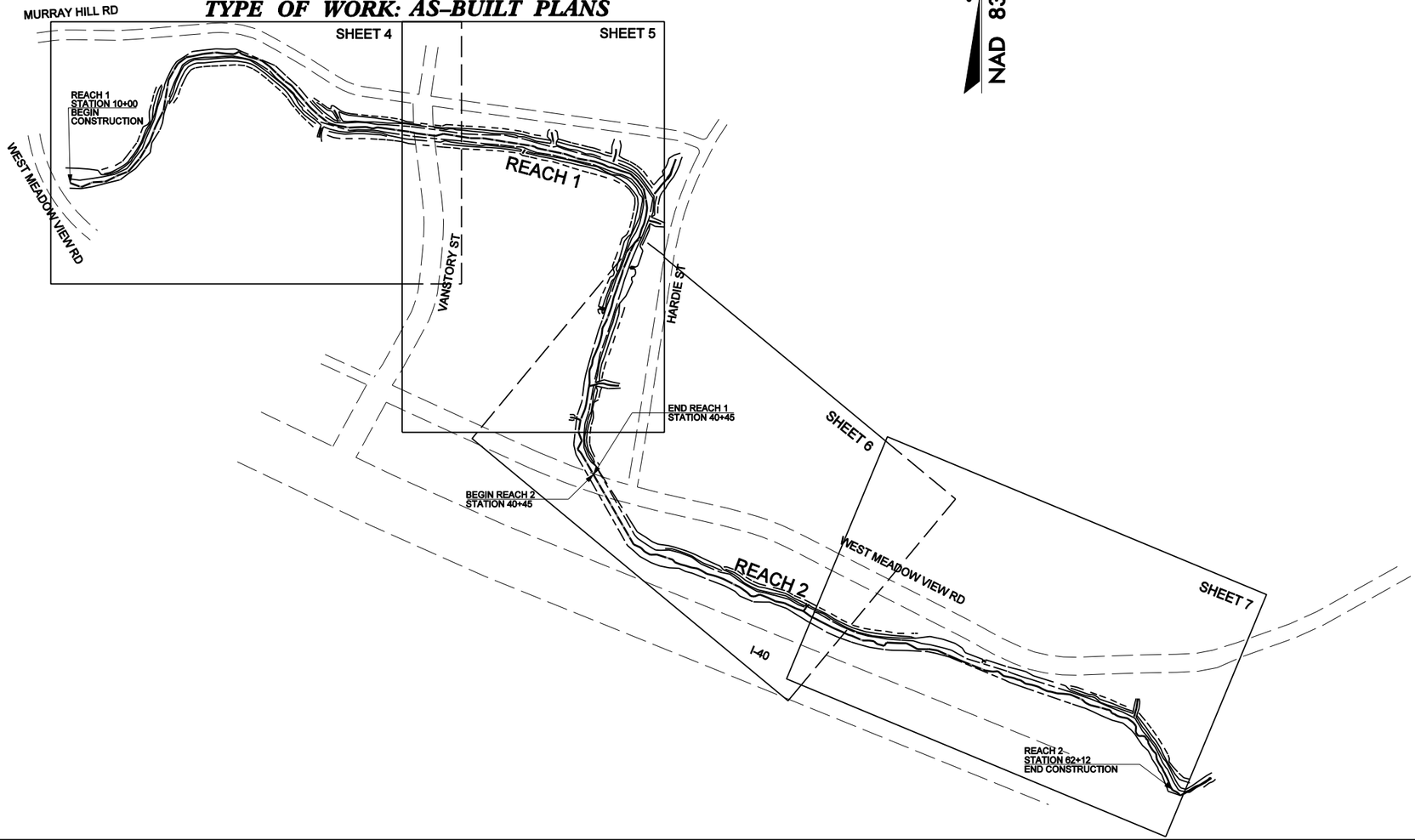
LOCATION: HILLSDALE PARK
SOUTH BUFFALO CREEK
GREENSBORO, NORTH CAROLINA

TYPE OF WORK: AS–BUILT PLANS

VICINITY MAP



INSET



NAD 83

INDEX OF SHEETS:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

	REACH 1	REACH 2
DESIGN STREAM TYPE(FT)	E4	B4c
DESIGN REACH LENGTH(FT)	3037	2265
BANKFULL XSEC AREA(FT^2)	103–113	166
BANKFULL WIDTH(FT)	36–44	66
BANKFULL DEPTH(FT)	2.6–2.9	2.5
W/D RATIO(FT)	12–17	26.4

PROJECT LENGTH

EXISTING STREAM LENGTH = 5434 FEET
PROPOSED DESIGN STREAM LENGTH = 5434 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
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P.E.
SIGNATURE:

STREAM CONVENTIONAL SYMBOLS

TOP OF BANK (EXISTING)

THALWEG (EXISTING)

MINOR CONTOUR LINE

MAJOR CONTOUR LINE

CENTERLINE /THALWEG (PROPOSED)

CONSERVATION EASEMENT

SAFETY FENCE

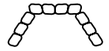
SILT FENCE

J-Hook

Double Wing Deflector

Silt Check

Step Pool



Cross Vane

Root Wad

Temporary Ford Stream Crossing

PROJECT REFERENCE NO.	SHEET NO.
0005326.01	1-A

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8000 REGENCY PARKWAY
SUITE 200
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
0005326O1	1-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

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

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 (CA)
- Prop. Control of Access Line (CA)
- 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 (FLOW)

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 (T)
- U/G Telephone Cable Hand Hold (HH)
- Cable TV Pedestal (C)
- U/G TV Cable Hand Hold (HH)
- U/G Power Cable Hand Hold (HH)
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole (P)
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole (W)
- Light Pole
- H–Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole (T)
- Power Transformer
- Sanitary Sewer Manhole (S)
- Storm Sewer Manhole (S)
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box (S)
- Fiber Optic Splice Box (F)
- 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
- U/G Test Hole (S.U.E.*) (ATTUR)
- Abandoned According to U/G Record
- 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 (EIP)
- Property Corner
- Property Monument (ECM)
- Property Number (123)
- Parcel Number (6)
- Fence Line
- Existing Wetland Boundaries (WW & ISBW)
- High Quality Wetland Boundary (HQ WLB)
- Medium Quality Wetland Boundaries (MQ WLB)
- Low Quality Wetland Boundaries (LQ WLB)
- Proposed Wetland Boundaries (WLB)
- Existing Endangered Animal Boundaries (EAB)
- Existing Endangered Plant Boundaries (EPB)

BUILDINGS & OTHER CULTURE

- Buildings
- Foundations
- Area Outline
- Gate
- Gas Pump Vent or U/G Tank Cap
- Church
- School
- Park
- Cemetery
- Dam
- Sign (S)
- Well (W)
- 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 (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)

revised 02/02/00

PROJECT REFERENCE NO.	SHEET NO.
000532601	2

PROJECT ENGINEER

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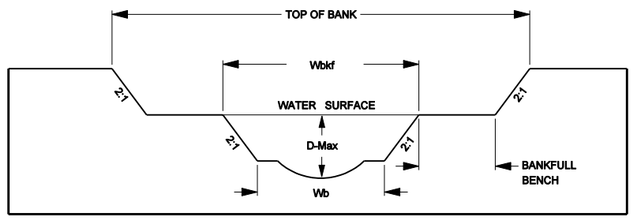
8000 REGENCY PARKWAY
SUITE 200
CARY, NC 27511
919-463-5488

REVISIONS

TYPICAL RIFFLE, POOL AND BANKFULL BENCH FOR HILLSDALE PARK

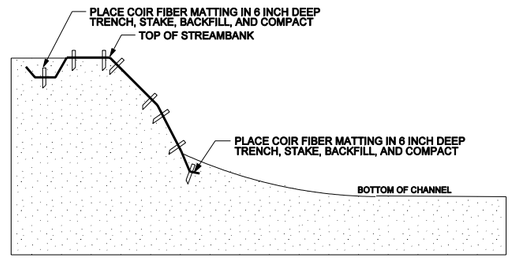
RIFFLE & POOL WITH BANKFULL BENCH (REACH 1)



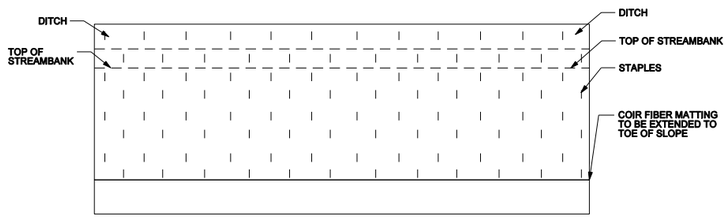
	REACH 1 & 2 RIFFLE	REACH 1 & 2 POOL
WIDTH OF BANKFULL (Wbkf) - FT	40	40
AVERAGE DEPTH - FT	4	4
MAXIMUM DEPTH (D-max) - FT	4	6
WIDTH TO DEPTH RATIO (bkfl W/D) - FT	10	10
BANKFULL AREA (Abkf) - FT ^{2}	160	160
BOTTOM WIDTH (Wb) - FT	20.8	16
BENCH WIDTH - FT	8-12	8-12

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 COINCINDENT WITH THE CENTER LINE.

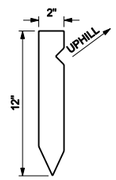
EROSION CONTROL MATTING



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.

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000532601	2-A

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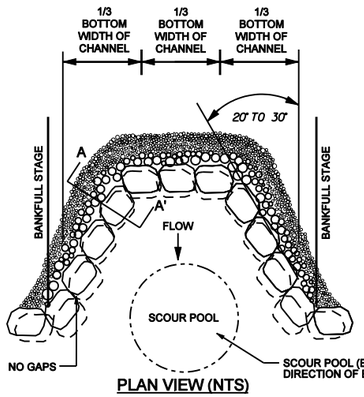
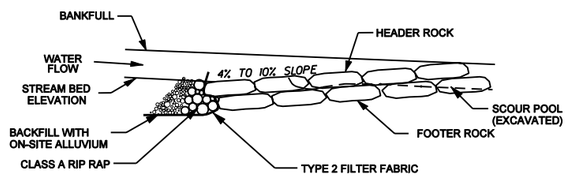
SUITE 200
CARY, NC 27511
919-463-5488

REVISIONS

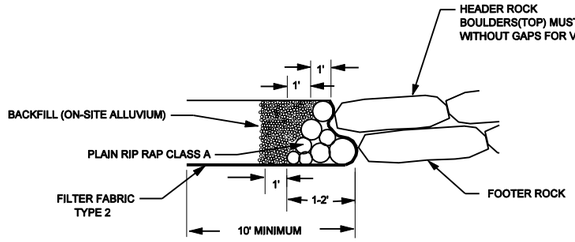
ROCK CROSS VANE



PLAN VIEW (NTS)

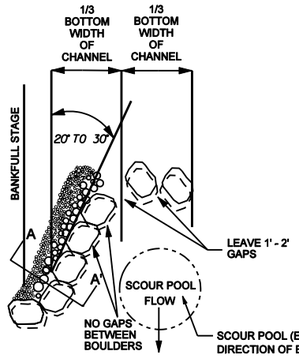


PROFILE VIEW (NTS)

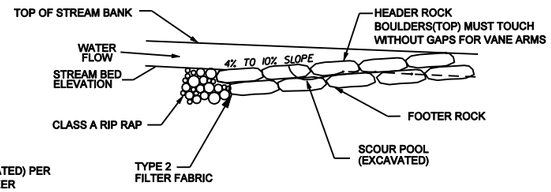


SECTION A-A' (NTS)

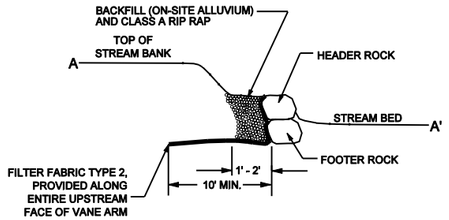
"J" HOOK VANE



PLAN VIEW (NTS)



PROFILE VIEW (NTS)

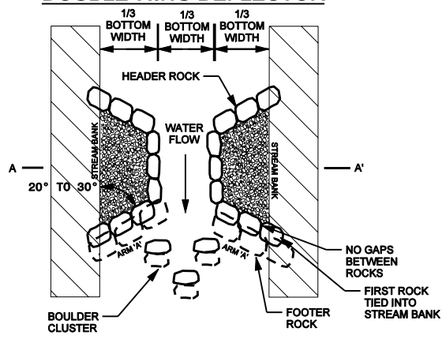


SECTION A - A' (NTS)

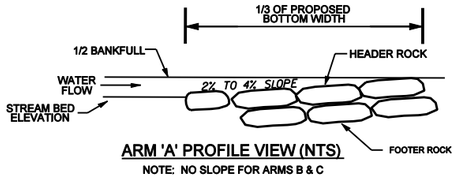
NOTES FOR ALL VANE STRUCTURES:

1. BOULDERS MUST BE AT LEAST 4' x 3' x 2'.
2. 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.
3. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAM BANK.
4. START AT BANKFULL AND PLACE FOOTER ROCKS FIRST AND THEN HEADER ROCKS.
5. CONTINUE WITH STRUCTURE, FOLLOWING ANGLE AND SLOPE SPECIFICATIONS.
6. AN EXTRA BOULDER CAN BE PLACED IN SCOUR POOL FOR HABITAT IMPROVEMENT.
7. USE CLASS A RIP RAP TO FILL GAPS ON UPSTREAM SIDE OF BOULDERS.
8. 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.

DOUBLE WING DEFLECTOR



PLAN VIEW (NTS)

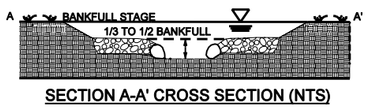


ARM 'A' PROFILE VIEW (NTS)

NOTE: NO SLOPE FOR ARMS B & C

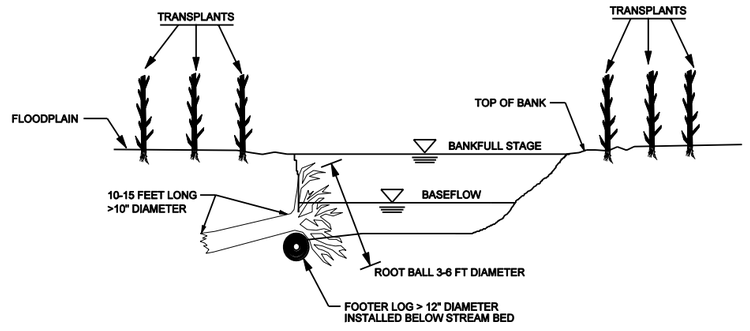
NOTE:
1. BOULDERS MUST BE AT LEAST 4' X 3' X 2'.

2. 6' X 4'X 3' BOULDERS ARE PREFERRED.

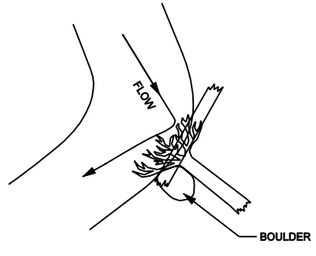


SECTION A-A' CROSS SECTION (NTS)

ROOT WADS



CROSS SECTION (NTS)



PLAN (NTS)

NOTES:

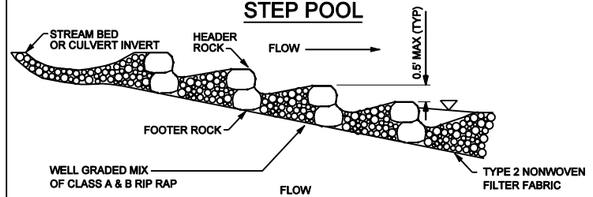
DRIVE POINT METHOD:

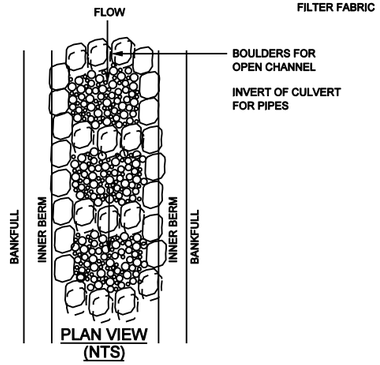
SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS UPSTREAM SO THAT THE STREAM FLOW MEETS THE ROOT WAD AT A 90-DEGREE ANGLE, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT OR BOULDER SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY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

TRENCHING METHOD:

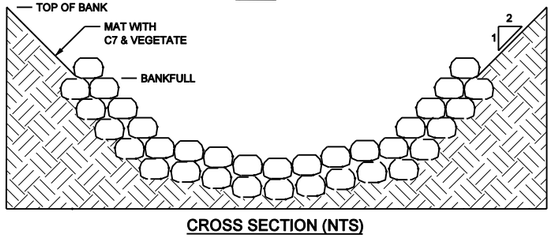
IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

STEP POOL





PLAN VIEW (NTS)



CROSS SECTION (NTS)

PROJECT REFERENCE NO.	SHEET NO.
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PROJECT ENGINEER

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919-463-5488

NAD 83

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

REVISIONS

MURRAY HILL RD

WEST MEADOW VIEW RD

PARK BOUNDARY

X-SECTION 3

X-SECTION 2

X-SECTION 1

X-SECTION 4

PP #1
X= 1752966.72
Y=835987.15
Z=756.45

PP #2

PP #3
X=1753201.36
Y=836703.78
Z=760.98

PP #4
INV=747.22

PP #5
INV=753.91

PP #6
X=1753243.50
Y=836970.76
Z=758.96

X=1753324.75
Y=836943.61
Z=760.83

X=1753399.71
Y=836919.89
Z=760.08

X=1753384.27
Y=836904.58
Z=756.42

INV=757.20

INV=756.28

PP #8

PP #9

INV=756.93

X=1753757.60
Y=836946.24
Z=756.93

PP #10
X=1753989.33
Y=836863.04
Z=761.54

PP #11

PP #12

PP #13

PP #14

INV=755.22

INV=752.57

INV= 747.34

INV= 754.10

INV=754.18

REACH 1 STATION 10+00
BEGIN CONSTRUCTION

VEG PLOT #1
25' X 100'

BEDROCK

SIPHON

42"

10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00

EMERALD DR

FAWN ST

VANSTORY ST

3 - 13'(W) X 11'(H) X RCBC

X= 1754033.631
Y= 836860.72
Z= 763.96

X= 1754093.19
Y= 836859.25
Z=762.42

MATCH LINE STA 24+75 SHT 5

PHOTO POINT - ⊙ PP#

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SUITE 200
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HALF SIZE SCALE: 1" = 100'

REVISIONS

HARDIE ST
CRESTRIDGE RD
MURRAY HILL RD
WOODBURY ST
WEST MEADOW VIEW RD
TENNIS COURT
PARK BOUNDARY
DO NOT DISTURB MANHOLE
X-SECTION 8
X-SECTION 7
X-SECTION 6
X-SECTION 5
PP #15
PP #16
PP #17
PP #18
PP #19
PP #20
PP #21
PP #22
PP #23
PP #24
PP #25
PP #26
PP #27
VEG PLOT #2
25' X 100'
INV=750.62
INV=750.00
INV=749.74
INV=749.74
INV=743.00
INV=748.84
INV=748.59
INV=753.53
INV=753.22
INV=755.80
4 - 12'(W) X 10'(H) RCBC
END REACH 1
STATION 40+45
MATCH LINE STA 40+45 SHT 6
MATCH LINE STA 24+75 SHT 4
NAD 83
PHOTO POINT - ⊙ PP#

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KEVIN L. TWEEDY
027337
JULY 28, 2005

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A CERTIFIED DOCUMENT

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

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

REVISIONS

NAD 83

MATCH LINE STA 52+00 SHT 7

MATCH LINE STA 40+45 SHT 5

BEGIN REACH 2
STATION 40+45

WEST MEADOW VIEW RD

PARK BOUNDARY

WALKING PATH

4 - 12'(W) X 10'(H) X RCBC

INV=748.18

INV=746.95

BEDROCK

PP #28

PP #29

PP #30

PP #31

PP #32

PP #33

PP #34

PP #35

PP #36

X-SECTION 9

X-SECTION 10

X=1754875.46
Y=834577.45
Z=753.72

X=1754957.20
Y=834627.12
Z=752.98

X=1754928.28
Y=834447.82
Z=751.07

X=1754639.22
Y=834467.03
Z=750.72

40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00

I-40

PHOTO POINT - ⊙ PP #

PROJECT REFERENCE NO.	SHEET NO.
000532601	7

PROJECT ENGINEER

THIS DOCUMENT
ORIGINALLY ISSUED AND
SEALED BY:

WILLIAM KENT
L-3708
DECEMBER 20, 2005

THIS MEDIA SHALL NOT BE CONSIDERED
A CERTIFIED DOCUMENT

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

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

REVISIONS

EMERYWOOD RD

WEST MEADOW VIEW RD

WALKING PATH

REACH 3

NAD 83

MATCH LINE STA 52+00 SHT 6

X-SECTION 11

X-SECTION 12

X=1755873.72
Y=834204.38
Z=751.36

X=1755828.83
Y=834214.33
Z=751.15

X=1755828.83
Y=1755812.22
Z=747.82

X=1755855.79
Y=834138.91
Z=750.40

INV=745.78
INV=745.85
INV=745.85
INV=740.40
SIPHON
INV=745.04
INV=741.00
SIPHON
INV=745.07
INV=744.87
INV=744.41
INV=744.63
INV=738.80
SIPHON
INV=744.28
INV=744.05

BEDROCK

PARK BOUNDARY

PARK BOUNDARY

PP #37
PP #38
PP #39
PP #40
PP #41
PP #42
PP #43
PP #44
PP #45
PP #46

REACH 2 STATION 62+12
END CONSTRUCTION

I-40

PHOTO POINT - ⊙ PP#