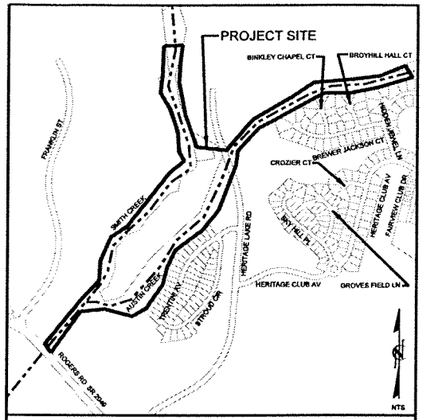
SMITH & AUSTIN

PROJECT: 010510501




VICINITY MAP

## INDEX OF SHEETS


| | |
|---|---|
| 1 | TITLE SHEET |
| 2 | TYPICAL SECTIONS |
| 2A-2B | DETAIL SHEETS |
| 3-7 | PLAN SHEETS |

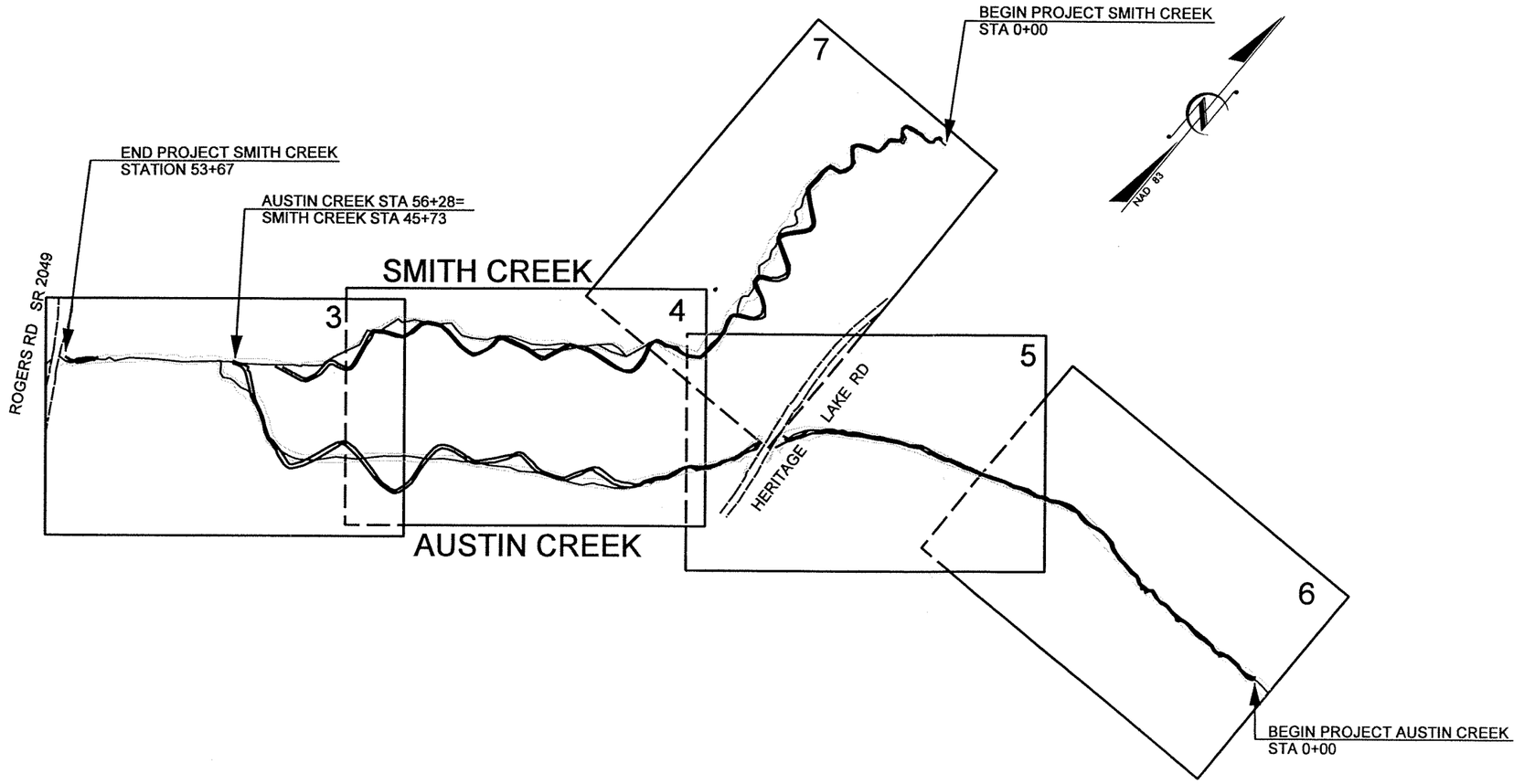

WETLANDS RESTORATION PROGRAM
DIVISION OF WATER QUALITY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| NC | 010510501 | 1 | 9 |

# SMITH AND AUSTIN CREEKS

***LOCATION: WAKE COUNTY***
***NORTH OF FORESTVILLE ROAD***

***TYPE OF WORK: AS-BUILT SURVEY***




***GRAPHIC SCALE***

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

***LEGEND***

| | |
|---|---|
| ROOT WAD | CONSERVATION ESMT |
| CROSS VANE | AS-BUILT CONTOUR (MAJOR) |
| W-WEIR | AS-BUILT CONTOUR (MINOR) |
| J-HOOK | OLD CHANNEL |
| ROCK VANE | SANITARY SEWER LINE |
| DOUBLE WING DEFLECTOR | SANITARY SEWER MANHOLE |
| SINGLE WING DEFLECTOR | POWER LINE |
| FIRE HYDRANT | POWER POLE |
| BENCHMARK | CONSTRUCTED RIFFLE |

***PROJECT LENGTH***

EXISTING STREAM LENGTH = 10276 FEET
PROPOSED DESIGN STREAM LENGTH = 10985 FEET

***CONTACT:*** JEFF JUREK
*PROJECT MANAGER*


*Prepared in the Office of:*
BUCK ENGINEERING
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Cary, NC 27511
Phone: 919-463-5488
Fax: 919-463-5490

WILL HARMAN, PG
*PROJECT MANAGER*

JIM BUCK, PE
*PROJECT ENGINEER*


***PROJECT ENGINEER***

*P.E.*
*SIGNATURE:*

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 010510501 | 2 |

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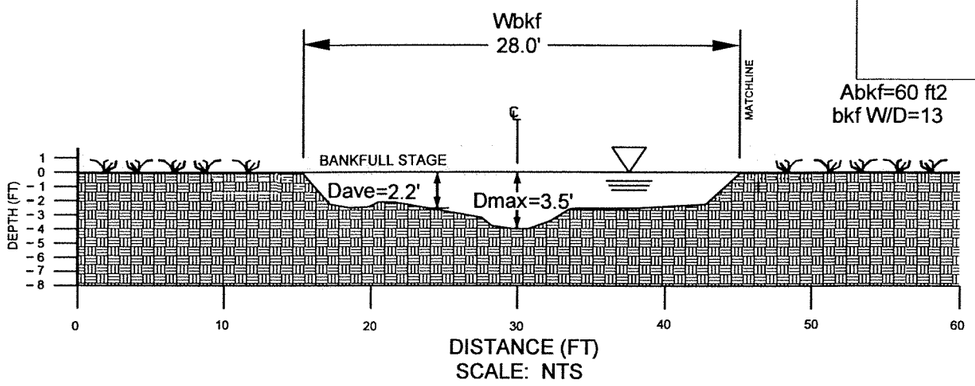
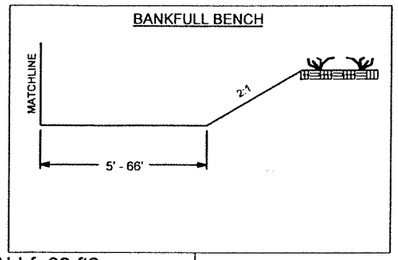
# TYPICAL CROSS SECTIONS FOR SMITH CREEK

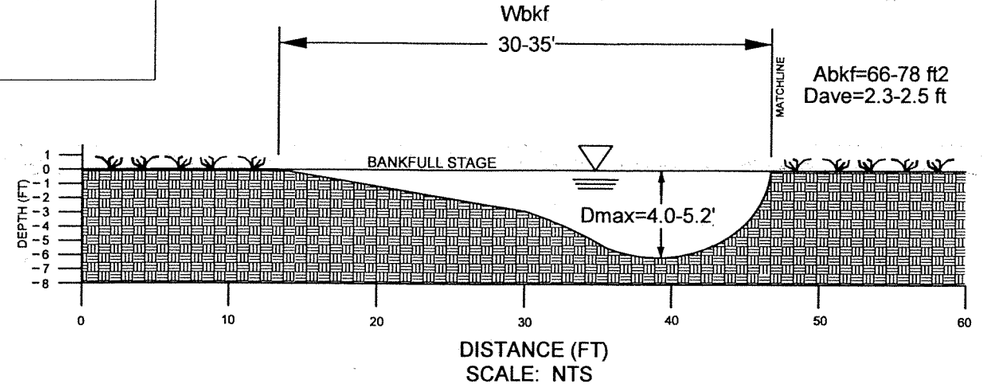
## TYPICAL SECTION - RIFFLE



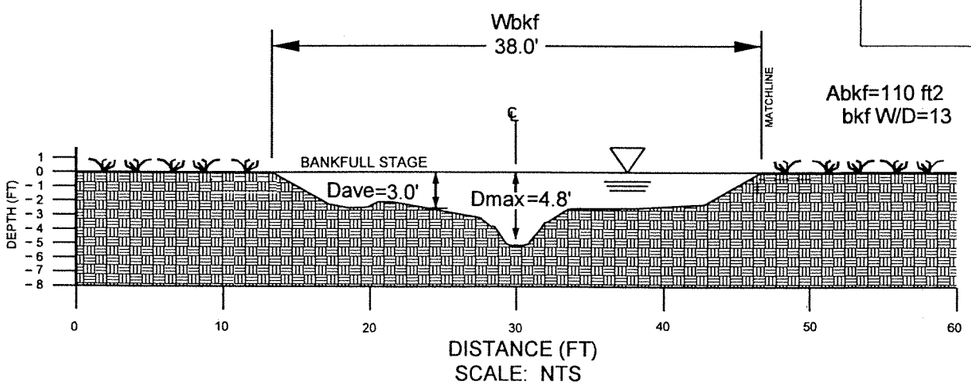

Abkf=60 ft2
bkf W/D=13

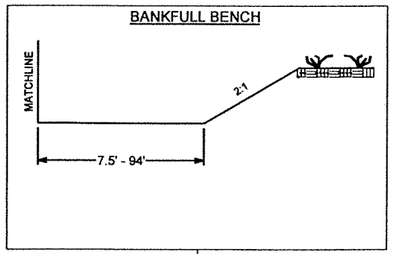
## TYPICAL SECTION - POOL




# TYPICAL CROSS SECTIONS FOR AUSTIN CREEK

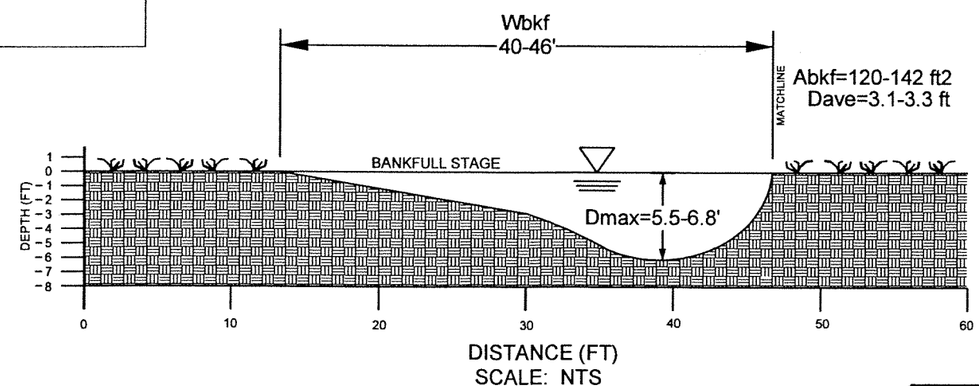
## TYPICAL SECTION - RIFFLE




Abkf=110 ft2
bkf W/D=13

## TYPICAL SECTION - POOL




***TYPICALS***

0 NTS
SCALE (FT)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 010510501 | 2-A |

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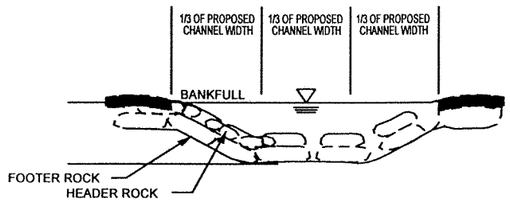
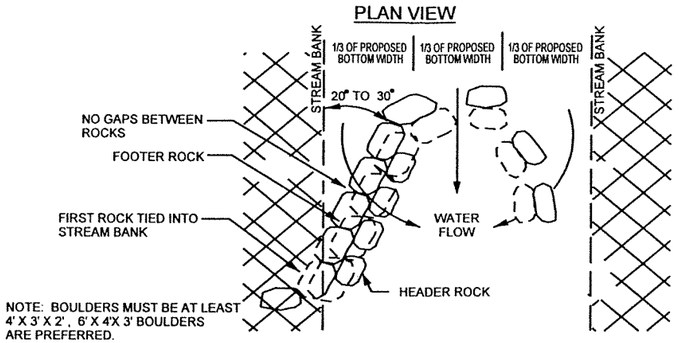
## "J" HOOK VANE

### CROSS SECTION




### PLAN VIEW



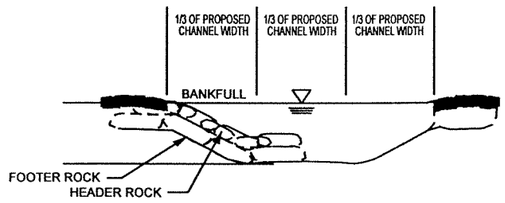

NOTE: BOULDERS MUST BE AT LEAST 4' X 3' X 2', 6' X 4'X 3' BOULDERS ARE PREFERRED.

### NOTES FOR ALL VANE STRUCTURES

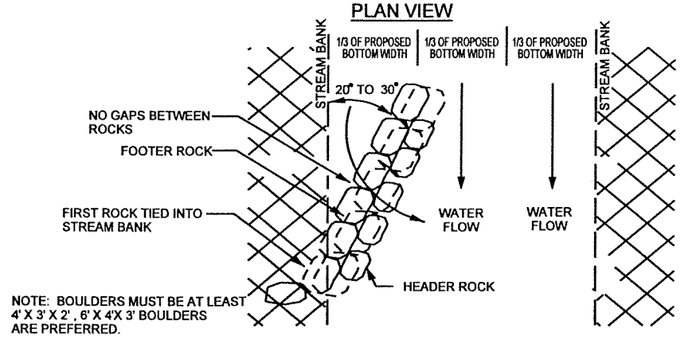
1. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAM BANK.
2. START AT BANKFULL AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
3. CONTINUE WITH STRUCTURE, FOLLOWING ANGLE AND SLOPE SPECIFICATIONS.
4. BOULDERS (TOP) MUST TOUCH WITHOUT GAPS.
5. AN EXTRA BOULDER CAN BE PLACED IN SCOUR POOL FOR HABITAT IMPROVEMENT.

## ROCK VANE

### CROSS SECTION

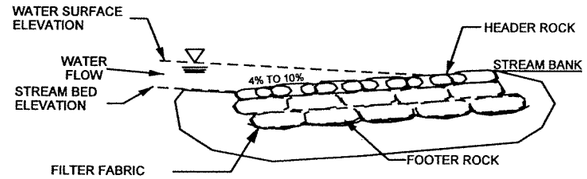



### PLAN VIEW



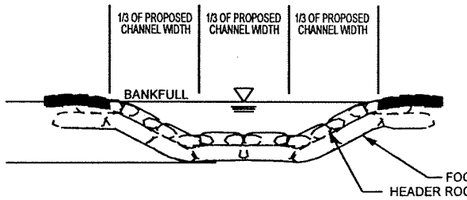

NOTE: BOULDERS MUST BE AT LEAST 4' X 3' X 2', 6' X 4'X 3' BOULDERS ARE PREFERRED.

### PROFILE VIEW FOR ROCK, AND "J" HOOK VANES

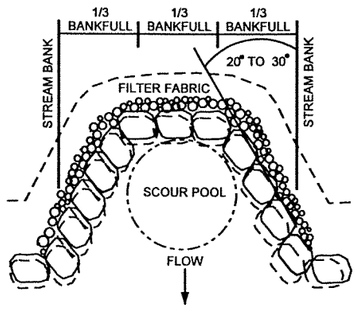



## CROSS VANE

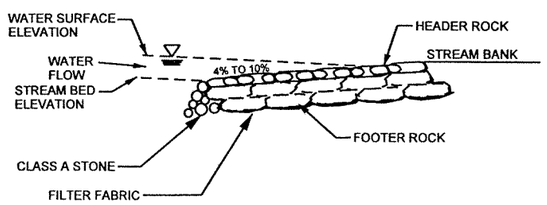
### CROSS SECTION



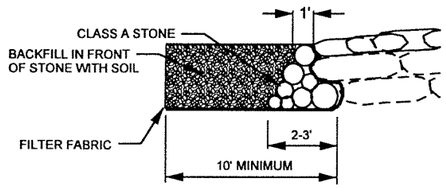

### PLAN VIEW




### PROFILE VIEW



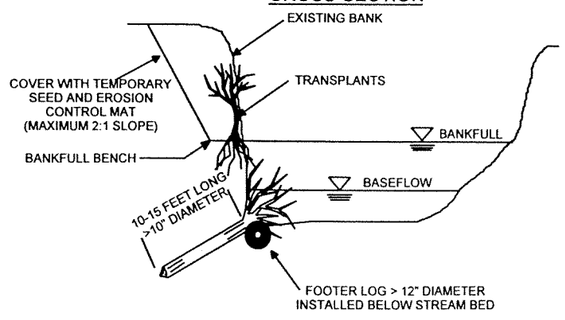

### PROFILE CUT VIEW



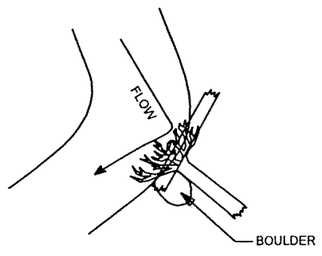

## ROOT WADS

### DRIVE - POINT METHOD

#### CROSS-SECTION

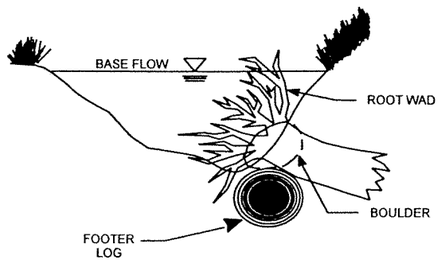



### PLAN




### TRENCHING METHOD

#### CROSS SECTION




### NOTES:

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 48" X 36" X 24". 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 CAN BE INSTALLED UNDERNEATH THE ROOT WAD. THE FOOTER LOG SHOULD BE PLACED IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. THE ROOT WAD IS PLACED ON TOP OF THE FOOTER. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

***DETAILS***

0 NTS
SCALE (FT)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 010510501 | 2-B |

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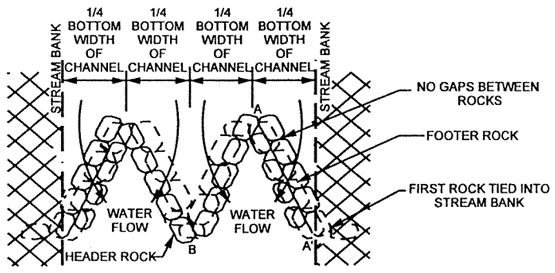
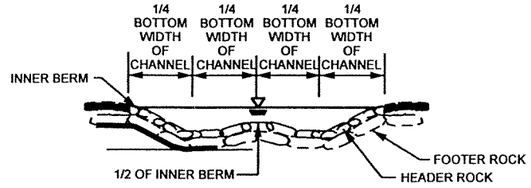
# W-WEIR

## PLAN VIEW

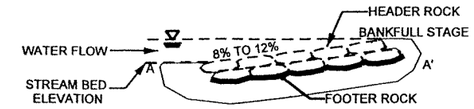



NOTE: BOULDERS MUST BE AT LEAST 6' X 4' X 3'.

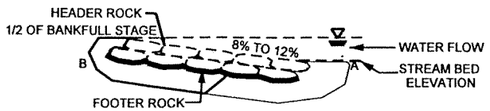
## CROSS SECTION




## PROFILE A - A'

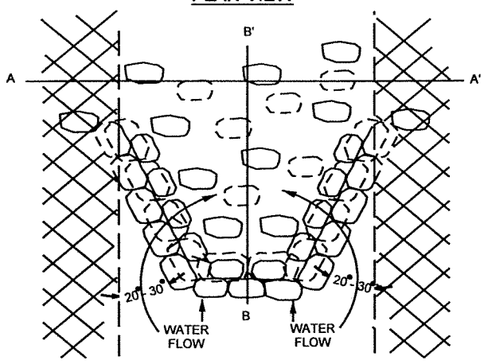



## PROFILE B - A

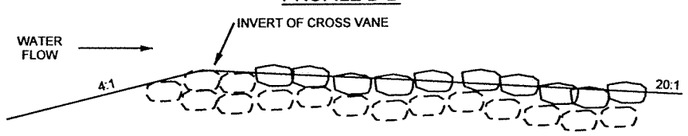



# CONSTRUCTED RIFFLE DETAIL

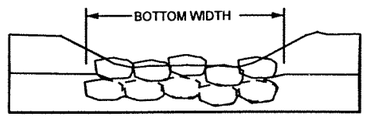
## PLAN VIEW




## PROFILE B-B'




## CROSS SECTION A-A'




EMERGENT BOULDERS

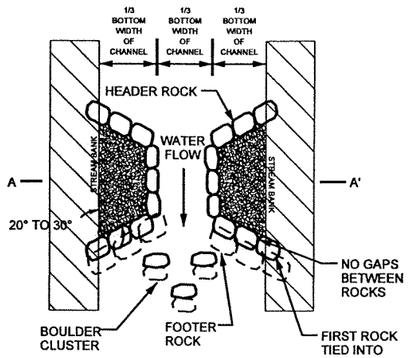
SUBMERGENT BOULDERS

## NOTES:

BOULDER/COBBLE RIFFLE SHOULD BE CONSTRUCTED DOWNSTREAM OF A ROCK CROSS VANE. EMERGENT BOULDERS SHOULD PROTRUDE ABOVE THE BED 3 TO 6 INCHES. SUBMERGENT BOULDERS SHOULD NOT BE ABOVE THE BED SURFACE BUT MAY EQUAL THE BED SURFACE ELEVATION.

# DOUBLE WING DEFLECTOR

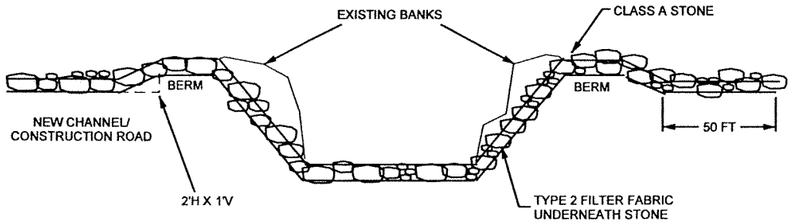
## PLAN VIEW




## CROSS SECTION A - A'


NOTE: BOULDERS MUST BE AT LEAST 4' X 3' X 2'. 6' X 4'X 3' BOULDERS ARE PREFERRED.

# TEMPORARY STREAM CROSSING

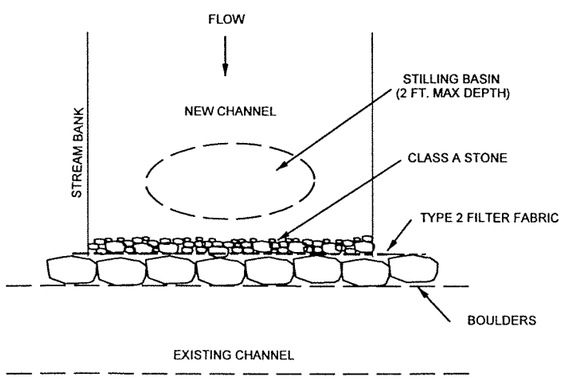



## NOTES:

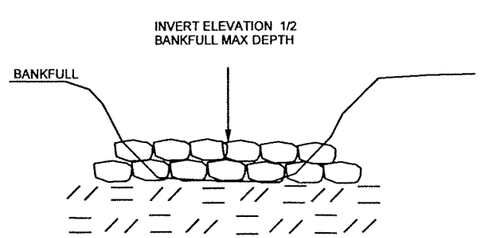
1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. HAVE ALL NECESSARY MATERIALS AND EQUIPMENT ON-SITE BEFORE WORK BEGINS.
3. MINIMIZE CLEARING AND EXCAVATION OF STREAMBANKS. DO NOT EXCAVATE CHANNEL BOTTOM. COMPLETE ONE SIDE BEFORE STARTING ON THE OTHER.
4. INSTALL STREAM CROSSING AT RIGHT ANGLE TO THE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

# SILT CHECK

## PLAN VIEW



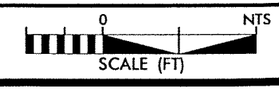

## CROSS SECTION




## NOTES:

THE SILT CHECK SHOULD BE INSTALLED AT THE DOWNSTREAM END OF THE CHANNEL BEING EXCAVATED. ONCE THE WATER IS MOVED INTO THE NEW CHANNEL, THE STILLING BASIN SHOULD BE DIPPED AND THE STRUCTURE REMOVED.

## *DETAILS*



| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 0105105.01 | 3 |

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AUSTIN CREEK STA 56+28 =
SMITH CREEK STA 45+73

END PROJECT SMITH CREEK
STA 53+67

ROGERS RD SR 2049

24" RCP

SMITH CREEK

AUSTIN CREEK

PHOTO POINT 81
PHOTO POINT 82
PHOTO POINT 83
PHOTO POINT 80
PHOTO POINT 79
PHOTO POINT 78
PHOTO POINT 74
PHOTO POINT 75
PHOTO POINT 76
PHOTO POINT 77
PHOTO POINT 34
PHOTO POINT 31
PHOTO POINT 32
PHOTO POINT 33
PHOTO POINT 30A

SR2-X5
X = 2145774.334
Y = 802042.107
Z = 228.154

X = 2145871.2697
Y = 801930.8573
Z= 225.0708

X = 2146019.188
Y = 801724.073
Z=226.158

X = 2146122.545
Y = 801618.579
Z = 225.189

AR3-X6
APPROXIMATE LOCATION OF
AR3 VEGETATION PLOT

X = 2146200.041
Y = 801571.120
Z = 226.727

APPROXIMATE LOCATION
OF MONITORING WELLS

30' GREENWAY AND
UTILITY EASEMENT

STATION 39+47

MATCHLINE SHEET 4

STATION 47+36

*SMITH AND AUSTIN*

50 25 0 50 100
SCALE (FT)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 0105105.01 | 4 |

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STATION 39+47

MATCHLINE SHEET 3

MATCHLINE SHEET 7
STA 20+89

PHOTO POINT 71
PHOTO POINT 70
SMITH CREEK
PHOTO POINT 67
PHOTO POINT 60
PHOTO POINT 59
PHOTO POINT 65
PHOTO POINT 64
PHOTO POINT 73
PHOTO POINT 72
PHOTO POINT 68
PHOTO POINT 69
PHOTO POINT 66
PHOTO POINT 63
PHOTO POINT 62
PHOTO POINT 61
APPROXIMATE LOCATION OF MONITORING WELL
SR2-X5
SR2-X4
SR2-X3
SR2-X2
SR2-X1
30' GREENWAY AND UTILITY EASEMENT
APPROXIMATE LOCATION OF TOWN OF WAKE FOREST PARKS AND RECREATION SOCCER COMPLEX
APPROXIMATE LOCATION OF TOWN OF WAKE FOREST PARKS AND RECREATION SOCCER COMPLEX
APPROXIMATE LOCATION OF TOWN OF WAKE FOREST PARKS AND RECREATION SOCCER COMPLEX
APPROXIMATE LOCATION OF TOWN OF WAKE FOREST PARKS AND RECREATION SOCCER COMPLEX PARKING LOT

STATION 47+36

MATCHLINE SHEET 5
STA 29+35

PHOTO POINT 28
PHOTO POINT 29
PHOTO POINT 30
PHOTO POINT 27
PHOTO POINT 26
PHOTO POINT 25
PHOTO POINT 24
PHOTO POINT 23
PHOTO POINT 22A
PHOTO POINT 22
PHOTO POINT 21
PHOTO POINT 20
PHOTO POINT 19
AUSTIN CREEK
APPROXIMATE LOCATION OF AR3 LIVE STAKE VEGETATION PLOT
STORMWATER OUTLET AND BMP DESIGNED AND CONSTRUCTED BY OTHERS.
AR3-X5
AR3-X4
AR3-X3
AR3-X2
AR3-X1
AR2-X3
BEDROCK KNICKPOINT DOWNSTREAM END STA 31+48.60

*SMITH AND AUSTIN*

50 25 0 50 100
SCALE (FT)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 0105105.01 | 5 |

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MATCHLINE SHEET 4
STA 29+35

20' GREENWAY AND UTILITY EASEMENT

APPROXIMATE LOCATION OF TOWN OF WAKE FOREST PARKS AND RECREATION SOCCER COMPLEX PARKING LOT

30' GREENWAY AND UTILITY EASEMENT

HERITAGE LAKE RD

APPROXIMATE LOCATION OF HERITAGE WAKE FOREST GOLF COURSE

PHOTO POINT 14

PHOTO POINT 13

PHOTO POINT 12

PHOTO POINT 16

PHOTO POINT 17

PHOTO POINT 15

PHOTO POINT 11

X = 2147339.317
Y = 802772.042
Z = 228.469

X = 2147314.177
Y = 802729.922
Z = 227.520

X = 2147846.403
Y = 803267.868
Z = 230.792

X = 2147872.977
Y = 803209.129
Z = 235.556

X = 2147433.759
Y = 802716.200
Z = 234.495

X = 2147485.140
Y = 802682.361
Z = 232.861

AR1-X4

AR2-X1

AR2-X2

GOLF CART PATH AND BRIDGE

AUSTIN CREEK

HERITAGE WAKE FOREST GOLF COURSE MAINTENANCE FACILITY

APPROXIMATE LOCATION OF HERITAGE WAKE FOREST GOLF COURSE

MATCHLINE SHEET 6
STA 14+40

*SMITH AND AUSTIN*

50 25 0 50 100
SCALE (FT)

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 010510501 | 6 |

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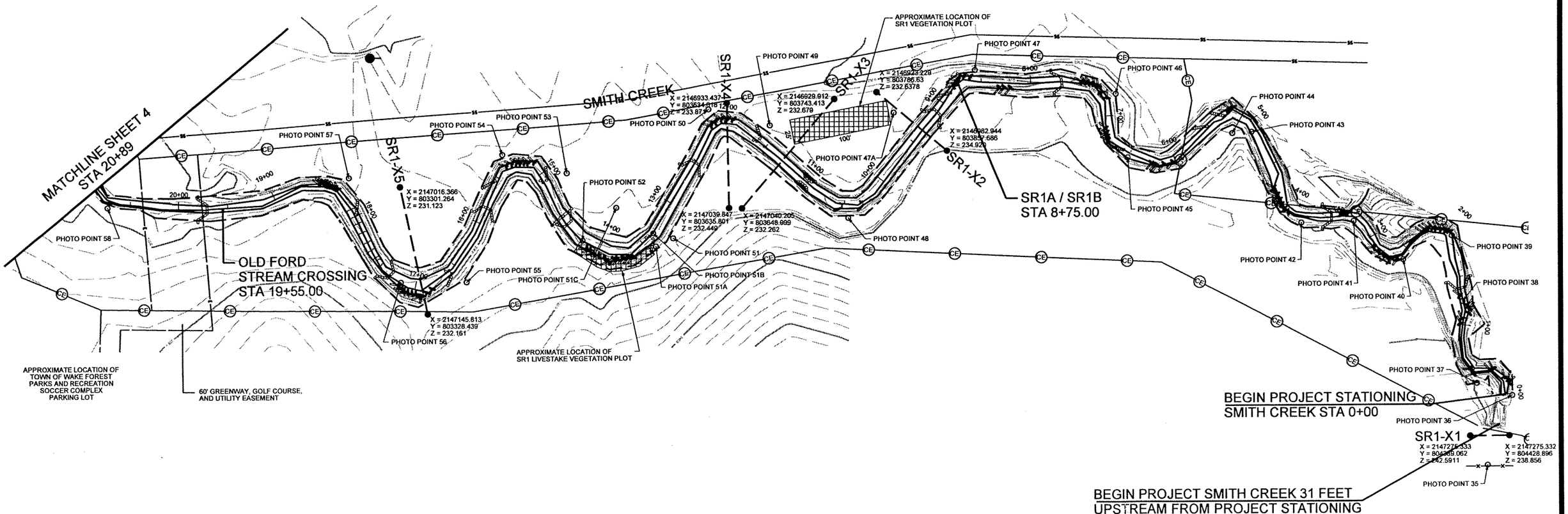


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