STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 21, 2007

U. S. Army Corps of Engineers
Regulatory Field Office
6508 Falls of Neuse Road
Raleigh, NC 27615

ATTN: Mr. Monte Matthews
NCDOT Coordinator

SUBJECT: **Nationwide 23 Permit Application** for the Proposed Rest Station in Wilkes County. Federal Project No. NHS-421(32), WBS Element 36401.1.1, T.I.P. No. K-4703 Division 11.

Dear Mr. Matthews:
Please find enclosed the Categorical Exclusion (CE) for the above referenced project, Natural Resource Technical Report, half-size design plans, permit drawings, and EEP confirmation letter. The NCDOT plans to construct a new rest area/ visitors center in Wilkes County to replace the Watauga rest area bypassed by the construction of the new US 421. Construction will require the extension of three existing culverts and the placement of one new culvert resulting in a total of 716 linear feet of permanent impacts to 4 streams. No wetlands occur on the project.

IMPACTS TO WATERS OF THE UNITED STATES
General Description: The project is located in the Yadkin River basin (HUC 03040101) and will impact unnamed tributaries of Little Cub Creek. Little Cub Creek is assigned a best usage classification of **C**, by the N.C. Division of Water Quality. Little Cub Creek is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River, nor is it listed on the 2004 Final 303(d) list. No designated Outstanding Resource Waters (ORW), High Quality Water (HQW), Water Supply I (WS-I), or Water Supply II (WS-II) or 303(d) streams occur within 1.0 mile of the project area. No streams classified as trout waters by the NC Wildlife Resources Commission will be impacted by the project.

Temporary Impacts: No temporary impacts are expected from the proposed project.

Permanent Impacts: Permanent stream impacts will occur at four sites and are described below.

Site 1: The extension of the existing 48-inch corrugated pipe will result in approximately 196 feet of stream impacts to UT 1. The outlet of the existing pipe is perched and the stream has

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
SUITE 240
RALEIGH, NC 27604

a large scour hole. Therefore, the NCDOT proposes to install a rock cross vane and energy dissipater so the pipe will no longer be perched and to prevent any additional erosion to the stream banks.

Site 2: The construction of the exit ramp will require the placement of an 8-inch corrugated steel pipe that will increase in size to a 36-inch corrugated steel pipe in UT 2, an intermittent stream channel. Stream impacts will total approximately 278 feet.

Site 3: The extension of the existing 60-inch corrugated metal pipe will result in approximately 124 feet of stream impacts to UT 3. NCDOT proposes to install a constructed riffle, cross vane, rock seal, and natural rock energy dissipator to prevent any erosion of the stream banks at the pipe outlet.

Site 4: The extension of the existing 42-inch corrugated metal pipe will result in approximately 118 feet of stream impacts to UT 4. The outlet of the existing pipe is perched and the stream has a large scour hole. Therefore, the NCDOT proposes to install a rock energy dissipator, constructed riffle, cross vane and rock seal so the pipe will no longer be perched and to prevent any additional erosion to the stream banks.

Utility Impacts: No impacts will occur due to utility relocations.

PROJECT SCHEDULE
The project is scheduled to let September 16, 2007 and has a review date of August 7, 2007.

FEDERALLY-PROTECTED SPECIES
Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2007, the Fish and Wildlife Service (FWS) lists one federally protected species for Wilkes County, the bog turtle. No biological conclusion is required for the bog turtle because it is listed as threatened due to similarity of appearance.

AVOIDANCE AND MINIMIZATION:
The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design and include:

- Rock energy dissipaters, constructed riffles, cross vanes and rock seals will be used at two pipe outlets to alleviate the perched outlets and prevent erosion to the stream banks.
- The rest area will be a "Green" building as detailed in the CE.

MITIGATION
Mitigation will be required for 215 feet of impacts at Site 2 at the request of the USACE at a 1:1 ratio for impacts below Station –L2-50+50 (See permit drawing sheet 15 of 15). The USACE will not require mitigation at Site 1, 3, and 4 because the channels are degraded at the pipe outlets and because the NCDOT proposes to place constructed riffles, cross vanes rock seals, and energy dissipaters at the pipe outlets.

REGULATORY APPROVALS

Section 404 Permit: This project has been processed by the Federal Highway Administration as a "Categorical Exclusion." NCDOT is hereby applying for a Clean Water Act Section 404 Nationwide Permit. The NCDOT requests that these activities be authorized by Nationwide Permit 23.

Section 401 Permit: NCDOT is hereby applying for a 401 Water Quality Certification from DWQ. We anticipate 401 General Certification number 3403 will apply to this project. All general conditions of the Water Quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a), we are providing two copies of this application to the NCDWQ for their notification.

We anticipate that comments from WRC will be required prior to authorization by the Army Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests WRC review and that WRC forward their comments to the Corps of Engineers and NCDOT within 30 calendar days of receipt of this application.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Brett Feulner at bmfeulner@dot.state.nc.us or (919) 715-1488.

A copy of this permit application will be posted on the DOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html.

Sincerely,

E. L. Lucas

pcw Gregory J. Thorpe, Ph.D. Environmental Management Director,
Project Development and Environmental Analysis Branch

cc: w/attachment

Mr. John Hennessy, NCDWQ (2 Copies)
Ms. Marla Chambers, NCWRC
Ms. Marella Buncick, USFWS
Mr. Victor Barbour, P.E. Project Services
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Heath Slaughter, Div 11 DEO
Mr. Michael Pettyjohn, P.E. Division 11 Engineer

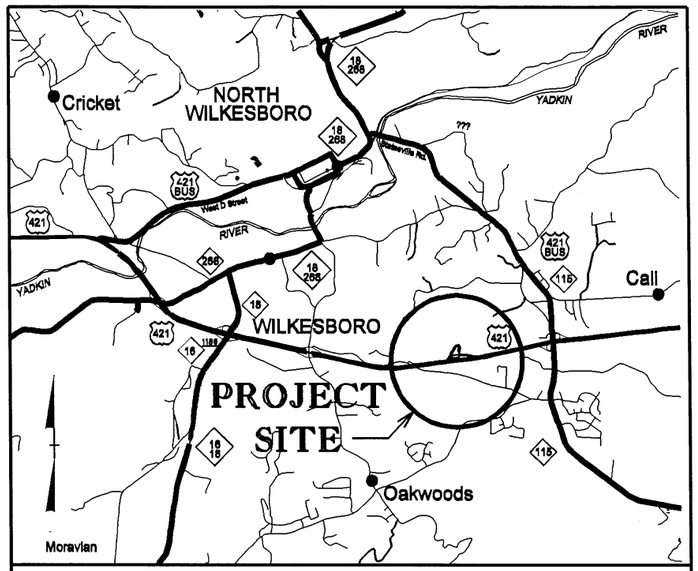
w/o attachment

Mr. Art McMillan, P.E., Highway Design
Mr. Majed Alghandour, P. E., Prog. and TIP
Ms. Beth Harmon, EEP
Mr. Jay Bennett, P.E., Roadway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Ryan White, E.I.T., PDEA
Mr. Todd Jones, NCDOT External Audit Branch

TIP PROJECT: K-4703

CONTRACT: C201679

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

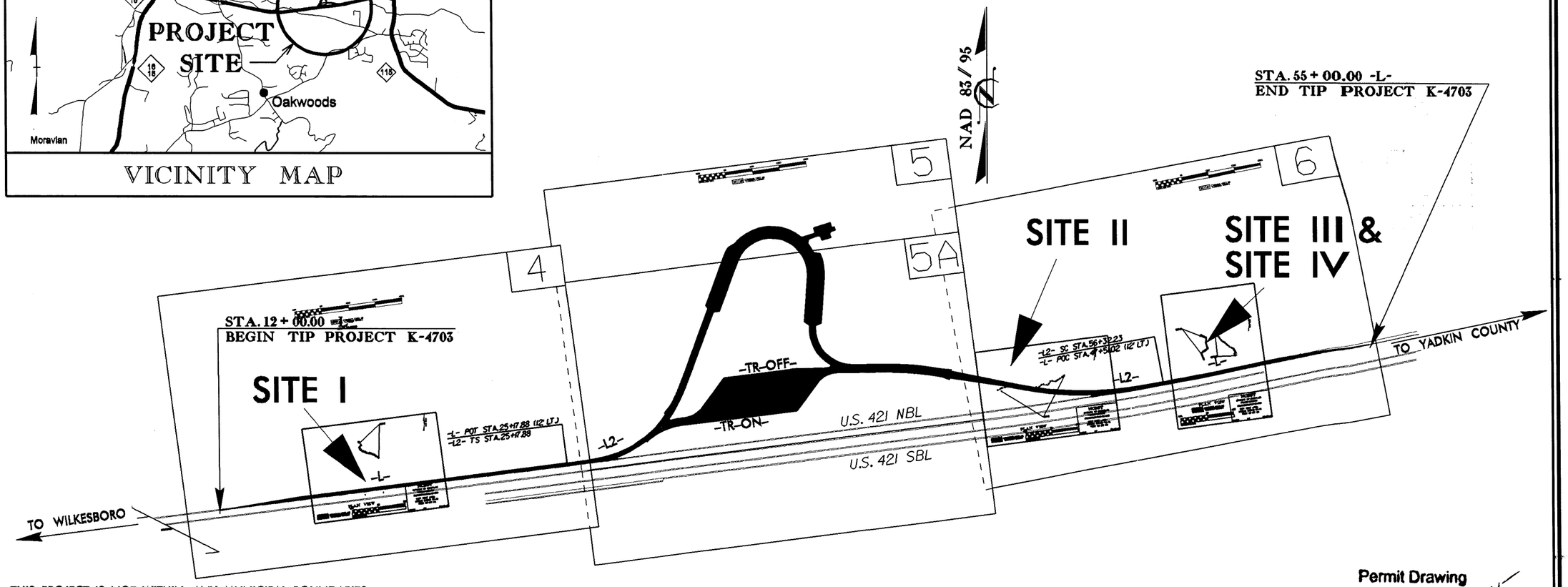
WILKES COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	K-4703	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
36401.1.1	NHS-421(32)	PE	

LOCATION: NEW REST AREA – NORTHBOUND US 421 WEST OF NC 115

TYPE OF WORK: GRADING, PAVING, AND DRAINAGE

WETLAND PERMIT DRAWINGS 01/09/07



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

NOTE: CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____

Permit Drawing
Sheet 1 of 15

GRAPHIC SCALES

50' 25' 0 50' 100'
PLANS

50' 25' 0 50' 100'
PROFILE (HORIZONTAL)

10' 5' 0 10' 20'
PROFILE (VERTICAL)

DESIGN DATA

ADT 2007	=	1000
ADT 2030	=	1500
DHV	=	11 %
D	=	100 %
T	=	32% *
V	=	20MPH
FUNC. CLASS.	=	REST AREA

* TTST 28% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT K-4703 = 0.981 MILES

TOTAL LENGTH OF TIP PROJECT K-4703 = 0.981 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: SEPTEMBER 18, 2007

ROGER D. THOMAS, P.E.
PROJECT ENGINEER

MICHAEL W. LITTLE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

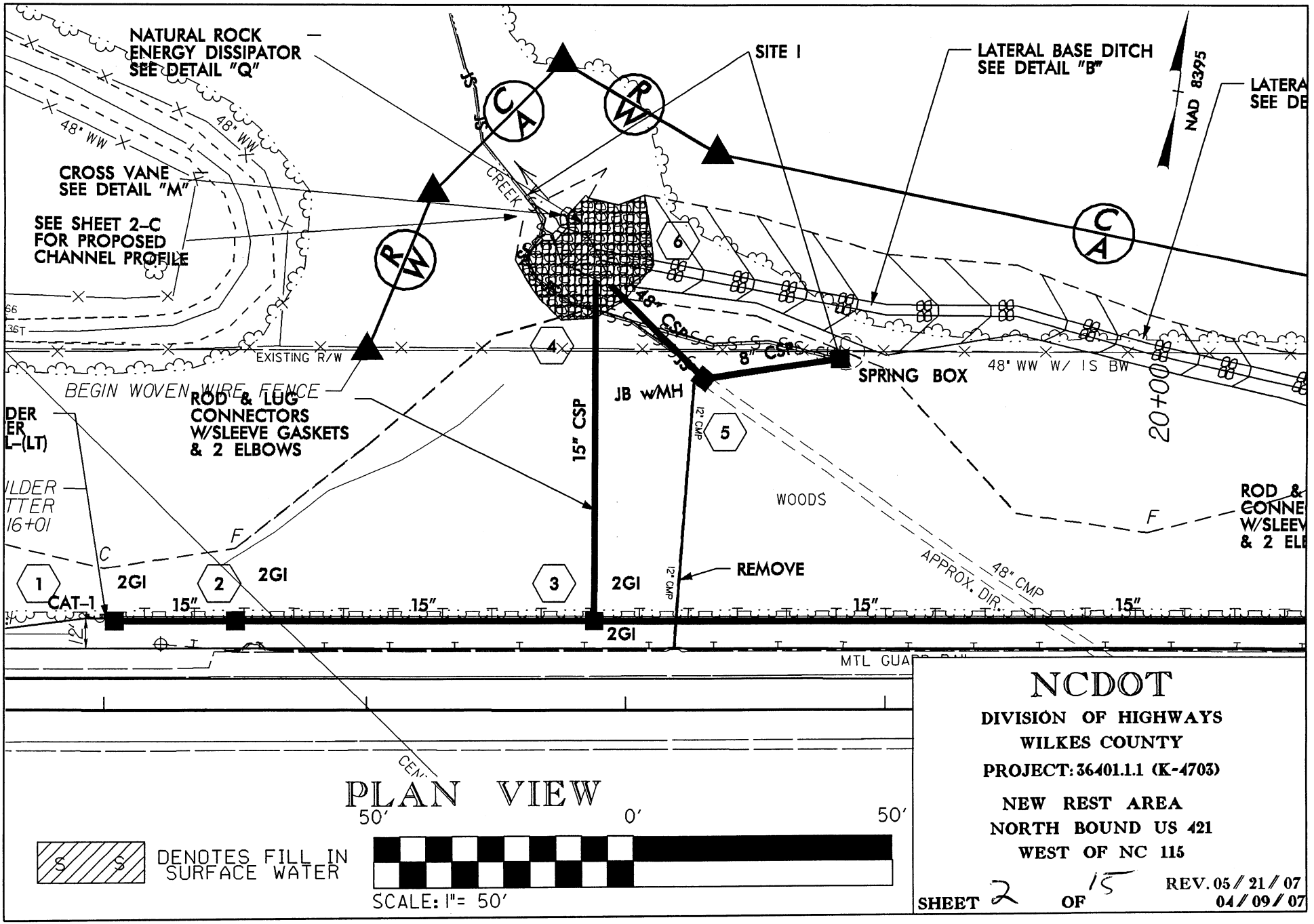
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

09-APR-2007 13:52
r:\hydraulics\permits\copy_k4703_rdy_tsh.dgn
ashepard



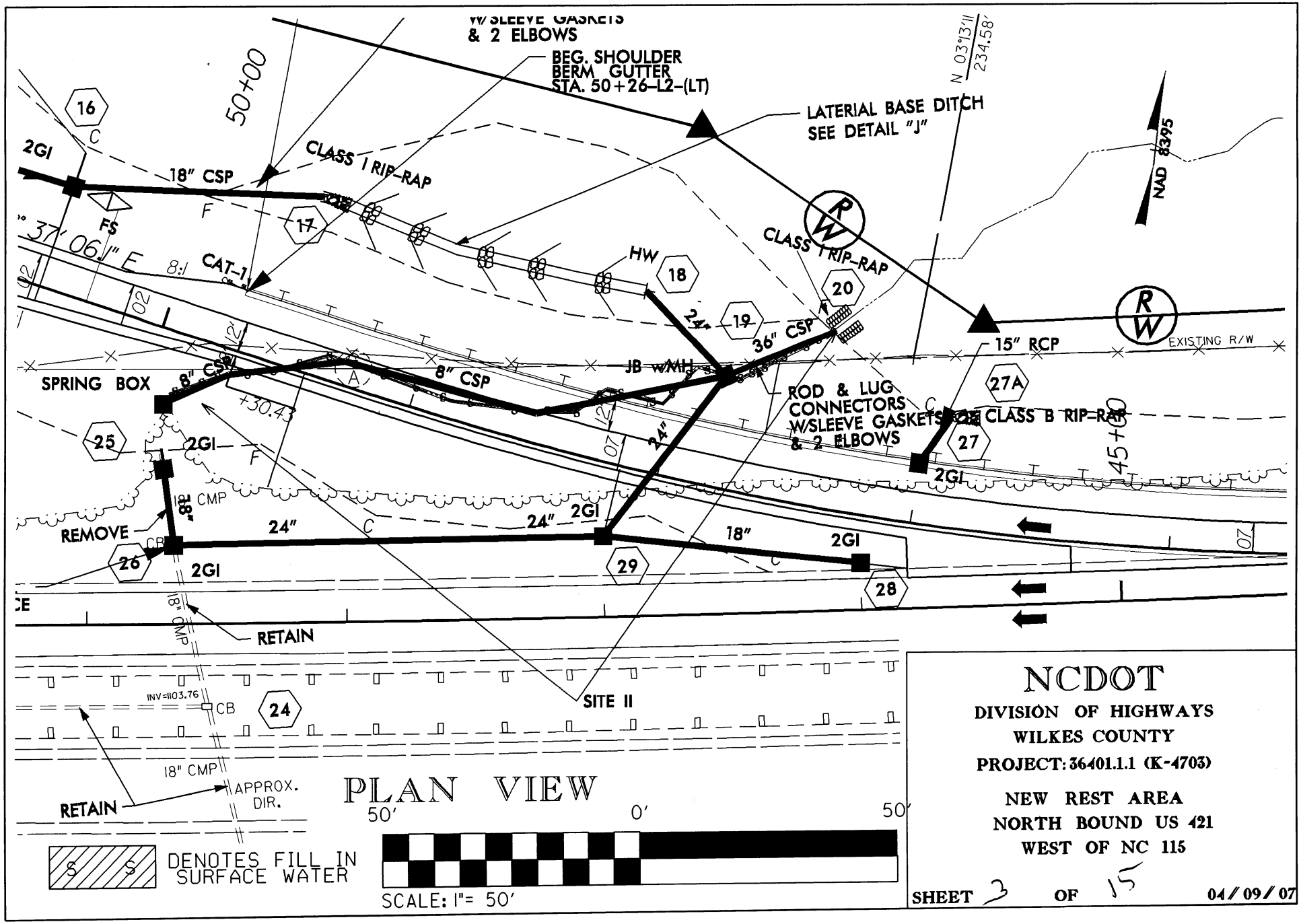
NCDOT

DIVISION OF HIGHWAYS
WILKES COUNTY
PROJECT: 36401.1.1 (K-4703)

NEW REST AREA
NORTH BOUND US 421
WEST OF NC 115

SHEET 2 **OF** 15

REV. 05 / 21 / 07
04 / 09 / 07

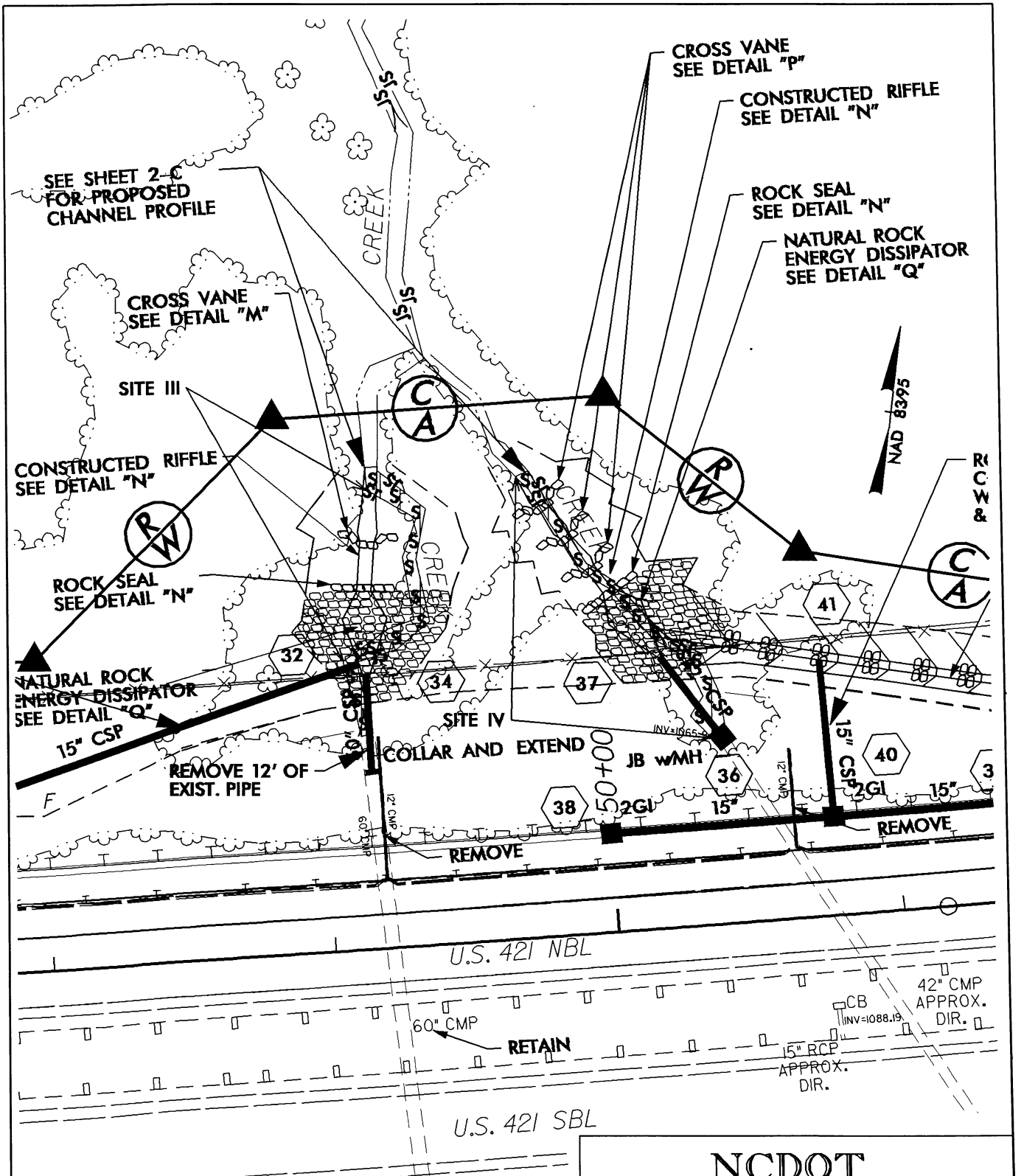


NCDOT

DIVISION OF HIGHWAYS
WILKES COUNTY
PROJECT: 36401.1.1 (K-4703)

NEW REST AREA
NORTH BOUND US 421
WEST OF NC 115

SHEET 3 **OF** 15 **04/09/07**



PLAN VIEW

S S DENOTES FILL IN SURFACE WATER

50′ 0′ 50′

SCALE: 1"= 50′

NCDOT

DIVISION OF HIGHWAYS

WILKES COUNTY

PROJECT: 36401.1.1 (K-4703)

NEW REST AREA

NORTH BOUND US 421

WEST OF NC 115

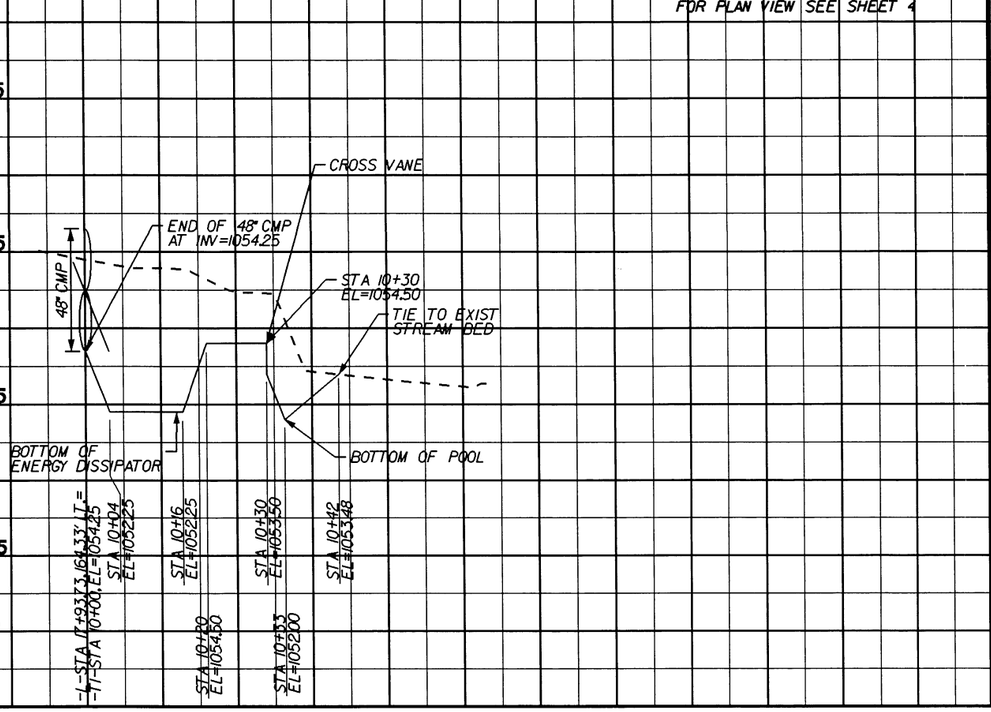
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

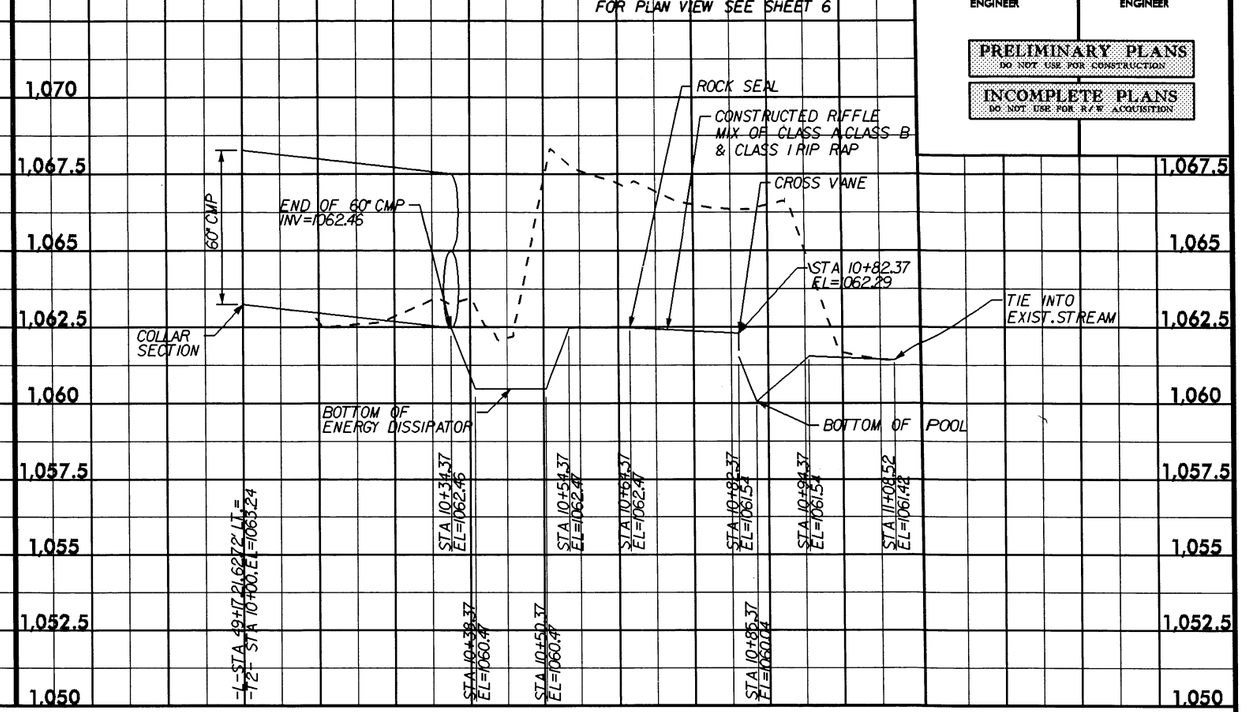
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

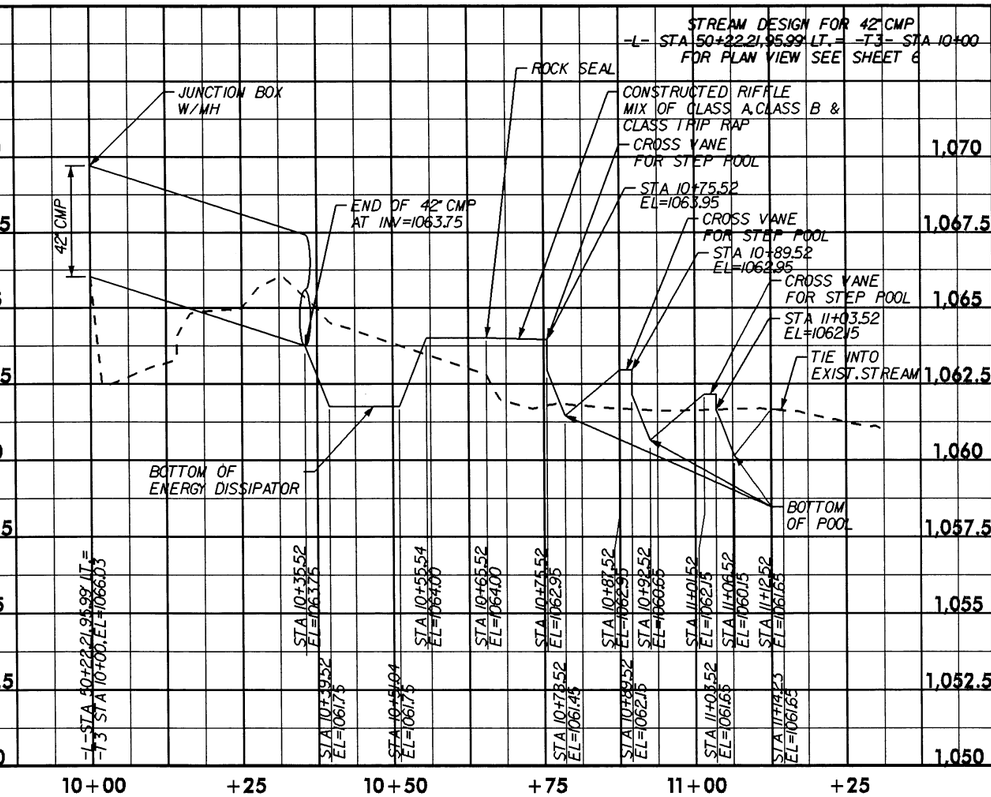
STREAM DESIGN FOR 48" CMP
-L- STA 17+93.73, 164.33' LT = -T1- STA 10+00
FOR PLAN VIEW SEE SHEET 4



STREAM DESIGN FOR 60" CMP
-L- STA 49+17.21,62.72' LT = -T2- STA 10+00
FOR PLAN VIEW SEE SHEET 6



STREAM DESIGN FOR 42" CMP
-L- STA 50+22.21,95.99' LT. = -T3- STA 10+00
FOR PLAN VIEW SEE SHEET 6



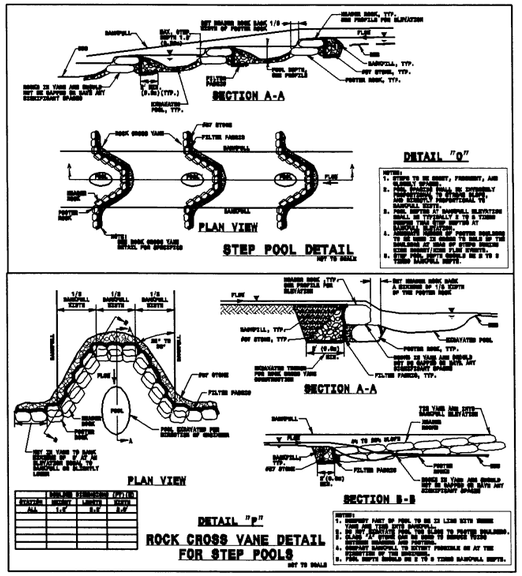
Permit Drawing Sheet 5 of 15

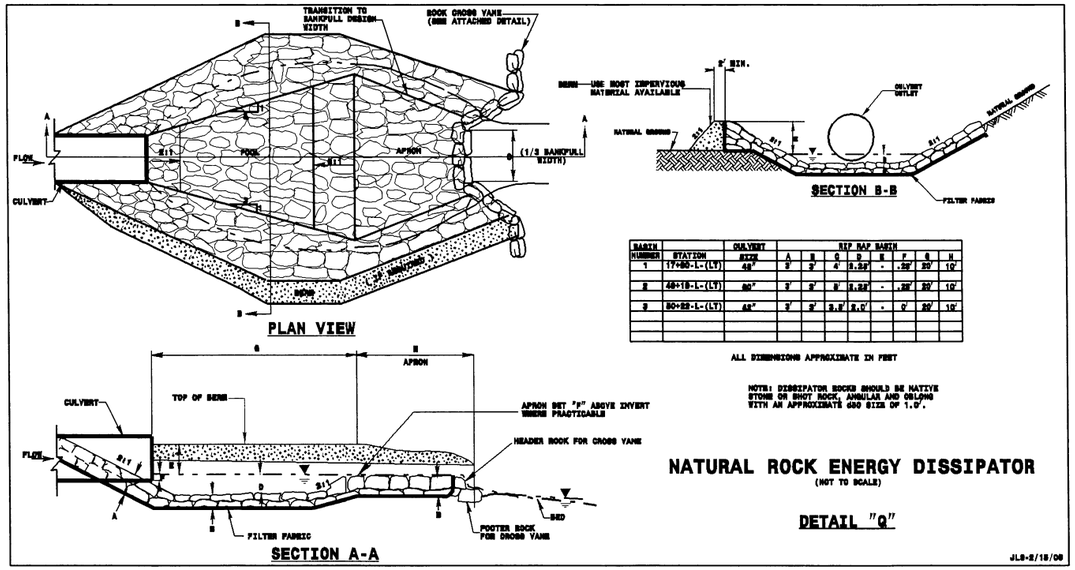
VERTICAL: 1"=2.5'
HORIZONTAL: 1"=12.5'

09-APR-2007 13:04
r:\hydraulics\k4703\hyd_pfl_ditch_streams2c.dgn
Released At 4:22:28

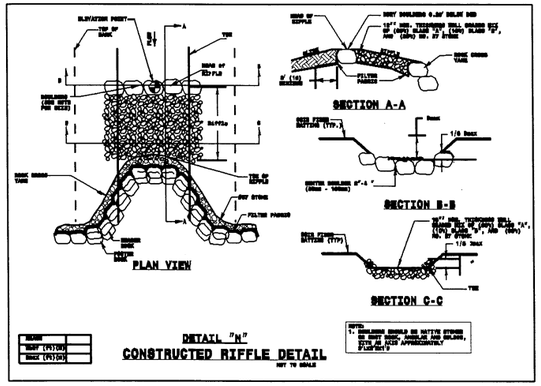
PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

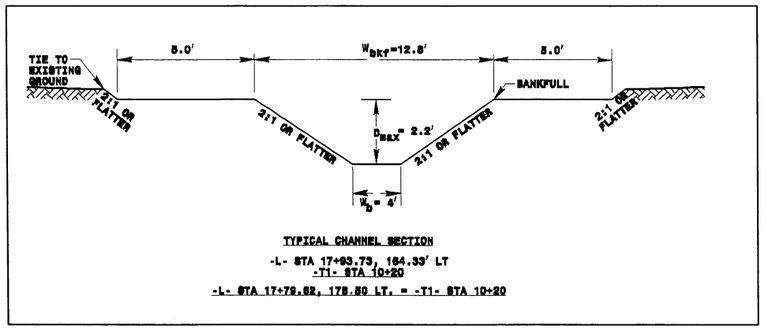
REVISIONS

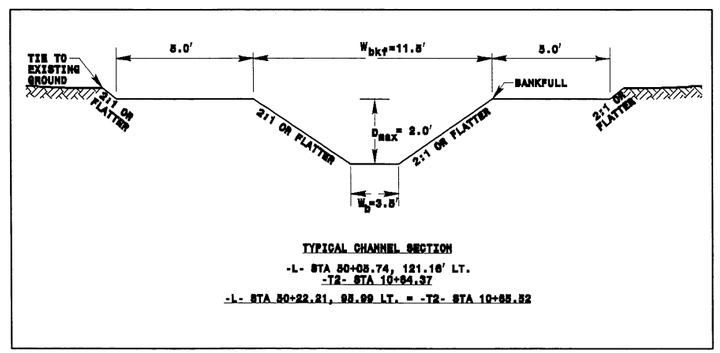


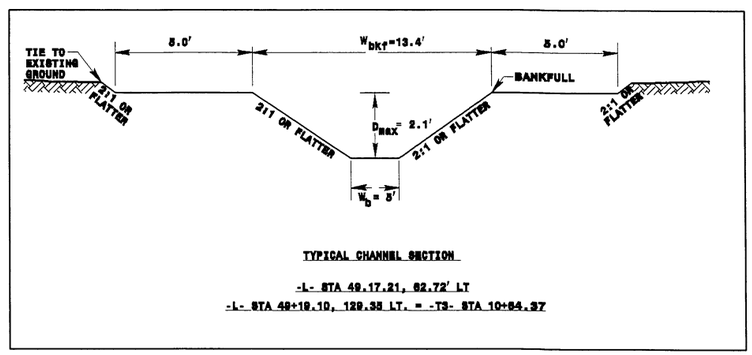


BASIN NUMBER	STATION	CULVERT SIZE	RIP RAP BASIN						
			A	B	C	D	E	F	G	H
1	17+90-L-(LT)	48"	3'	2'	4'	8.33'	-	.25'	20'	10'
2	46+15-L-(LT)	60"	3'	2'	5'	8.33'	-	.25'	20'	10'
3	80+82-L-(LT)	42"	3'	2'	3.2'	8.0'	-	0'	20'	10'









Permit Drawing
Sheet 6 of 15

PROJECT REFERENCE NO.	SHEET NO.
K-4703	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

REVISIONS

S 77°17'05" W 519.43'

N 00°27'47" E 122.33'

S 45°39'02" E 70.29'

N 39°34'53" E 517.20'

N 00°27'47" E 118.41'

N 43°37'40" E 25.57'

N 00°27'47" E 444.51'

N 13°29'09" W 362.90'

MELINDA DELOIS WADE-EDMUNDS ET.AL

CHESTER RUSSELL WADE

ISFD

DETAIL "A"
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground, 2H, D, 4.0' Min., Front Ditch Slope

Min. D= 1.0 Ft.

FROM STA.12+00 TO STA.13+50-L-(LT)

BEGIN PROJECT K-4703
-L- STA. 12+00.00

-L2- SPIRAL DATA
PIs Sta 26+51.65
θs = 14°19' 26.2"
Ls = 200.00'
LT = 133.77'
ST = 67.01'

N 84°03'43" E 169.88'

LEATHA EDWARDS

N 12°12'49" W 211.11'

S 05°08'12" E 156.75'

S 66°30'33" W 186.44'

NAD 83'95

68.00' DUKE POWER EASEMENT 100 KVW LINE

WILLIAM LESTER WILFONG JR.

Sta. 18+00 - 23+00-L-(LT)
DA= 5.73 AC
Cwt=0.41
tc=3.44 @ 21 min. & I10=4.09
Q25= 8.84 cfs & Q10= 7.29 cfs
Sc= 11.437% n=.04
45 = 0.63' & d10 = 0.48'
V25= 4.17 ftsec & V10= 4.33 ftsec
Shear Stress= 2.27

DETAIL "B"
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2H, D, 2H, b, F/Ft., FIN Slope, B, Filter Fabric

*When B is < 6.0'

Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

Type of Liner= CL"I" Rip-Rap

FROM STA.18+00 TO STA.19+00 -L-(LT)
FROM STA.20+50 TO STA.23+00 -L-(LT)

DETAIL "C"
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2H, D, 2H, b, F/Ft., EXIST. FIN Slope, B, Filter Fabric

*When B is < 6.0'

Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

Type of Liner= CL"I" Rip-Rap

FROM STA.19+00 TO STA.20+50 -L-(LT)

DETAIL "D"
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2H, D, 2H, b, F/Ft., FIN Slope, B

Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM STA.23+50-L- TO STA.25+17.88-L-(LT)
FROM STA. 25+17.88-L2- TO STA. 26+50-L2-(LT)

WILLIAM LESTER WILFONG JR.

ABAND. I S F D

TRACT LINE

Sta. 12+00 - 18+80-L-(LT)
DA= 0.89 AC
Cwt=0.09
tc=4.89 @ 21 min. & I10=5.48
Q25= 1.70 cfs & Q10= 1.90 cfs
Sc= 2.41% n=.048
45 = 0.30' & d10 = 0.32'
V25= 1.97 ftsec & V10= 2.02 ftsec
Shear Stress= 0.78

Sta. 22+80-L-to 26+80-L2-(LT)
DA= 2.98 AC
Cwt=0.43
tc=3.72 @ 20 min. & I10=4.18
Q25= 4.73 cfs & Q10= 3.30 cfs
Sc= 3.50% n=.06
45 = 0.29' & d10 = 0.46'
V25= 2.83 ftsec & V10= 2.41 ftsec
Shear Stress= 1.18

NATURAL ROCK ENERGY DISSIPATOR SEE DETAIL "Q"

CROSS VANE SEE DETAIL "M"

SEE SHEET 2-C FOR PROPOSED CHANNEL PROFILE

SPECIAL CUT DITCH SEE DETAIL "A"

TIE TO EXISTING FENCE

BEGIN WOVEN WIRE FENCE

ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS

LATERAL BASE DITCH SEE DETAIL "B"

LATERAL BASE DITCH SEE DETAIL "C"

LATERAL BASE DITCH SEE DETAIL "D"

DEAD PINE & OLD FENCE

END WOVEN WIRE FENCE

-L- POT STA.25+17.88 (12' LT.)=
-L2- TS STA.25+17.88

-BL- STA 10+00.00 POT

-L- STA 25+09.28 PNG

-L- N 82° 42' 14.7" E

N 82° 40' 55.2" E

E.EDGEWOOD MILL RD.

EXISTING R/W

EX.R/W

48" WW

48" WW W/ IS B.W

48" WW W/ I S BW

15" CSP

15" RCP

48" CMP

APPROX. DIR.

APPROX. JUNCTION

MTL GUARD RAIL

CABLE GUARD RAIL

CONC DITCH

CONC WALK

GRAVEL

WOODS

WELL

I S F D

JB wMH

SPRING BOX

CATCH BASIN

CB TOP=407.90

CB TOP=402.68

3' PAVED SHOULDER

U.S. 421 NBL

U.S. 421 SBL

25' BST

RETAIN

CENTERLINE OF POWER LINES DIVERTED

CENTERLINE OF POWER LINES

BM#1
-BL- STA 8+62.93
128.09' RIGHT
ELEV. 1137.27'

NOTE: SEE SHEET 7 FOR -L2- PROFILE

STA.10+00.00

STA.25+00.00

21-MAY-2007 10:37
21-Mud-Lucas AT HY212436
lwilliamson

Permit Drawing #5
Sheet 1 of 1

PROJECT REFERENCE NO.	SHEET NO.
K-4703	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

REVISIONS

BEGIN PROJECT K-4703
-L- STA. 12+00.00

-L2- SPIRAL DATA
PIs Sta 26+51.65
θs = 14°19' 26.2"
Ls = 200.00'
LT = 133.77'
ST = 67.07'

DETAIL "A"
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2H, D, 4H:1V Flatter, Front ditch Slope
Min. D= 1.0 Ft.
FROM STA.12+00 TO STA.13+50-L-(Lt)

DETAIL "B"
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2H, D, B, Z, D, 1'/Ft., FIN Slope, Filter Fabric
*When B is < 6.0'
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
Type of Liner= CL'I' Rip-Rap
FROM STA.18+00 TO STA.19+00 -L-(LT)
FROM STA.20+50 TO STA.23+00 -L-(LT)

DETAIL "C"
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2H, D, B, Z, D, b, 1'/Ft., EXIST. FIN Slope, Filter Fabric
*When B is < 6.0'
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
Type of Liner= CL'I' Rip-Rap
FROM STA.19+00 TO STA.20+50 -L-(LT)

DETAIL "D"
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2H, D, B, Z, D, b, 1'/Ft., FIN Slope
Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.
FROM STA.23+50-L- TO STA.25+17.88-L-(LT)
FROM STA. 25+17.88-L2- TO STA. 26+50-L2-(LT)

MELINDA DELOIS WADE-EDMUNDS ET.AL
CHESTER RUSSELL WADE
LEATHA EDWARDS
WILLIAM LESTER WILFONG JR.
WILLIAM LESTER WILFONG JR.
68.00' DUKE POWER EASEMENT 100 KVW LINE
TRACT LINE
NAD 83'95

S 77°17'05" W 519.43'
N 00°27'47" E 122.33'
S 45°39'02" E 200.29'
N 38°34'53" E 317.20'
N 00°27'47" E 118.41'
N 43°37'40" E 215.57'
N 00°27'47" E 444.59'
S 14°04'42" E 10.72'
N 84°03'43" E 169.88'
S 12°50'01" E 156.75'
S 66°30'33" W 166.44'
N 17°09'51" W 82.90'
N 45°45'25" W 201.71'

E.EDGEWOOD MILL RD.
TIE TO EXISTING FENCE
SPECIAL CUT DITCH SEE DETAIL "A"
BEGIN WOVEN WIRE FENCE
END WOVEN WIRE FENCE
NATURAL ROCK ENERGY DISSIPATOR SEE DETAIL "G"
CROSS VANE SEE DETAIL "M"
SEE SHEET 2-C FOR PROPOSED CHANNEL PROFILE
LATERAL BASE DITCH SEE DETAIL "A"
LATERAL BASE DITCH SEE DETAIL "B"
LATERAL BASE DITCH SEE DETAIL "C"
LATERAL BASE DITCH SEE DETAIL "D"
DEAD PINE & OLD FENCE
SPRING BOX
ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS
REMOVE
RETAIN
APPROX. DIR.
APPROX. JUNCTION
U.S. 421 NBL 25' BST
U.S. 421 SBL 25' BST
3' PAVED SHOULDER
3' GRASS SHOULDER
BEG. SHOULDER BERM GUTTER -L- STA.16+01
BEG. SHOULDER BERM GUTTER STA.16+01-L-(LT)
300' TAPER
MTL. GUARD RAIL
CABLE GUARD RAIL
CONC DITCH
CONC WALK
GRAVEL
WELL
TS-F.D
ISFD
ABAND. IS F.D
EXISTING R/W
EX.R/W
20' PRIVATE R/W 28 6243 PG. 516
LAYING GATE
15" RCP
15" CMP
CB TOP=407.80
CB TOP=403.66
CENTERLINE OF POWER LINES OVERHEAD
WOODS
-L- STA.10+00.00
-L- STA.15+00.00
-L- STA.20+00.00
-L- STA.25+00.00
-L- STA.25+17.88
-L- N 82°42'14.7" E
N 82° 40' 55.2" E
-L- POT STA.25+17.88 (12' LT.)= -L2- P.I. STA.25+17.88
-L2- STA.25+68.00
-L2- P.I. STA.26+50.00
-L2-
-EL-

BMH
-BL- STA 8+62.93
128.09' RIGHT
ELEV. 1137.27'

NOTE: SEE SHEET 7 FOR -L2- PROFILE

Perm. Drawing Sheet 8 of 15

21-MAY-2007 10:38
r:\hydraulics\k4703.hyd_dm.dgn
wadamatoo AT 1"=20'

PROJECT REFERENCE NO.	SHEET NO.
K-4703	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SCALE: 1" = 100'

DENOTES FILL IN SURFACE WATER

NAD 83'95

-L2- CURVE DATA

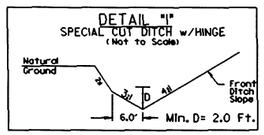
PI Sta 51+17.74
Θs = 4° 46' 28.7"
Ls = 200.00'
LT = 133.38'
ST = 66.71'

PI Sta 53+08.73
Δ = 11° 50' 06.5" (LT)
D = 4° 46' 28.7"
L = 247.87'
T = 124.38'
R = 1,200.00'
SE = SEE PLANS

PI Sta 55+04.80
Θs = 0° 27' 30.0"
Θs = 4° 46' 30.5"
Ls = 200.00'
LT = 127.55'
ST = 72.57'

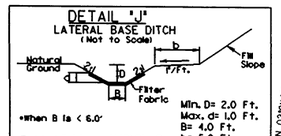
PI Sta 58+14.24
Δ = 1° 40' 12.3" (LT)
D = 0° 27' 31.7"
L = 364.01'
T = 182.02'
R = 12,488.00'
SE = SEE PLANS

DETAIL "I"
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



FROM STA.48+30-L2- TO STA.49+50-L2-(LT)

DETAIL "J"
LATERAL BASE DITCH
(Not to Scale)

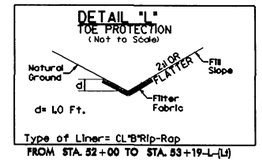


FROM STA.50+42-L2- TO STA.51+78-L2-(LT)

DETAIL "H"
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)

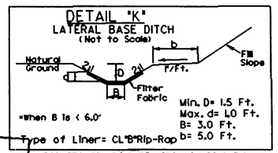
FROM STA.42+30 TO STA.49+50-L2-LT

DETAIL "L"
TOE PROTECTION
(Not to Scale)



FROM STA. 52+00 TO STA. 53+19-L-(Lt)

DETAIL "K"
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 50+26.5 TO STA. 52+00-L-(Lt)

END PROJECT K-4703
-L- STA. 55 + 00.00

BESSIE B. HARRIS ET.AL

Sta. 47+96 to 49-50-L3-Lt
DA= 0.38 AC
Curb=0.40
I8=4.89 @ 10 min. & I10=8.45
Q8= 1.13 cfs & Q10= 1.56 cfs
Se= 9.40%, n=.045
d8 = 0.32' & d10 = 0.34'
V8= 3.18 ft/sec & V10= 3.11 ft/sec
Shear Stress= 1.99

Sta. 50-42-L- to 51+78-L-Lt
DA= 3.42 AC
Curb=0.47
I8=4.89 @ 10 min. & I10=8.45
Q8= 7.86 cfs & Q10= 8.76 cfs
Se= 8.40% n=.063
d8 = 0.49' & d10 = 0.49'
V8= 5.5 ft/sec & V10= 5.7 ft/sec
Shear Stress=2.8

BOBBY MARSHALL PARKS

JAMES WESLEY HARRIS

Sta. 50+26.5 - 52+00-L-(Lt)
DA= 0.85 AC
Curb=0.40
I8=4.89 @ 10 min. & I10=8.45
Q8= 1.64 cfs & Q10= 1.85 cfs
Se= 11.84% n=.04
d8 = 0.19' & d10 = 0.20'
V8= 2.56 ft/sec & V10= 2.69 ft/sec
Shear Stress= 1.48

Sta. 52+00 - 53+19-L-(Lt)
DA= 0.85 AC
Curb=0.40
I8=4.89 @ 10 min. & I10=8.45
Q8= 1.64 cfs & Q10= 1.85 cfs
Se= 8.16% n=.04
d8 = 0.44' & d10 = 0.48'
V8= 2.69 ft/sec & V10= 2.88 ft/sec
Shear Stress= 2.24

Sta. 47+96 to 49-50-L3-Lt
DA= 0.38 AC
Curb=0.40
I8=4.89 @ 10 min. & I10=8.45
Q8= 1.13 cfs & Q10= 1.56 cfs
Se= 9.40%, n=.045
d8 = 0.32' & d10 = 0.34'
V8= 3.18 ft/sec & V10= 3.11 ft/sec
Shear Stress= 1.99

Sta. 50-42-L- to 51+78-L-Lt
DA= 3.42 AC
Curb=0.47
I8=4.89 @ 10 min. & I10=8.45
Q8= 7.86 cfs & Q10= 8.76 cfs
Se= 8.40% n=.063
d8 = 0.49' & d10 = 0.49'
V8= 5.5 ft/sec & V10= 5.7 ft/sec
Shear Stress=2.8

S 86°57'43" E 536.38'
N 03°35'46" E 238.63'
N 03°52'49" W 404.09'
N 89°45'17" E 709.83'
S 89°11'49" E 129.55'
S 03°58'23" W 556.82'
N 77° 52' 05.9" E
S 78° 31' 06" E
N 03°33'19" E 234.58'

PLANTED STONE
WOODS
ROCK
EXISTING R/W
CREEK
SITE II
SITE III
WOOD
CABLEGUARD RAIL
TIE TO EXISTING GUARDRAIL
REMOVING GUARDRAIL
REMOVE EXIST. BOX & REPLACE
REMOVE 12' OF EXIST. PIPE
COLLAR AND EXTEND
REMOVE
RETAIN
APPROX. JUNCTION
APPROX. DIR.
SPRING BOX
SEE SHEET 2-C FOR PROPOSED CHANNEL PROFILE
SEE SHEET 9 & 10 FOR -L2- PROFILE

CROSS VANE SEE DETAIL "M"
CONSTRUCTED RIFFLE SEE DETAIL "N"
ROCK SEAL SEE DETAIL "N"
NATURAL ROCK ENERGY DISSIPATOR SEE DETAIL "Q"
ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS
LATERAL BASE DITCH SEE DETAIL "K"
TOE PROTECTION SEE DETAIL "L" 300' TAPER
SPECIAL CUT DITCH SEE DETAIL "I"
BEGIN SHOULDER BERM GUTTER -L2- STA.50+26
END SHOULDER BERM GUTTER -L- STA.55+00

-L2- STA.49+10.00 MATCH LINE

TOP=1128.98 INV=1126.23
TOP=1130.75 INV=127.75
TOP=1114.50 INV=1111.50
INV=1099.07
INV=1087.65
TOP=1096.80 NE. INV=1086.42 NW. INV=1087.42 W. INV=1087.42
TOP=1101.00 INV=1101.00
TOP=1104.63 N & S. INV=1099.02 E. INV=1098.52
TOP=1102.20 NE. INV=1097.41 E. INV=1097.91
TOP=1102.50 W. INV=1098.42
INV=1076.25
INV=1098.31
TOP=1101.65 INV=1098.65
TOP=1094.18 INV=1091.43
TOP=1096.63 INV=1093.88
INV=1062.46
INV=1063.75
TOP=1094.00 INV=1091.25
SITE INV=1065.39
TOP=1093.75 INV=1090.85
TOP=1094.12 INV=1091.37
TOP=1088.63 INV 15" CSP=1084.5 INV=1080.43
INV=1082.10
INV=1070.93
TOP=1101.47 INV=1092.47

NCDOT
DIVISION OF HIGHWAYS
WILKES COUNTY
PROJECT: 34401.1.1 (K-4703)
NEW REST AREA
NORTH BOUND US 421
WEST OF NC 116
SHEET OF 04/09/07

PLAN VIEW
50' 0' 50'
SCALE: 1" = 50'

-L- CURVE DATA

PI Sta 45+88.19
Δ = 4° 50' 08.8" (LT)
D = 0° 27' 30.1"
L = 1,055.00'
T = 527.82'
R = 12,500.00'
SE = SEE PLANS

09-APR-2007 13:25
I:\hydr-projs\permit\k4703_hyd_prm_west.dgn
psheperd
Active HY212438

Permit Drawing
Sheet 9 of 15

PROJECT REFERENCE NO.	SHEET NO.
R-4703	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SCALE: 1" = 100'

DENOTES FILL IN SURFACE WATER

NAD 83'95

-L2- CURVE DATA

PI Sta 51+17.74
Δs = 4° 46' 28.7"
Ls = 200.00'
LT = 133.38'
ST = 66.71'

PI Sta 53+08.73
Δ = 11° 50' 06.5" (LT)
D = 4° 46' 28.7"
L = 247.87'
T = 124.38'
R = 1,200.00'
SE = SEE PLANS

PI Sta 55+04.80
Δs = 0° 27' 30.0"
Δs = 4° 46' 30.5"
Ls = 200.00'
LT = 127.55'
ST = 72.57'

PI Sta 58+14.24
Δ = 1° 40' 12.3" (LT)
D = 0° 27' 31.7"
L = 364.01'
T = 182.02'
R = 12,488.00'
SE = SEE PLANS

DETAIL "I"
SPECIAL CUT DITCH w/HINGE
(Not to Scale)

FROM STA.48+30-L2- TO STA.49+50-L2-(LT)

DETAIL "J"
LATERAL BASE DITCH
(Not to Scale)

FROM STA.50+42-L2- TO STA.51+78-L2-(LT)

DETAIL "H"
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)

FROM STA.42+30 TO STA.49+50-L2-LT

DETAIL "L"
TOE PROTECTION
(Not to Scale)

Type of Liner= CL'B'Rip-Rap
FROM STA. 82+00 TO STA. 83+19-L-(LT)

DETAIL "K"
LATERAL BASE DITCH
(Not to Scale)

Type of Liner= CL'B'Rip-Rap
FROM STA.50+26.5 TO STA. 82+00-L-(LT)

BESSIE B. HARRIS ET.AL

BESSIE B. HARRIS ET.AL

BOBBY MARSHALL PARKS

JAMES WESLEY HARRIS

REVISIONS

SPECIAL CUT DITCH SEE DETAIL "I"

BEGIN SHOULDER BERM GUTTER -L2- STA.50+26

ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS

LATERAL BASE DITCH SEE DETAIL "J"

CROSS VANE SEE DETAIL "M"

CONSTRUCTED RIFFLE SEE DETAIL "N"

ROCK SEAL SEE DETAIL "N"

NATURAL ROCK ENERGY DISSIPATOR SEE DETAIL "Q"

TOE PROTECTION SEE DETAIL "L"

END SHOULDER BERM GUTTER -L- STA.55+00

END PROJECT R-4703
-L- STA. 55 + 00.00

SEE SHEET 2-A FOR PROPOSED CHANNEL PROFILE

SPRING BOX

REMOVE EXIST. BOX & REPLACE

REMOVE 32' OF EXIST. PIPE

COLLAR AND EXTEND

RETAIN

REMOVE

APPROX. DIR.

APPROX. JUNCTION

CABLE GUARD RAIL

PLAN VIEW

SCALE: 1"= 50'

NCDOT
DIVISION OF HIGHWAYS
WILKES COUNTY
PROJECT: 34401.1.1 (R-4703)
NEW REST AREA
NORTH BOUND US 421
WEST OF NC 116
SHEET OF 94/95/96

-L- CURVE DATA
PI Sta 45+88.19
Δ = 4° 50' 08.8" (LT)
D = 0° 27' 30.0"
L = 1055.00'
T = 527.82'
R = 12,500.00'
SE = SEE PLANS

NOTES: SEE SHEET 9 & 10 FOR -L2- PROFILE

09-APR-2007 13:26
c:\hydr-cad\r4703_L_profile-wt.dgn
pshepard

Permit Drawing
Sheet 10 of 15

8/23/2

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	K-4703	X-21

L2 STA 50+00.55
.01 .01

2:1

5.83:1

1107.72

FILL IN
SURFACE WATER

41+50.00

L2 STA 49+69.18
.02 .02

2:1

5:1

1115.02

3:1

1108.60

41+00.00

L2 STA 49+16.81
.012 .012

2:1

4:1

1117.62

4:1

1109.49

40+50.00

Permit Drawing
Sheet 11 of 15

04-APR-2007 12:45
r:\hydraulics\Permit\k4703_rdy_l_xpl.dgn
asheperd AT HY212438

PROJ. REFERENCE NO.	SHEET NO.
K-4703	X-22

0 5 10

43+00.00

FILL IN SURFACE WATER

1087.66

1105.90

-L2- STA 51+77.89

.058 .058

6.76:1

1105.23

2:1

43+00.00

42+50.00

FILL IN SURFACE WATER

1092.01

1108.22

-L2- STA 51+26.08

.055 .055

6.28:1

1106.06

42+50.00

42+00.00

FILL IN SURFACE WATER

1096.39

1111.16

-L2- STA 50+73.9

.042 .042

6.32:1

1106.90

42+00.00

Permit Drawing
Sheet 12 of 15

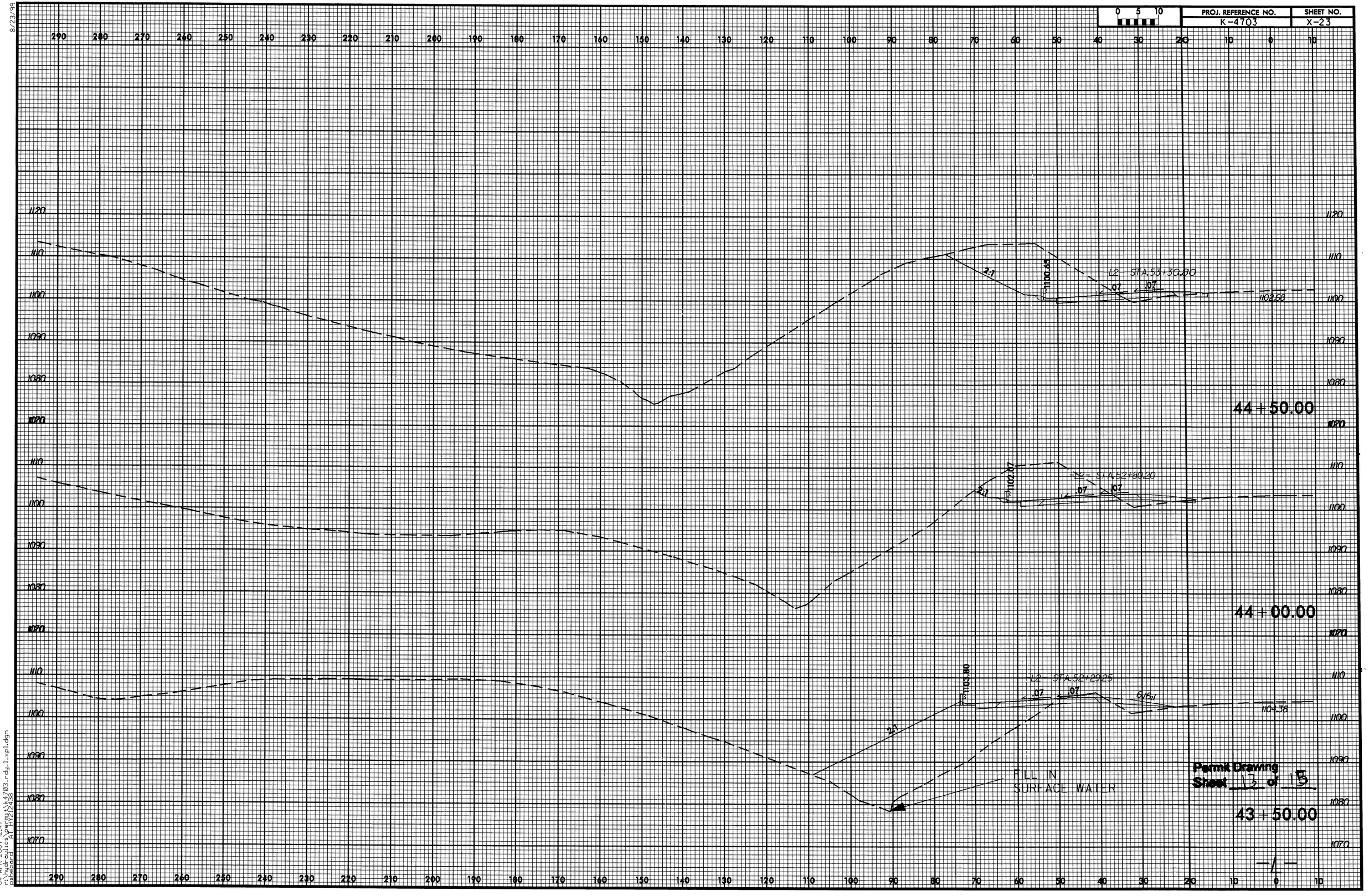
-L-

8/23/95

04-APR-2007 12:47
r:\hydraulics\permits\k4703_rdy_1_xpl.dgn
rsheperd

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	K-4703	X-23



Permit Drawing Sheet 12 of 15

04-APR-2007 12:47
r:\hydraulics\Permit\k4703_rdy_1.xpl.dgn
oshepard
NTS 1"=40'

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
(1)	Lester Wilfong, Jr.	252 E. Edgewood Mill Rd. Wilkesboro, N.C. 228697
(2)	Bessie Harris, et al C/O Mary Smith	675 Camp Joe Harris Rd. N. Wilkesboro, N.C. 28659
(3)	James Wilson Harris	1195 Camp Joe Harris Rd. N. Wilkesboro, N.C. 28659

NCDOT

DIVISION OF HIGHWAYS

WILKES COUNTY

PROJECT: 36401.1.1 (K-4703)

NEW REST AREA

NORTH BOUND US 421

WEST OF NC 115

04/09/07

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
I	17+60 to	48" CSP								196		
	18+28 -L- LT											
II	41+30 TO	8" CSP TO								278*		
	43+93 -L- LT	36" CSP										
III	49+14 TO	60" CSP								124		
	49+43 -L- LT											
IV	49+77 TO	42" CSP								118		
	50+43 -L- LT											
TOTALS:										716		

*-Stream mitigation will be required beginning at Station -L2- 50+50, a distance of 215 feet

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WILKES COUNTY
WBS - 36401.1.1 (K-4703)

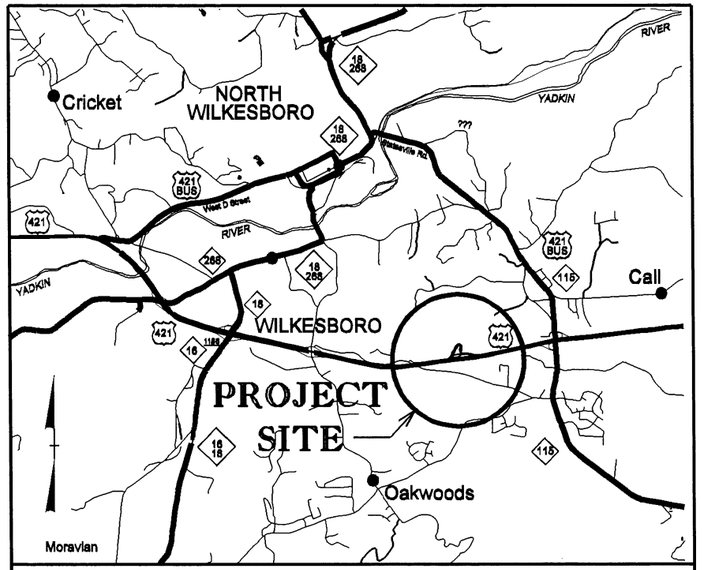
SHEET 15 of 15 5/17/2007

ATN Revised 3/31/05

TIP PROJECT: K-4703

CONTRACT: C201679

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

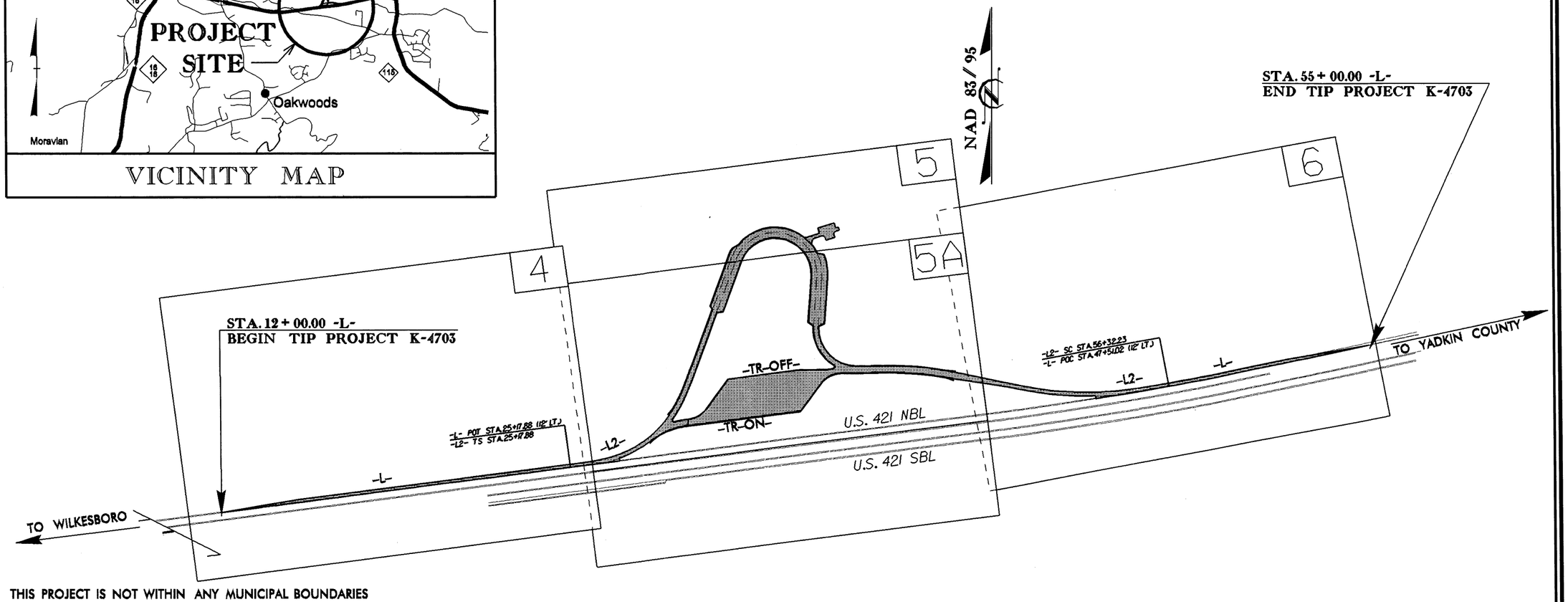
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WILKES COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	K-4703	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
36401.1.1	NHS-421(32)	PE	

LOCATION: NEW REST AREA – NORTHBOUND US 421 WEST OF NC 115

TYPE OF WORK: GRADING, PAVING, AND DRAINAGE



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

NOTE: CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____

GRAPHIC SCALES

50' 25' 0 50' 100'
PLANS

50' 25' 0 50' 100'
PROFILE (HORIZONTAL)

10' 5' 0 10' 20'
PROFILE (VERTICAL)

DESIGN DATA

ADT 2007	=	1000
ADT 2030	=	1500
DHV	=	11 %
D	=	100 %
T	=	32% *
V	=	20MPH
FUNC. CLASS.	=	REST AREA
* TTST 28%		DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT K-4703 = 0.981 MILES

TOTAL LENGTH OF TIP PROJECT K-4703 = 0.981 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: SEPTEMBER 18, 2007

ROGER D. THOMAS, P.E.
PROJECT ENGINEER

MICHAEL W. LITTLE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

10-APR-2007 lbll
r:\roadway\plans\k4703_rdy_tsh.dgn

6/2/99

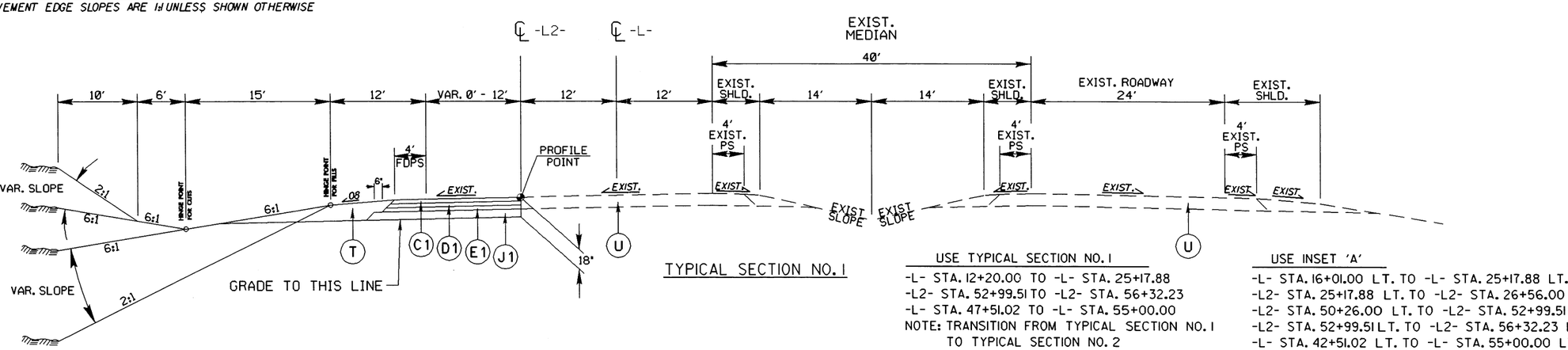
PROJECT REFERENCE NO.	SHEET NO.
K-4703	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD. IN EACH OF TWO LAYERS.	R1	2'-6" CONCRETE CURB & GUTTER
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.	R2	CONCRETE SHOULDER BERM GUTTER
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD.	T	EARTH MATERIAL
J1	PROP. 8" AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
J2	PROP. VAR. DEPTH AGGREGATE BASE COURSE		

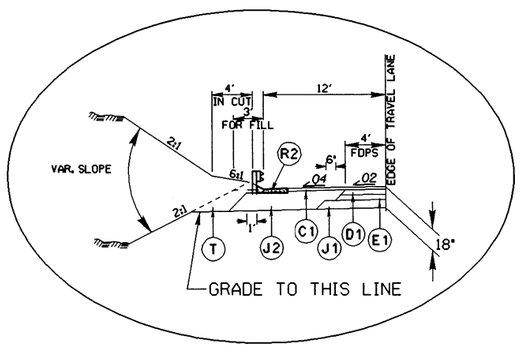
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



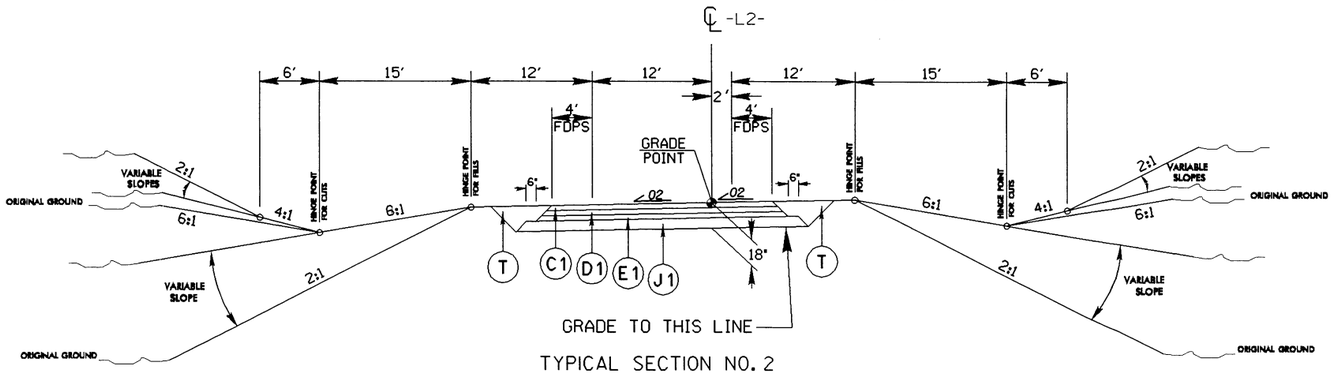
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 12+20.00 TO -L- STA. 25+17.88
-L2- STA. 52+99.51 TO -L2- STA. 56+32.23
-L- STA. 47+51.02 TO -L- STA. 55+00.00
NOTE: TRANSITION FROM TYPICAL SECTION NO. 1 TO TYPICAL SECTION NO. 2
-L2- STA. 25+17.88 TO -L2- STA. 27+36.67

USE INSET 'A'
-L- STA. 16+01.00 LT. TO -L- STA. 25+17.88 LT.
-L2- STA. 25+17.88 LT. TO -L2- STA. 26+56.00 LT.
-L2- STA. 50+26.00 LT. TO -L2- STA. 52+99.51 LT.
-L2- STA. 52+99.51 LT. TO -L2- STA. 56+32.23 LT.
-L- STA. 42+51.02 LT. TO -L- STA. 55+00.00 LT.



INSET 'A'



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-L2- STA. 27+36.67 TO -L2- STA. 28+27.39
-L2- STA. 50+30.43 TO -L2- STA. 52+99.51
NOTE: TRANSITION FROM TYPICAL SECTION NO. 2 TO TYPICAL SECTION NO. 3
-L2- STA. 28+27.39 TO -L2- STA. 29+50.00

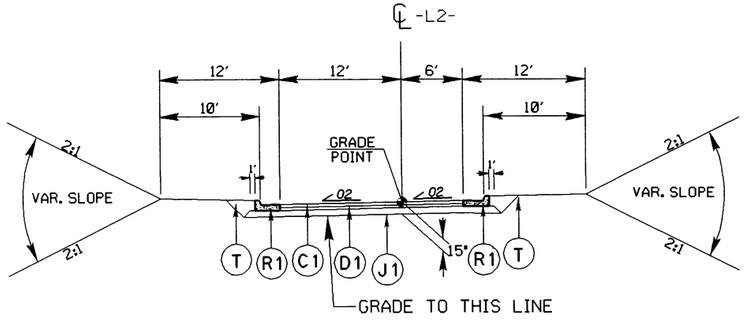
10-APR-2007 11:11
K:\ROADWAY\PROJECTS\K4703_rdy_typ.dgn
$$$$USERNAME$$$$

6/2/99

PAVEMENT SCHEDULE	
C1	3" S9.5B
D1	4" I19.0B
E1	3" B25.0B
J1	8" ABC
J2	VAR. ABC
R1	2'-6" CONC. C&G
R2	CONC. SBG
T	EARTH MATERIAL

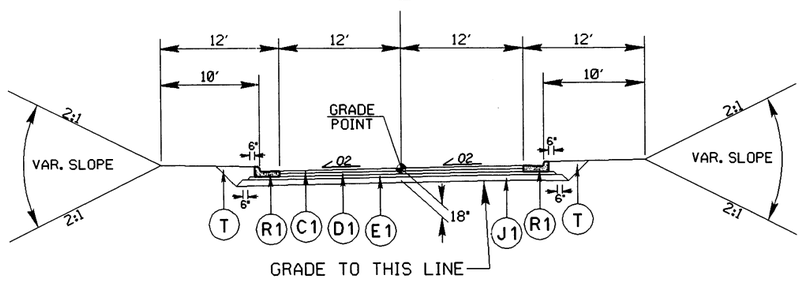
PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
-L2- STA. 29+50.00 TO -L2- STA. 33+88.32
-L2- STA. 42+10.33 TO -L2- STA. 43+80.00



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-L2- STA. 43+80.00 TO -L2- STA. 48+30.37

NOTE: TRANSITION FROM TYPICAL SECTION NO. 4 TO TYPICAL SECTION NO. 2
-L2- STA. 48+30.37 TO -L2- STA. 50+30.43

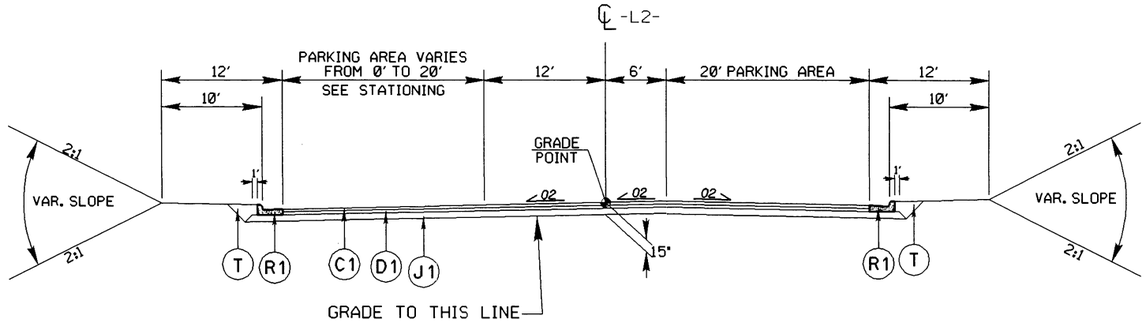
10-APR-2007 lhl2
r:\roadway\pro\k4703_rdy_typ.dgn
$$$$USERNAME$$$$

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

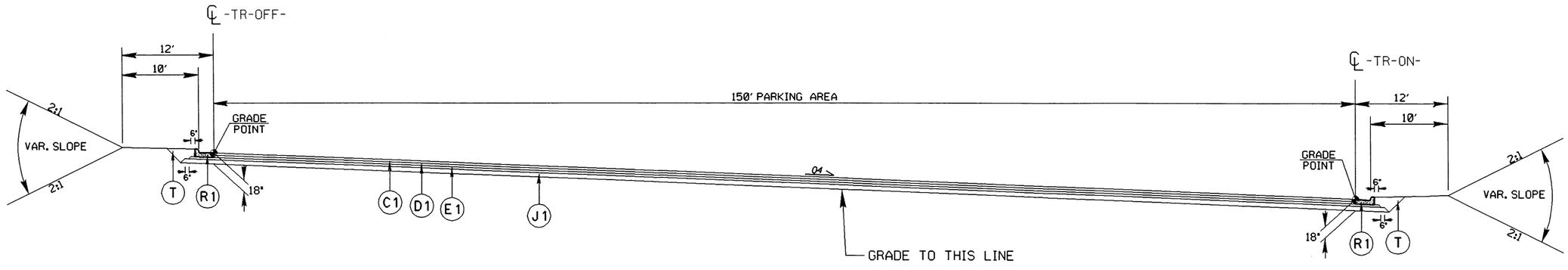
PAVEMENT SCHEDULE	
C1	3" S9.5B
D1	4" I19.0B
E1	3" B25.0B
J1	8" ABC
R1	2'-6" CONC. C&G
T	EARTH MATERIAL



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-L2- STA. 33+88.32 TO -L2- STA. 36+13.87 (12' PARKING AREA ON LEFT)
-L2- STA. 36+13.87 TO -L2- STA. 39+67.92 (0' PARKING AREA ON LEFT)
-L2- STA. 39+67.92 TO -L2- STA. 42+10.33 (20' PARKING AREA ON LEFT)



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

-TR-ON- STA. 13+29.35 TO -TR-ON- STA. 15+79.35

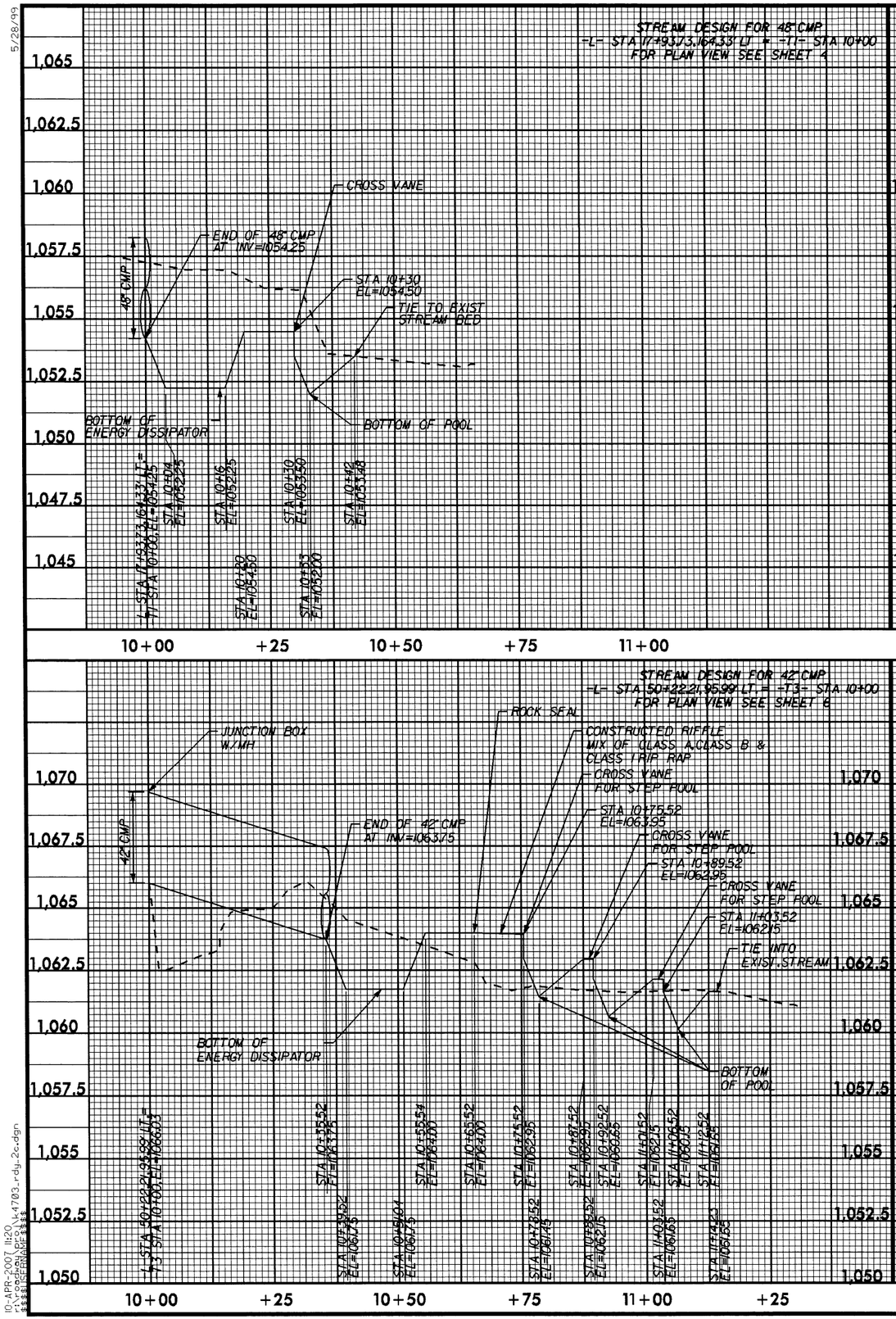
10-APR-2007 11:12
M:\Roadway\Projects\k4703_rdy_typ.dgn
$$$$USERNAME$$$$

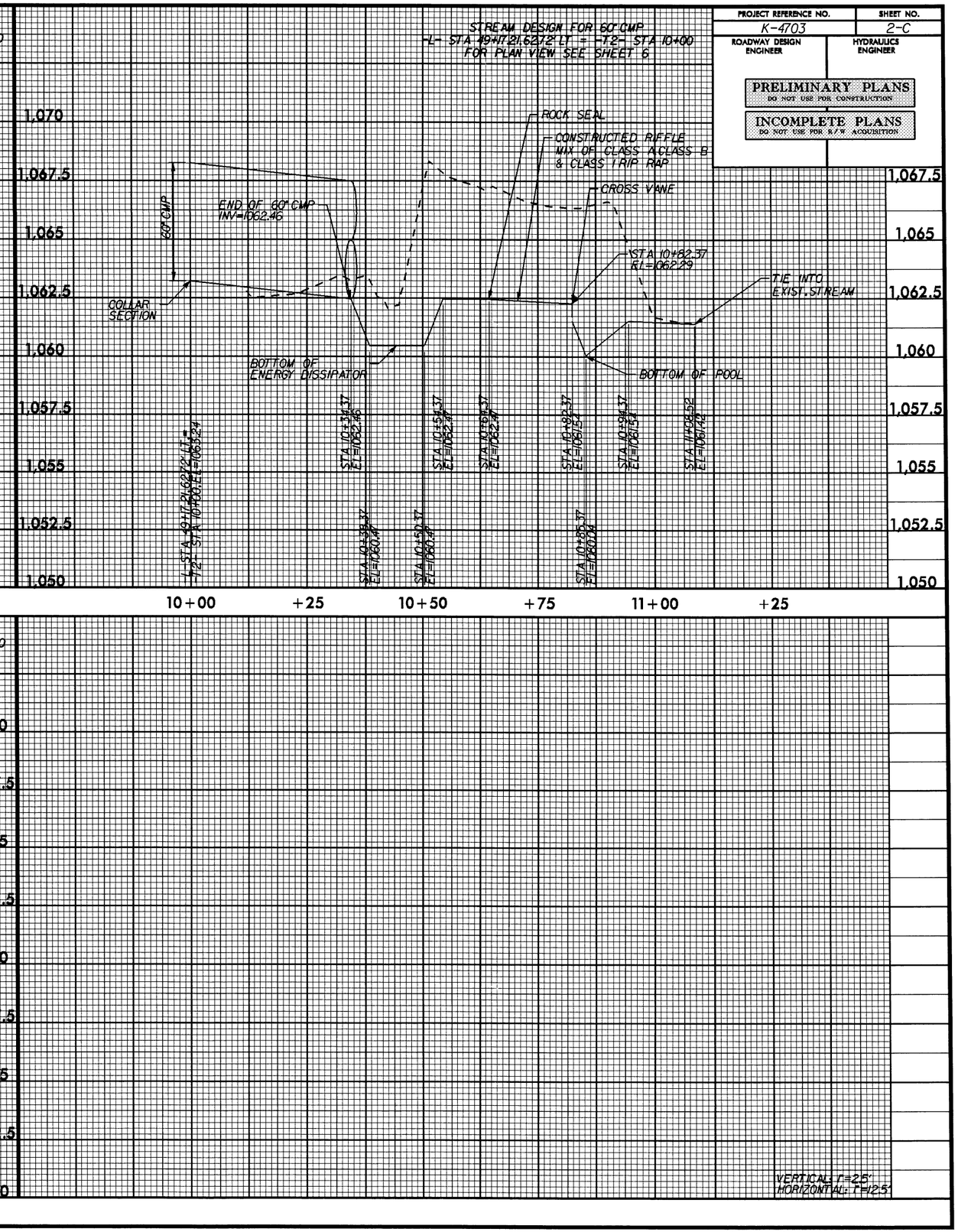
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



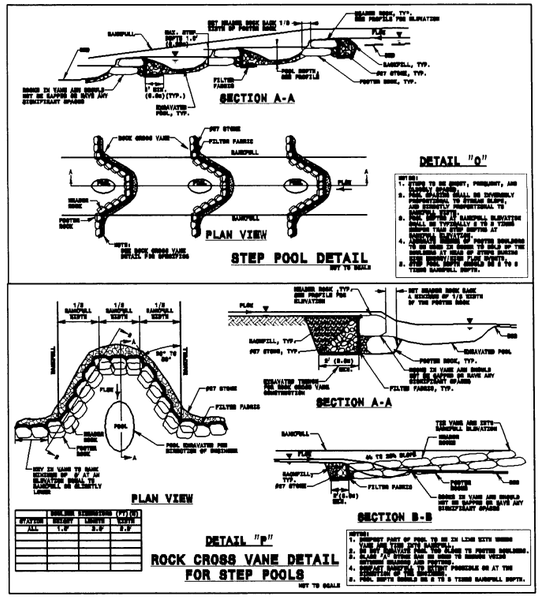


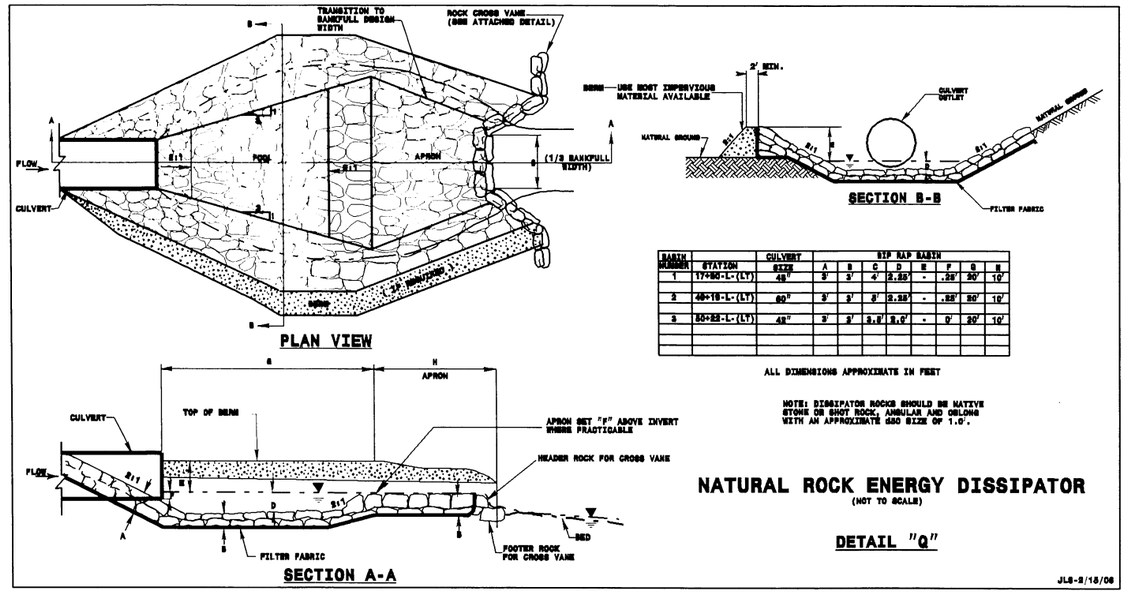
VERTICAL: 1"=25'
HORIZONTAL: 1"=125'

10-APR-2007 11:20
r:\roadpln\plot\k4703_rdy_2c.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

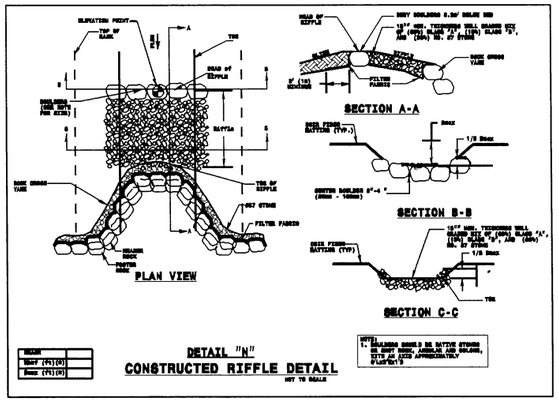


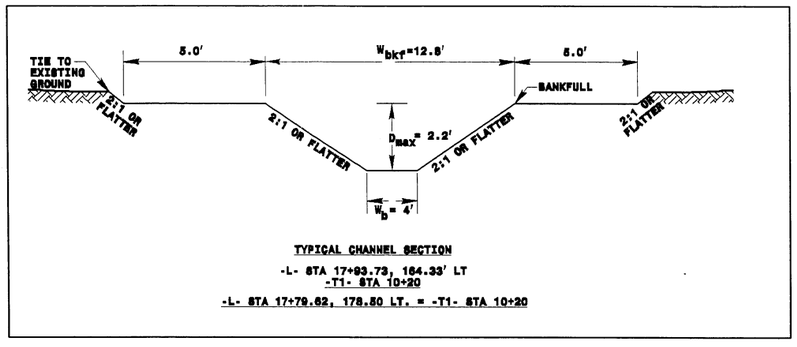


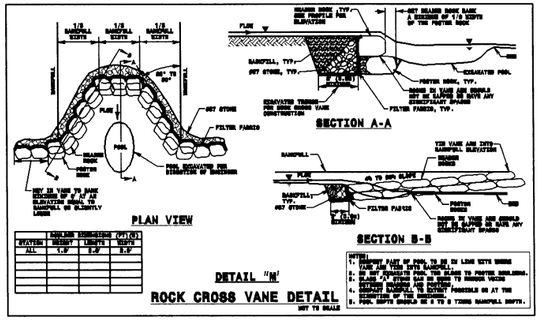
BASIN NUMBER	STATION	CULVERT SIZE	RIP RAP BASIN A	B	C	D	E	F	G	H
1	17+90-L-(LT)	48"	3'	3'	4'	2.25'	-	.25'	20'	10'
2	40+18-L-(LT)	60"	3'	3'	8'	2.25'	-	.25'	20'	10'
3	50+23-L-(LT)	48"	3'	3'	3.5'	3.0'	-	0'	20'	10'

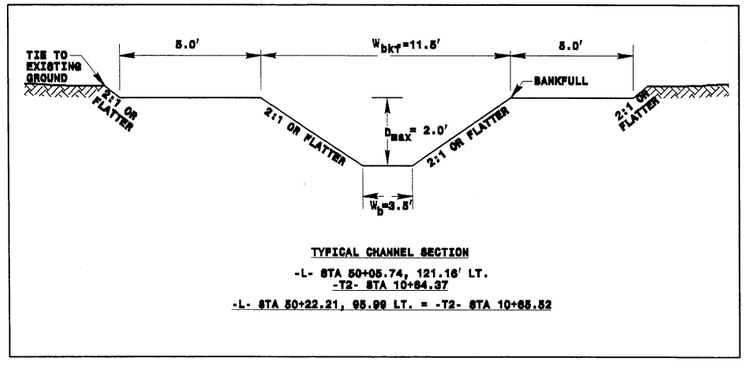
ALL DIMENSIONS APPROXIMATE IN FEET

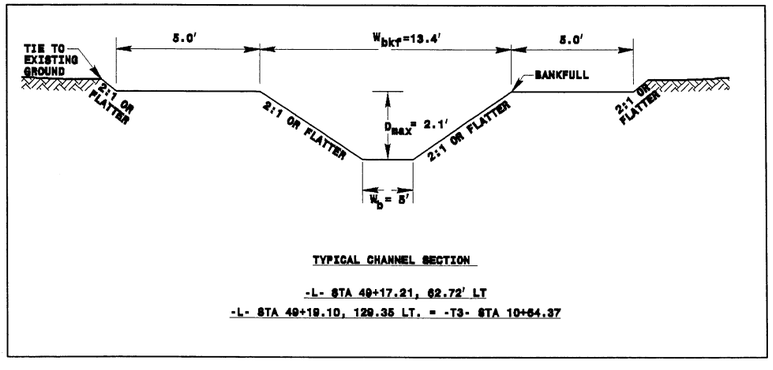
NOTE: DISSIPATOR ROCKS SHOULD BE NATIVE STONES OR SHOT ROCK, ANGULAR AND COBBLE WITH AN APPROXIMATE d50 SIZE OF 1.0'.





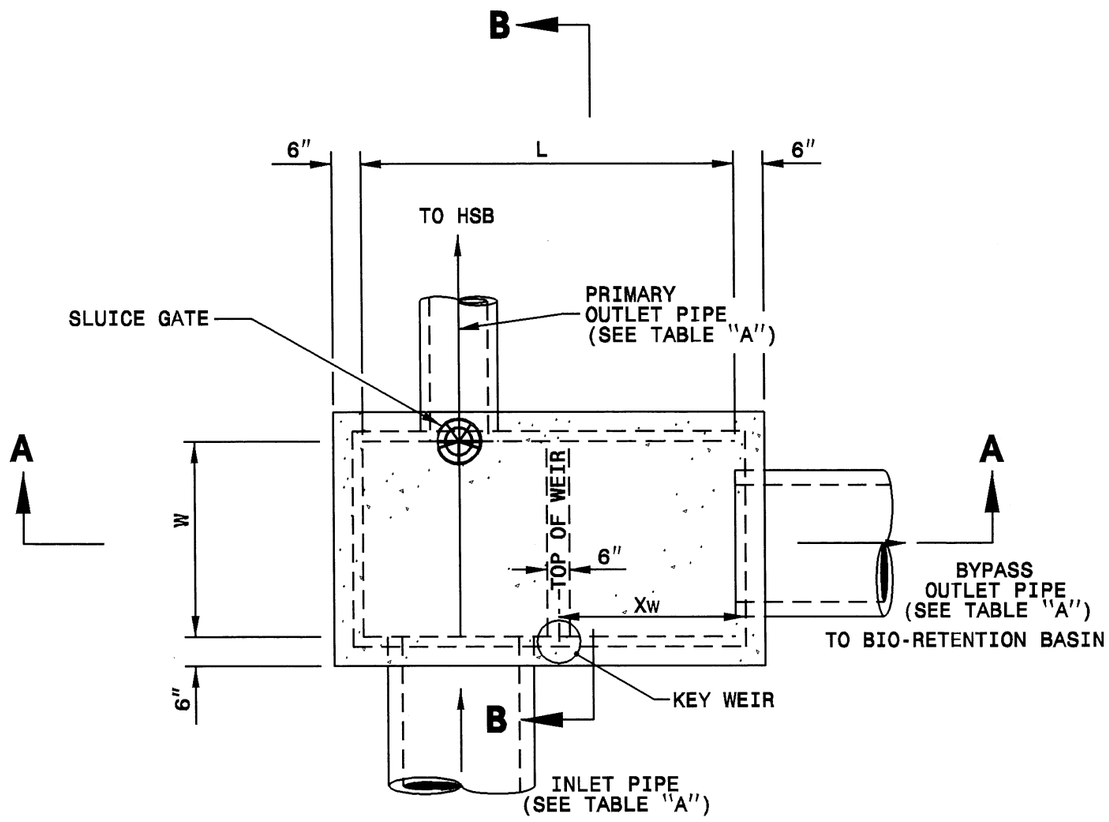




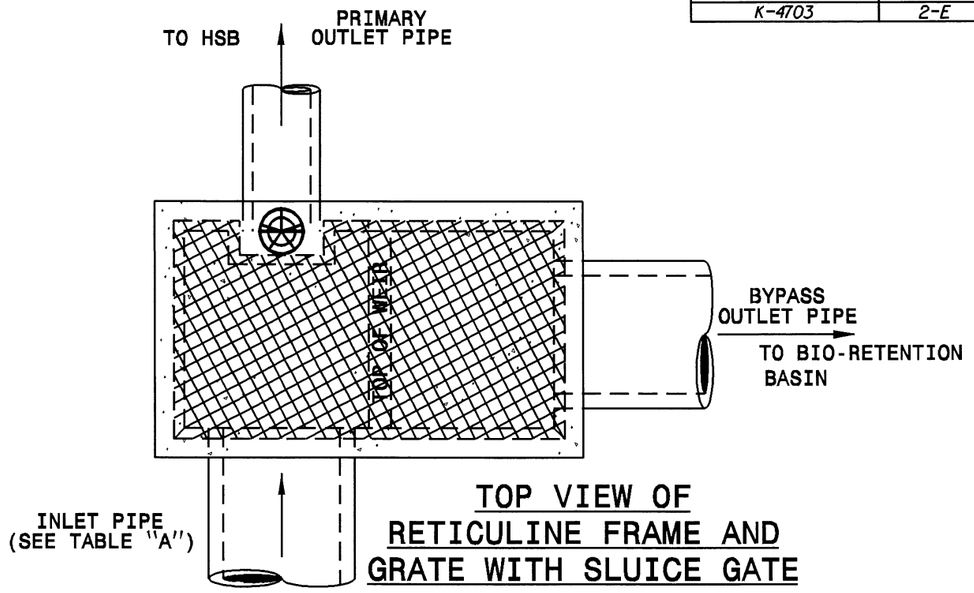


10-APR-2007 11:20
K:\Projects\K-4703\Design\K4703_rdy_2d.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-E



PLAN VIEW



TOP VIEW OF RETICULINE FRAME AND GRATE WITH SLUICE GATE

TABLE "A"

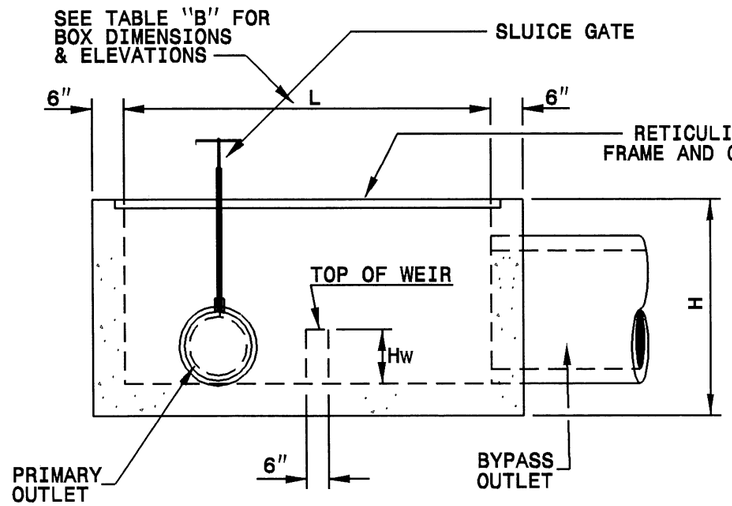
PIPE SIZE AND INVERT ELEVATION

BASIN	INLET PIPE DIA.	PRIMARY OUTLET PIPE DIA.	SECONDARY OUTLET PIPE DIA.	INLET PIPE INV. ELEV.	PRIMARY OUTLET PIPE INV. ELEV.	SECONDARY OUTLET PIPE INV.ELEV.	CONCRETE QTY. (YD.^{3})
Sta. 29+88-L2- (44.47 Lt)	24"	18"	24"	1126.59'	1126.59'	1126.59'	3.2

TABLE "B"

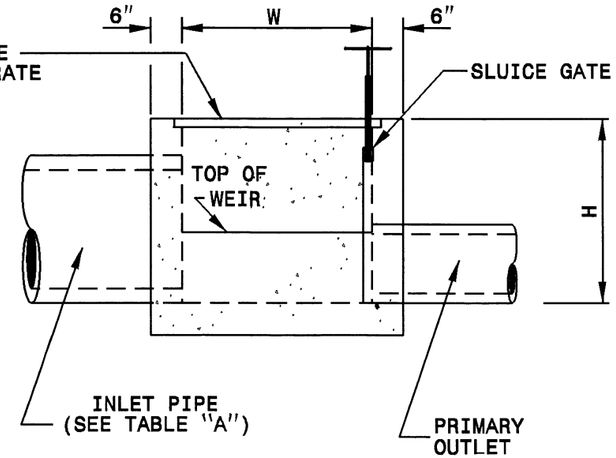
BOX AND WEIR SIZE & INVERT ELEVATION

BASIN	BOX DIMENSIONS L	BOX DIMENSIONS W	BOX DIMENSIONS H	BOX INVERT ELEV.	TOP OF BOX INVERT ELEV.	WEIR HEIGHT (Hw)	WEIR LOCATION (Xw)
Sta. 29+88-L2- (44.47 Lt)	8'	4'	5.21'	1126.59'	1131.80'	18"	4'



NOTE: (SEE TABLE "B" FOR WEIR HEIGHT & LOCATION)

VIEW A-A



VIEW B-B

NOTES:

USE CLASS 'B' CONCRETE THROUGHOUT.

PLACE STEPS IN ALL STRUCTURES OVER 3' IN HEIGHT IN ACCORDANCE WITH STD.NO. 840.66. (12" ON CENTERS)

RETICULINE FRAMES AND GRATES TO BE APPROVED BY THE ENGINEER.

USE REBAR PLACEMENT AND QUANTITIES AS SHOWN BY THE ENGINEER.

USE REBAR PLACEMENT AS SHOWN IN STD.NO. 840.31.

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SPLITTER BOX DETAILS

ORIGINAL BY:	TSpell	DATE:	Jan.16.2006
MODIFIED BY:	jwdunnehoo	DATE:	2-19-07
CHECKED BY:		DATE:	
FILE SPEC.:	r:\hydraulics\k4703_splitter box.dgn		

5/28/99

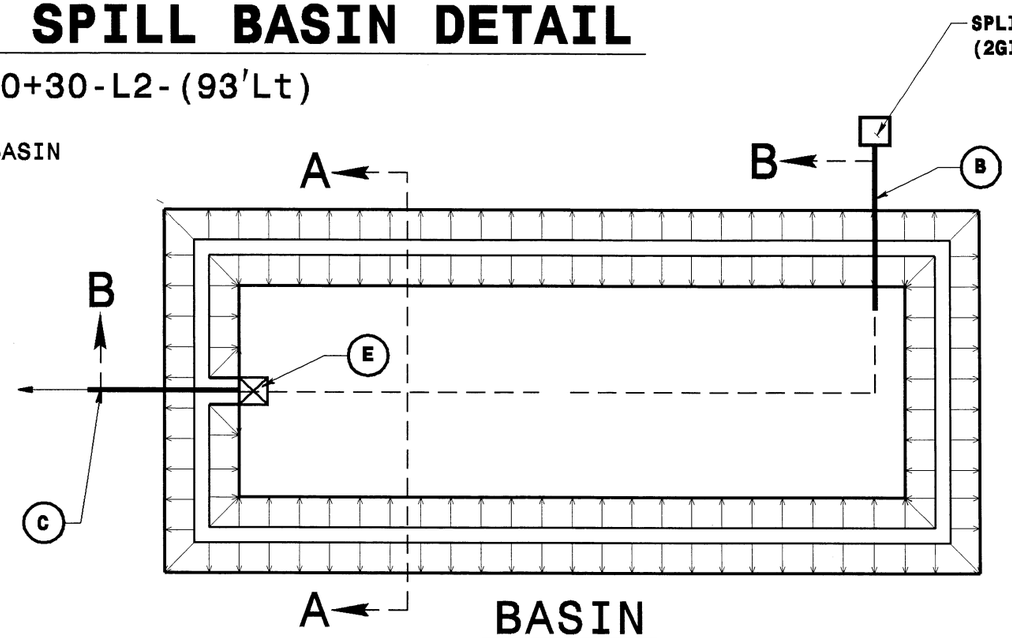
PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-F

HAZARDOUS SPILL BASIN DETAIL

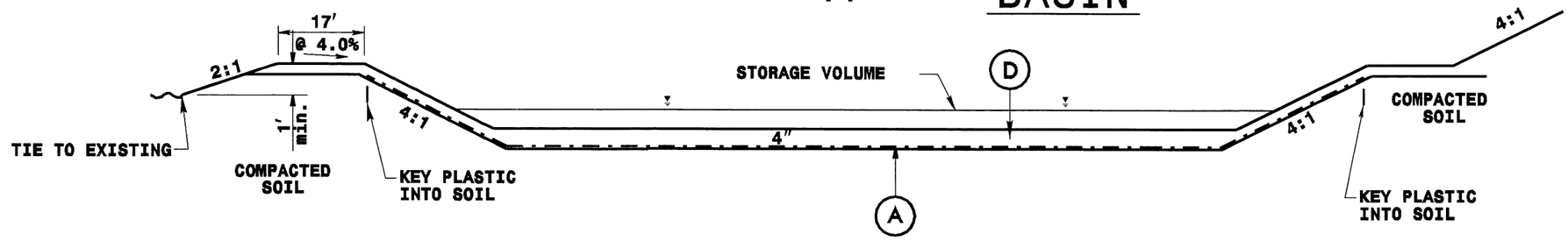
Sta. 30+30-L2-(93'Lt)

MATERIALS	
A	10MM IMPERVIOUS PLASTIC
B	18" RCP INLET PIPE
C	24" RCP OUTFALL PIPE
D	TOP SOIL AND BERMUDA SOD
E	OUTLET CONTROL STRUCTURE (SEE SPECIAL DETAIL)
F	CLASS B RIP RAP

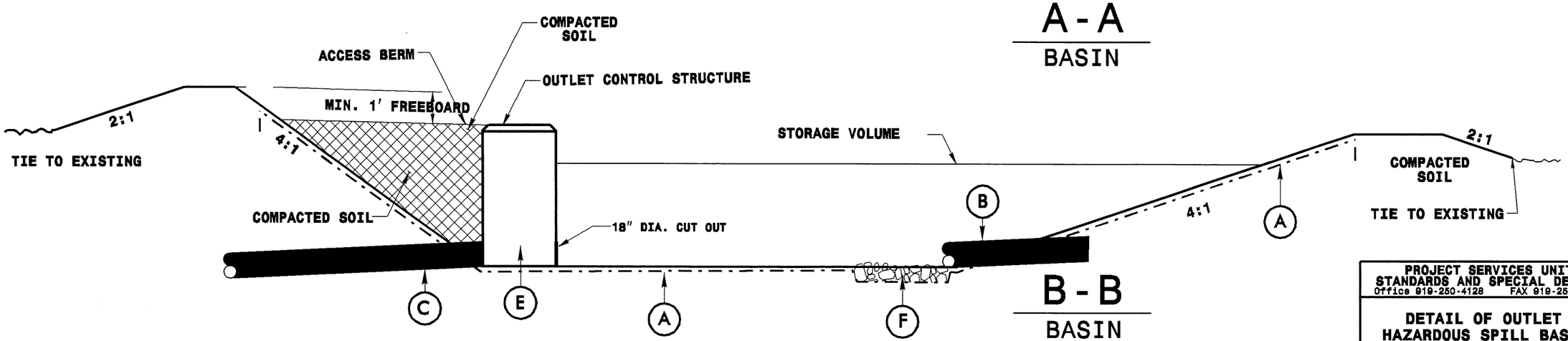
NOTE:
SEE PLAN SHEET #5 FOR SHAPE AND SIZE OF BASIN
SURFACE AREA AT ELEV. 1126 = 1784 SF.
SURFACE AREA AT ELEV. 1129 = 4115 SF.



BASIN



A - A
BASIN



B - B
BASIN

TYPICAL SECTIONS

*NOT TO SCALE

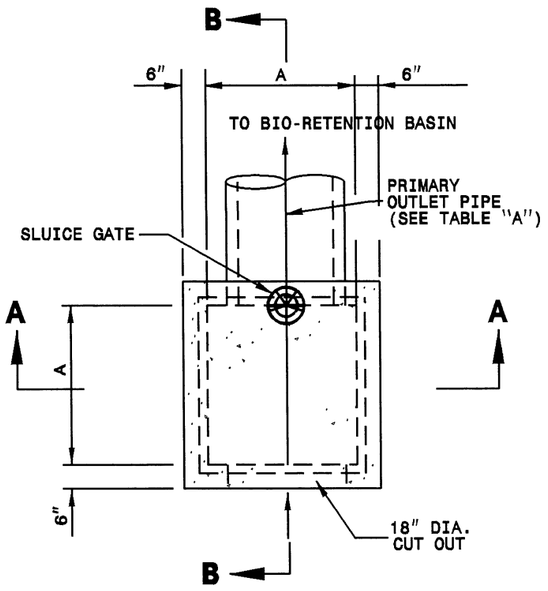
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF OUTLET
HAZARDOUS SPILL BASIN

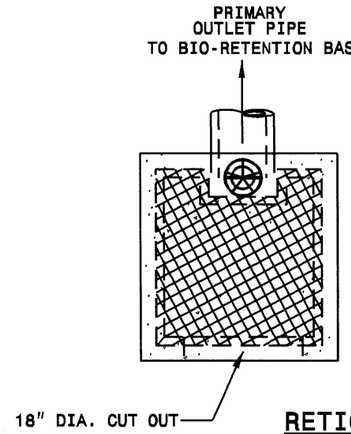
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: jwdunnehoo DATE: 2-19-07
CHECKED BY: _____ DATE: _____
FILE SPEC.: K4703 hazardous spill retention basin.dgn

10-APR-2007 11:20
r:\roadway proj\k4703\SPECIAL DETAILS\K4703 hazardous spill retention basin.dgn

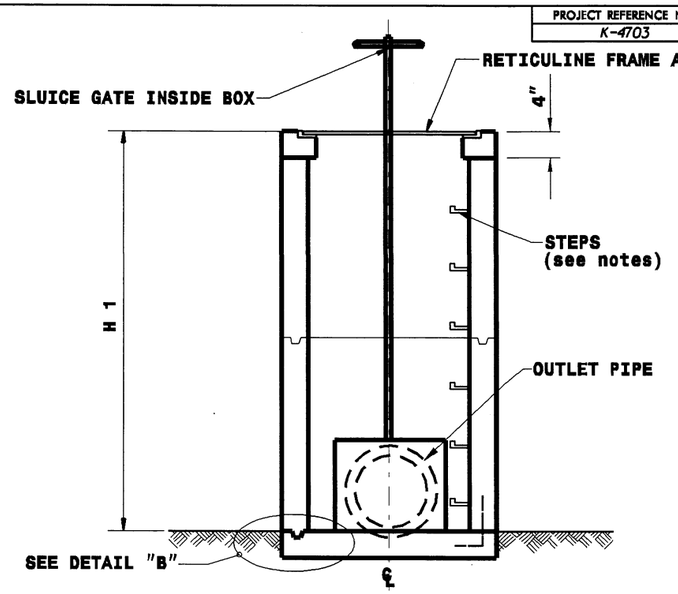
PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-G



PLAN VIEW



TOP VIEW OF RETICULINE FRAME AND GRATE WITH SLUICE GATE



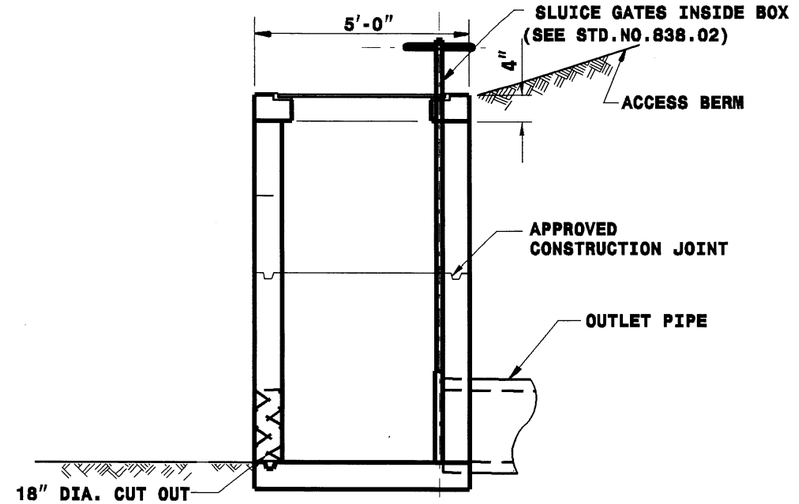
VIEW A-A

TABLE "A"

MINIMUM DIMENSIONS FOR OUTLET CONTROL STRUCTURE

BASIN	OUTLET PIPE D	OUTLET PIPE INVERT	BOX HEIGHT H1	TOP OF GRATE ELEV.	18" CUT OUT INVERT		POOL BASIN ELEV.
Sta. 30+30-L2-	18"	1126.0	3.0	1129.0	1126.0		1126.0
(93'Lt)							

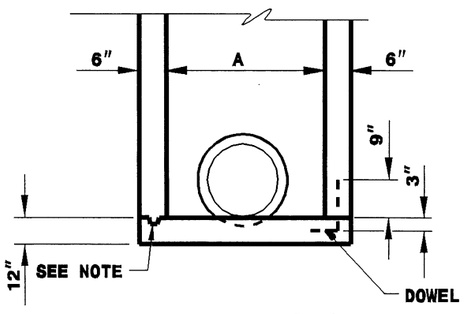
PIPE D	"A"	BARS-X		BARS-Y		"F"	TOTAL CONCRETE QUANTITIES
		QTY.	LENGTH	QTY.	LENGTH		
18"	4'-0"	6	6'-5"	6	6'-5"	5'-0"	1.9 CU.YDS.



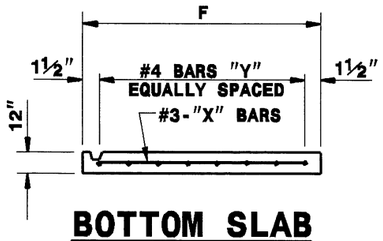
VIEW B-B

GENERAL NOTES:

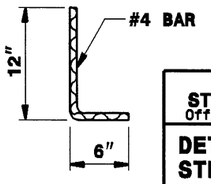
* CHANGES IN ELEVATIONS MUST BE APPROVED BY THE ENGINEER.
* CLASS 'B' CONCRETE TO BE USED THROUGHOUT. PRECAST CONCRETE STRUCTURES TO BE SUBMITTED FOR APPROVAL.
* OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2 INCH KEYWAY, OR #4 BAR DOWELS AT 12 INCH CENTERS, AS DIRECTED BY THE ENGINEER.
* FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
* IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD 840.00.
* ALL DRAWDOWN STRUCTURES OVER 3 FEET IN DEPTH TO BE PROVIDED WITH STEPS 12 INCH ON CENTERS. STEPS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD 840.66.
* FOR 8'-0" IN HEIGHT OR LESS USE 8 INCH WALLS AND BOTTOM SLAB. OVER 8'-0" IN HEIGHT USE 12" WALLS TO 6'-0" FROM TOP OF WALL AND USE 8 INCH THICK WALLS FOR THE REMAINING 6'-0". ADJUST QUANTITIES ACCORDINGLY
* RETICULINE FRAME AND GRATE TO BE APPROVED BY THE ENGINEER..



DETAIL 'B'



BOTTOM SLAB



DOWEL

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF OUTLET CONTROL STRUCTURE FOR HAZARDOUS SPILL BASIN

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: jwdunnehoo DATE: 2-19-07
CHECKED BY: _____ DATE: _____
FILE SPEC.: k4703_hazardous spill retention basin.dgn

10-APR-2007 11:20
I:\projects\k4703_rdy_2f_g.dgn
$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-H

MATERIALS

A	200 ST GEOTEXTILE FABRIC
B	POLYPROPYLENE WOVEN MONOFILAMENT GEOTEXTILE FABRIC
C	
D	24" RCP INLET PIPE
E	24" RCP OUTFALL PIPE
F	6" PERFORATED HDPE D/W W/ FILTER SOCK
G	6" HDPE N12 D/W SOLID CLEANOUT PIPE
H	PRECAST DI BOX (SEE BOX SUMMARY)
I	ENGINEERED SOIL (SAND 70%, EXCAVATED MATERIAL 30%)
J	12 MONTH AGED HARDWOOD MULCH
K	CLASS B RIP RAP
L	WASH STONE NO. 57 AS PER NCDOT SPEC.

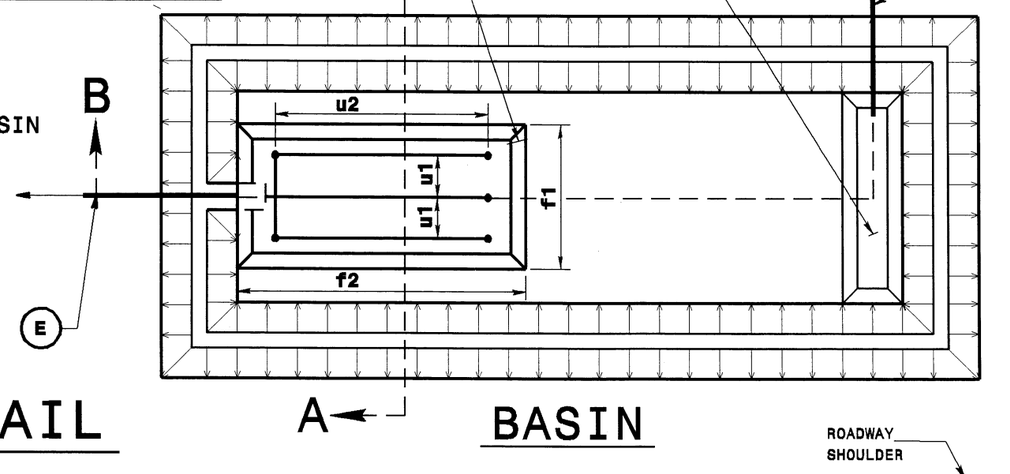
DIMENSIONS FOR UNDERDRAIN PIPE & FILTER BED				
BASIN	UNDERDRAIN DIMENSIONS		FILTER BED DIMENSIONS	
	SPACING(u1)	LENGTH(u2)	WIDTH(f1)	LENGTH(f2)
WESTBOUND	24 FT.	VAR.	VAR.	VAR.

TABLE"A"

NOTE:

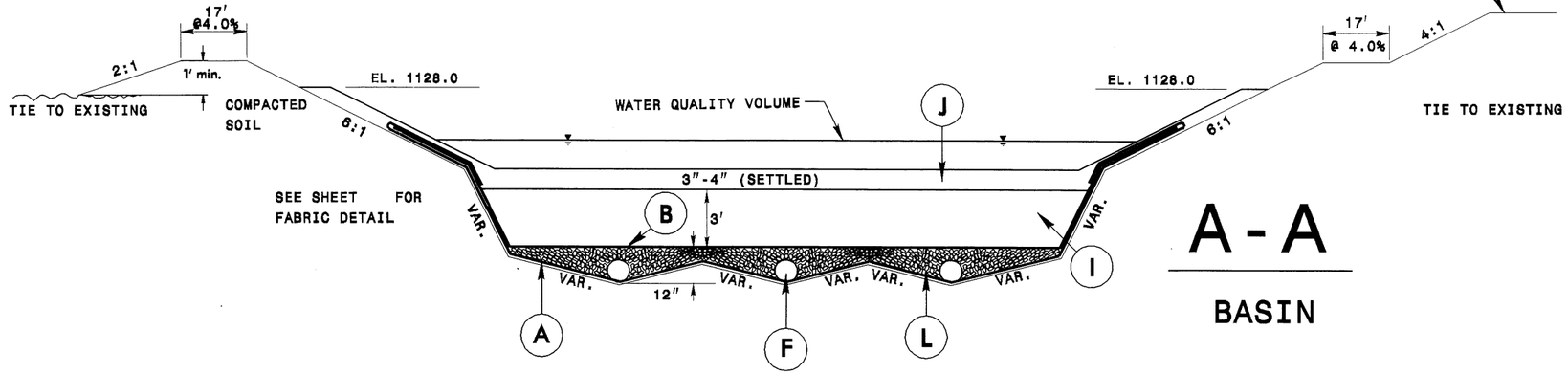
SEE PLAN SHEET #5 FOR SHAPE AND SIZE OF BASIN AND LENGTH OF UNDERDRAIN PIPES.

ENGINEERED SOIL SURFACE AREA AT ELEV. 1125.5 = 12094 SF.



BASIN

BIO-RETENTION DETAIL



A-A

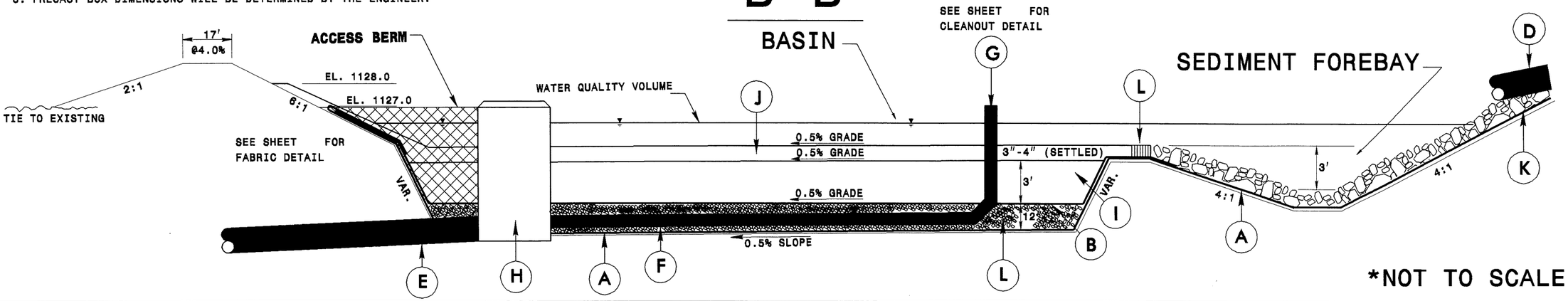
BASIN

NOTES

1. ENTIRE BASIN AND SEDIMENT FOREBAY WILL BE LINED WITH FILTER FABRIC (TYPE 200ST).
2. BASIN AND FOREBAY DIMENSIONS WILL VARY (AS DIRECTED BY THE ENGINEER).
3. PRECAST BOX DIMENSIONS WILL BE DETERMINED BY THE ENGINEER.

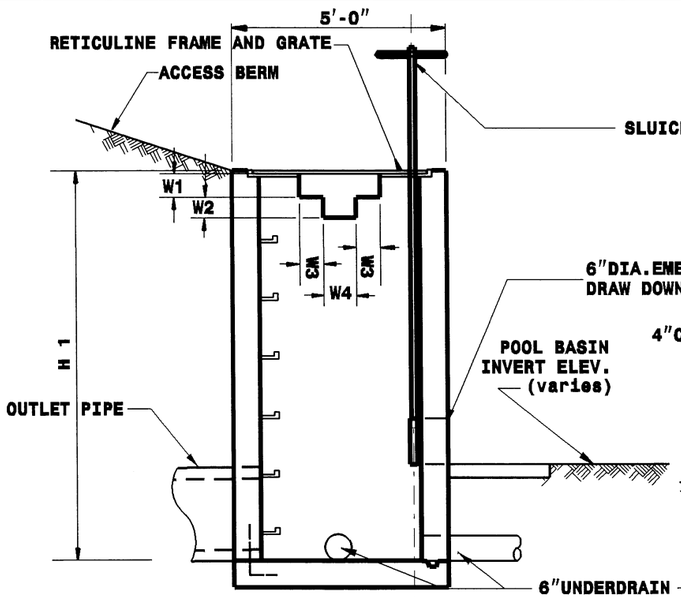
B-B

BASIN

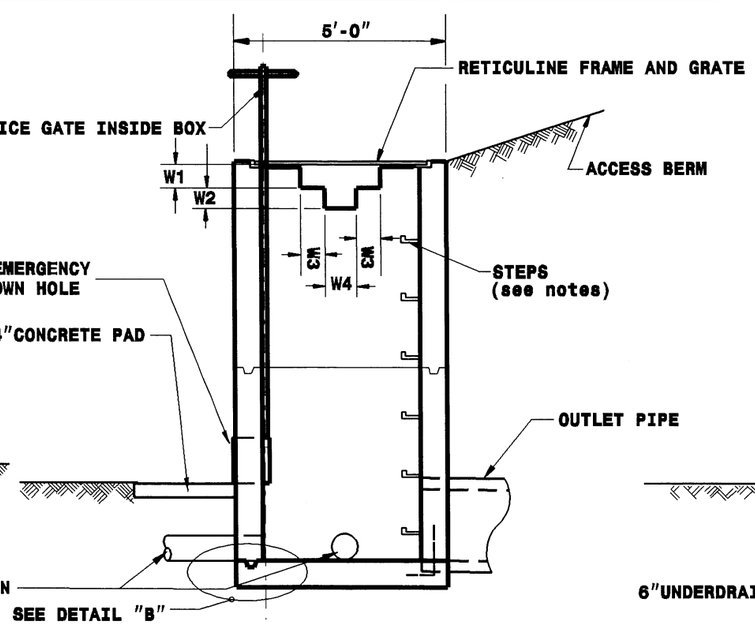


*NOT TO SCALE

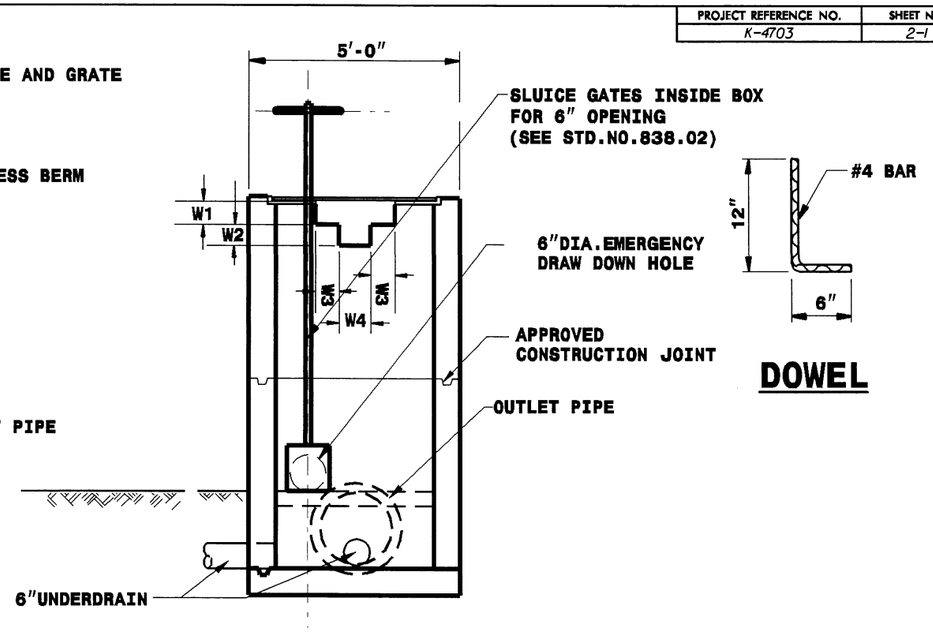
PROJECT REFERENCE NO.	SHEET NO.
K-4703	2-1



STRUCTURE SIDE 1



STRUCTURE SIDE 2



STRUCTURE FRONT

DOWEL

TABLE "A"

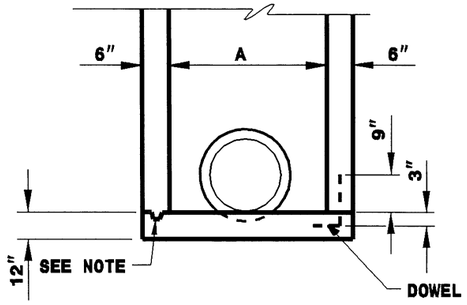
MINIMUM DIMENSIONS FOR OUTLET CONTROL STRUCTURE

BASIN	PIPE D	OUTLET PIPE INVERT	BOX HEIGHT H1	TOP OF GRATE ELEV.	UNDER DRAIN INVERT	ORFICE PLATE OPENING INVERT	POOL BASIN ELEV. @ PAD ELEV.	WEIR DIMENSIONS					
								W1	W2	W3	W4	W1 EL	W2 EL
Sta. 33+18-L2-	24"	1120.27'	6.56'	1126.83'	1120.52'		1124.61'	0.50'	0.50'	0.90'	1.20'	1125.5'	1126.0'
(174 Lt)													

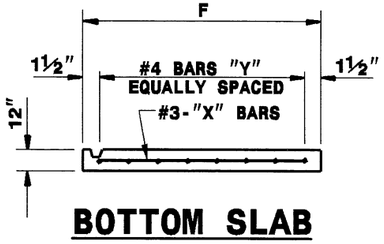
PIPE D	"A"	BARS-X		BARS-Y		"F"	TOTAL CONCRETE QUANTITIES
		QTY.	LENGTH	QTY.	LENGTH		
24"	4'-0"	6	6'-5"	6	6'-5"	5'-0"	4.4 CU.YDS.

GENERAL NOTES:

* CHANGES IN ELEVATIONS MUST BE APPROVED BY THE ENGINEER.
* CLASS 'B' CONCRETE TO BE USED THROUGHOUT. PRECAST CONCRETE STRUCTURES TO BE SUBMITTED FOR APPROVAL.
* OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2 INCH KEYWAY, OR #4 BAR DOWELS AT 12 INCH CENTERS, AS DIRECTED BY THE ENGINEER.
* FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
* IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD 840.00.
* ALL DRAWDOWN STRUCTURES OVER 3 FEET IN DEPTH TO BE PROVIDED WITH STEPS 12 INCH ON CENTERS. STEPS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD 840.66.
* FOR 8'-0" IN HEIGHT OR LESS USE 8 INCH WALLS AND BOTTOM SLAB. OVER 8'-0" IN HEIGHT USE 12" WALLS TO 6'-0" FROM TOP OF WALL AND USE 8 INCH THICK WALLS FOR THE REMAINING 6'-0". ADJUST QUANTITIES ACCORDINGLY
* RETICULINE FRAME AND GRATE TO BE APPROVED BY THE ENGINEER..



DETAIL 'B'



BOTTOM SLAB

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF OUTLET CONTROL STRUCTURE FOR BIO-RETENTION BASIN

ORIGINAL BY:		DATE:	
MODIFIED BY:	jwdunnehoo	DATE:	2-19-07
CHECKED BY:		DATE:	
FILE SPEC.:	p:\hydraulics\k4703_bio-retention_typ.dgn		

PROJECT REFERENCE NO.	SHEET NO.
K-4703	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

REVISIONS

-L2- SPIRAL DATA
Pls Sta 26+51.65
θs = 14° 19' 26.2"
Ls = 200.00'
LT = 133.77'
ST = 67.01'

NAD 83'95

S 77°17'05" W
519.43'

N 00°27'47" E
124.33'

S 45°19'02" E
200.29'

N 39°34'53" E
57.20'

N 00°27'47" E
118.14'

N 45°37'40" E
265.57'

N 00°27'47" E
444.58'

N 30°23'09" W
306.28'

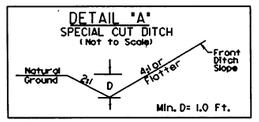
N 84°03'43" E
169.88'

N 12°12'49" W
207.77'

S 10°09'12" E
156.75'

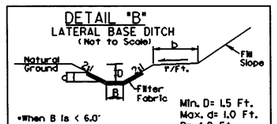
S 66°30'33" W
166.44'

DETAIL "A"
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 12+00 TO -L- STA. 13+50 (LT)

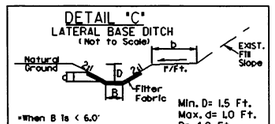
DETAIL "B"
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
Type of Liner= CL"F Rip Rap

FROM -L- STA. 18+00 TO -L- STA. 19+00 (LT)
FROM -L- STA. 20+50 TO -L- STA. 23+00 (LT)

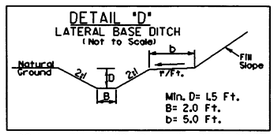
DETAIL "C"
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.
Type of Liner= CL"F Rip Rap

FROM -L- STA. 19+00 TO -L- STA. 20+50 (LT)

DETAIL "D"
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM -L- STA. 23+00 TO -L- STA. 25+17.88 (LT)
FROM -L2- STA. 25+17.88 TO -L2- STA. 26+50 (LT)

MELINDA DELOIS WADE-EDMUNDS ET.AL
DB 944 PG 263

CHESTER RUSSELL WADE
DB 916 PG 59

LEATHA EDWARDS
DB 588 PG 203

WILLIAM LESTER WILFONG JR.
DB 773 PG 345
DB 650 PG 980
DB 639 PG 504

68.00'
DUKE POWER EASEMENT
100 KVW LINE

BEGIN PROJECT K-4703
-L- STA. 12+00.00

NATURAL ROCK ENERGY DISSIPATOR SEE DETAIL "Q" SEE DETAIL 2-D

CROSS VANE SEE DETAIL "M" SEE SHEET 2-D

SEE SHEET 2-C FOR PROPOSED CHANNEL PROFILE

-L- +75 250.00'

-L- +25 200.00'

-L- +00 EX.R/W

-L- +35 215.00'

LATERAL BASE DITCH SEE DETAIL "B"

LATERAL BASE DITCH SEE DETAIL "C"

LATERAL BASE DITCH SEE DETAIL "B"

LATERAL BASE DITCH SEE DETAIL "D"

DEAD PINE & OLD FENCE

TRACT LINE

ABAND. I S F D

I S F D

WELL

WELL

GRAVEL

CONC WALK

GRAVEL

GRAVEL

20' PRIVATE R/W DB 543 PG 581

GATE

48" WW

EXISTING R/W

EX.R/W +48.06 97.94'

-L- +00 EX.R/W

E. EDGEWOOD MILL RD.

SPECIAL CUT DITCH SEE DETAIL "A"

300' TAPER

BEG. SHOULDER BERM GUTTER -L- STA. 16+01

15+00

+39.59 98.16'

+44.75 138.73'

20+00

+13.39 138.93'

+90.54 97.94'

EX.R/W

WOODS

48" WW W/ I S B W

48" WW W/ I S BW

JB WMH INV=1057.76

15" CMP

48" CMP APPROX. DIR.

ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS

ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS

REMOVE

REMOVE

CAT-1

2GI

MTL GUARD RAIL

CONC DITCH

3' PAVED SHOULDER

U.S. 421 NBL
25' BST

3' PAVED SHOULDER

MTL GUARD RAIL

15" RCP

RETAIN

CB INV=1103.80

N 82° 40' 55.2" E

CENTERLINE OF POWER LINES OVERHEAD

CABLE TV BURIED R/W

CB INV=1118.87

RETAIN

APPROX. DIR.

15" CMP

U.S. 421 SBL
25' BST

APPROX. JUNCTION

-L- N 82° 42' 14.7" E

N 82° 53' 30.0" E

-L2-

-L2- STA. 25+80.00

MATCH LINE

SEE SHEET NO. 5

-L- POT STA. 25+17.88 (12' LT.)=
-L2- T.S STA. 25+17.88

-BL- GPS K4703-1 15+00.00 POT
-L- POT STA. 13+35.10 (34.56' RT.)

-BL- GPS K4703-2 15+09.28 PINC
-L- POT STA. 23+44.38 (34.17' RT.)

BM#1
-BL- STA 8+62.93
128.09' RIGHT
ELEV. 1137.26'

NOTE: SEE SHEET 7 FOR -L2- PROFILE

10-APR-2007 11:12
r:\roadway\PCG\k4703_rdy_psh4.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
K-4703	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NOTES: (1) SEE SHEETS 8 & 9 FOR -L2- PROFILE
(2) SEE SHEET 10 FOR -TR-ON- & -TR-OFF- PROFILES

NAD 83/95

REVISIONS

-L2- CURVE DATA

PIs Sta 26+51.65
Δs = 14° 19' 26.2" (LT)
Ls = 200.00'
LT = 133.77'
ST = 67.01'

PI Sta 28+38.88
Δ = 33° 39' 40.9" (LT)
D = 14° 19' 26.2"
L = 235.00'
T = 121.00'
R = 400.00'
SE = SEE PLANS

PIs Sta 30+19.95
Δs = 14° 19' 26.2"
Ls = 200.00'
LT = 133.77'
ST = 67.01'

PI Sta 43+85.09
Δ = 94° 49' 57.9" (LT)
D = 38° 11' 49.9"
L = 248.27'
T = 163.22'
R = 150.00'
SE = SEE PLANS

PI Sta 46+98.15
Δ = 163° 39' 27.7" (RT)
D = 35° 48' 35.5"
L = 457.02'
T = 1,114.30'
R = 160.00'
SE = SEE PLANS

PI Sta 47+03.49
Δ = 12° 09' 42.6" (RT)
D = 4° 46' 28.7"
L = 254.72'
T = 127.84'
R = 1,200.00'
SE = SEE PLANS

DETAIL "D"
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, b, B, F/Ft., Fill Slope
Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.
FROM -L- STA. 23+50 TO -L- STA. 25+17.88 (LT)
FROM -L2- STA. 25+17.88 TO -L2- STA. 26+50 (LT)

DETAIL "E"
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1.0 Ft.
FROM -L2- STA. 26+50 TO -L2- STA. 27+50 (LT)

DETAIL "F"
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)
NATURAL GROUND, VAR., D, VAR., Min. D= 1.5 Ft., B= 6.0 Ft.
FROM -L2- STA. 30+00 TO -L2- STA. 35+00 (RT)
SEE PROF. CROSS SECTIONS FOR FRONT AND REAR SLOPES

DETAIL "G"
BERM "V" DITCH
(Not to Scale)
Natural Ground, 2:1, D, 2:1, b, 2:1, RDWY
Min. D= 1.0 Ft.
b= 5.0 Ft.
FROM -L2- STA. 43+00 TO -L2- STA. 46+05.9 (LT)

DETAIL "H"
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)
NATURAL GROUND, 2:1, 3:1, D, 4:1, D= 2.0 Ft.
FROM -L2- STA. 42+30 TO -L2- STA. 48+30 (LT)

DETAIL "I"
SPECIAL CUT DITCH w/HINGE
(Not to Scale)
Natural Ground, 3:1, D, 4:1, Front Ditch Slope, 6.0', Min. D= 2.0 Ft.
FROM -L2- STA. 48+30 TO -L2- STA. 49+50 (LT)

-PAD- POT Sta. 11+25.00
-PAD- POT Sta. 10+00.00
-L2- POC Sta. 38+50.00
-L2- PC STA. 35+83.86
-L2- PT STA. 40+40.87
-L2- PC STA. 42+21.87
-L2- PC STA. 45+75.65
-L2- PT STA. 48+30.37
-L2- ST STA. 31+52.88
-L2- CS STA. 29+52.88
-L2- SC STA. 27+17.88
-L2- STA. 25+80.00 MATCH LINE
-L2- STA. 49+10.00 MATCH LINE
-TR-ON- PC STA. 10+00.00 = -L2- POC STA. 28+27.39
-TR-ON- PT STA. 11+57.13
-TR-ON- POT STA. 15+79.35
-L2- PT STA. 44+70.15 = -TR-OFF- POT STA. 14+76.44
-TR-OFF- PC STA. 12+40.76
-TR-OFF- PT STA. 12+97.62
-TR-OFF- POT STA. 10+00.00

CLASS 'B' RIP RAP
EST. 2 TONS
7 SY FILTER FABRIC

CLASS 'B' RIP RAP
EST. 4 TONS
13 SY FILTER FABRIC

CLASS 'B' RIP RAP
EST. 1 TON
5 SY FILTER FABRIC

BIO-RETENTION BASIN CONTROL STRUCTURE
SEE SHEET 2-I

BIO-RETENTION BASIN
SEE SHEET 2-H

HAZARDOUS SPILL BASIN CONTROL STRUCTURE
SEE SHEET 2-G

HAZARDOUS SPILL BASIN
SEE SHEET 2-F

SPLITTER BOX
SEE SHEET 2-E

SEDIMENT FOREBAY
SEE SHEET 2-H

SPECIAL BACK OF CURB CUT DITCH
SEE DETAIL "F"

SPECIAL CUT DITCH
SEE DETAIL "E"

ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS

END SHOULDER BERM GUTTER
-L2- STA. 26+56

4 Combo Car-trailer/Delivery Truck

Proposed Sidewalk

Planting Islands

LARRY PIERCE
DB 543 PG 566

WILLIAM LESTER WILFONG JR.
DB 773 PG 345
DB 650 PG 980
DB 639 PG 504

WILLIAM HENRY McCURDY
DB 714 PG 886

BESSIE B. HARRIS ET.AL
DB 544 PG 501
TRACT ONE

RETAIN

CONC DITCH

SEE SHEET NO.6

SEE SHEET NO.4

10-APR-2007 11:12
r:\projects\PROJ\K-4703_rdy.psh5.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
K-4703	5-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

REVISIONS

WILLIAM LESTER WILFONG JR.

WILLIAM HENRY McCURDY

LARRY PIERCE

BESSIE B. HARRIS ET.AL

WOODS

EXISTING R/W

REBAR

N 02°54'16" E 294.54'

N 03°36'41" E 265.14'

S 03°36'41" W 0.87'

S 03°09'45" W 0.45'

S 03°59'45" W 847.44'

S 4°03'09.2" W

NAD 83'95

35+00

30+00

40+00

45+00

-L2-

-L-

-TR-

-L2- ST STA. 31+52.88

-L2- CS STA. 29+52.88

-L2- SC STA. 27+17.88

-L2- PT STA. 40+40.87

-L2- PC STA. 42+21.87

-L2- PC STA. 45+75.65

-L2- PT STA. 48+30.37

N 20°23'41.4" E

N 82°42'14.7" E

N 89°13'11.2" E

-TR-OFF- PC STA. 12+40.76

-TR-OFF- PT STA. 12+97.62

-TR-OFF- POT STA. 10+00.00

-L2- PT STA. 44+70.15 =
-TR-OFF- POT STA. 14+76.44

S 78°37'05.1" E

-TR-ON- N 82°42'15.9" E

AXLE TO REBAR

48" WW W/ TS BW

+97.34
127.49'

+96.46
96.96'

+00.36
126.36'

+00.63
97.83'

-TR-ON- PT STA. 11+57.13

-TR-ON- POT STA. 15+79.35

-TR-ON- PC STA. 10+00.00 =
-L2- POC STA. 28+27.39

CONC DITCH

18" CMP

CB

MTL GUARD RAIL

3' BST SHOULDER

U.S. 421 NBL

25' BST

-L-

N 82°42'14.7" E

15" CMP

APPROX. DIR.

N 82°53'30.0" E

CABLE GUARD RAIL

N 82°39'52.9" E

N 81°27'03.5" E

U.S. 421 SBL

-BL-5 22+09.73 PINC
-L- POT STA. 30+44.83 (36.46' RT.)

-BL-6 30+05.48 PINC
-L- POT STA. 38+40.58 (35.92' RT.)

BM#2
-BL- STA 26+69.38
91.43' RIGHT
ELEV. 1124.41'

-L2- CURVE DATA

PIs Sta 26+51.65	PI Sta 28+38.88	PIs Sta 30+19.95
θs = 14°19'26.2"	Δ = 33°39'40.9" (LT)	θs = 14°19'26.2"
Ls = 200.00'	D = 14°19'26.2"	Ls = 200.00'
LT = 133.77'	L = 235.00'	LT = 133.77'
ST = 67.07'	T = 121.00'	ST = 67.07'
	R = 400.00'	
	SE = SEE PLANS	
PI Sta 43+85.09	PI Sta 46+98.15	PI Sta 47+03.49
Δ = 94°49'57.9" (LT)	Δ = 163°39'27.7" (RT)	Δ = 12°09'42.6" (RT)
D = 38°11'49.9"	D = 35°48'35.5"	D = 4°46'28.7"
L = 248.27'	L = 457.02'	L = 254.72'
T = 163.22'	T = 1,114.30'	T = 127.84'
R = 150.00'	R = 160.00'	R = 1,200.00'
	SE = SEE PLANS	

-TR-ON- CURVE DATA

PI Sta 10+80.41
Δ = 30°00'37.0" (RT)
D = 19°05'54.9"
L = 157.13'
T = 80.41'
R = 300.00'
SE = SEE PLANS

-TR-OFF- CURVE DATA

PI Sta 12+69.22
Δ = 6°30'56.5" (RT)
D = 11°27'33.0"
L = 56.86'
T = 28.46'
R = 500.00'
SE = SEE PLANS

10-APR-2007 11:12
c:\projects\k4703_rdy_psh5a.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
K-4703	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83/95

REVISIONS

S 86°57'43" E
536.38'

PLANTED STONE

-L2- CURVE DATA

PI Sta 51+17.74	PI Sta 53+08.73	PI Sta 55+04.80	PI Sta 58+14.24
Θs = 4°46' 28.7"	Δ = 11°50' 06.5" (LT)	Θs = 0°27' 30.0"	Δ = 1°40' 12.3" (LT)
Ls = 200.00'	D = 4°46' 28.7"	Ls = 200.00'	D = 0°27' 31.7"
LT = 133.38'	L = 247.87'	LT = 127.55'	L = 364.01'
ST = 66.71'	T = 124.38'	ST = 72.57'	T = 182.02'
	R = 1,200.00'		R = 12,488.00'
	SE = SEE PLANS		SE = SEE PLANS

N 89°45'17" E
709.83'

N 02°29'49" W
404.19'

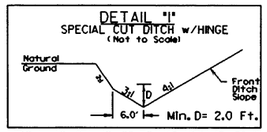
N 01°03'39" E
436.09'

S 01°58'23" W
506.82'

ROCK

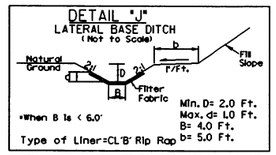
S 89°11'49" E
129.55'

DETAIL "I"
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



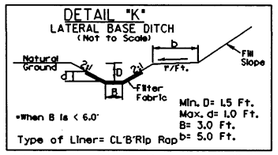
FROM -L2- STA. 48+30 TO -L2- STA. 49+50 (LT)

DETAIL "J"
LATERAL BASE DITCH
(Not to Scale)



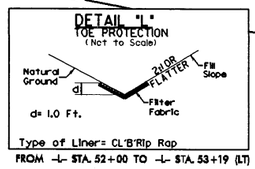
FROM -L2- STA. 50+42 TO -L2- STA. 51+78 (LT)

DETAIL "K"
LATERAL BASE DITCH
(Not to Scale)



FROM -L- STA. 50+26.5 TO -L- STA. 52+00 (LT)

DETAIL "L"
TOE PROTECTION
(Not to Scale)



FROM -L- STA. 52+00 TO -L- STA. 53+19 (LT)

(2)
BESSIE B. HARRIS ET.AL

BOBBY MARSHALL PARKS

(3)
JAMES WESLEY HARRIS

WOODS

-L2- TS STA. 49+84.35

-L2- STA. 49+10.00
MATCH LINE

-L2- SC STA. 51+84.35

-L2- CS STA. 54+32.23

-L2- SC STA. 56+32.23 =
-L- POC STA. 47+51.02 (12' LT)

BEGIN SHOULDER BERM GUTTER
-L2- STA. 50+26

LATERAL BASE DITCH
SEE DETAIL "J"

ROD & LUG CONNECTORS W/SLEEVE GASKETS & 2 ELBOWS

CLASS 'I' RIP RAP
EST. 2 TONS
8 SY FILTER FABRIC

CLASS 'I' RIP RAP
EST. 10 TONS
25 SY FILTER FABRIC

CLASS 'I' RIP RAP
EST. 1 TONS
5 SY FILTER FABRIC

-L- +84.35
135.00'

-L- +50
110.00'

-L- +00
110.00'

-L- +10
150.00'

-L- +30
190.00'

-L- +75
130.00'

-L- +00
EX. R/W

CROSS VANE
SEE DETAIL "P"
SEE SHEET 2-D

CONSTRUCTED RIFFLE
SEE DETAIL "N"
SEE SHEET 2-D

ROCK SEAL
SEE DETAIL "N"
SEE SHEET 2-D

NATURAL ROCK ENERGY DISSIPATOR
SEE DETAIL "Q"
SEE SHEET 2-D

SEE SHEET 2-C
FOR PROPOSED
CHANNEL PROFILE

CREEK

END PROJECT K-4703
-L- STA. 55 + 00

SEE SHEET NO.5

S 78°37'06.1" E
+46.72

SPRING BOX

+30.73

48" WW W/ I.S BW

15" CSP

18" CSP

24" CSP

JB wMH

REMOVE EXIST. BOX & REPLACE

REMOVE 12' OF EXIST. PIPE

COLLAR AND EXTEND

TOE PROTECTION
SEE DETAIL "L"

300' TAPER

EXISTING R/W

RETAIN

REMOVE

2GI

FS

CB

-L-

N 81° 27' 03.5" E

N 78° 02' 03.5" E

N 77° 52' 05.9" E

TIE TO EXISTING GUARDRAIL

U.S. 421 NBL

U.S. 421 SBL

CABLEGUARD RAIL

60" CMP

42" CMP

18" CMP

15" RCP

APPROX. DIR.

APPROX. JUNCTION

-L- PC STA. 40+60.38

-L- CURVE DATA
PI Sta 45+88.19
Δ = 4°50' 08.8" (LT)
D = 0°27' 30.1"
L = 1,055.00'
T = 527.82'
R = 12,500.00'
SE = SEE PLANS

-BL-7 39+91.54 PINC
-L- POC STA. 48+24.57 (37.78' RT.)

-L- PT STA. 51+15.38

NOTES: SEE SHEET 9 & 10 FOR -L2- PROFILE

10-APR-2007 11:12
\\ss22\DGN\K4703_rdy_psh6.dgn
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	7

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM #1 EL. 1137.26'
TOP OF R/W MON.
AT NE FENCE CORNER IN R/W FENCE
-BL- STA. 8+63 (128' RT.)
-L- STA. 16+98.09 (162.51' RT)

-L-

BEGIN SP. DITCH GRADE
STA. 12+00.00 ELEV. = 1100.37

(+) 2.33%

END SP. DITCH GRADE
STA. 13+50.00 ELEV. = 1103.89

BEGIN SP. DITCH GRADE
STA. 16+00.00 ELEV. = 1105.25

(+) 1.33%

PI = 19+60.00
ET = 1107.10

(+) 10.72%

PI = 21+60.00
ET = 1068.30

(+) 10.42%

(+) 3.50%

(+) 3.50%

BEGIN SPECIAL DITCH GRADE LT.
-L2- STA. 25+17.88 = -L- STA. 25+17.88
ET. = 1115.33

(+) 0.20%

1127.70

1118.38

BEGIN GRADE
-L- STA. 25+17.88 (21.47' LT.) =
-L2- STA. 25+17.88
ET. = 1127.53

FOR -L2- PLAN VIEW
SEE SHEET 4 & 5

1,180 1,170 1,160 1,150 1,140 1,130 1,120 1,110 1,100 1,090 1,080 1,070 1,060 1,050 1,040 1,030 1,020

12 13 14 15 16 17 18 19 20 21 22 23 24 25

10-APR-2007 11:12
r:\roadway\projects\k4703_rdy_pfl.dgn
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L2-

PI = 41+50.00
EL = 1,117.28'
VC = 700'
K = 64
SSD = 372'

PI = 29+25.00
EL = 1,128.36'
VC = 480'
K = 127

1,180
1,170
1,160
1,150
1,140
1,130
1,120
1,110
1,100
1,090
1,080
1,070
1,060
1,050

26 27 28 29 30 31 32 33 34 35 36 37 38 39

1+67.53

(+)3.99357%

(+)4.00000%

(+)3.48851%

(+)3.50681%

(+)0.20394%

(-)0.07943%

118.81 L.C.T.O.

PI = 34+60.00
EL = 1,147.55

PI = 33+60.00
EL = 1,143.80

PI = 31+75.00
EL = 1,130.50

BEGIN SP. DITCH GRADE PT.
STA 30+01 ELEV. = 1,131.89

END SPECIAL DITCH GRADE LT.
STA 27+50.00
EL. 1,124.07

END SP. DITCH GRADE PT.
STA 35+90 ELEV. = 1,151.62

FOR -L2- PLAN VIEW
SEE SHEET 5

10-APR-2007 11:12
r:\projects\PDP3\k4703_rdy_pf1.dgn
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM #2 EL. 1121.41'
8" SPIKE IN BASE OF A 10" POPLAR TREE
-BL- STA. 26+69 (91' RT.)
-L- STA. 35+04.54 (127.58' RT.)
-L2- STA. 44+50.63 (378.73' RT.)

-L2-

PI = 41+50.00
EL = 1,177.28'
VC = 700'
K = 64
SSD = 372'

PI = 47+00.00
EL = 1,139.07'
VC = 200'
K = 190
SSD = 1125'

PI = 51+35.00
EL = 1,104.27'
VC = 580'
K = 87

BEGIN SPECIAL DITCH GRADE LT.
STA. 43+00.00
EL. 1169.70

END SPECIAL DITCH GRADE LT.
STA. 46+05.31
EL. 1170.29

BEGIN SPECIAL DITCH GRADE LT.
STA. 42+30.00
EL. 1163.24

END SPECIAL DITCH GRADE LT.
STA. 45+50.10
EL. 1,1450

BEGIN SPECIAL DITCH GRADE LT.
STA. 50+42.00
EL. 1099.07

END SPECIAL DITCH GRADE LT.
STA. 51+73.00
EL. 1,087.65

PI = 44+00.00
EL = 1165.94

PI = 44+00.00
EL = 1157.80

PI = 45+32.00
EL = 1164.40

PI = 47+50.00
EL = 1133.30

1,180 1,170 1,160 1,150 1,140 1,130 1,120 1,110 1,100 1,090 1,080 1,070 1,060 1,050 1,040 1,030

40 41 42 43 44 45 46 47 48 49 50 51 52 53

FOR -L2- PLAN VIEW
SEE SHEETS 5 & 6

10-APR-2007 11:12
r:\roadway\pro\k4703_rdy_pf1.dgn
$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
K-4703	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L2-

-L-

PI = 51+35.00
EL = 1,104.27'
VC = 580'
K = 87

PI = 55+56.00
EL = 1,098.65'
VC = 140'
K = 378
SSD = 298.3'

1.0177

(-)1.3349%

(-)1.3349%

(-)1.7054%

END GRADE -L2- STA 55+32.23 =

BEGIN PROFILE -L- STA 47+51.02 (12' LT.)

ELEV. 1,097.35

BEGIN SP. DITCH GRADE LT.
STA 50+26.50 ELEV. 1,063.75

(+)2.3381%

END SP. DITCH GRADE LT.
STA 52+00 ELEV. 1,064.29

FOR -L2- PLAN VIEW
SEE SHEET 6

-TR-ON-

PI = 11+50.00
EL = 1,130.71'
VC = 200'
K = 71

BEGIN GRADE -TR-ON- STA 10+00.00
EL. 1,128.96

(+)1.1667%

(+)1.7999%

END GRADE -TR-ON- STA 9+79.35
EL. 1,144.38

FOR -TR-ON- PLAN VIEW
SEE SHEET 5

-TR-OFF-

PI = 14+05.00
EL = 1,160.08'
VC = 120'
K = 11

BEGIN GRADE -TR-OFF- STA 10+00.00
EL. 1,143.86

(+)4.0000%

(-)4.0000%

END GRADE -TR-OFF- STA 14+76.44
EL. 1,155.04

FOR -TR-OFF- PLAN VIEW
SEE SHEET 5

-PAD-

BEGIN GRADE -PAD- STA 10+12.00
EL. 1,165.34

(-)2.3009%

END GRADE -PAD- STA 11+25.00
EL. 1,162.74

FOR -PAD- PLAN VIEW
SEE SHEET 5

10-APR-2007 lh12
r:\roadway\pro\k4703_rdy_pfl.dgn
$$$$USERNAME$$$$

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**K-4703**
State Project No.	**36401.1.1**
Federal Project No.	**NHS-421(32)**

A. Project Description: (Include project scope and location and refer to the attached project location map.)

Vistors Center / Rest Area located on new location to replace bypassed rest area on old US 421.. The proposed Rest Area / Visitor's Center will be constructed on a 22-acre site.

B. Purpose and Need:

The primary responsibility of the state to persons using the highway system is safety. Rest areas are an important instrument for the safety of the highway system. Accident reduction is the primary function of a rest area. Greater highway safety is a major benefit of establishing rest areas, through safe off-road locations for motorists to rest, sleep, change drivers, and check vehicle loads and/or minor mechanical problems. Additional benefits for motorists are relief from extended travel periods, increased comfort and convenience, and locations for public agencies to communicate with travelers. The new Wilkes County facility will replace the Watauga rest area on old US 421 that was bypassed when the new US 421 was opened. The Watauga County facility will be permanently closed.

Well-designed, well-maintained rest areas also create a positive image for out-of-state travelers and enhance the quality of life for state residents. They provide opportunities for DOT and tourism groups to communicate with motorists in promoting state and local programs. They also provide road and weather information and directional services such as maps, routing suggestions, traffic incident warnings, and road construction schedules.

The Wilkes County rest area/visitor center will also be the NCDOT's first "Green" building experience. The term "Green" refers to more environmentally friendly practices than in normal building design and construction. Many buildings today have some forms of "Green" design. The Leadership in Energy and Environmental Design (LEED) program has a checklist of items you can incorporate that allow you to earn additional points. A project can be certified with as few as 26 points, or it can receive a platinum certification with 52-69 points. The planning is in process for a LEED certified project that will utilize environmentally sustainable products and practices. When the project is complete, it should be an educational experience for the public and for the Department of Transportation, in addition to its primary purpose of safety.

C. Proposed Improvements:

Circle one or more of the following Type II improvements which apply to the project:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).

a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
b. Widening roadway and shoulders without adding through lanes
c. Modernizing gore treatments
d. Constructing lane improvements (merge, auxiliary, and turn lanes)
e. Adding shoulder drains
f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
g. Providing driveway pipes
h. Performing minor bridge widening (less than one through lane)

2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

a. Installing ramp metering devices
b. Installing lights
c. Adding or upgrading guardrail
d. Installing safety barriers including Jersey type barriers and pier protection
e. Installing or replacing impact attenuators
f. Upgrading medians including adding or upgrading median barriers
g. Improving intersections including relocation and/or realignment
h. Making minor roadway realignment
i. Channelizing traffic
j. Performing clear zone safety improvements including removing hazards and flattening slopes
k. Implementing traffic aid systems, signals, and motorist aid
l. Installing bridge safety hardware including bridge rail retrofit

3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

a. Rehabilitating, reconstructing, or replacing bridge approach slabs
b. Rehabilitating or replacing bridge decks
c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
d. Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.

5. Construction of new truck weigh stations or rest areas.

6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

D. Special Project Information: (Include Environmental Commitments and Permits Required.)

Construction is likely to be authorized by Nationwide Permits (NWP) Number 23 (Categorical Exclusion) and 33 (Temporary Construction, Access, and Dewatering). The project will also require a 401 Water Quality Certification Number 3361 from the Department of Environmental and Natural Resources prior to issuance of the NWP 23.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions

ECOLOGICAL		YES	NO
(1)	Will the project have a substantial impact on any unique or important natural resource?		X
(2)	Does the project involve habitat where federally listed endangered or threatened species may occur?		X
(3)	Will the project affect anadromous fish?		X
(4)	If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	

		YES	NO
(5)	Will the project require the use of U. S. Forest Service lands?		X
(6)	Will the quality of adjacent water resources be adversely impacted by proposed construction activities?		X
(7)	Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?		X
(8)	Will the project require fill in waters of the United States in any of the designated mountain trout counties?	X	
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?		X

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?		X
(11)	Does the project involve Coastal Barrier Resources Act resources?		X
(12)	Will a U. S. Coast Guard permit be required?		X
(13)	Will the project result in the modification of any existing regulatory floodway?		X
(14)	Will the project require any stream relocations or channel changes?		X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?		X
(16)	Will the project require the relocation of any family or business?		X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?		X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	
(19)	Will the project involve any changes in access control?		X

(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?		X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?		X
(22)	Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	
(23)	Is the project anticipated to cause an increase in traffic volumes?		X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?		N/A
(26)	Is there substantial controversy on social, economic, or environmental grounds concerning the project?		X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?		X
(29)	Will the project affect any archaeological remains which are important to history or pre-history?		X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?		X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?		X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the Natural System of Wild and Scenic Rivers?		X

F. Additional Documentation Required for Unfavorable Responses in Part E
(Discussion regarding all unfavorable responses in Part E should be provided below. Additional supporting documentation may be attached, as necessary.)

G. CE Approval

TIP Project No. K-4703
State Project No. 36401.1.1
Federal-Aid Project No. NHS-421(32)

Project Description: (Include project scope and location. Attach location map.)

Vistors Center / Rest Area located on new location to replace bypassed rest area on old US 421.. The proposed Rest Area / Visitor's Center will be constructed on a 22-acre site.

Categorical Exclusion Action Classification: (Check one)

_____ TYPE II(A)
__X__ TYPE II(B)

Approved:

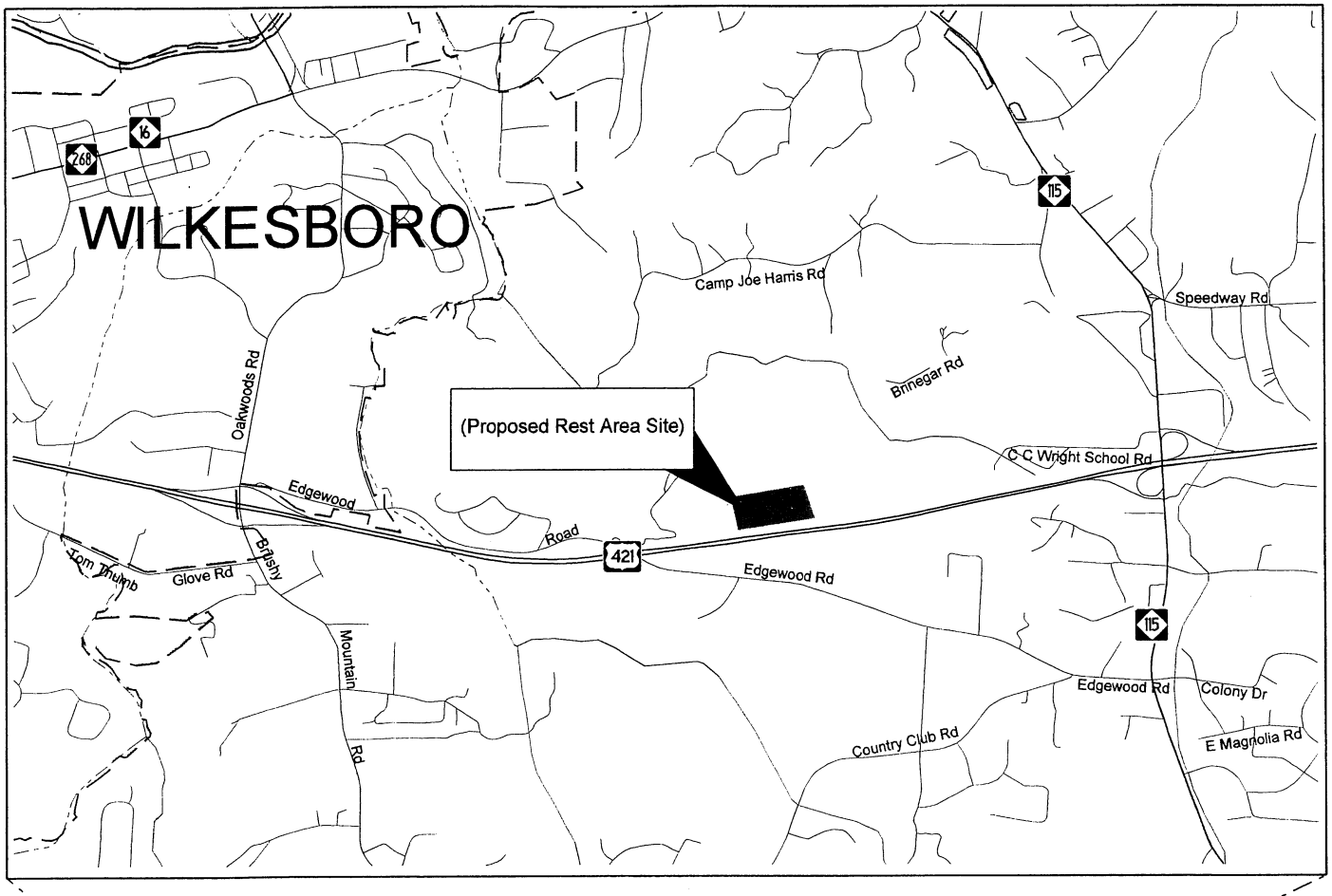
2/24/06 Teresa A. Hart
Date
Teresa A. Hart, PE
Assistant Manager
Project Development and Environmental Analysis Branch

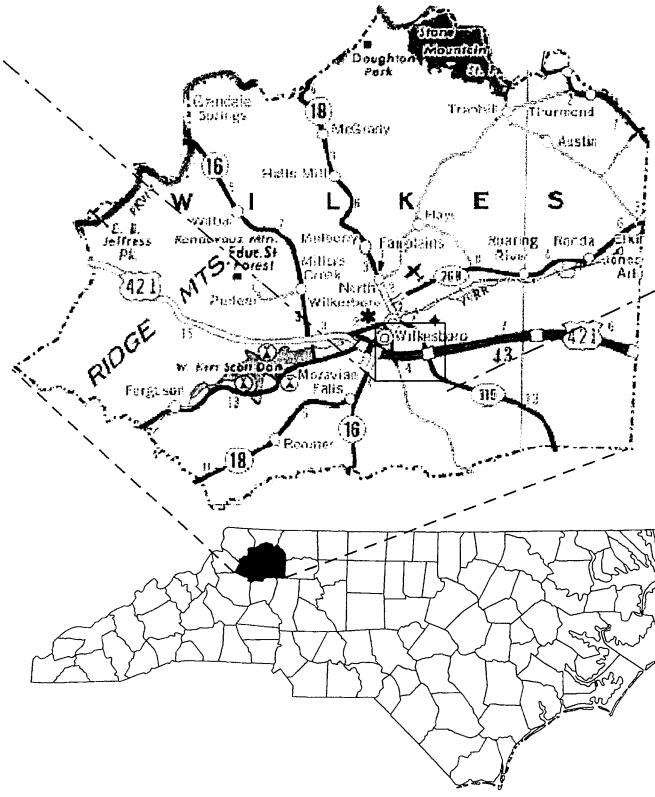
2/24/06 James F. Bridges
Date
James F. Bridges, PE
Project Engineer
Project Development and Environmental Analysis Branch

2/24/06 Ryan L. White
Date
Ryan L. White, EIT
Project Development Engineer
Project Development and Environmental Analysis Branch

For Type II(B) projects only:

2/27/06 for Thomas D. Rigsby
Date
Division Administrator
Federal Highway Administration





NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

REST AREA ON NEW LOCATION
TO REPLACE BYPASSED
REST AREA ON OLD US 421
WILKES COUNTY
T.I.P. PROJECT K-4703

FIGURE1: VICINITY MAP

PROPOSED NEW VISITOR CENTER
ON US 421
WILKES COUNTY

Natural Resources Technical Report
Tip No. K-4703
WBS Element 36401.1.1
Federal-Aid Project NHS-421(32)

North Carolina Department of Transportation

Project Development and Environmental Analysis Branch

October 11, 2004

TABLE OF CONTENTS

TABLES

FIGURES

1.0 INTRODUCTION

This Natural Resources Technical Report (NRTR) is prepared by the North Carolina Department of Transportation (NCDOT) prior to the preparation of a Categorical Exclusion (CE) for the proposed project. The purpose of this technical report is to inventory, catalog, and describe the various natural resources likely to be impacted by the proposed action. The report also attempts to identify and estimate the likely consequences of the anticipated impacts to these resources. These descriptions and estimates are relevant only in the context of the preliminary design concepts. It may become necessary to conduct additional field investigations should design parameters and criteria change.

1.1 Project Description

The proposed project involves the construction of a new Visitor's Center on US 421 in Wilkes County. In the project area US 421 is a four lane dived highway with controlled access. The current let date for the project is October 18, 2005. The project is located in central Wilkes County, about 1 miles south of Wilkesboro, NC (Figure 1). Four project alternatives were originally developed however Alternative 1 and Alternative 4 have been dropped from further consideration. Alternatives 2 and 3 are the only alternatives and are addressed in this NRTR. Both sites are located on the north side of US 421 between US 421 Business/ NC 115 and NC 18.

1.2 Project Purpose

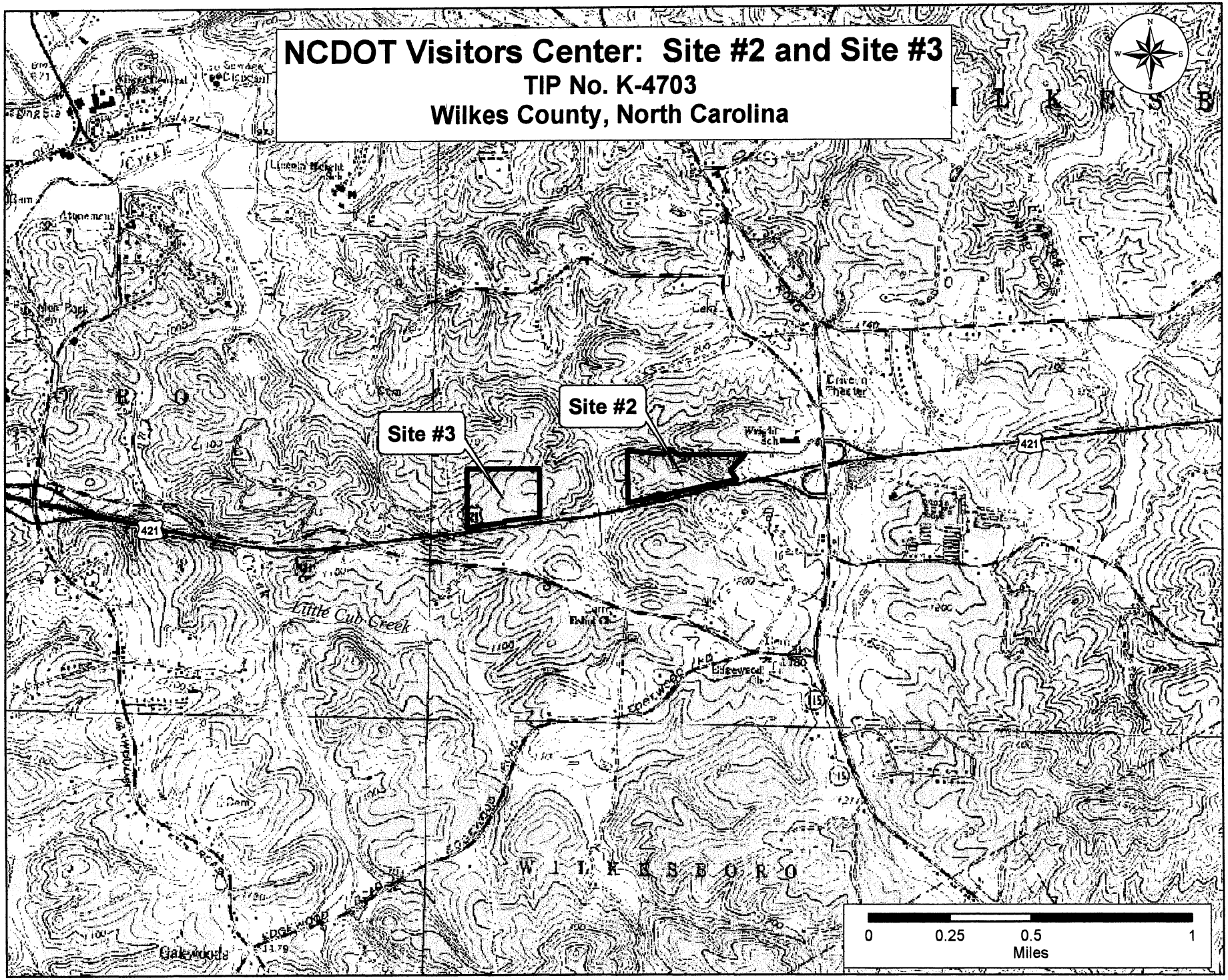
The purpose of this technical report is to inventory, catalog, and describe the various natural resources likely to be impacted by the proposed project. This report attempts to identify and estimate the probable consequences of the anticipated impacts to these resources. Recommendations are made for measures that will minimize resource impacts. These descriptions are relevant only in the context of current design concepts. If design parameters and criteria change, additional field investigations may need to be conducted.

1.3 Methodology

Research was conducted prior to field investigations. Published resource information pertaining to the project area was gathered and reviewed. Resources utilized in this preliminary investigation of the project area include:

- Geological Survey (USGS) quadrangle maps (Wilkesboro).
- NCDOT aerial photographs of the project area (1:1200).
- USDA Soil Conservation Service, currently known as Natural Resource Conservation Service, Soil Survey of Wilkes County, North Carolina (1994).
- NC Center for Geographic Information and Analysis Environmental Sensitivity Base Maps of Wilkes County (1995).

Water resource information was obtained from publications of the Department of Environment and Natural Resources (DENR, 2003). Information concerning the occurrence of federal and state protected species in the study area was obtained from the United States Fish and Wildlife Service (FWS) list of protected and candidate species


NCDOT Visitors Center: Site #2 and Site #3
TIP No. K-4703
Wilkes County, North Carolina
Site #3
Site #2
421
Little Cub Creek
W I L K E S B O R O
0
0.25
0.5
1
Miles

(January 29, 2003) and from the N.C. Natural Heritage Program (NCNHP) database of rare species and unique habitats. NCNHP files were reviewed for documented occurrences of state or federally listed species and locations of significant natural areas.

A general field survey was conducted at both project alternative sites by NCDOT biologist Brett Feulner and Matt Haney on June 8, 2004. Water resources were identified and their physical characteristics were recorded. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990) where appropriate, and plant nomenclature follows Radford *et al.* (1968). Animal taxonomy follows Martof, *et al.* (1980), Menhenick (1991), Potter, *et al.* (1980), and Webster, *et al.* (1985). Vegetative communities were mapped utilizing aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

Jurisdictional wetlands, if present, were identified and evaluated based on criteria established in the "Corps of Engineers Wetland Delineation Manual" (Environment Laboratory, 1987) and "Guidance for Rating the Values of Wetlands in North Carolina" (Division of Environmental Management, 1995). Wetlands were classified based on the classification scheme of Cowardin, *et al.* (1979).

1.4 Qualifications of the Principal Investigator

Investigator:	Brett Feulner
Education	B.S. Forest Management, NCSU 2001
Experience	Environmental Biologist, NCDOT 2/03- Present Environmental Scientist. LandMark Design Group 6/01-12/02
Expertise	Natural resource surveys, wetland delineation and clean water act section 401 and 404, and CAMA permitting

1.5 Terminology and Definitions

For the purposes of this report, the following terms are used for describing the limits of natural resources investigations. "Project area" denotes the two areas bounded by the proposed right-of-way limits. The "project vicinity" is an area extending 1 mile on all sides of the project area, and "project region" is an area equivalent in size to the area represented by a 7.5-minute USGS quadrangle map with the project study area occupying the central position.

2.0 PHYSICAL RESOURCES

The project area lies in the western portion of North Carolina within the Blue Ridge and Piedmont physiographic provinces of the Appalachian Mountain System. Elevations in the project area are between 1,100 and 1,200 feet above mean sea level (National Geodetic Vertical Datum 1929). The topography of the project vicinity is characteristic of

areas in the foothills and includes moderate to steep slopes with deep soils. The proposed project is in a rural area in Wilkes County approximately 1 mile south of the city limits of Wilkesboro, NC. Land use in the project region is a mixture of forestland with urban development.

2.1 Soils

Information about soils in the project area was taken from maps and descriptions provided by the Wilkes County Soil Survey Office (USDA-SCS 1997). The provisional map units in the project area are listed below. None of the soils in the project area are on the NRCS list of hydric soils for North Carolina.

- **Pacolet sandy clay loam:** This gently sloping to strongly sloping, very deep, well drained soil is on found on side slopes and ridge tops in the piedmont. Included with this soil-mapping unit are small areas of Bethlehem, Chewlaca and Rion soils. This soil is the most predominant soil found in both alternatives. Within Alternative 2 Pacolet soil series is found within all community types on the western boundary and on the eastern boundary. Within Alternative 3 Pacolet is found in the eastern ¾ of the project area.
- **Pacolet sandy loam:** This moderately steep, very deep, well drained soil is on found on side slopes in the piedmont. Included with this soil-mapping unit are small areas of Wateree and Rion soils. This soil is found in Alternative 2 surrounding the pond.
- **Rion fine sandy loam:** This moderately steep, very deep, well drained soil is on found on side slopes and narrow ridge tops in the piedmont. Included with this soil-mapping unit are Pacolet, Wateree, Wedowee, Ashler, Bethlehem, and Chewacla. This soil is found within Alternative 3 on the western edge of the project.

2.2 Water Resources

This section contains information concerning water resources likely to be impacted by the proposed project. Water resource assessments include the physical characteristics (determined by field survey), best usage classifications, and water quality aspects of the water resources. Probable impacts to surface waters are also discussed, as well as means to minimize impacts.

2.2.1 Physical Characteristics of Water Resources

The project is located in the Yadkin River basin (USGS HUC 03040101). There is one water resource within the project study area; a man made pond that flows into an Unnamed Tributary to Little Cub Creek (UT). The pond originates on site and is feed by storm water runoff from US 421 and groundwater. The UT originates at the outlet of the man made pond, just outside the northern edge of the project boundary. The UT then flows downstream into Little Cub Creek approximately two miles downstream.

2.2.2 Best Usage Classification

Surface waters in North Carolina are assigned a classification by the Division of Water Quality (DWQ) that is designed to maintain, protect, and enhance water quality within the state. Little Cub Creek [Stream Index # 12-41-1(2)] is classified as a *Class C* water body

(NCDENR, 2003b). *Class C* waters are protected for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities. **No waters classified as High Quality Waters (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area.**

Little Cub Creek is not considered estuarine water; therefore there will be no impacts to Essential Fish Habitat associated with the proposed project.

2.2.3 Water Quality

This section describes the quality of the water resources within the project area. Potential impacts to water quality from point and non-point sources are evaluated. Water quality assessments are based upon published resource information and field study observations.

2.2.3.1 General Watershed Characteristics

The project area is in a predominately-forested watershed. However, to the north Wilkesboro and North Wilkesboro are developed. Non-point source runoff from adjacent landscaping, and roadways is likely to be the primary source of water quality degradation to the water resources located within the project vicinity. Nutrient loading from fertilizers, contaminants and roadway runoff, and septic systems could affect water quality. No straight-piping was observed in the project area.

2.2.3.2 Basin-wide Assessment Report

Basin-wide water quality assessments are conducted by the Environmental Sciences Branch, Water Quality Section of the DWQ. The program has established monitoring stations for sampling selected benthic macroinvertebrates, which are known to have varying levels of tolerance to water pollution. An index of water quality can be derived from the number of taxa present and the ratio of tolerant to intolerant taxa. Streams can then be given a bioclassification ranging from Poor to Excellent.

There are no macroinvertebrate-monitoring stations within one mile of the project area. There are two Benthic Macroinvertebrate sampling locations on the Yadkin River located between five and six miles downstream of the convergence of Cub Creek and the Yadkin River. The first station is located approximately five miles downstream and was last evaluated in June 1993 and received a rating of Good. The second station is located approximately six miles downstream and was evaluated in June 1993 and received a rating of Good-Fair. In the project vicinity, the Yadkin River is classified by the DWQ as Fully Supporting its best intended use.

2.2.3.3 Section 303(d) Impaired Waters

North Carolina's Clean Water Act (CWA) §303(d) List (NCDENR 2002b) is a comprehensive public accounting of all impaired water bodies. An impaired water body is one that is damaged by pollutants such as nitrogen, phosphorus, and fecal coliform

bacteria, or by hydromodification and habitat degradation. The source of impairment might be from point sources, non-point sources and atmospheric deposition. The standards violation might be due to an individual pollutant, multiple pollutants, or an unknown cause of impairment. This list is compiled by the North Carolina Division of Water Quality and submitted to the EPA by April 1 of every even year.

No water resources in the project area are designated as biologically impaired water bodies regulated under the provisions of CWA §303(d). The project does not drain to any CWA §303(d) listed waters, nor are any listed waters within 1 mile of the project.

2.2.3.4 Point Source Discharge Permits

Point source discharges in North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. All dischargers are required to obtain a permit to discharge. There is one permit issued to discharge in the UT. Wilkes County Schools holds Permit NC51047. This discharge is located immediately downstream of the project area.

2.2.3.5 Non-Point Source Discharge

Unlike pollution from industrial and sewage treatment, non-point source (NPS) pollution comes from many non-discrete sources. As rainfall or snowmelt runoff moves over the earth's surface, natural and man-made pollutants are picked up, carried, and ultimately deposited into lakes, rivers, wetlands, coastal waters, and groundwater. Non-point source pollution includes fertilizers, herbicides, and insecticides from farms and residential areas; hydrocarbons or other chemicals from urban runoff; sediments from construction sites, land clearing, and eroding stream banks; bacteria and nutrients from livestock, animal wastes, and faulty septic systems; and atmospheric deposition. The effects of NPS pollutants on water resources vary, and in many instances, may not be known. These pollutants generally have harmful effects on drinking water supplies, recreation, wildlife, and fisheries.

NCDOT biologists conducted a visual observation of potential NPS discharges located within and near the project study area. Atmospheric deposition from passing vehicles; fertilizers, herbicides, and insecticides from nearby residential and commercial areas; and hydrocarbon and chemical runoff from nearby roadways were identified as potential sources of NPS pollution near the project area. Overall, the threat of non-point source discharge is moderate in the project area. The town of Wilkesboro and the and development surrounding the city have the potential to generate pollutants described above.

2.2.4 Water Resource Impacts

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during construction may result in long-term impacts to the aquatic community. Project construction may result in the following impacts to surface water resources on site and off site:

- Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion, and/or construction.
- Decreased light penetration/water clarity from increased sedimentation.
- Changes in water temperature with vegetation removal.
- Changes in the amount of available organic matter with vegetation removal.
- Increased concentration of toxic compounds from highway runoff, construction activities and construction equipment, and spills from construction equipment.
- Alteration of water levels and flows as a result of interruptions and/or additions to surface and groundwater flow from construction.

Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts will be made to ensure that no sediment leaves the construction site. NCDOT's *Best Management Practices for the Protection of Surface Waters* will be implemented, as applicable, during the construction phase of the project to ensure that no sediment leaves the construction site.

3.0 BIOTIC RESOURCES

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities among associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships among these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species are by the common name only. Fauna observed during field investigations are denoted with an asterisk (*).

3.1 Terrestrial Communities

Four terrestrial communities occur within the project area, a dry mesic oak hickory forest, and a mixed hardwood white pine forest, maintained areas and an abandoned field (**Figure 2A and 2B**). Table 1A and Table 1B shows the relative abundance of each community type in the project study area. Dominant faunal components associated with this terrestrial area are discussed following the community descriptions.

Table 1A: Estimated Area of Terrestrial Communities in Project Alternative 2

Community	**Acres**
Dry Mesic Oak Hickory Forest	1.49
Mixed Hardwood Pine Forest	0.30
Maintained Areas	0.27
Abandoned Field	-
Total Impact	**2.06**

Table 1B: Estimated Area of Terrestrial Communities in Project Alternative 3

Community	Acres
Dry Mesic Oak Hickory Forest	1.93
Mixed Hardwood Pine Forest	-
Maintained Areas	-
Abandoned Field	0.10
Total Impact	**2.03**

3.1.1 Dry Mesic Oak-Hickory Forest

The Dry Mesic Oak Hickory Forest is found in both alternatives and is the most abundant community found in the project study area. Tree species found in the canopy include yellow poplar (*Liriodendron tulipifera*), white oak (*Quercus alba*), red oak (*Q. rubra*) black cherry (*Prunus serotina*), pignut hickory (*Carya glabra*) and eastern red cedar (*Juniperus virginiana*). The shrub and herbaceous layer is composed of juvenile species found in the canopy as well as sourwood (*Oxydendrum arboreum*), deer berry (*Vaccinium stamineum*), poison ivy (*Toxicodendron radicans*) multiflora rose (*Rosa multiflora*), and red maple (*Acer rubrum*).

3.1.2 Mixed Hardwood Pine Forest

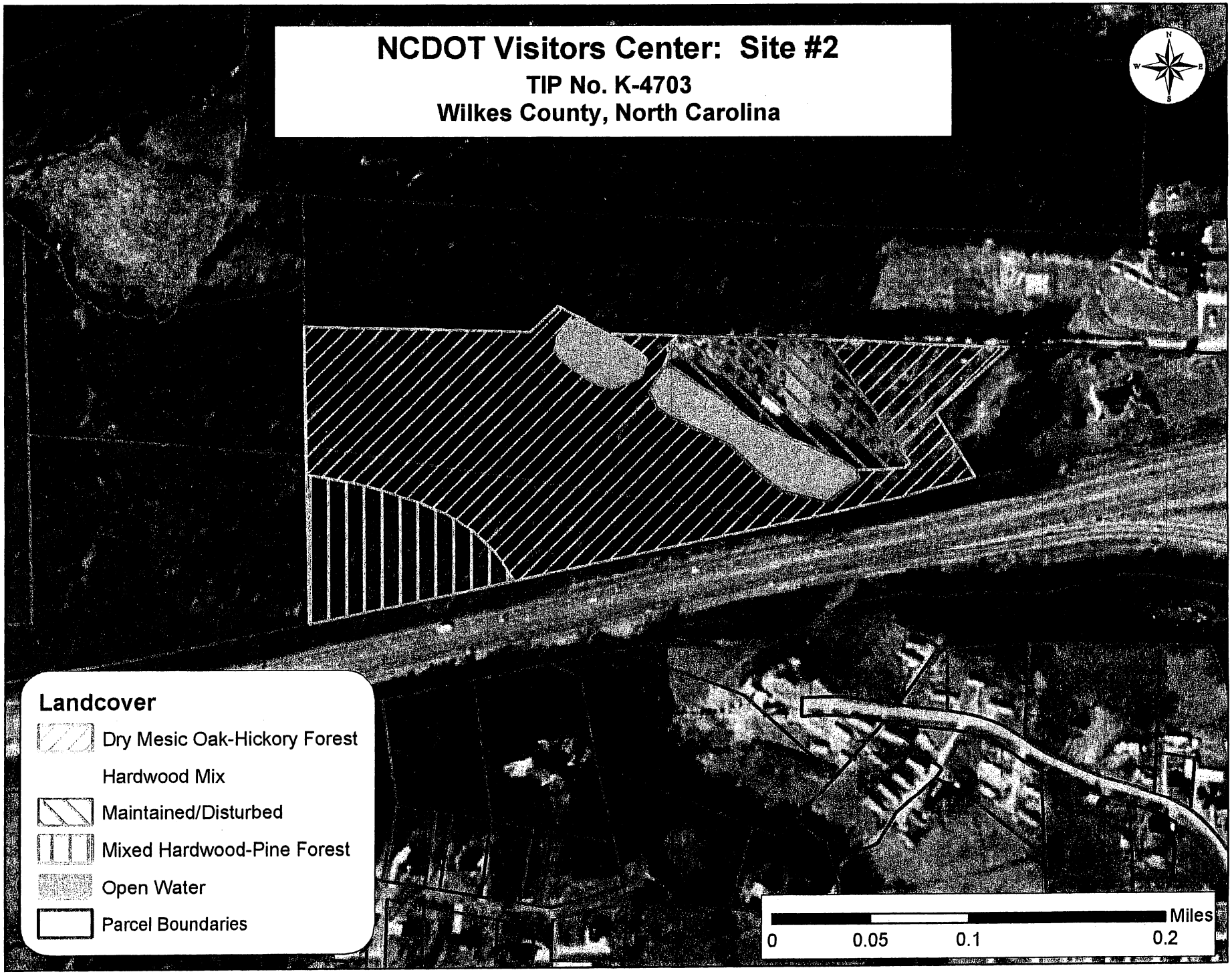
The Mixed Hardwood Pine Forest is found in Alternative 2 in the southwest corner. Vegetation found in this community is similar to the vegetation found in the adjacent dry mesic oak-hickory forest. The presence of white pine (*Pinus strobus*) as one of the common tree species distinguishes this community. Other tree species that make up the canopy layer include white oak, yellow poplar, red oak, and umbrella magnolia (*Magnolia tripetala).* The shrub and herbaceous layer is composed of juvenile species found in the canopy as well as red maple, deer berry sourwood, smilax (*Smilax rotundifolia*), and American holly (*Ilex opaca*).

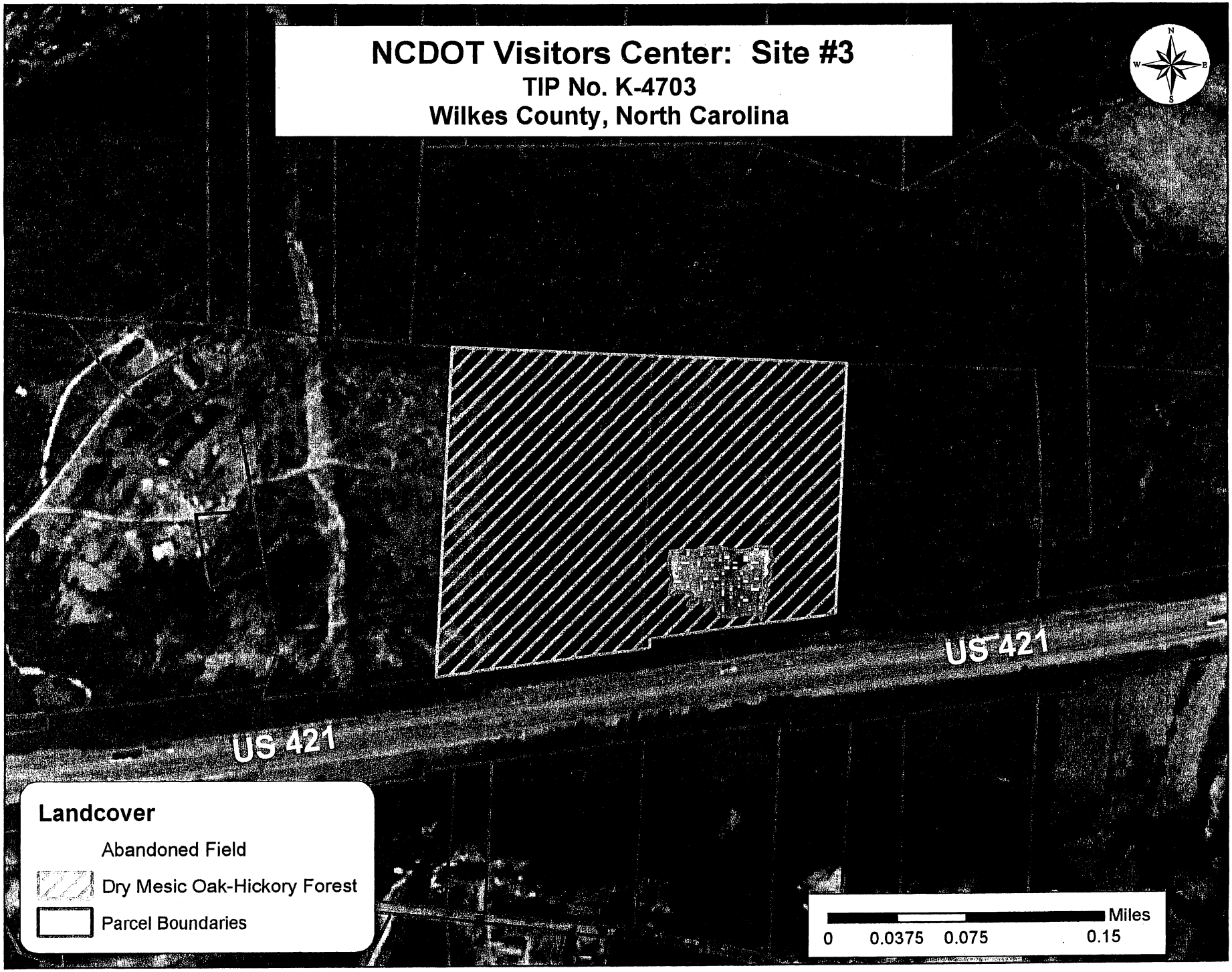
3.1.3 Maintained Areas

This community is found in Alternative 2 to the west of the man made pond. This area contained a vacant house and other associated structures. This community appears to be mowed several times a year. Species observed in this community include fescue (*Festuca* sp.), rye grass (*Lolium* sp.), golden rod (*Solidago* sp.), wingstem (*Actinomeris alternifolia*), oxeye daisy (*Chrysanthemum leucanthemum*), multiflora rose, and lespedeza (*Lespedeza* sp.).

3.1.4 Abandoned Field

This community is found in the central portion of Alternative 3. This community is similar to the maintained community found in Alternative 2, however this area has not been regularly maintained, and woody vegetation is becoming established. Juvenile trees found in this community includes yellow poplar, and Virginia pine (*P. virginiana*). Other species found in the abandoned field include milkweed (*Asclepias* sp.), broom sedge (*Andropogon virginicus*), blackberry (*Rubus argutus*), Japanese honeysuckle (*Lonicera japonica*), trumpet creeper (*Campsis radicans*), ox-eye daisy, goldenrod, and privet (*Ligustrum sininse*).


NCDOT Visitors Center: Site #2
TIP No. K-4703
Wilkes County, North Carolina
N
W
E
S
Landcover
Dry Mesic Oak-Hickory Forest
Hardwood Mix
Maintained/Disturbed
Mixed Hardwood-Pine Forest
Open Water
Parcel Boundaries
Miles
0
0.05
0.1
0.2


NCDOT Visitors Center: Site #3
TIP No. K-4703
Wilkes County, North Carolina
N
W
E
S
US 421
US 421
Landcover
Abandoned Field
Dry Mesic Oak-Hickory Forest
Parcel Boundaries
Miles
0
0.0375
0.075
0.15

3.1.4 Faunal Component

Species that prefer open areas to feed and nest in can be found in the disturbed communities. The European starling (*Sturnus vulgaris*) and American robin (*Turdus migratorius*) are common birds that use these habitats to find insects, seeds, and worms. The American crow (*Corvus brachyrhynchos*) and the Virginia opossum (*Didelphis virginiana*) are true opportunists and will eat virtually any edible items including vegetation, fruits, seeds, insects, and carrion.

Many species are highly adaptive and may utilize the edges of forests and clearings or prefer a mixture of habitat types. The Eastern cottontail (*Sylvilagus floridanus*) prefers a mix of herbaceous and woody vegetation and may be found in the dense shrub vegetation and out in the roadside, and residential areas. White-tailed deer* (*Odocoileus virginianus*) will utilize forested areas as well as the adjacent open areas. Indigo bunting (*Passerina cyanea*) and common yellowthroat (*Geothlypis trichas*) are Neotropical migrants that inhabit dense, shrubby vegetation along transitional areas. Blue jays (*Cyanocitta cristata*), American goldfinches (*Carduelis tristis*), Northern cardinals (*Cardinalis cardinalis*), song sparrows (*Melospiza melodia*), white-throated sparrows (*Zonotrichia albicollis*), and bluebirds (*Sialia sialis*) also utilize edge habitat.

The riparian areas such as those along the man made pond are preferred habitat for semiaquatic species such as beaver (*Castor canadensis*). Raccoons* (*Procyon lotor*) are also frequently found near ponds. Many other vertebrate species, including those listed in the paragraphs above, will be found in riparian areas searching for water.

Forested areas are important habitat for many species. Neotropical migratory birds, in particular, are dependent on these areas. The ovenbird (*Seiurus aurocapillus*), red-eyed vireo (*Vireo olivaceus*), eastern spotted skunk (*Spilogale putorius*), and rock vole (*Microtus crotorrhinus*) prefer the dry woods such as the slopes of the hardwood communies previously described. In the leaf litter of forested habitats, the Northern short-tailed shrew (*Blarina brevicauda*) and the white-footed mouse (*Peromyscus leucopus*) may be found. Gray squirrels (*Sciurus carolinensis*) are often observed in wooded areas. The Eastern box turtle (*Terrapene carolina*) is a terrestrial turtle but will be found near streams in hot, dry weather. The five-lined skink* (*Eumeces fasciatus*) may also be found in forested communities.

3.2 Aquatic Communities

Within the project area, the the man made pond is a headwater pond that is feed by ground water and stormwater from US 421. The bed material consists of clay, sand, and pebbles. On the day of the site visit, the water was turbid with some suspended sediment. The riparian community on the west is the dry mesic oak hickory forest and to the east the maintained community. This community is described in Section 3.1.1. and 3.1.3. No aquatic vegetation was observed in the pond.

Wilkes County is designated a "trout" county by the North Carolina Wildlife Resources Commission (WRC). **Little Cub Creek is not designated as a Public Mountain Trout Water in the project area.**

3.3 Summary of Anticipated Impacts

Project construction will have various impacts to the previously described terrestrial and aquatic communities. Any construction activities in or near these resources have the potential to impact biological functions. This section will cover general impacts that may occur due to project construction.

3.3.1 Terrestrial Communities

Terrestrial communities in the project area may be impacted permanently by project construction from clearing and paving. Destruction of natural communities in the project area will result in the loss of foraging and breeding habitats for the various animal species that utilize the area. Animal species will be displaced into surrounding communities. Adult birds, mammals, and some reptiles are mobile enough to avoid mortality during construction. Young animals and less mobile species, such as many amphibians, may suffer direct loss during construction. The plants and animals that are found in the upland communities are generally common throughout western North Carolina.

Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts should be made to ensure that no sediment leaves the construction site.

3.3.2 Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperature as a result of the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the terrestrial communities. The loss of aquatic plants and animals may affect terrestrial fauna that relies on them as a food source.

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Aquatic invertebrates may drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity. Potential adverse effects can be minimized through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters.*

4.0 JURISDICTIONAL TOPICS

This section provides inventories and impact analyses for two federal and state regulatory issues: "Waters of the United States" and rare and protected species.

4.1 Waters of the United States

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR § 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). These waters are regulated by the U.S. Army Corps of Engineers (USACE). Any action that proposes to dredge or place fill material into surface waters or wetlands falls under these provisions.

4.1.1 Characteristics of Wetlands and Surface Waters

Potential wetland communities were investigated pursuant to the 1987 *Corps of Engineers Wetland Delineation Manual.* The three parameter approach is used where hydric soils, hydrophytic vegetation and prescribed hydrologic characteristics must **all** be present for an area to be considered a wetland. **No wetlands were found in the project study area.**

The man made pond meet the definition of surface waters, and are therefore classified as Waters of the United States. The pond is approximately 125 feet wide and 900 feet long.

4.1.2 Summary of Anticipated Impacts

Project construction may effect jurisdictional surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ. Project impacts are not currently known, however due to the proximity of the stream, impacts can be avoided by selecting Alternative 3 or through project design. The amount of surface water impacts will be calculated when project the project alternative is selected.

4.2 Permit Issues

Impacts to jurisdictional surface waters are not anticipated from the proposed project. If impacts to waters of the US occur permits and certifications from various state and federal agencies will be required prior to construction activities.

If project impacts do occur, construction is likely to be authorized by Nationwide Permit (NWP) No. 23 (approved Categorical Exclusions), as promulgated under 67 FR 2020, 2092; January 15, 2002. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

- the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions that neither individually nor cumulatively have a significant affect on the human environment; and

- the Office of the Chief Engineer has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

Construction may also require authorization by Nationwide Permit (NWP) No. 33 (Temporary Construction, Access and Dewatering), also as promulgated under 67 FR 2020, 2092; January 15, 2002. This permit authorizes temporary structures, work, and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites; provided that the associated primary activity is authorized by the Corps of Engineers or the U.S. Coast Guard (USCG), or for other construction activities not subject to the Corps or USCG regulations.

This project will also require a 401 Water Quality Certification (WQC) No. 3403, from the Department of Environment and Natural Resources (DENR) prior to issuance of a NWP 23 and WQC No. 3366 prior to the issuance of a NWP 33. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. Final permit decision rests with the USACE.

4.2.1 Mitigation

The function of avoidance, minimization, and mitigation is to restore and maintain the chemical, biological, and physical integrity of waters of the United States by avoiding impacts, minimizing impacts, and rectifying impacts. Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

4.2.1.1 Avoidance

Avoidance mitigation examines all appropriate and practical possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and USACE, in determining "appropriate and practical" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practical in terms of costs, existing technology and logistics in light of overall project purposes. Specific avoidance measures for this project include:

- Selecting Alternative 3 as the preferred alternative
- If Alternative 2 is selected, designing the project to avoid the pond

4.2.1.2 Minimization

Minimization includes the examination of appropriate and practical steps to reduce the adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Practical means to minimize impacts to surface waters impacted by the proposed project include:

- Decreasing the footprint of the proposed project

- Installation of temporary silt fences, earth berms, and temporary ground cover during construction
- Strict enforcement of sedimentation and erosion control BMPs for the protection of surface waters and wetlands
- Using plants acceptable for erosion control on stream banks and stream buffers
- Reduction of clearing and grubbing activity in and adjacent to water bodies.
- Judicious pesticide and herbicide usage

4.2.1.3 Compensation

Compensatory mitigation is not normally considered until anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent possible. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, creation, and enhancement of waters of the United States. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site (*i.e.*, compensatory on-site mitigation). Mitigation is not required for wetland impacts less then 1/10 an acres or stream impacts less then 150 feet. Wetland impacts greater then 0.1 acre will require mitigation. No mitigation is anticipated because there are no wetlands and stream impacts are not expected.

4.3 Rare and Protected Species

Some populations of plants and animals are declining either as a result of natural forces or their difficulty adapting to changes in their natural habitat as a result of human activities. Rare and protected species listed for Wilkes County, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

4.3.1 Species Under Federal Protection

Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The USFWS lists 1 species under federal protection for Wilkes County as of January 29, 2003 (USFWS 2004). The following table lists the species, its status and biological conclusion.

Table 2. Species under Federal Protection in Wilkes County

Scientific Name	Common Name	Federal Status	Biological Conclusion
Clemmys muhlenbergii	Bog Turtle	T(S/A)	Not Required
Notes: T	Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.		

A brief description of the characteristics and habitat requirements of the bog turtle follows, along with a conclusion regarding potential project impact. Surveys for federally

protected species are valid for two years from the survey date, if habitat is present in the project area. If the project is not constructed within those two years, the area may need to be resurveyed prior to the let date.

Name: Bog turtle (*Clemmys muhlenbergi*)
Family: Emydidae
Federal Status: Threatened Due to Similarity of Appearance (southern population)
Date Listed: June 4, 1987

Characteristics:
The bog turtle is a small semi-aquatic reptile, measuring 3-4.5 inches in length, with a weakly keeled, dark brown carapace and a blackish plastron with lighter markings along the midline. There is a conspicuous orange or yellow blotch on each side of the head. This species exhibits sexual dimorphism; the males have concave plastrons and longer, thicker tails, while females have flat plastrons and shorter tails.

Distribution and Habitat:
The bog turtle is found in the eastern United States, in two distinct regions. The northern population, in Massachusetts, Connecticut, southern New York, New Jersey, Pennsylvania, Maryland, and Delaware is listed as Threatened and protected by the Endangered Species Act. The southern population, occurring in Virginia, North Carolina, South Carolina, Tennessee, and Georgia is listed as Threatened Due to Similarity of Appearance.

Preferred bog turtle habitat consists of fens, sphagnum bogs, swamps, marshy meadows and pastures. Areas with clear, slow-flowing water, soft mud substrate, and an open canopy are ideal. Clumps of vegetation such as tussock sedge and sphagnum moss are important for nesting and basking. This species hibernates from October to April, hiding just under the frozen surface of mud. The diet consists of beetles, moth and butterfly larvae, caddisfly larvae, snails, nematodes, millipedes, seeds, and carrion (Nemuras 1967).

Mating takes place in May and June, and the female deposits the clutch of 2-6 eggs in a sedge tussock, a clump of sphagnum moss, or loose soil about a month later. The eggs hatch in 42-56 days. A female may not nest every year, and probably only produces one clutch per reproductive year.

Threats to Species:
The primary threats to the bog turtle are loss of habitat (from increased residential and commercial development as well as draining, clearing, and filling of wetlands) and illegal collecting for the pet trade. Nest predation and disease may also play a role in the population decrease.

Distinctive Characteristics:

The bog turtle is distinguished from other turtles by its small size and the bright orange or yellow blotch on each side of its head.

Biological Conclusion:
This species is listed as Threatened Due to Similarity of Appearance, and is therefore not protected under Section 7 of the Endangered Species Act. However, in order to control the illegal trade of individuals from the protected northern population, federal regulations are maintained on the commercial trade of all bog turtles. No survey is required for this species.

4.3.2 Federal Species of Concern and State Status

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. **Table 3** includes FSC species listed for Wilkes County and their state classifications. Organisms that are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant Species in North Carolina and the North Carolina Natural Heritage Heritage Program list of Rare Animal Species in North Carolina are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1987. However, state listed species are not protected from NCDOT activities.

Table 3. Federal Species of Concern for Wilkes County.

Scientific Name	Common Name	NC Status	Habitat
Dendroica cerulea	Cerulean warbler	SR	Yes
Speyeria diana	Diana fritillary butterfly	SR	Yes
Speyeria idalia	Regal fritillary butterfly	SR	Yes
Juglans cinerea	Butternut	-	Yes
Pycnanthemum torrei	Torrey's mountain-mint	SR-T	Yes

"E"--An Endangered species is one whose continued existence as a viable component of the State's flora is determined to be in jeopardy.

"SR"--A Significantly Rare species is one which is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction, direct exploitation or disease. The species is generally more common elsewhere in its range, occurring peripherally in North Carolina.

"-T"--These species are rare throughout their ranges (fewer than 100 populations total).

5.0 CONCLUSIONS AND RECOMMENDATIONS

Within the study area for this project, there is one man made pond and no wetlands. The man made pond drains into an Unnamed Tributary of Little Cub Creek. Little Cub Creek is a Class C stream located within the Yadkin River Basin. Project impacts are not currently known. Little Cub Creek is not listed as a 303(d) stream and is not a trout stream. No Biological Conclusion is required for the federally protected Bog Turtle.

In order to minimize impacts and avoid the permit application process Alternative 3 is the recommended preferred alternative. No jurisdictional water resources are located on the

preferred alternative. All BMP's for the protection of surface waters and wetlands should be strictly followed.

6.0 REFERENCES

American Ornithologists' Union. 1983 Checklist of North American Birds, Sixth Edition.".

Amoroso, JamieL., and John T Finnegan, 2002. *Natural Heritage Program List of the Rare Plant Species of North Carolina.* North Carolina Natural Heritage Program. http://ils.unc.edu/parkproject/nhp/2002plist.pdf, Accessed January 21, 2004.

Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Fish and Wildlife Service, Office of Biological Services, FWS/OBS-79/31. U.S. Department of the Interior, Washington, DC.

Environmental Laboratory. 1987. "U.S. Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1." U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Lee, D.S., J.B. Funderburg, Jr. and M.K. Clark. 1982. A Distributional Survey of North Carolina Mammals. Raleigh, North Carolina Museum of Natural History.

LeGrand, H.E., Jr. and S.P. Hall. 2001. *Natural Heritage Program List of the Rare Animal Species of North Carolina.* North Carolina Natural Heritage Program, Division of Parks and Recreation, North Carolina Department of Environment and Natural Resources. Raleigh, North Carolina.

Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison, III. 1980. *Amphibians and Reptiles of the Carolinas and Virginia.* University of North Carolina Press, Chapel Hill, North Carolina.

North Carolina Department of Environment and Natural Resources (NCDENR). 2003. *Yadkin Pee Dee River: Basin-Wide Water Quality Plan.* Water Quality Section, Division of Water Quality, Raleigh, North Carolina.
<http://h2o.enr.state.nc.us/basinwide/yadkin/YadkinPD_wq_dt_management_plan0103.htm > Accessed June 10, 2004

NCDENR. 1999. "North Carolina Water Quality Assessment and Impaired Waters List (2002 Integrated 305(b) and 303(d) Report). Water Quality Section, Division of Water Quality, Raleigh, North Carolina.
<http://h2o.enr.state.nc.us/tmdl/2002%20Integrated%20Rept.pdf> Accessed June 10, 2004

NCDENR. 1999a. "NPDES Downloads-List of Active Permits Updated 8/8/03."
Water Quality Section, Division of Water Quality.
< http://h2o.enr.state.nc.us/basinwide/yadkinpd/documents/indstormwtrprmts.DOC >
Accessed June 10, 2004

NCDENR. "Basinwide Information Management System: North Carolina Waterbodies Reports". <http://h2o.enr.state.nc.us/bims/Reports/reports.html.> Accessed June 10, 2004.

Radford, A.E., H.E. Ahles and C.R. Bell. 1968. *Manual of the Vascular Flora of the Carolinas.* The University of North Carolina Press, Chapel Hill, North Carolina.

Rohde, F.C., R.B. Arndt, D.G. Lindquist, and J.F. Parnell. 1994. *Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware.* University of North Carolina Press, Chapel Hill, North Carolina.

Schafale, M.P. and A.S. Weakley. 1990. *Classification of the Natural Communities of North Carolina, Third Approximation.* North Carolina Natural Heritage Program, Division of Parks and Recreation, NCDENR, Raleigh, NC.

United States Department of Agriculture, Soil Conservation Service(USDA-SCS). 1997 Soil Survey of Wilkes County, North Carolina.

United States Fish and Wildlife Service. "Endangered Species/ Section 7 Program in North Carolina." *North Carolina Ecological Services.* <http://nc-es.fws.gov/es/countyfr.html> Accessed June 10, 2004.

Webster, W.D., J.F. Parnell, and W.C. Biggs, Jr. 1985. *Mammals of the Carolinas, Virginia, and Maryland.* The University of North Carolina Press, Chapel Hill, North Carolina.

April 25, 2007

Mr. Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

K-4703, US 421 Rest Area, Wilkes County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on April 20, 2007, the impacts are located in CU 03040101 of the Yadkin River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Stream: 215 feet

During the review of this request, it was noted that this project was not included in the 2007 Impact Projection Database; however, EEP will provide the requested stream mitigation. Depending on the availability and projected need of stream mitigation in this cataloging unit, additional stream mitigation may be required that was not included in the biennial budget submitted to NCDOT on April 2, 2007 (revised April 16, 2007).

EEP commits to implementing sufficient compensatory stream mitigation to offset the impacts associated with this project by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, fully executed on March 8, 2007. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Monte Matthews, USACE – Raleigh
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: K-4703