

# TRANSPORTATION INVESTMENT REPORT

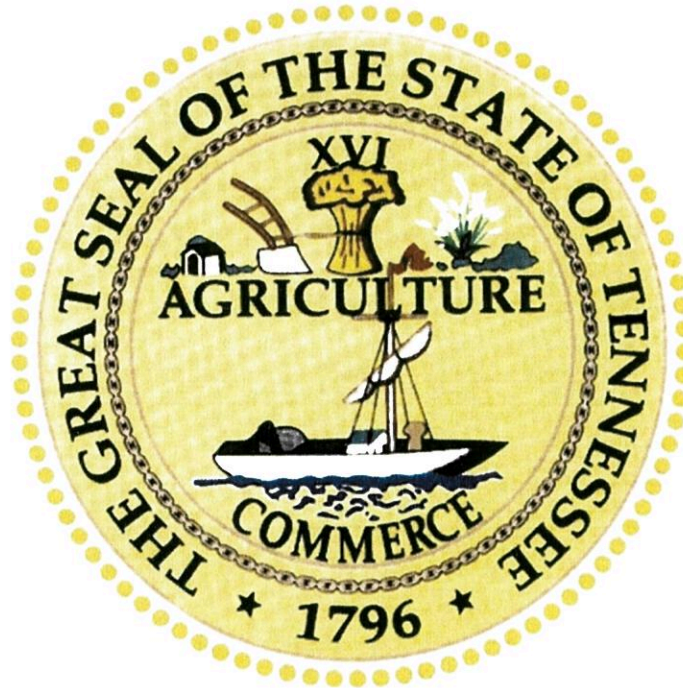
## Special Bridge Replacement Program

Local Route 0911 – Lower Big Sandy Road

Bridge over Ramble Creek @ L.M. 15.72

Benton County

PIN 118562.00

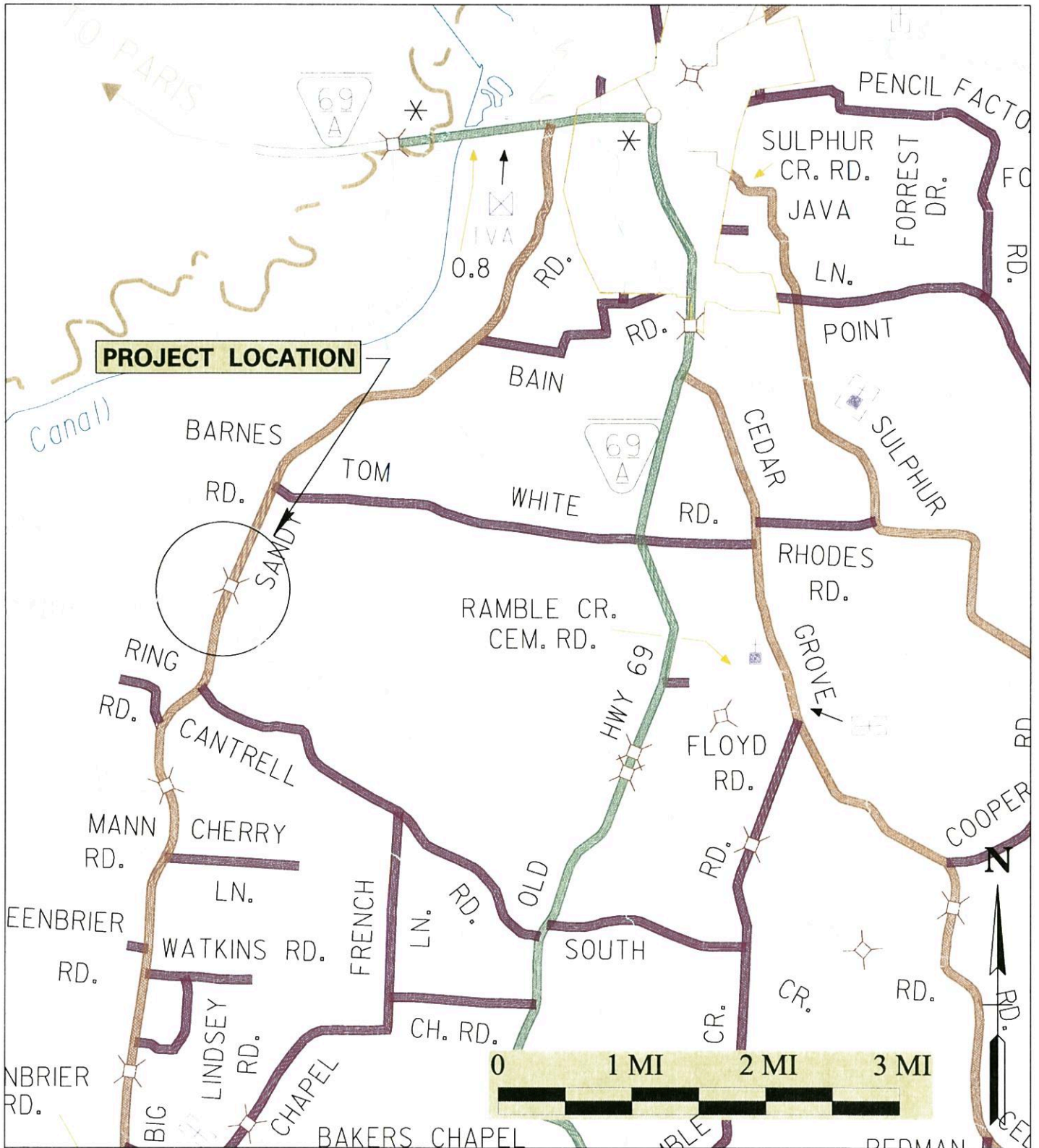


PREPARED BY  
TENNESSEE DEPARTMENT OF TRANSPORTATION  
Strategic Transportation Investments Division

Approved by [Signature] Date 3/6/14 Approved by Paul DeGyves (PD) Date 3-31-14  
Chief of Environment and Planning Deputy Commissioner and Chief Engineer

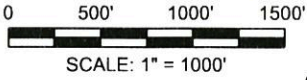
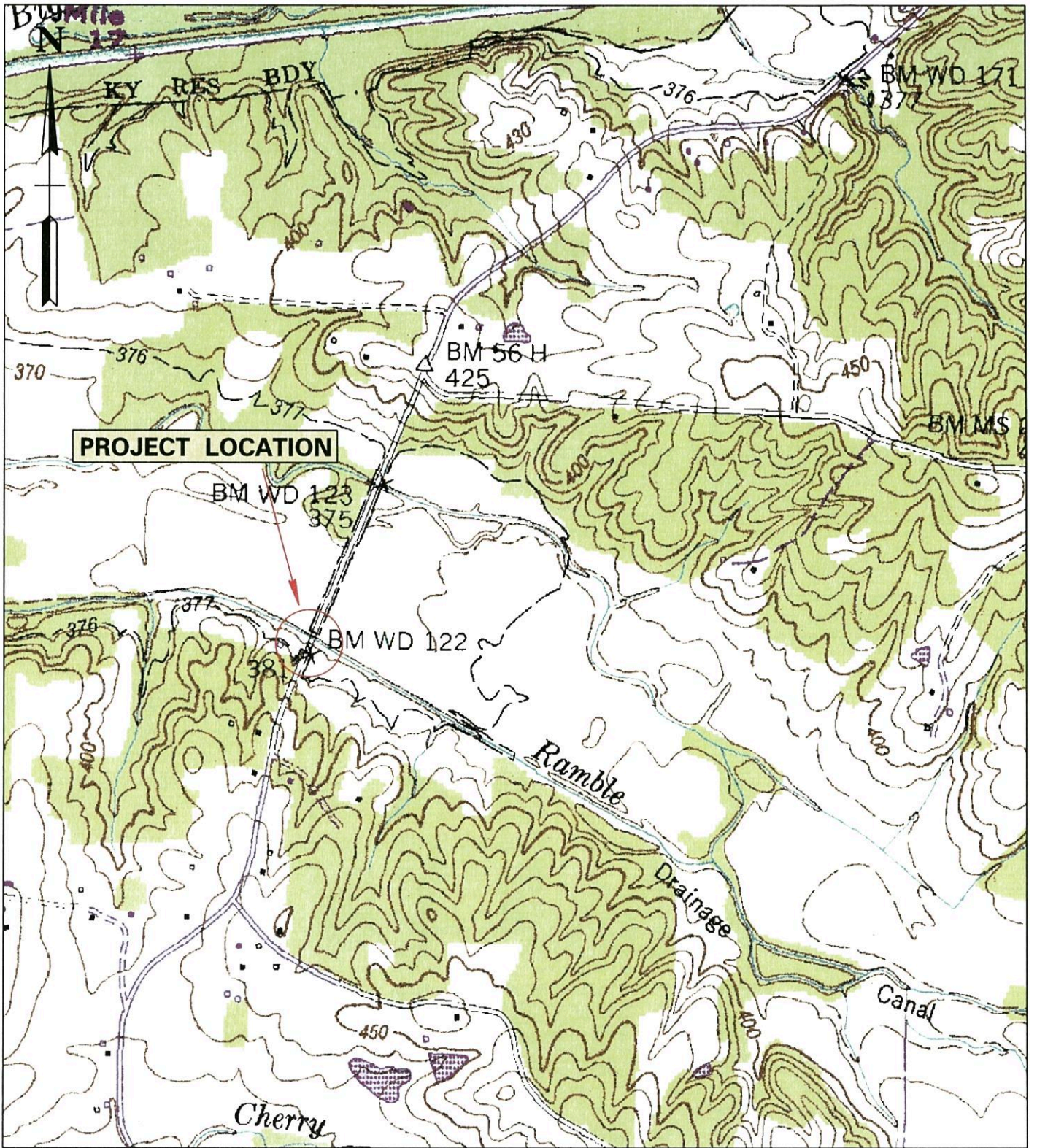
Approved by:	Signature:	Date:
Transportation Director Strategic Trans. Inv. Division	<u>[Signature]</u>	3-4-14
Engineering Director Design Division	<u>Jennifer Lloyd (JL)</u>	2/25/14
Engineering Director Structures Division	<u>Wayne J. Segel</u>	2/20/14

This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.



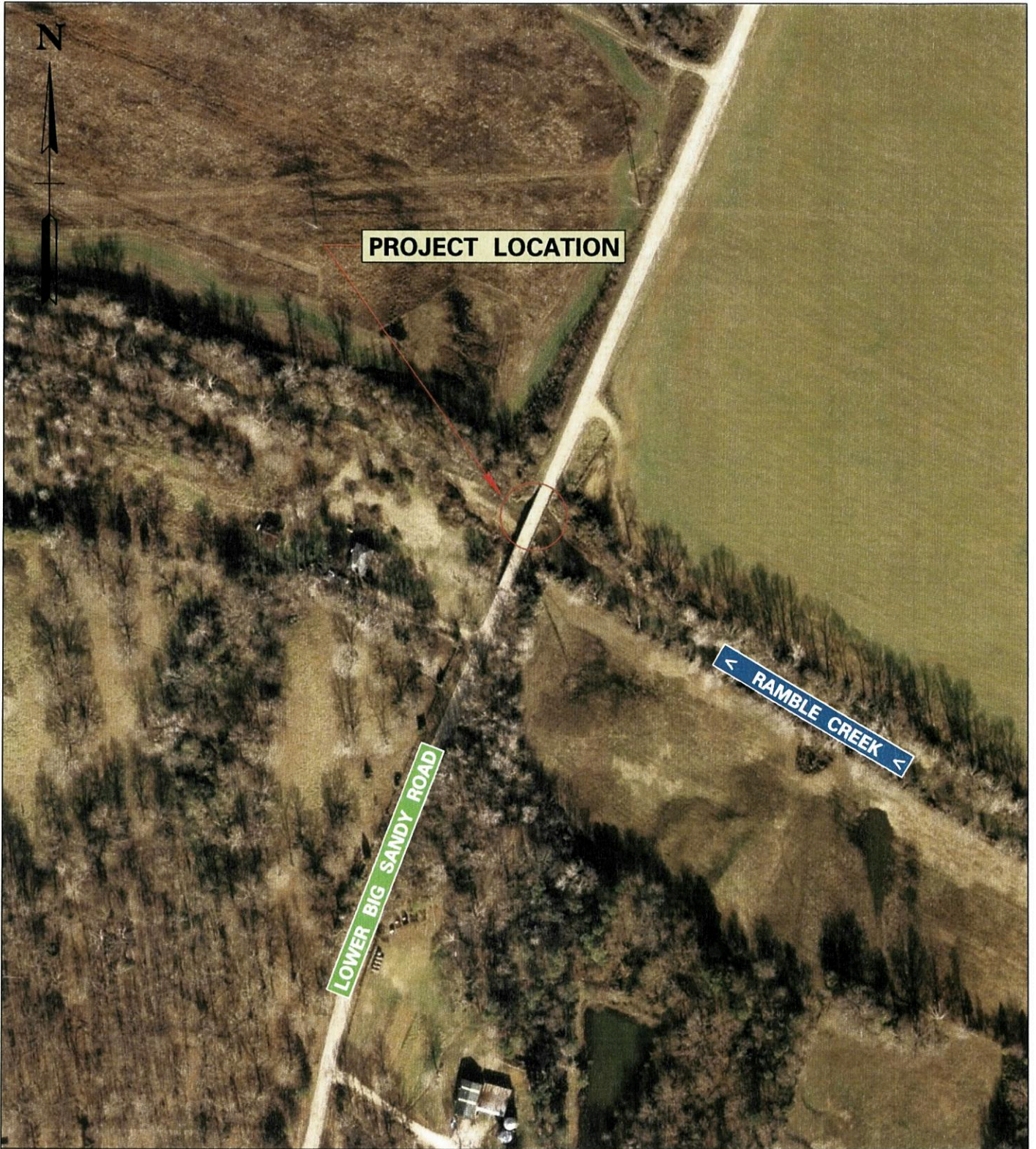
**AREA MAP**  
**LOWER BIG SANDY ROAD (LR 0911) BENTON COUNTY**  
**BRIDGE OVER RAMBLE CREEK @ L.M. 15.72**  
**BRIDGE ID 03S80400019**





**PROJECT MAP**  
**SANDY RIVER ROAD (LR0911) BENTON COUNTY**  
**BRIDGE OVER RAMBLE CREEK @ L.M. 15.72**  
**BRIDGE ID 03S80400019**





0' 100' 200' 300'  
SCALE: 1" = 200'

AERIAL MAP

LOWER BIG SANDY ROAD (0911) BIG SANDY, TN BENTON COUNTY  
BRIDGE OVER RAMBLE CREEK @ L.M. 15.72  
BRIDGE ID 03S80400019



**BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS**

County: Benton Route: Lower Big Sandy Road (0911) Log Mile: 15.72  
 Feature Crossed: Ramble Creek System: Local Road  
 Functional Class: Rural Minor Collector Bridge ID: 03S80400019

**EXISTING CONDITIONS**

2018 AADT: 560 App. Cross Section: 20' 26'(3' Dirt Shoulders)/60' No. Lanes: 2  
 Approach Alignment: Tangent Year Built: 1950 Load Limit: 15 tons  
 Width (out to out): 21' 7" Sidewalks: Right -- Left -- Length: 160'  
 No. Spans: Approach: -- Main: 4  
 Substructure: Wooden Piers Vertical Clearance: 10' Sufficiency Rating: 35.3  
 Other: \_\_\_\_\_

**PROPOSED IMPROVEMENTS**

STANDARDS FROM RD01-TS-2 Type of Work: Replace  
 Design Year: 2038 Design AADT: 670 Terrain Rolling ADL (F): - (R): -  
 Project Length: 680' Bridge Length: 180 ft Approach Length: 250'  
 Design Speed (MPH): 40 Posted Speed (MPH): None  
 Approach Width: 22'/30'/As Required Bridge Width (O to O): 32 ft No. Lanes: 2  
 Right-of-Way Required: 0.2 Ac Tract(s) 2 Structure Type: Prestress Concrete

**MAINTENANCE OF TRAFFIC**

Temporary Detour:  Temporary Runaround:  Stage Construct:   
 Alternate Route: SR 69A runs parallel to Lower Big Sandy Road with Tom White Road and Cantrell Road connecting the  
the two routes. Total detour length is approximately 5.4 miles.  
 Remarks: \_\_\_\_\_

**ESTIMATED COST**

Right-of-Way: \$10,000 Approaches: \$179,100 Structure: \$771,800  
 Preliminary Engineering: \$130,800 Utilities: \$27,200 Misc./Cont.: \$263,400  
 Mobilization: \$56,600 Total: \$1,438,900

Remarks: The existing alignment will be maintained and the grade is to be raised 3.6 ft with a total roadway width of 30 feet  
total, with 11 feet lanes and 4 feet shoulder in order to meet the design standards according to RD01-TS-1. ROW will be  
required from the adjacent land owners in order to widen the roadway approaches.

Field Investigation by: David Duncan, Michael Gilbert, Paige Harris, Amy Rauch (TDOT-STI). Blake Mayo (Hydraulics).  
Jason Moody (Reg. 4 Traffic). Burt Hutchins, Ryan Philpott (TDOT Region 4 Design). Hermon Odle (TDOT Reg. 4 ROW).  
Ken Thorne (NWTDD RPO). Buck Carter (Benton County).

Route:	Lower Big Sandy Road (LR0911)
Description:	Bridge over Ramble Creek @ L.M. 15.72
County:	Benton
Length:	680'
Date:	October 9, 2013

<u>DESCRIPTION</u>	<u>LOCAL</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>TOTAL</u>
Right-of-Way	\$ 2,000		\$ 8,000	\$ 10,000
Clearing and Grubbing	\$ 2,400		\$ 9,600	\$ 12,000
Earthwork	\$ -		\$ -	\$ -
Railroad Crossing or Separation	\$ -		\$ -	\$ -
Drainage	\$ 260		\$ 1,040	\$ 1,300
Utilities	\$ 5,400		\$ 21,800	\$ 27,200
Structures	\$ 154,400		\$ 617,400	\$ 771,800
Pavement Removal	\$ 9,400		\$ 37,600	\$ 47,000
Paving	\$ 12,100		\$ 48,500	\$ 60,600
Roadway and Pavement Appurtenances	\$ -		\$ -	\$ -
Retaining Walls	\$ -		\$ -	\$ -
Topsoil	\$ 460		\$ 1,840	\$ 2,300
Seeding	\$ 140		\$ 560	\$ 700
Sodding	\$ -		\$ -	\$ -
Rip-Rap or Slope Protection	\$ 2,800		\$ 11,300	\$ 14,100
Fencing	\$ -		\$ -	\$ -
Signing	\$ 400		\$ 1,400	\$ 1,800
Pavement Markings	\$ -		\$ -	\$ -
Lighting	\$ -		\$ -	\$ -
Signalization	\$ -		\$ -	\$ -
Guardrail	\$ 2,900		\$ 11,400	\$ 14,300
Other Construction Items (15%)	\$ 28,900		\$ 115,600	\$ 144,500
Maintenance of Traffic	\$ 5,000		\$ 20,000	\$ 25,000
Mobilization (5%)	\$ 11,300		\$ 45,300	\$ 56,600
CONSTRUCTION COST (rounded)	\$ 237,900		\$ 951,300	\$ 1,189,200
Engineering and Contingency (10%)	\$ 23,800		\$ 95,100	\$ 118,900
TOTAL CONSTRUCTION COST (rounded)	\$ 261,700		\$ 1,046,400	\$ 1,308,100
Preliminary Engineering (10%)	\$ 26,200		\$ 104,600	\$ 130,800
<b>PROJECT COST<sup>1</sup> (rounded)</b>	<b>\$ 287,900</b>		<b>\$ 1,151,000</b>	<b>\$1,438,900</b>

<sup>1</sup> For estimating future project costs, a compounded inflation rate of 10 % should be applied from the date of this estimate.



TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
-	Right-of-Way	LS	LS	\$ 10,000.00	\$ 10,000
<b>RIGHT-OF-WAY TOTAL (ROUNDED)</b>					<b>\$ 10,000</b>
201-01	Clearing and Grubbing	LS	LS	\$ 12,000.00	\$ 12,000
<b>CLEAR AND GRUBBING TOTAL (ROUNDED)</b>					<b>\$ 12,000</b>
203-03	Borrow Excavation (Unclassified)	CY	853	\$ 10.05	\$ 8,573
<b>EARTHWORK TOTAL (ROUNDED)</b>					<b>\$ 8,600</b>
202-03.01	Removal of Asphalt Pavement	SY	8,000	\$ 5.00	\$ 40,000
415-01.02	Cold Planing Bituminous Pavement	SY	2,000	\$ 3.50	\$ 7,000
<b>PAVEMENT REMOVAL TOTAL (ROUNDED)</b>					<b>\$ 47,000</b>
209-08.02	Temporary Silt Fence (w/ backing)	LF	400	\$ 3.25	\$ 1,300
<b>DRAINAGE TOTAL (ROUNDED)</b>					<b>\$ 1,300</b>
	Underground Utilities	LF	680	\$ 40.00	\$ 27,200
<b>UTILITIES TOTAL (ROUNDED)</b>					<b>\$ 27,200</b>
	Removal of Existing Bridge	SF	3452.8	\$ 15.00	\$ 51,792
	3 span prestress box beam bridge	SF	5,760	\$ 125.00	\$ 720,000
<b>STRUCTURES TOTAL (ROUNDED)</b>					<b>\$ 771,800</b>
<b>Asphalt</b>					
411-03.10	ACS Mix (PG76-22) Grading D	TON	78.0	\$ 91.03	\$ 7,103
403-01	Bituminous Material for Tack Coat (TC)	TON	1.1	\$ 571.21	\$ 608
402-01	BITUMINOUS MATERIAL FOR PRIME COAT (PC)	TON	1.8	\$ 508.44	\$ 939
402-02	AGGREGATE FOR COVER MATERIAL (PC)	TON	6.7	\$ 23.27	\$ 155
307-02.08	ASPHALT CONC MX(PG70-22)(BPMB-HM)GR B-M2	TON	150.6	\$ 77.65	\$ 11,695
307-03.01	ASPHALT CONC MIX (PG76-22)(BPMB-HM) GR A	TON	329.7	\$ 77.65	\$ 25,599
411-01.07	ACS MIX (PG64-22) GRADING E SHOULDER	TON	22.7	\$ 82.94	\$ 1,882
303-01	Mineral Aggregate, TY A Base, Grading D	TON	693.3	\$ 18.08	\$ 12,534
<b>PAVING TOTAL (ROUNDED)</b>					<b>\$ 60,600</b>
712-01	Traffic Control	LS	25,000	\$ 25,000.00	\$ 25,000
<b>MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)</b>					<b>\$ 25,000</b>
203-07	Furnishing & Spreading Topsoil	CY	222	\$ 10.00	\$ 2,222
<b>TOPSOIL TOTAL (ROUNDED)</b>					<b>\$ 2,300</b>
801-01	Seeding (With Mulch)	UNIT	15	\$ 40.00	\$ 600
801-03	Water	MG	1	\$ 7.00	\$ 8
<b>SEEDING TOTAL (ROUNDED)</b>					<b>\$ 700</b>
713-99.91	Signs	LS	LS	\$ 1,500.00	\$ 1,500
713-15.41	Sign Removal	LS	LS	\$ 300.00	\$ 300
<b>SIGNING TOTAL (ROUNDED)</b>					<b>\$ 1,800</b>
716-13.06	Spray Thermo Pvrnt Mrkng (40 mil)(4" Line)	LM	0.515	\$ 2,542.00	\$ 1,309
<b>PAVEMENT MARKINGS TOTAL (ROUNDED)</b>					<b>\$ -</b>
705-02.02	Single Guardrail (Type 2)	LF	50	\$ 15.55	\$ 778
705-04.04	GUARDRAIL TERMINAL (TYPE 21)	EACH	4	\$ 1,823.22	\$ 7,293
705-01.01	Guardrail at Bridge Ends	LF	108	\$ 56.85	\$ 6,140
<b>GUARDRAIL TOTAL (ROUNDED)</b>					<b>\$ 14,300</b>
709-05.06	Machined Rip-Rap (Class A-1)	TON	470	\$ 30.00	\$ 14,100
<b>RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)</b>					<b>\$ 14,100</b>



**STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION**

**PROJECT PLANNING DIVISION**  
SUITE 1000, JAMES K. POLK BUILDING  
505 DEADERICK STREET  
NASHVILLE, TN 37243  
(615) 741-2208

**JOHN C. SCHROER**  
COMMISSIONER

**BILL HASLAM**  
GOVERNOR

**MEMORANDUM**

**TO:** Steve Allen, Director  
Strategic Transportation Investments Division

**FROM:** David Duncan, Transportation Project Specialist *DD 3/5/2014*  
Project Investigation and Coordination Office

**DATE:** February 20, 2014

**SUBJECT:** TPR Field Review (Special Bridge Replacement Program)  
Lower Big Sandy Road, Bridge over Ramble Creek  
Log Mile 15.72  
Benton County  
PIN: 118562.00

A field review was held for the above-mentioned project on July 18, 2013.

The existing structure is a four (4) span steel bridge with an out-to-out width of 21.6 feet. The overall bridge length is 160 feet with approximately 10.0 feet for the vertical clearance. The sufficiency rating for this bridge is 35.3. The 10-year and 100-year discharges and depths of flow for the drainage basin were determined using the appropriate regression equations. It was determined that the 100-year flow depth is 12.2 feet and the 10-year flow depth is 9.1 feet.

The proposed structure will be three (3) span 180 feet prestress concrete beam bridge with a total clearance of 12.2 feet (10.0 feet existing). The structure will remain on the existing centerline, but will require the grade to be raised 3.6 feet. It is estimated that a small amount of ROW will be required to adjust the drainage ditches when raising the grade. There were no above ground utilities directly adjacent to the structure and its approaches, and no visible underground utility markers. It is estimated that a waterline is present adjacent to the roadway and as a contingency included in the cost estimate.

The route has a base year (2018) AADT of 560 and a design year (2038) AADT of 670. The bridge over Ramble Creek will consist of an out-to-out width of 32.0 feet with two, eleven (11)



feet lanes and four (4) feet shoulders according to RD01-TS-2 for 40 MPH design speed. The length of the entire project will be approximately 680 feet.

It is recommended to close the road and utilize a temporary detour while the proposed bridge is being constructed which the local officials from Benton County agreed with while on the field review. Traffic will be detoured to SR 69A which runs parallel to Lower Big Sandy Road using Tom White Road and Cantrell which connect between the two routes. The total detour length is approximately 5.4 miles.

The required approach work, utility relocations, estimated replacement, and preliminary engineering costs for this bridge are approximately \$1,438,900.

DD

cc: File



## CHECK LIST OF DETERMINANTS FOR LOCATION STUDY

If any of the following facilities or ESE categories are located within the project area or corridor, place an "x" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

- |   |   |
|---|---|
| 1. Agricultural land usage                          | X |
| 2. Airport (existing or proposed)                   |   |
| 3. Commercial area, shopping center                 |   |
| 4. Floodplains                                      | X |
| 5. Forested land                                    |   |
| 6. Historical, cultural, or natural landmark        |   |
| 7. Industrial park, factory                         |   |
| 8. Institutional usages                             |   |
| a. School or other educational institution          |   |
| b. Church or other religious institution (Cemetery) |   |
| c. Hospital or other medical facility               |   |
| d. Public building, e.g., fire station              |   |
| e. Defense installation                             |   |
| 9. Recreation usages                                |   |
| a. Park or recreational area                        |   |
| b. Game preserve or wildlife area                   |   |
| 10. Residential establishment                       | X |
| 11. Urban area, town, city, or community            |   |
| 12. Waterway, lake, pond, river, stream, spring     |   |
| Permit required: Coast Guard                        |   |
| Section 404   | X |
| TVA Section 26a review                              | X |
| NPDES   | X |
| Aquatic Resource Alteration                         | X |
| 13. Other   |   |
| 14. Location coordinated with local officials       | X |
| 15. Railroad crossings                              |   |
| 16. Hazardous materials site                        |   |



TENNESSEE DEPARTMENT OF TRANSPORTATION  
PROJECT PLANNING DIVISION

PROJECT NO: 99109-1453-04 ROUTE: 0911 [BIG SANDY RD]  
COUNTY: BENTON CITY: BIG SANDY  
PROJECT PIN NUMBER: 118562.00  
PROJECT DESCRIPTION: BRIDGE AND APPROACHES OVER RAMBLER CREEK ON BIG SANDY RD @ I.M. 15.72

**DIVISION REQUESTING:**

MAINTENANCE  PAVEMENT DESIGN   
PLANNING  STRUCTURES   
PROG. DEVELOPMENT & ADM.  SURVEY & DESIGN   
PUBLIC TRANS. & AERO.  TRAFFIC SIGNAL DESIGN   
OTHER   
YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: \_\_\_\_\_  
PROJECTED LETTING DATE: \_\_\_\_\_

**TRAFFIC ASSIGNMENT:**

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADI	YEAR	AADI	DHV	%	YEAR	DIR.DIST.	DHV	AADI	FLEX	RIGID
560	2018	670	87	13	2038	65-35	3	4		

REQUESTED BY: NAME: LISA REANEY DATE: 3-8-13  
DIVISION: PLANNING  
ADDRESS: 1000 J. K. POLK BUILDING  
NASHVILLE TN 37243

REVIEWED BY: TONY ARMSTRONG *Tony Armstrong* DATE: 3-13-13  
TRANSPORTATION MANAGER 1  
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: DUDLEY DANIEL *Dudley Daniel* DATE: 3-13-13  
TRANSPORTATION MANAGER 2  
SUITE 1000, JAMES K. POLK BUILDING

**COMMENTS:**

THIS TRAFFIC IS BASED ON 2012 CYCLE COUNT. THE FUTURE TRAFFIC IS BASED ON GROWTH RATE FROM THE ADAM COMPUTER PROGRAM.

**DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADI.**

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADHS ARE NOT REQUIRED FOR AADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.  
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 3/16/12)





PROJECT: BENTON/LOWER BIG SANDY ROAD BRIDGE OVER RAMBLE CREEK (W/15.271) (PROPOSED ALIGNMENT DESIGN)

STATE OF TENNESSEE  
DEPARTMENT OF TRANSPORTATION  
PROJECT PLANNING DIVISION

BRUNNEN & ASSOCIATES, INC.  
1000 N. GAY ST., SUITE 1000  
MEMPHIS, TN 38103  
901.527.1111

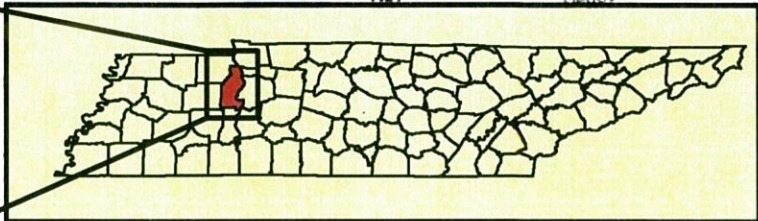
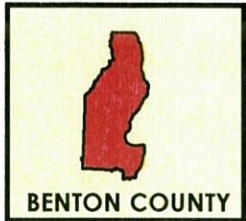
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0 10 20 30 40 50 60 70 80 90 100

DATE: 10/15/2013  
DRAWN BY: [Name]  
CHECKED BY: [Name]

0/9/2013 14:20:04  
X:\Projects\Benton\Lower Big Sandy Road Bridge Over Ramble Creek (W/15.271)\Transportation\Proposed Alignment Design



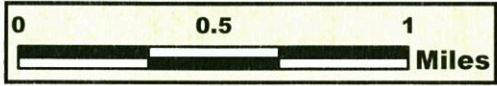


BENTON COUNTY

**PROJECT LOCATION**

TOTAL DETOUR LENGTH = 5.4 mi

ESTIMATED TIME = 14 min



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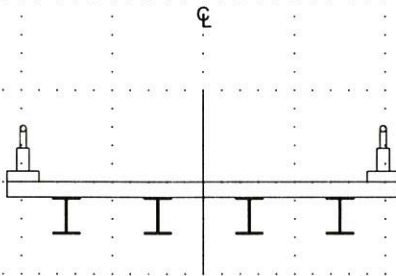


**DETOUR MAP**  
**BRIDGE REPLACEMENT**  
**LOWER BIG SANDY ROAD LR0911**  
**BRIDGE OVER RAMBLE @ L.M. 15.72**  
**BENTON COUNTY**

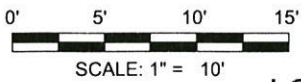
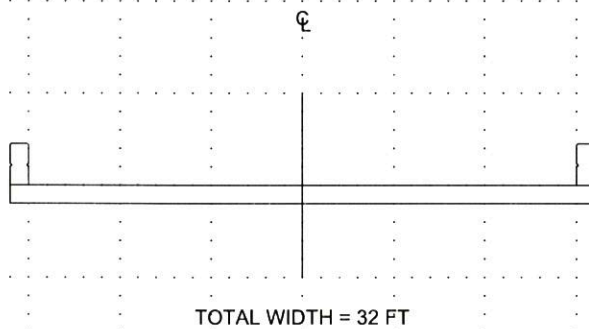




EXISTING STRUCTURE



COMPLETED PROPOSED STRUCTURE



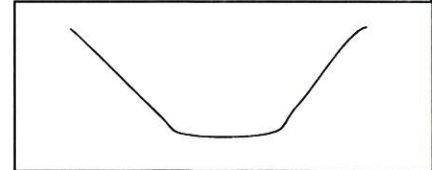
**STAGE CONSTRUCTION DETAIL**  
**LOWER BIG SANDY ROAD (LR0911) BENTON COUNTY**  
**BRIDGE OVER RAMBLE CREEK @ L.M. 15.72**  
**BRIDGE ID 03S80400019**

## SITE INSPECTION

INSPECTION MADE BY: David Duncan BRIDGE ID: 03S80400019 COUNTY: Benton  
 Date: 10/9/13 Route Name: Lower Sandy River Road Stream Name: Ramble Creek

### CHANNEL

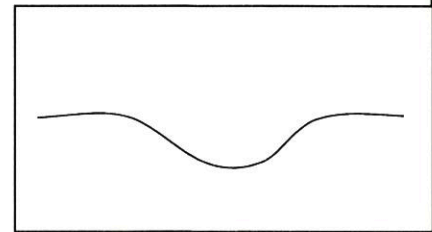
Approx depth and width of channel: Horizontal: 20 Vertical: 2.5  
 Depth of normal flow: 2.5 In Reservoir:  Yes  No  
 Depth of Ordinary High Water: --  
 Type of material in stream bed: Gravel  
 Type of vegetation on banks: Large Timber  
 "N" factor of the channel: 0.03  
 Are channel banks stable: Yes  No   
 Skew of the channel with the roadway: 90 °



Channel Shape Sketch

### FLOODPLAIN

Is the skew same as the channel?  Yes  No  
 Is it symmetrical about the channel?  Yes  No  
 Type of vegetation in the floodplain and "N" factors  
 Left U.S.: 0.15 Right U.S.: 0.15  
 Left D.S.: 0.15 Right D.S.: 0.15  
 Are roadway approaches lower than the structure?  Yes  No  
 Are there any buildings in the floodplain?  Yes  No  
 Approx. floor elevations: --  
 Flood information from local residents:  
 (elevations & dates) --



Floodplain Sketch

### EXISTING STRUCTURE

Length: 160 No. of spans: 4 Structure type: Steel No. of lanes: 2 Skew: 90 °  
 Width (out to out): 21' 7" Width (curb to curb): 18' Approach:  paved  graveled  
 Sidewalks on Structure:  Yes  No Bridgerail type: Concrete Parapet Bridgerail height = 3.58'  
 Superstructure depth: 5.17' Finished Grade to low girder = 2' 10" Girder depth = 2'  
 Are any substructures in the channel?  Yes  No Vertical Clearance = 10' ft  
 Indications of overtopping: Yes  
 High water marks: None  
 Local scour:  Yes,  No  
 Any signs of stream  aggradation or  degradation?  
 Any drift or drift potential?  Yes,  No  
 Any obstructions (pipes, stock fences, etc.)? --

### PROPOSED STRUCTURE

Replacement  Rehabilitate  Widening  New Location  
 Bridge length: 180 ft Bridge type: Prestress Concrete Span arrangement: 3 @ 60' Skew: 90 °  
 Bridge width: 32.0 ft Sidewalks: None Design Speed (MPH): 40 ADT ( 2038 ) = 670  
 Proposed grade: -- Proposed alignment: Maintain Existing  
 Method of maintaining traffic:  Stage construction  On site detour  Close road  Shift Centerline N/A  
 Cost of proposed Structure: \$125 per ft<sup>2</sup> X 180 / 32.0 length (ft) / width (ft) Cost = \$720,000  
 Cost of bridge removal: \$15 per ft<sup>2</sup> X 160 / 21.6 length (ft) / width (ft) Cost = \$51,792  
 Detour structure: Type and size = None Cost = --

**Total Structure Cost = \$771,800**



**Bridge TPR Flow Calculations  
For Hydrologic Area 2  
Area > 300 Acres**

County: Benton  
 Bridge ID: 03S80400019  
 Route: Lower Sandy River Road (0911)  
 Feature Crossed: Ramble Creek  
 Log Mile: 15.72

By: DD  
 Date: 8/19/13  
 PIN: 118562.00

**DRAINAGE BASIN**

Measurement from quad = 9,894 acres  
 Contributing Drainage Area, CDA = acres/640 = 15.46 sq. mi.

**USGS REGRESSION EQUATIONS FOR FLOW**

$Q_2 = 207(CDA)^{0.725} =$  1,507 cfs  
 $Q_5 = 344(CDA)^{0.715} =$  2,437 cfs  
 $Q_{10} = 444(CDA)^{0.711} =$  3,111 cfs  
 $Q_{25} = 578(CDA)^{0.708} =$  4,017 cfs  
 $Q_{50} = 682(CDA)^{0.706} =$  4,714 cfs  
 $Q_{100} = 788(CDA)^{0.705} =$  5,431 cfs

**DEPTH OF FLOW EQUATIONS**

10-Year Flood Depth =  $5.33(CDA)^{0.197} =$  9.1 ft  
 100-Year Flood Depth =  $7.43(CDA)^{0.181} =$  12.2 ft

**AREAS**

Existing Area Below Low Chord = 566 ft<sup>2</sup>  
 Proposed Area Below Low Chord = 570 ft<sup>2</sup>  
 Proposed 10-Year Flood Area,  $A_{10} =$  183 ft<sup>2</sup>  
 Proposed 100-Year Flood Area,  $A_{100} =$  303 ft<sup>2</sup>

**VELOCITIES**

Proposed 10-Year Flood Velocity,  $V_{10} = Q_{10}/A_{10} =$  17.0 fps  
 Proposed 100-Year Flood Velocity,  $V_{100} = Q_{100}/A_{100} =$  17.9 fps

**MAP SCALE 1" = 1000'**

500 0 500 1,000 1,500 2,000 FEET

METE

**NFIP**

**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 0080E**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**BENTON COUNTY, TENNESSEE**

**AND INCORPORATED AREAS**

**PANEL 80 OF 340**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BENTON COUNTY	470218	0080	E
BIG SANDY TOWN OF	470296	0080	E

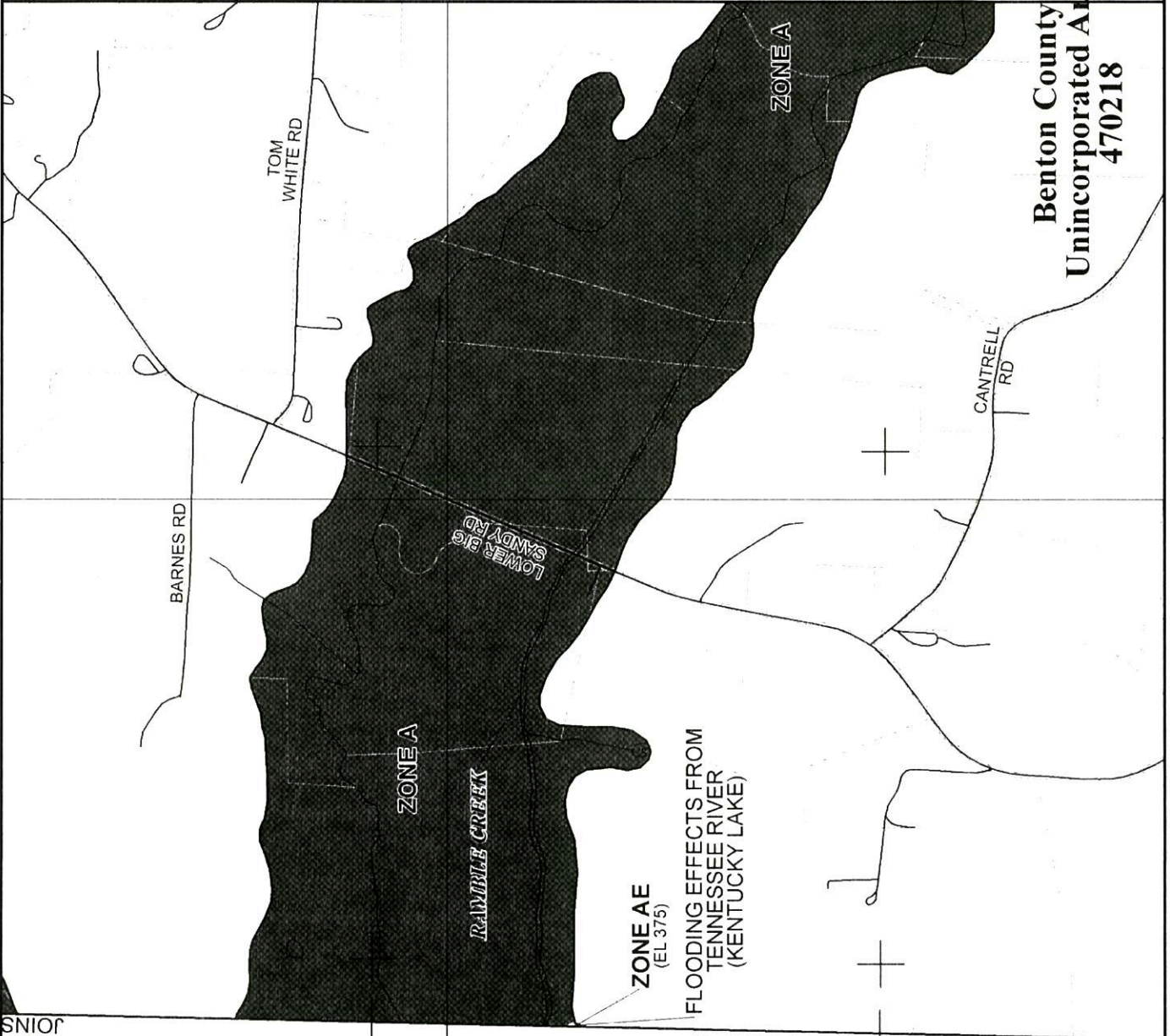
Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER 47005C0080E**

**MAP REVISED JULY 3, 2012**

Federal Emergency Management Agency

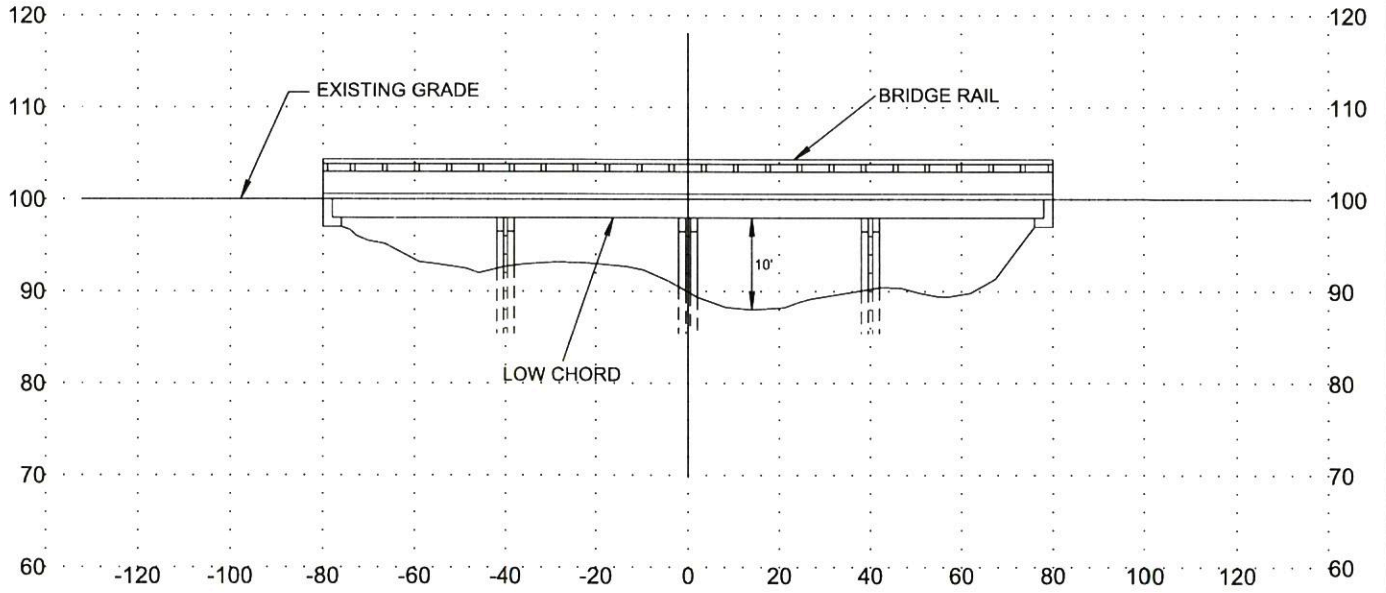
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



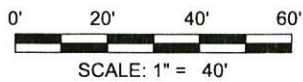
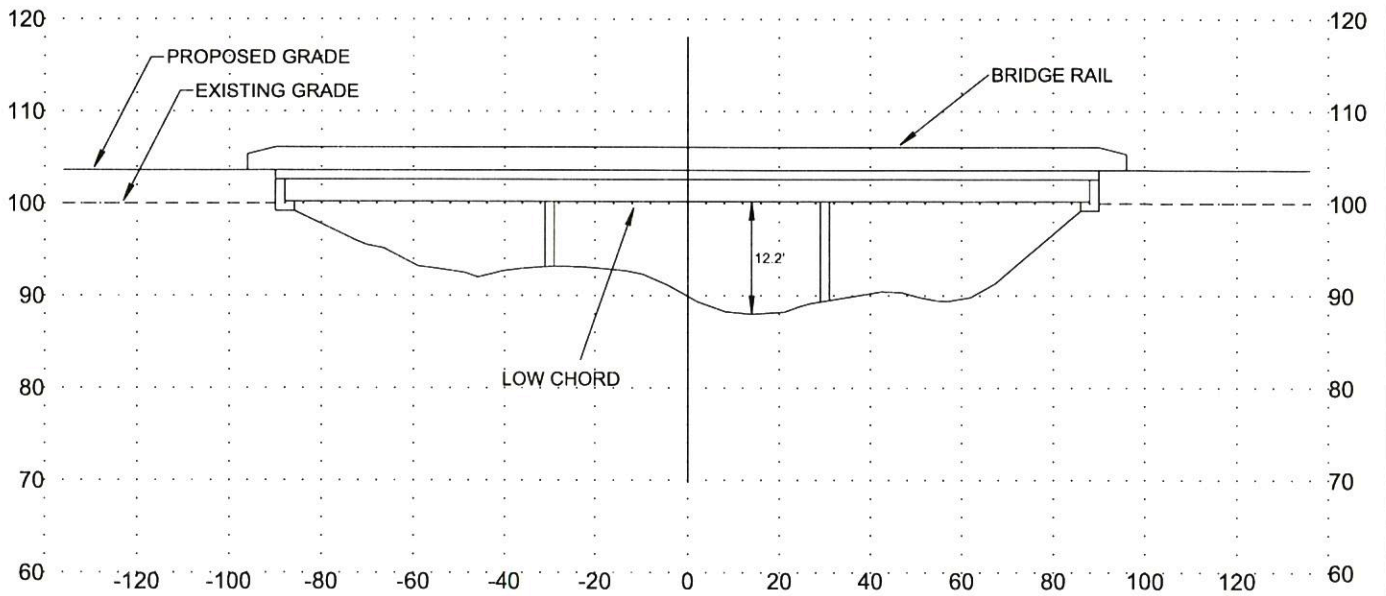
SNIOF



### EXISTING STRUCTURE (INLET)



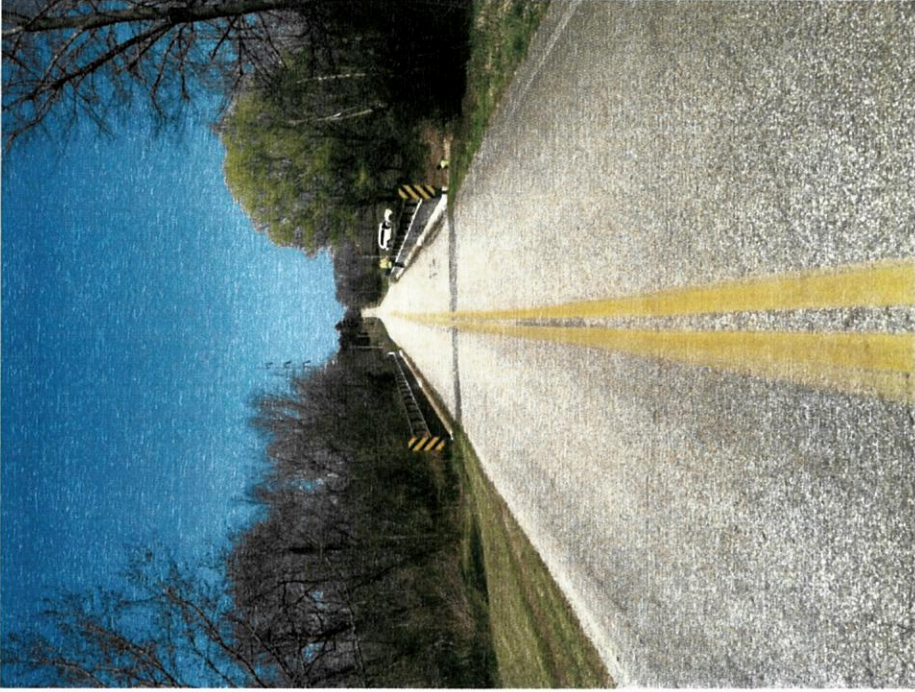
### PROPOSED STRUCTURE (INLET)



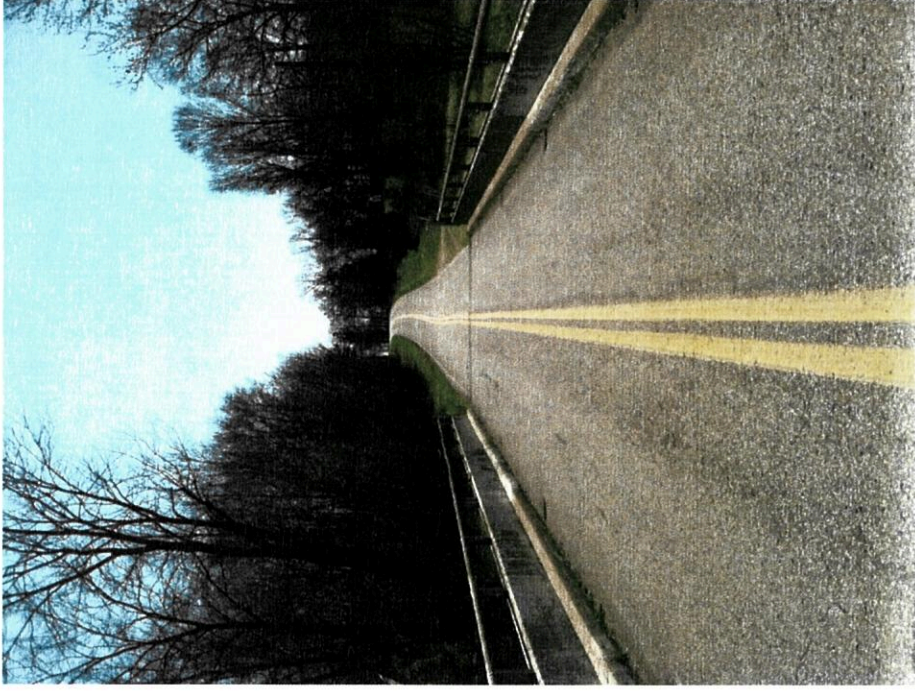
### BRIDGE SECTIONS

LOWER BIG SANDY ROAD (0911) BIG SANDY, TN BENTON COUNTY  
BRIDGE OVER RAMBLE CREEK @ L.M. 15.72  
BRIDGE ID 03S80400019

BENTON COUNTY  
BRIDGE ID: 03S80400019



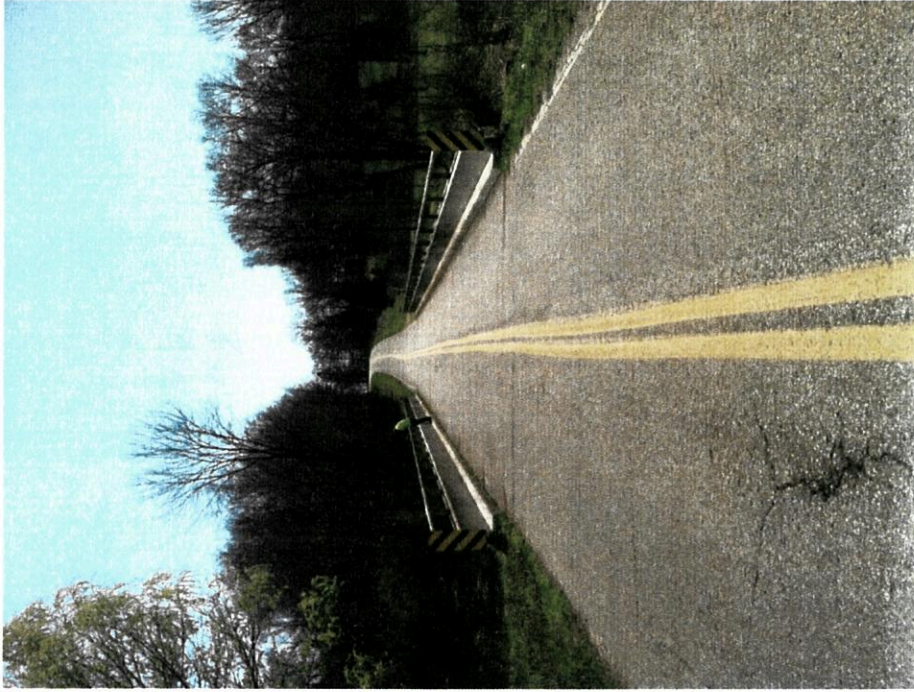
Northbound Approach (*Looking North*)



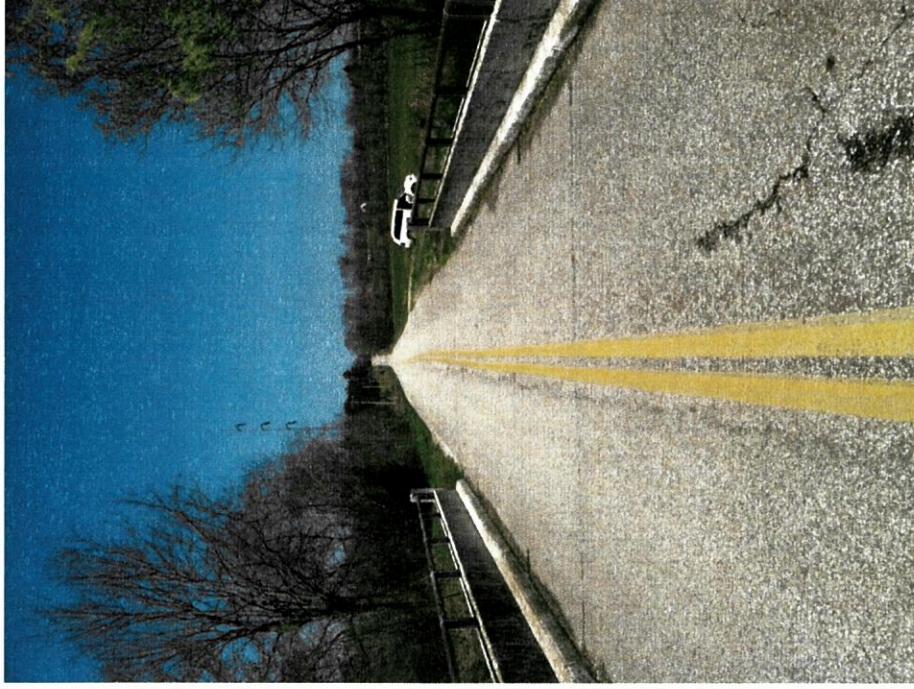
Northbound Approach (*Looking South*)



BENTON COUNTY  
BRIDGE ID: 03S80400019



Southbound Approach (*Looking South*)



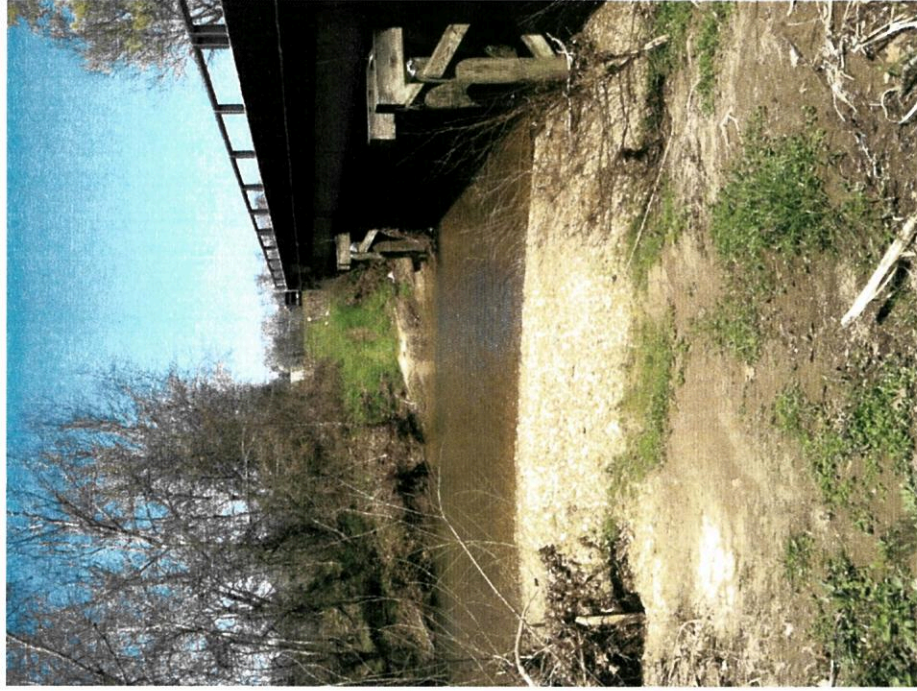
Southbound Approach (*Looking North*)



BENTON COUNTY  
BRIDGE ID: 03S80400019



Inlet



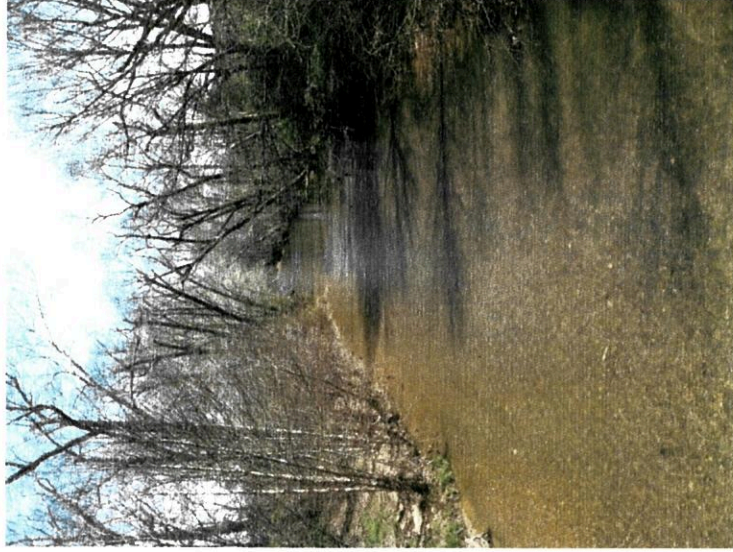
Outlet



BENTON COUNTY  
BRIDGE ID: 03S80400019



LEFT



UPSTREAM



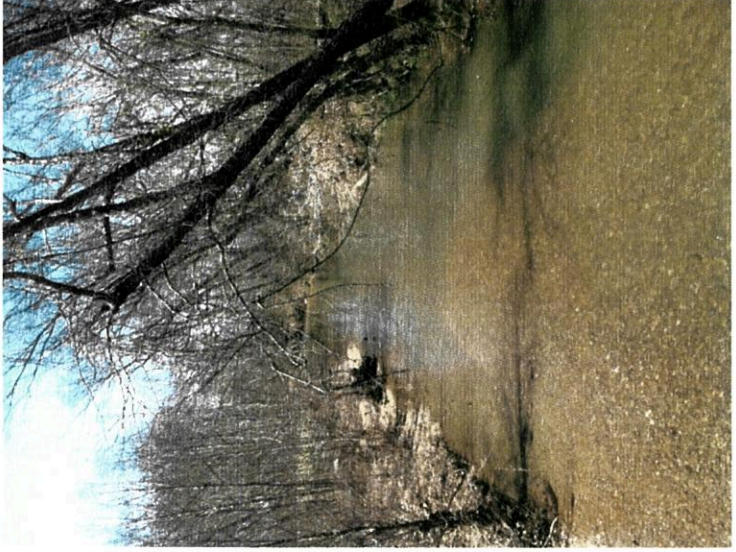
RIGHT



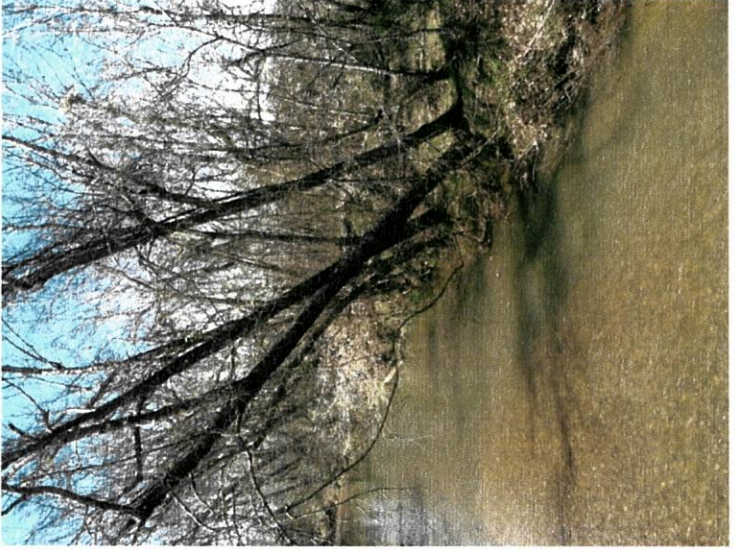
BENTON COUNTY  
BRIDGE ID: 03S80400019



LEFT



DOWNSTREAM



RIGHT



BENTON COUNTY  
BRIDGE ID: 03S80400019



SUBSTRUCTURES