

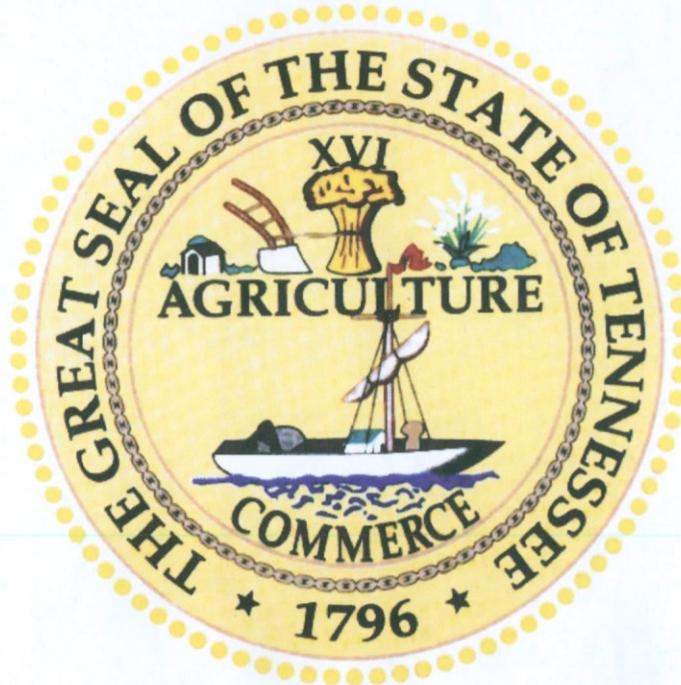
# TRANSPORTATION PLANNING REPORT

## Special Bridge Replacement Program

LOCAL ROUTE 0A323 LAYS ROAD, L.M. 0.01

SCOTT COUNTY

PIN 107719.00



PREPARED BY

ARCADIS

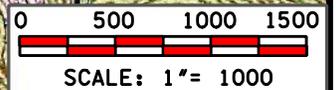
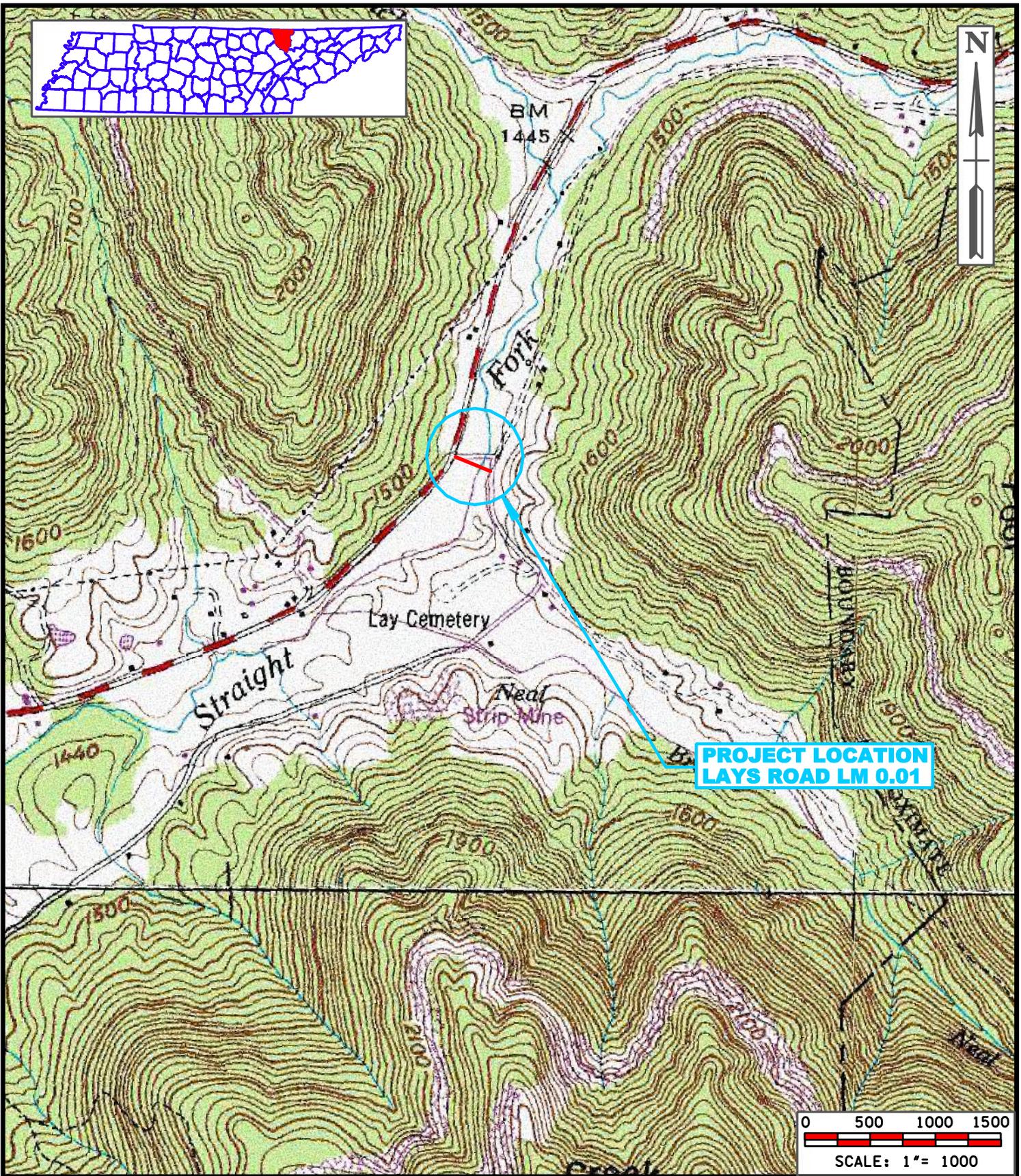
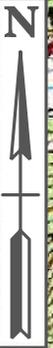
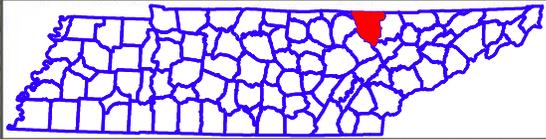
FOR THE

TENNESSEE DEPARTMENT OF TRANSPORTATION

Approved by [Signature] Date 2/28/13 Approved by Paul Deyon Date 3/20/13  
Chief of Environment and Planning Deputy Commissioner and Chief Engineer

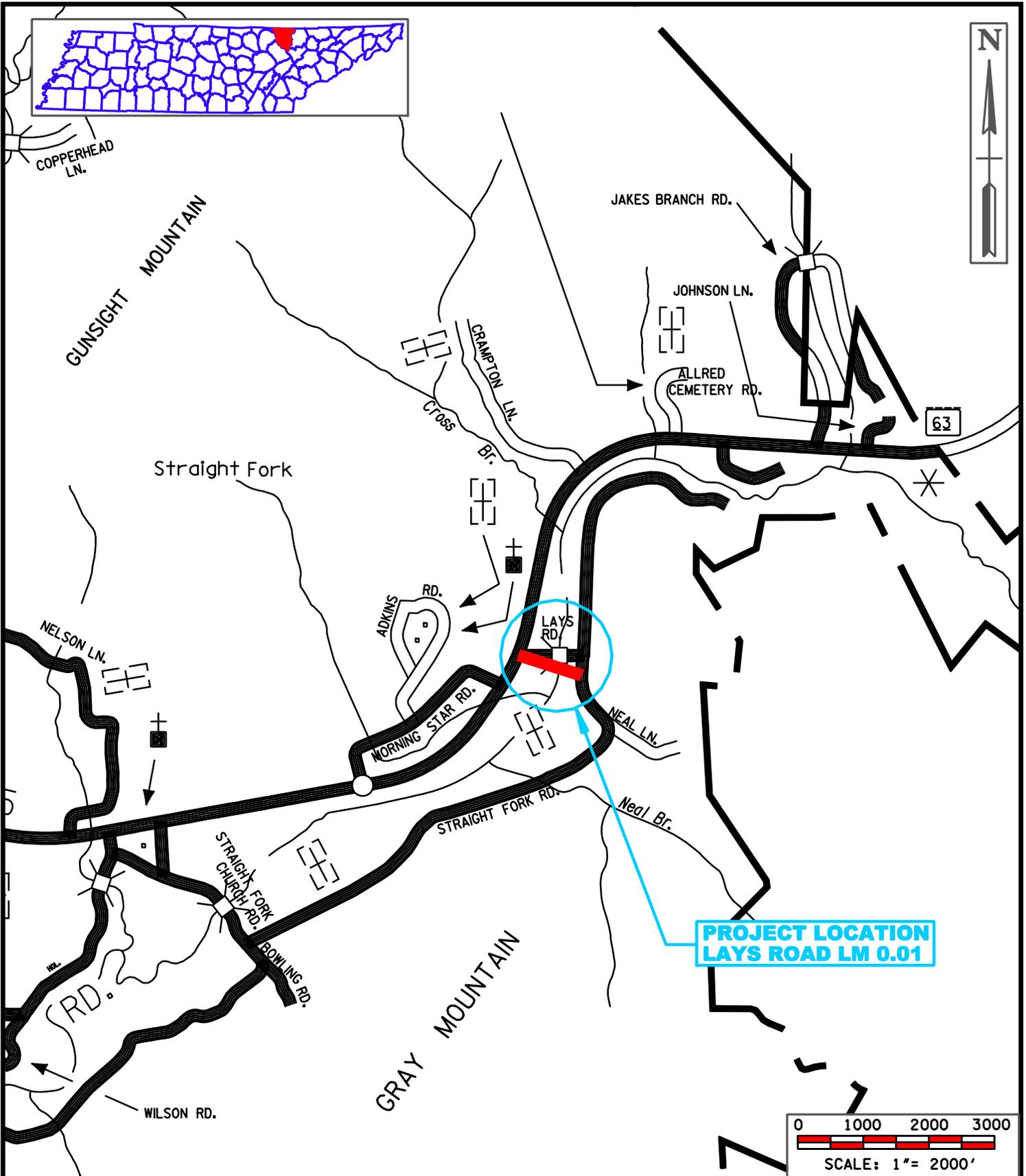
Approved by:	Signature:	Date:
Transportation Director Project Planning Division	<u>[Signature]</u>	1-28-13
Engineering Director Design Division	<u>Carolyn Schnecko</u>	2-04-13
Engineering Director Structures Division	<u>Wayne J. Seger</u>	2-4-13

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



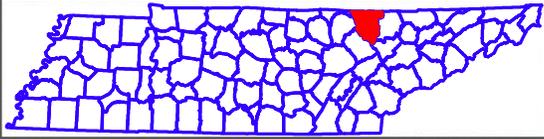
**VICINITY MAP**  
**LOCAL ROUTE 0A323 (LAYS ROAD)**  
**BRIDGE OVER STRAIGHT FORK CREEK @ L.M. 0.01**  
**BRIDGE NUMBER 760A1850001**  
**SCOTT COUNTY, TN**

DRAWN BY: <b>BH</b>	CHECKED BY: <b>HM</b>
<b>0A323 LAY'S ROAD L.M. 0.01</b>	
<b>PIN 107719.00</b>	
	DATE: <b>11-5-12</b>

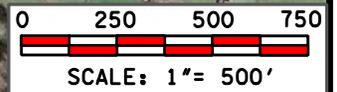


**LOCATION MAP  
LOCAL ROUTE 0A323 (LAYS ROAD)  
BRIDGE OVER STRAIGHT FORK CREEK @ L.M. 0.01  
BRIDGE NUMBER 760A1850001  
SCOTT COUNTY, TN**

DRAWN BY: <b>BH</b>	CHECKED BY: <b>HM</b>
<b>0A323 LAY'S ROAD L.M. 0.01</b>	
<b>PIN 107719.00</b>	
DATE: <b>11-5-12</b>	



**PROJECT LOCATION  
LAYS ROAD LM 0.01**



**AERIAL MAP  
LOCAL ROUTE 0A323 (LAYS ROAD)  
BRIDGE OVER STRAIGHT FORK CREEK @ L.M. 0.01  
BRIDGE NUMBER 760A1850001  
SCOTT COUNTY, TN**

DRAWN BY:

**BH**

CHECKED BY:

**HM**

**0A323 LAY'S ROAD L.M. 0.01**

**PIN 107719.00**

DATE:

**11-5-12**

**TRANSPORTATION PLANNING WORKSHEET  
BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS**

County: Scott Route: 0A323 (Lays Road) Log Mile: 0.01  
 Feature Crossed: Straight Fork Creek System: Local  
 Functional Class: Rural Local Bridge ID: 760A1850001

**EXISTING CONDITIONS**

2016 AADT: 150 App. Cross Section: 18'/18'/30' No. Lanes: 1  
 Approach Alignment: Tangent Year Built: 1930 Load Limit: 10 Tons  
 Width (out to out): 18' 8" Sidewalks: Right -- Left -- Length: 76'  
 No. Spans: Approach: -- Main: 2  
 Substructure: C.M. Arch Pipes Vertical Clearance: 13.7' Sufficiency Rating: 43.4  
 Other: Heavy concrete scaling with rebar exposed along bridge rail. Bridge is located approximately 25' from Straight Fork Road.

**PROPOSED IMPROVEMENTS**

STANDARDS FROM RD01-TS- 1A Type of Work: Replace  
 Design Year: 2036 Design AADT: 180 Terrain Rolling ADL (F): -- (R): --  
 Proj. Length: 225' Lays Rd Bridge: 60' Approach Length: 142'  
 Design Speed (MPH): 35 Posted Speed (MPH): 35  
 Approach Width: 20'/20'/As Required Bridge Width (O to O): 26 ft No. Lanes: 2  
 Right-of-Way Req.: 1 (Approx. 0.76 ac) Tract(s) Structure Type: Con Span Bridge

**MAINTENANCE OF TRAFFIC**

Temporary Detour:  Temporary Runaround:  Stage Construct:   
 Alternate Route: Through traffic will be maintained on existing bridge during construction of proposed bridge.

Remarks: Second phase construction - removal of existing bridge.

**ESTIMATED COST**

Right-of-Way: \$5,000 Approaches: \$137,000 Structure: \$395,700  
 Preliminary Engineering: \$62,000 Utilities:  Misc./Cont.: \$56,400  
 Mobilization: \$26,900 Total: \$683,000

Remarks:

Field Investigation by: Glenda Tyus (Planning), David Duncan (Planning), Lisa Reaney (Planning),  
 Doug Shook (Reg. 1 ROW), Mark Parrish (Reg. 1 Design), Jay Morgan (Reg. 1 Design),  
 Dick Sexton (SCRD Road Superintendent), Kelvin King (SCRD), Clint Butler and Harvey McKaig (ARCADIS)

Route:	0A323 (Lays Road)
Description:	Bridge over Straight Fork Creek (760A1850001)
	L.M. 0.01
County:	Scott
Length:	225'
Date:	November 5, 2012

<u>DESCRIPTION</u>	<u>LOCAL</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>TOTAL</u>
Right-of-Way	\$ 1,000	\$ -	\$ 4,000	\$ 5,000
Clearing and Grubbing	\$ 1,000	\$ -	\$ 4,000	\$ 5,000
Earthwork	\$ 3,300	\$ -	\$ 13,200	\$ 16,500
Railroad Crossing or Separation	\$ -	\$ -	\$ -	\$ -
Drainage	\$ 660	\$ -	\$ 2,640	\$ 3,300
Utilities	\$ -	\$ -	\$ -	\$ -
Structures	\$ 79,100	\$ -	\$ 316,600	\$ 395,700
Pavement Removal	\$ 200	\$ -	\$ 1,000	\$ 1,200
Paving	\$ 4,600	\$ -	\$ 18,600	\$ 23,200
Roadway and Pavement Appurtenances	\$ -	\$ -	\$ -	\$ -
Retaining Walls	\$ -	\$ -	\$ -	\$ -
Topsoil	\$ -	\$ -	\$ -	\$ -
Seeding	\$ -	\$ -	\$ -	\$ -
Sodding	\$ -	\$ -	\$ -	\$ -
Rip-Rap or Slope Protection	\$ -	\$ -	\$ -	\$ -
Fencing	\$ -	\$ -	\$ -	\$ -
Signing	\$ -	\$ -	\$ -	\$ -
Pavement Markings (Stop Bar)	\$ 100	\$ -	\$ 300	\$ 400
Lighting	\$ -	\$ -	\$ -	\$ -
Signalization	\$ -	\$ -	\$ -	\$ -
Guardrail	\$ 3,000	\$ -	\$ 11,800	\$ 14,800
Other Construction Items (15%)	\$ 13,900	\$ -	\$ 55,800	\$ 69,800
Maintenance of Traffic	\$ 500	\$ -	\$ 2,000	\$ 2,500
Mobilization (5%)	\$ 5,400	\$ -	\$ 21,500	\$ 26,900
CONSTRUCTION COST (rounded)	\$ 112,800	\$ -	\$ 451,400	\$ 564,300
Engineering and Contingency (10%)	\$ 11,300	\$ -	\$ 45,100	\$ 56,400
TOTAL CONSTRUCTION COST (rounded)	\$ 124,100	\$ -	\$ 496,500	\$ 620,700
Preliminary Engineering (10%)	\$ 12,400	\$ -	\$ 49,700	\$ 62,000
<b>PROJECT COST <sup>1</sup>(rounded)</b>	<b>\$ 137,000</b>	<b>\$ -</b>	<b>\$ 546,000</b>	<b>\$ 683,000</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	\$ 5,000.00	\$ 5,000
<b>RIGHT-OF-WAY TOTAL (ROUNDED)</b>					<b>\$ 5,000</b>
201-01	Clearing and Grubbing	LS	LS	\$ 5,000.00	\$ 5,000
<b>CLEAR AND GRUBBING TOTAL (ROUNDED)</b>					<b>\$ 5,000</b>
203-01	Road and Drainage Exc. (Unclassified)	CY	1100	\$ 15.00	\$ 16,500
<b>EARTHWORK TOTAL (ROUNDED)</b>					<b>\$ 16,500</b>
202-03.01	Removal of Asphalt Pavement	SY	230	\$ 5.00	\$ 1,150
415-01.02	Cold Planning Bituminous Pavement	SY	0	\$ 3.50	\$ -
<b>PAVEMENT REMOVAL TOTAL (ROUNDED)</b>					<b>\$ 1,200</b>
209-08.02	Temporary Silt Fence (w/ backing)		1000	\$ 3.25	\$ 3,250
<b>DRAINAGE TOTAL (ROUNDED)</b>					<b>\$ 3,300</b>
	Underground Utilities	LF	0	\$ 40.00	\$ -
<b>UTILITIES TOTAL (ROUNDED)</b>					<b>\$ -</b>
	Removal of Existing Bridge	SF	1420	\$ 15.00	\$ 21,300
	60' Con-Span Bridge	SF	1,560	\$ 240.00	\$ 374,400
<b>STRUCTURES TOTAL (ROUNDED)</b>					<b>\$ 395,700</b>
<b>Asphalt</b>					
--	Full Depth Paving	SY	610	\$ 38.00	\$ 23,180
411-03.10	ACS Mix (PG76-22) Grading D	TON	0.0	\$ 85.00	\$ -
403-01	Bituminous Material for Tack Coat (TC)	TON	0.0	\$ 480.00	\$ -
303-01	Mineral Aggregate, TY A Base, Grading D	TON	0.0	\$ 14.93	\$ -
<b>PAVING TOTAL (ROUNDED)</b>					<b>\$ 23,200</b>
<b>RETAINING WALLS TOTAL (ROUNDED)</b>					<b>\$ -</b>
712-01	Traffic Control	LS	1	\$ 2,500.00	\$ 2,500
<b>MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)</b>					<b>\$ 2,500</b>
716-02.05	Plastic Pavement Marking (Stop Bar)	LF	30	\$ 12.41	\$ 372
716-11.01	Spray Thermo Pvmnt Mrkng (4" Line)	LM	0.00	\$ 1,100.00	\$ -
<b>PAVEMENT MARKINGS TOTAL (ROUNDED)</b>					<b>\$ 400</b>
730-40	Temporary Traffic Signal System	EACH	0	\$ 18,000.00	\$ -
<b>SIGNALIZATION TOTAL (ROUNDED)</b>					<b>\$ -</b>
<b>FENCE TOTAL (ROUNDED)</b>					<b>\$ -</b>
705-02.02	Single Guardrail (Type 2)	LF	55	\$ 15.55	\$ 855
705-04.05	Guardrail Terminal (Type-In-Line)	LF	0	\$ 472.00	\$ -
705-04.04	Guardrail Terminal (Type 21)	EACH	4	\$ 1,773.47	\$ 7,094
705-01.01	Guardrail at Bridge Ends	LF	120	\$ 56.85	\$ 6,822
706-01	Guardrail Removed	LF	0	\$ 2.00	\$ -
705-04.07	Type 38 End Terminal	EACH	0	\$ 2,500.00	\$ -
705-02.50	Shop Curved Guardrail	LF	0.0	\$ 19.04	\$ -
<b>GUARDRAIL TOTAL (ROUNDED)</b>					<b>\$ 14,800</b>
709-05.09	Machined Rip-Rap (Class B)	TON	0	\$ 20.34	\$ -
<b>RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)</b>					<b>\$ -</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:** Project Planning Office  
**FROM:** ARCADIS  
**DATE:** November 5, 2012  
**SUBJECT:** TPR Field Review (Off System Bridge Replacement Program)  
Local Route 0A323 (Lays Road), Bridge over Straight Fork Creek, Log Mile 0.01, Scott County  
PIN 107719.00

A field review was held for the above-mentioned project on August 16, 2012.

The existing structure consists of two (2) corrugated metal arch pipes with an out-to-out width of 18 feet 8 inches. Overall bridge length is 76 feet with approximately 13.7 feet of vertical clearance. Bridge sufficiency rating is 43.4. The 10-year and 100-year discharges and depths of flow for the drainage basin were determined using the appropriate regression equations. The calculated 100-year flow depth is 7.9 feet and the 10-year flow depth is 6.1 feet. There is no evidence overtopping has occurred.

The proposed alignment for this structure will be shifted south to improve the approach angle with the creek while maintaining current traffic. The structure will be designed to meet the TDOT design standard RD01-TS-1A for a design speed of 35 mph with a posted 35 mph speed limit. The relocated roadway and proposed bridge will retain similar grades to the existing roadway.

The route has a base year (2016) AADT of 150 and a design year (2036) AADT of 180. The proposed bridge over Straight Fork Creek will consist of an out-to-out width of twenty six (26) feet with two (2) ten (10) foot lanes. The proposed structure is to be a con-span bridge or approved equal with a total length of approximately 60 feet. The proposed vertical clearance shall be approximately thirteen (13) feet, which is above the 100 year flow depth of 7.9 feet. Given that there were no indications of overtopping, the proposed vertical clearance will be sufficient. Right-of-way is expected to be acquired for the proposed realignment (See Figure 1).

The required approach work, right-of-way, estimated replacement and preliminary engineering costs for this bridge are approximately \$683,000.

GT

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	
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	
11.	Urban area, town, city, or community	
12.	Waterway, lake, pond, river, stream, spring	x
	Permit required:	
	Coast Guard	
	Section 404	x
	TVA Section 26a review	
	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: Lays Road [0A323]  
 COUNTY: Scott CITY: Huntsville  
 PROJECT PIN NUMBER: \_\_\_\_\_  
 PROJECT DESCRIPTION: Bridge over Straight Fork Creek @ L.M. 0.01

**DIVISION REQUESTING:**

MAINTENANCE	<input type="checkbox"/>	PAVEMENT DESIGN	<input type="checkbox"/>
PLANNING	<input checked="" type="checkbox"/>	STRUCTURES	<input type="checkbox"/>
PROG. DEVELOPMENT & ADM.	<input type="checkbox"/>	SURVEY & DESIGN	<input type="checkbox"/>
PUBLIC TRANS. & AERO.	<input type="checkbox"/>	TRAFFIC SIGNAL DESIGN	<input type="checkbox"/>
YEAR PROJECT PROGRAMMED FOR CONSTRUCTION:	_____	OTHER _____	<input type="checkbox"/>
PROJECTED LETTING DATE:	_____		

**TRAFFIC ASSIGNMENT:**

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
150	2016	180	22	12	2036	65-35	1	2		

REQUESTED BY: NAME Glenda Tyus DATE 7/17/12  
 DIVISION Project Planning  
 ADDRESS 10<sup>th</sup> Floor, JK Polk Bldg.  
Nashville, TN 37243

REVIEWED BY: TONY ARMSTRONG *Tony Armstrong* DATE 7-17-12  
 TRANSPORTATION MANAGER 1  
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: DUDLEY DANIEL *Dudley Daniel* DATE 7-18-12  
 TRANSPORTATION MANAGER 2  
 SUITE 1000, JAMES K. POLK BUILDING

**COMMENTS:**

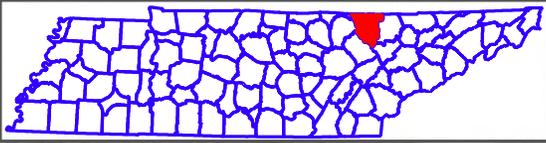
This Traffic is based on 1998 Structure Count from ADAM. The Future Traffic Count is based on the Growth Rate from the ADAM Computer Program.

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

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR ADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.

SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

(REV. 4/10/12)



EXISTING BRIDGE TO BE REMOVED



OBLITERATE EXISTING PAVEMENT

LAYS ROAD

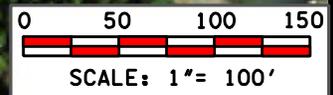
STRAIGHT FORK ROAD

PROPOSED 60' CON SPAN BRIDGE

PROPOSED R.O.W.

SR 63

STRAIGHT FORK CREEK



**BRIDGE REPLACEMENT  
LOCAL ROUTE 0A323 (LAYS ROAD)  
BRIDGE OVER STRAIGHT FORK CREEK @ L.M. 0.01  
BRIDGE NUMBER 760A1850001  
SCOTT COUNTY, TN**

DRAWN BY:

**BH**

CHECKED BY:

**HM**

**0A323 LAY'S ROAD L.M. 0.01**

**PIN 107719.00**

**FIGURE 1**

DATE:

**11-5-12**



**Bridge TPR Flow Calculations  
For Hydrologic Area 1  
Area > 230 Acres**

County: Scott  
 Bridge ID: 760A1850001  
 Route: 0A323 (Lays Road)  
 Feature Crossed: Straight Fork Creek  
 Log Mile: 0.01

By: BH  
 Date: 9/20/12  
 PIN: 107719.00

**DRAINAGE BASIN**

Measurement from quad = 5,395 acres  
 Contributing Drainage Area, CDA = acres/640 = 8.43 sq. mi.

**USGS REGRESSION EQUATIONS FOR FLOW**

$Q_2 = 119(CDA)^{0.756} =$  596 cfs  
 $Q_5 = 197(CDA)^{0.740} =$  954 cfs  
 $Q_{10} = 258(CDA)^{0.731} =$  1,226 cfs  
 $Q_{25} = 343(CDA)^{0.721} =$  1,595 cfs  
 $Q_{50} = 412(CDA)^{0.715} =$  1,892 cfs  
 $Q_{100} = 485(CDA)^{0.709} =$  2,199 cfs

**DEPTH OF FLOW EQUATIONS**

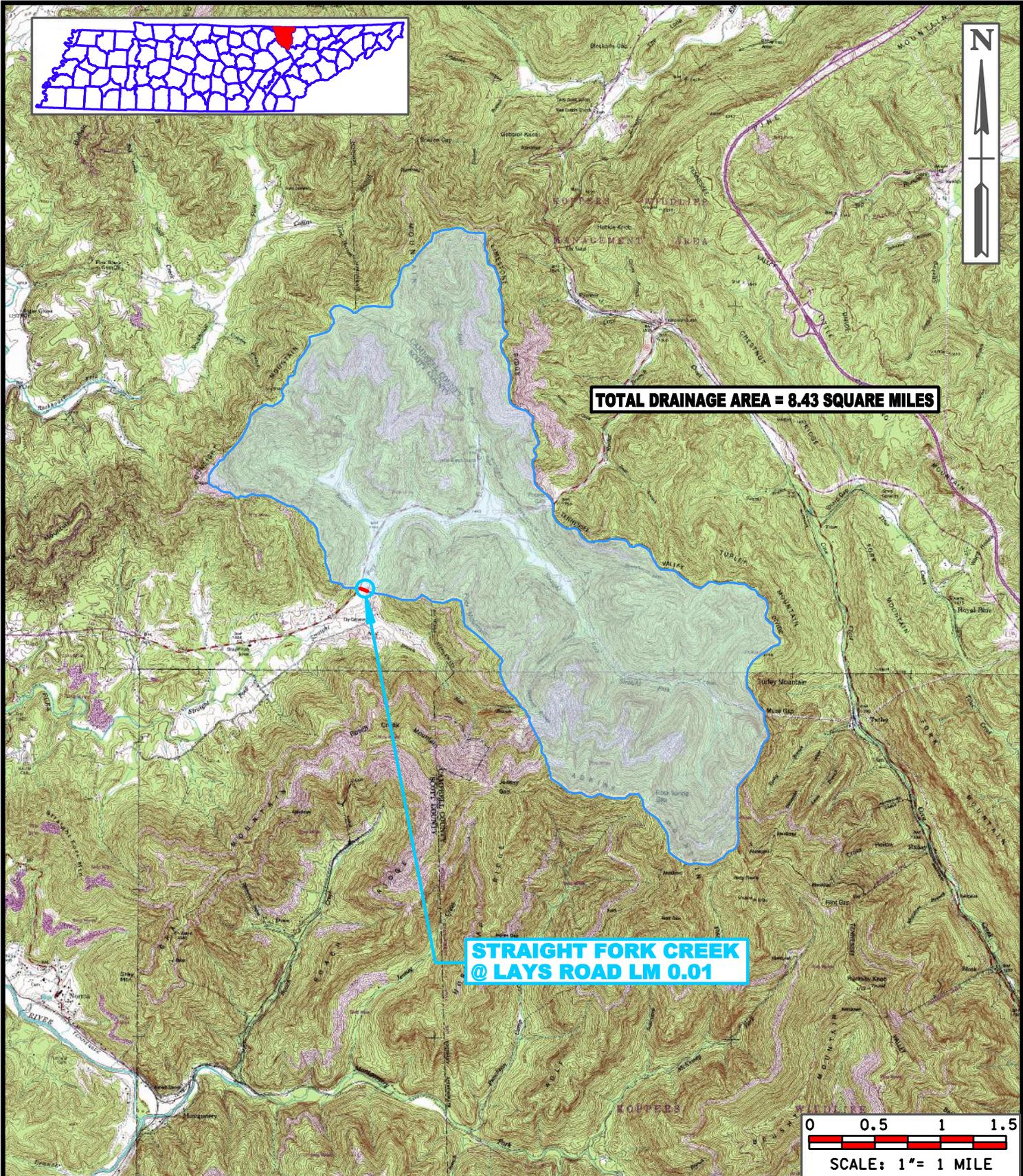
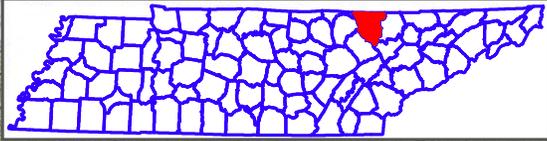
10-Year Flood Depth =  $4.11(CDA)^{0.184} =$  6.1 ft  
 100-Year Flood Depth =  $5.32(CDA)^{0.186} =$  7.9 ft

**AREAS**

Existing Area Below Low Chord = 435 ft<sup>2</sup>  
 Proposed Area Below Low Chord = 774 ft<sup>2</sup>  
 Proposed 10-Year Flood Area,  $A_{10} =$  395 ft<sup>2</sup>  
 Proposed 100-Year Flood Area,  $A_{100} =$  502 ft<sup>2</sup>

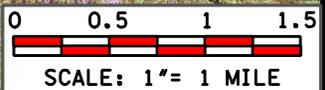
**VELOCITIES**

Proposed 10-Year Flood Velocity,  $V_{10} = Q_{10}/A_{10} =$  3.1 fps  
 Proposed 100-Year Flood Velocity,  $V_{100} = Q_{100}/A_{100} =$  4.4 fps



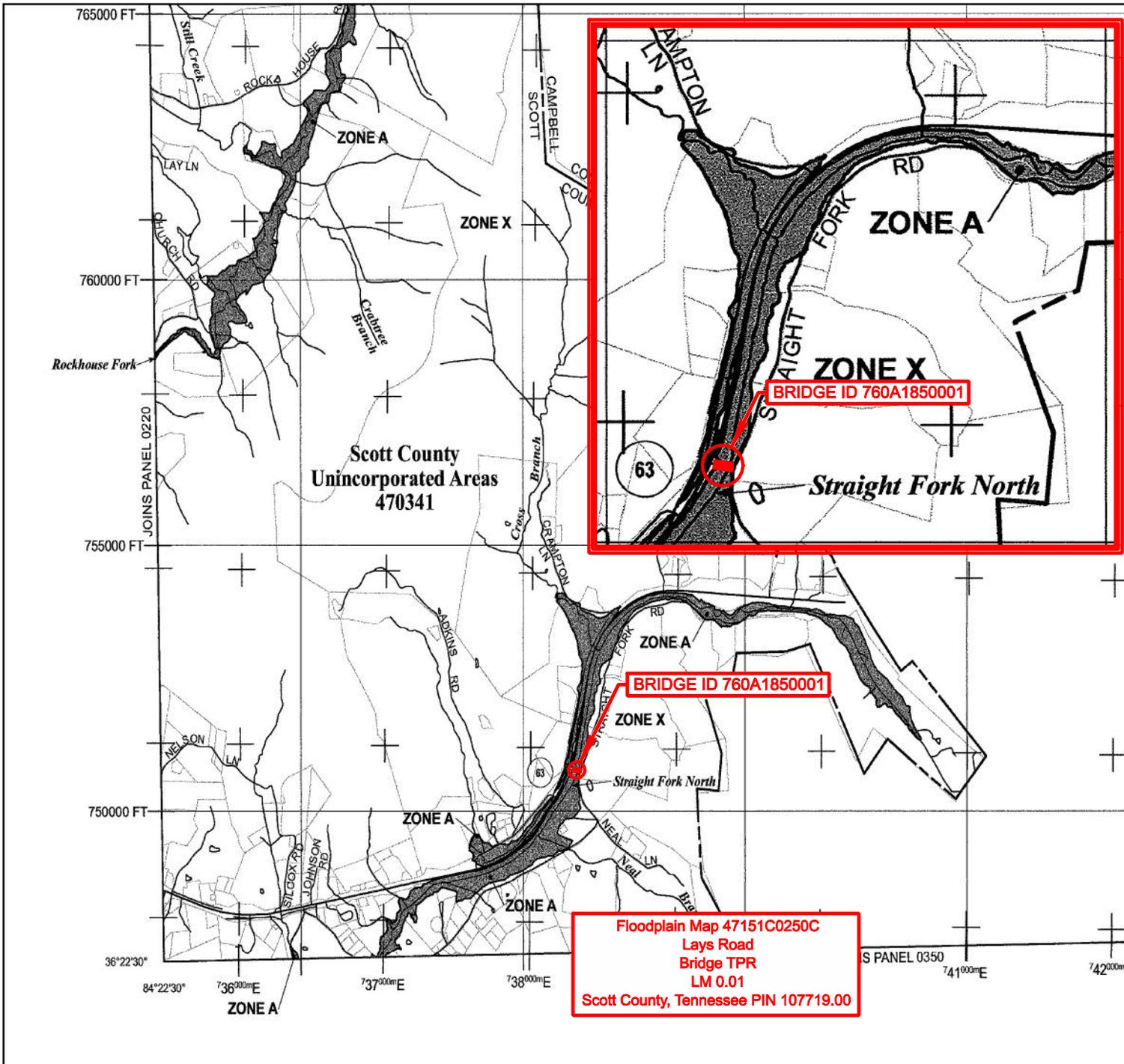
**TOTAL DRAINAGE AREA = 8.43 SQUARE MILES**

**STRAIGHT FORK CREEK @ LAYS ROAD LM 0.01**



**WATERSHED MAP  
LOCAL ROUTE 0A323 (LAYS ROAD)  
BRIDGE OVER STRAIGHT FORK CREEK @ L.M. 0.01  
BRIDGE NUMBER 760A1850001  
SCOTT COUNTY, TN**

<b>DRAWN BY:</b> BH	<b>CHECKED BY:</b> HM
<b>0A323 LAY'S ROAD L.M. 0.01</b>	
<b>PIN 107719.00</b>	
<b>DATE:</b> 11-5-12	



Floodplain Map 47151C0250C  
 Lays Road  
 Bridge TPR  
 LM 0.01  
 Scott County, Tennessee PIN 107719.00



MAP SCALE 1" = 2000'  
 1,000 0 1,000 2,000 3,000 4,00

PANEL 0250C

**FIRM**  
 FLOOD INSURANCE RATE MAP  
 SCOTT COUNTY,  
 TENNESSEE  
 AND INCORPORATED AREAS

PANEL 250 OF 425  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SCOTT COUNTY	470341	0250	C

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.

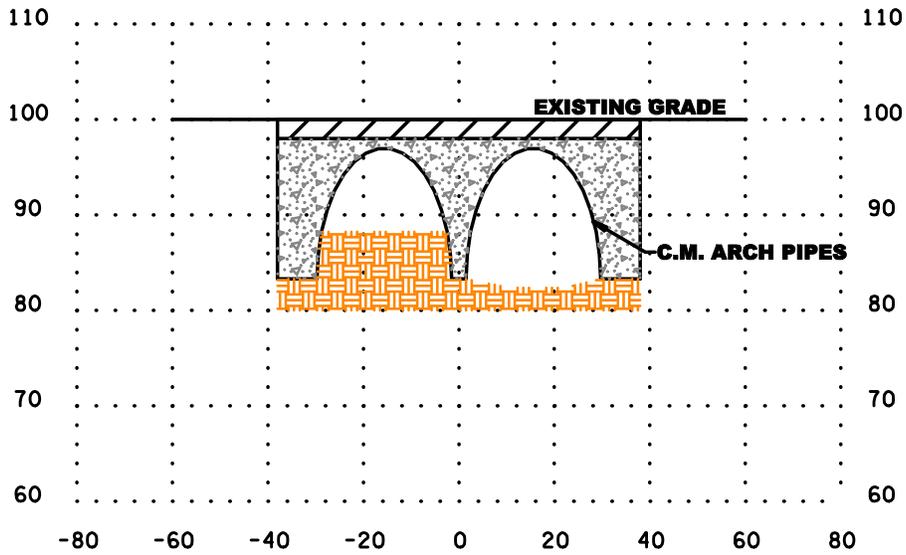


MAP NUMBER  
 47151C0250C  
 EFFECTIVE DATE  
 SEPTEMBER 28, 2007

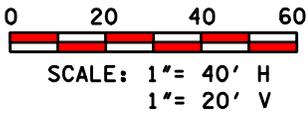
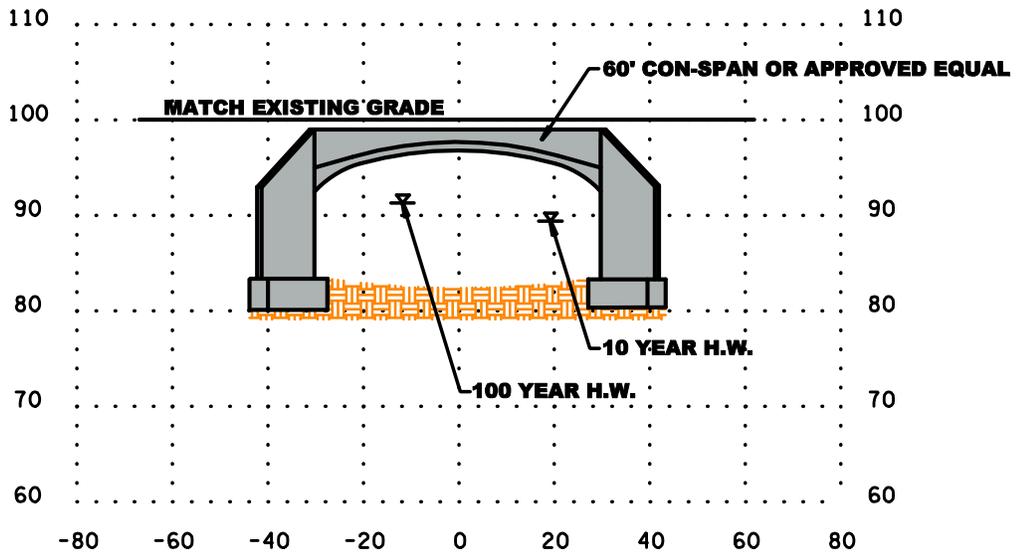
Federal Emergency Management Agency

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

### EXISTING STRUCTURE (INLET)



### EXISTING STRUCTURE (INLET)



### BRIDGE SECTIONS

**LOCAL ROUTE 0A323 (LAYS ROAD) SCOTT COUNTY  
BRIDGE OVER STRAIGHT FORK CREEK @ L.M. 0.01  
BRIDGE ID 760A1850001**



**View of Structure (Outlet)**



**View of Structure (Inlet)**



**Westbound Bridge Approach on Lays Road**



**Eastbound Bridge Approach on Lays Road**



**Upstream**



**Downstream**



**Upstream Left**



**Upstream Right**



**Downstream Left**



**Downstream Right**