TRANSPORTATION PLANNING REPORT

Special Bridge Replacement Program

LOCAL ROUTE A300 (AUCTION LANE)
BRIDGE OVER RUTHERFORD FORK OBION RIVER
LOG MILE 1.24
CARROLL COUNTY
PIN 116915.00

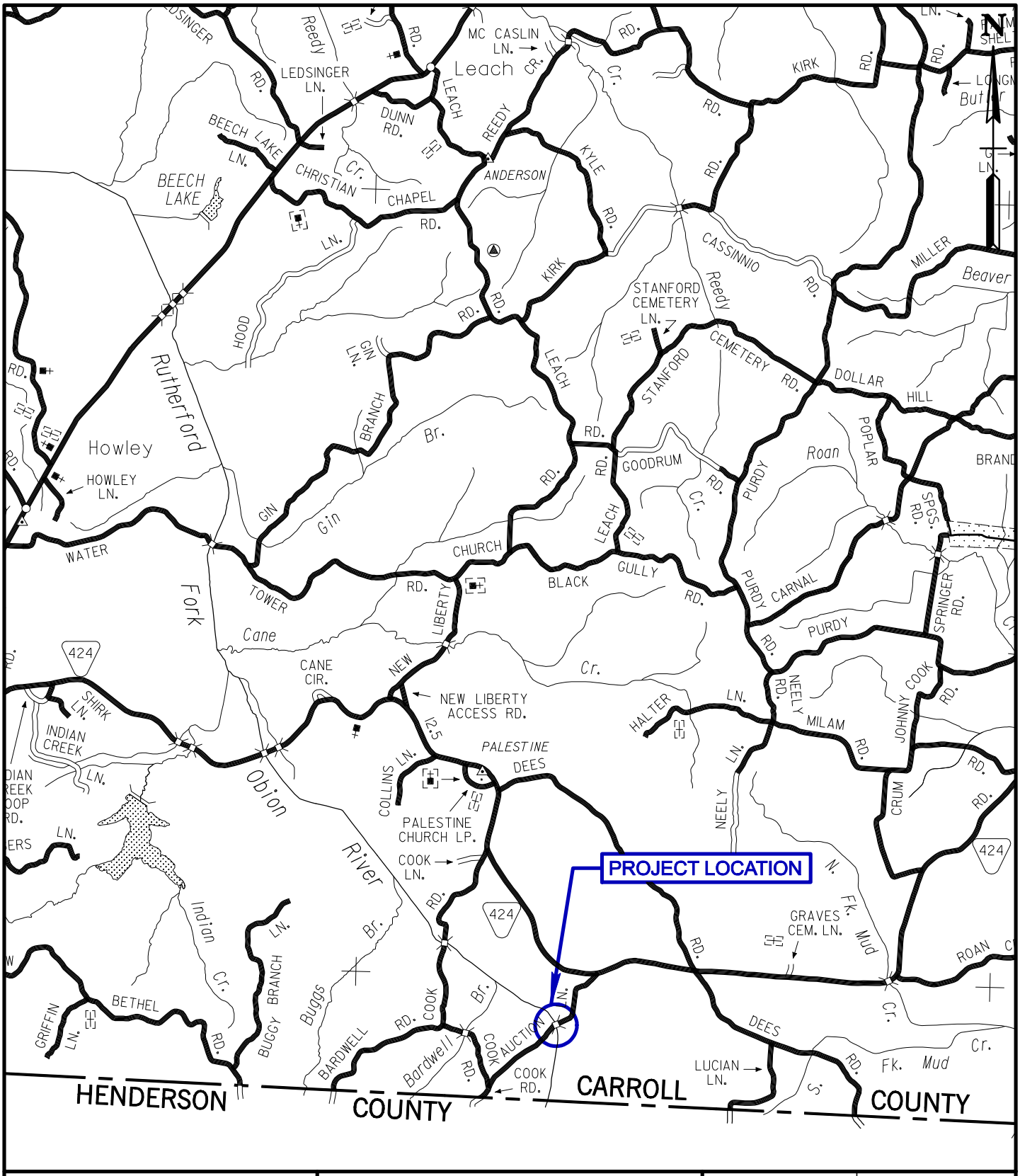
PREPARED BY
ALFRED BENESCH AND COMPANY
FOR THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Approved by _____ *Date* 2/28/13
Chief of Environment and Planning

Approved by _____ *Date* 3/20/13
Deputy Commissioner and Chief Engineer

Approved by:	Signature	DATE
Transportation Director **Project Planning Division**		12-10-12
Engineering Director **Design Division**	Carolyn Structure	12/10/12
Engineering Director **Structures Division**	Wayne L. Leger	1/30/13

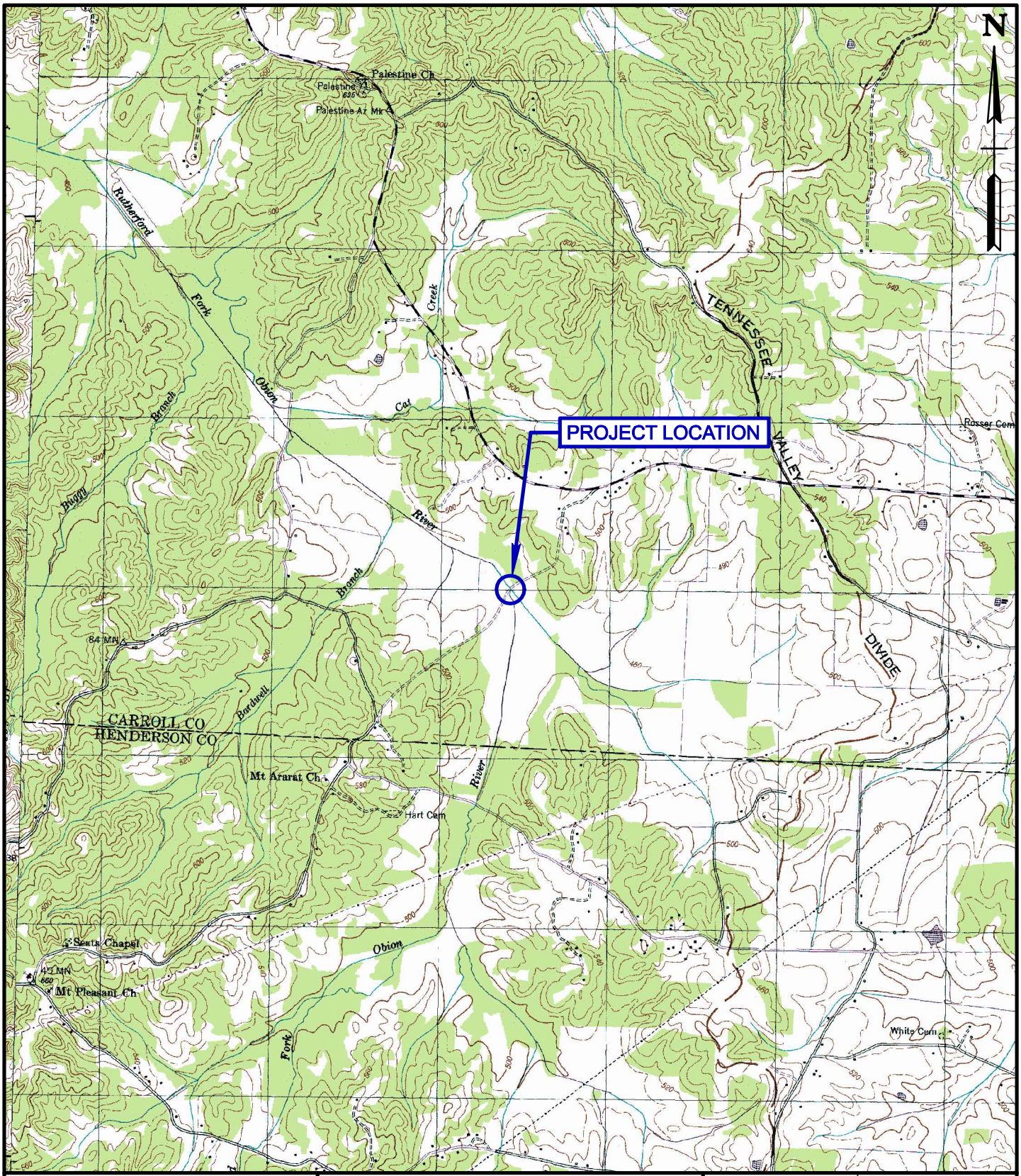
This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.



TDOT

LOCATION MAP

COUNTY:	CITY:
CARROLL	N/A
LOCAL ROUTE A300 (AUCTION LN.)	
PIN 116915.00	
SCALE: 1"= 1 MILE	DATE: 06-01-12

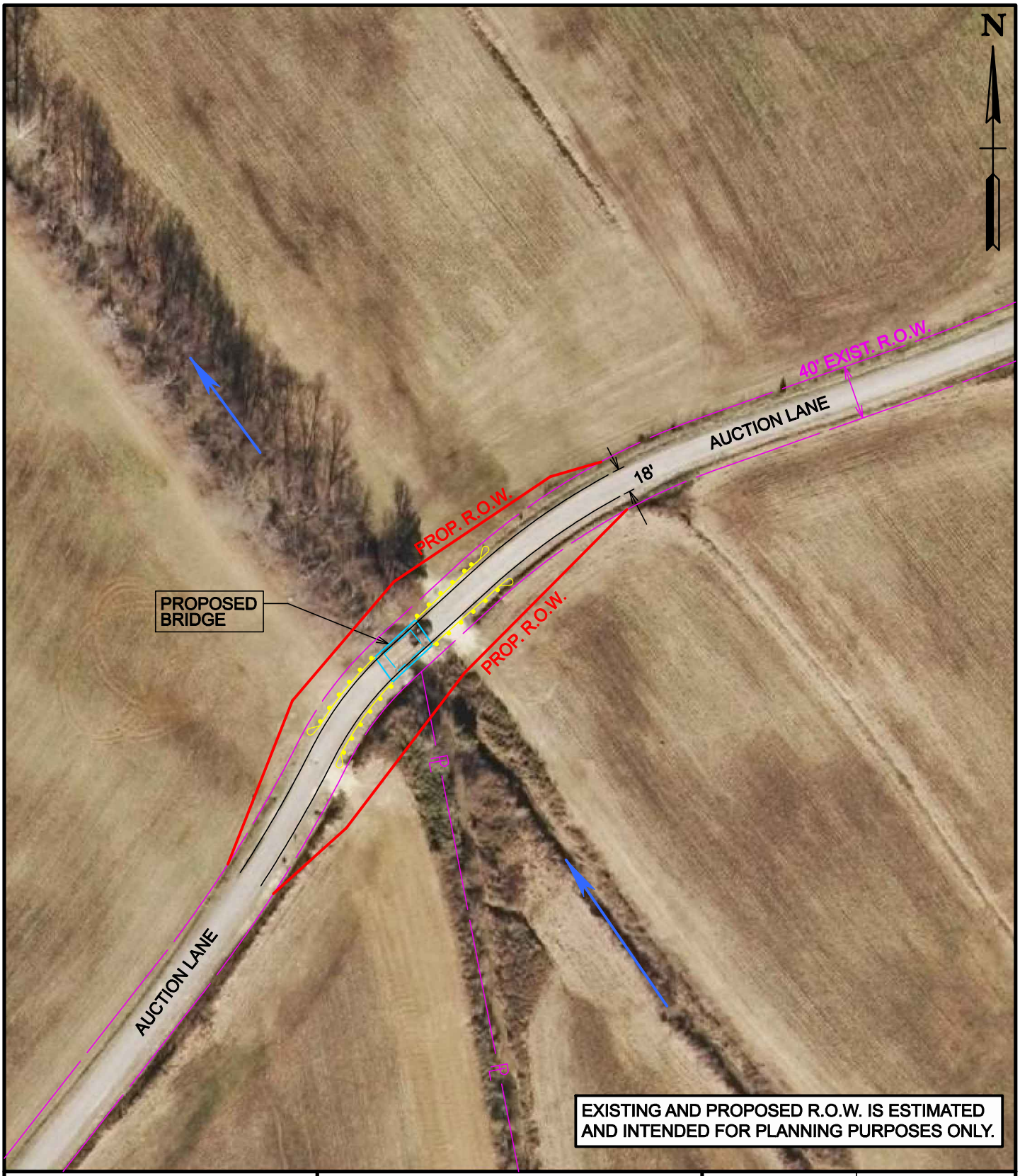


VICINITY MAP

COUNTY:	CITY:
CARROLL	N/A
LOCAL ROUTE A300 (AUCTION LN.)	
PIN 116915.00	
SCALE: 1"= 1/2 MILE	DATE: 06-01-12

AERIAL

COUNTY:	CITY:
CARROLL	N/A
LOCAL ROUTE A300 (AUCTION LN.)	
PIN 116915.00	
SCALE:	DATE:
1"= 500'	06-01-12



TDOT

PROPOSED LAYOUT

COUNTY:	CITY:
CARROLL	N/A
LOCAL ROUTE A300 (AUCTION LN.)	
PIN 116915.00	
SCALE: 1"= 100'	DATE: 10-31-12

TRANSPORTATION PLANNING WORKSHEET

BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS

County Carroll Route A300-Auction Lane Log Mile 1.24

Feature Crossed Rutherford Fork Obion River System Local

Functional Class Rural /Local Bridge I.D. 090A3000001

EXISTING CONDITIONS

2016 ADT 30 App. Cross Section 16'/18'/40' No. Lanes 1

Approach Alignment curved west, curved east Year Built 1970 Load Limit 10 Tons

Width (curb to curb) 16.1' Sidewalks: Right N/A Left N/A Length 28'

No. Spans: Approach 0 Main 1

Substructure Timber Abutments Vertical Clearance N/A Sufficiency Rating 39.3

Other: Speed limit is not posted. UG Telephone conduit attached to downstream side of bridge.
No other utilities noted within project area.

PROPOSED IMPROVEMENTS STANDARDS FROM RD01-TS- 1A Type of Work Replace

Design Year 2036 ADT 40 DHV 5 ADL (F) ---- (R) ----

Length of Project 500' Structure Length 50' Design Speed (MPH) 30

Approach Width 18'/20'/as required Bridge Width 22.33' No. Lanes 2

Right-of-Way Required 3 Tracts Temporary Detour YES (3.4 miles)

Alternate Route SR-424 to Cook Rd. South to Auction Lane

Remarks: Road will be closed during construction and traffic will be maintained with a detour. The proposed detour route is State Route 424 to Cook Road to Auction Lane (See Detour Map), a total distance of 3.4 miles. The existing alignment will be maintained and grade raised approximately 2'. Due to potential for debris collecting at the inlet, the proposed structure is a 50' single span concrete bridge. Exact size and type of structure will be determined by TDOT Structures during the design process.

ESTIMATED COST

Right-of-Way	$ 17,000	Approaches	$ 311,400	Structure	$ 179,000
Preliminary Engineering	$ 52,800	Utilities	$ 20,000	Total	$ 580,200

Remarks:

Field Investigation by: Kevin McAlister, Greg Freeman, Brian Gaffney (Benesch); Glen Blankenship (TDOT Survey)
David Duncan, Gena Gilliam, Lisa Reaney (TDOT Planning); Michael Russell (TDOT Design)
Seth Hendren (TDOT ROW); Jason Moody (TDOT Traffic); Ricky Scott, Scotty Bailey (Carroll Co.)

Route:	**Local Route A300 (Auction Lane)**
Description:	**Bridge over Rutherford Fork Obion River**
	L.M. 1.24
County:	**Carroll**
Length:	**N/A**
Date:	**November 28, 2012**

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
Right-of-Way	$ 3,400	$ -	$ 13,600	$ 17,000
Clearing and Grubbing	$ 800	$ -	$ 3,200	$ 4,000
Earthwork	$ 4,200	$ -	$ 16,800	$ 21,000
Railroad Crossing or Separation	$ -	$ -	$ -	$ -
Drainage	$ 11,800	$ -	$ 47,200	$ 59,000
Utilities	$ 4,000	$ -	$ 16,000	$ 20,000
Structures	$ 35,800	$ -	$ 143,200	$ 179,000
Pavement Removal	$ 2,400	$ -	$ 9,600	$ 12,000
Paving	$ 5,600	$ -	$ 22,400	$ 28,000
Roadway and Pavement Appurtenances	$ -	$ -	$ -	$ -
Retaining Walls	$ -	$ -	$ -	$ -
Topsoil	$ -	$ -	$ -	$ -
Seeding	$ -	$ -	$ -	$ -
Sodding	$ 2,400	$ -	$ 9,600	$ 12,000
Rip-Rap or Slope Protection	$ 1,000	$ -	$ 4,000	$ 5,000
Fencing	$ -	$ -	$ -	$ -
Signing	$ 600	$ -	$ 2,400	$ 3,000
Pavement Markings	$ 200	$ -	$ 800	$ 1,000
Lighting	$ -	$ -	$ -	$ -
Signalization	$ -	$ -	$ -	$ -
Guardrail	$ 3,200	$ -	$ 12,800	$ 16,000
Pay Item Quantity Adjustment (15%)[1]	$ 11,300	$ -	$ 45,200	$ 56,600
Maintenance of Traffic	$ 4,600	$ -	$ 18,400	$ 23,000
Mobilization (5%)	$ 4,600	$ -	$ 18,300	$ 22,800
CONSTRUCTION COST (rounded)	$ 95,900	$ -	$ 383,500	$ 479,400
Engineering and Contingency (10%)	$ 9,600	$ -	$ 38,400	$ 48,000
TOTAL CONSTRUCTION COST (rounded)	$ 105,500	$ -	$ 421,900	$ 527,400
Preliminary Engineering (10%)	$ 10,600	$ -	$ 42,200	$ 52,800
PROJECT COST [2] (rounded)	**$ 116,100**	**$ -**	**$ 464,100**	**$ 580,200**

[1] ***For estimating purposes, pay items are adjusted for fluctuation of cost based on quantity.***

[2] ***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	1	$ 16,800.00	$ 16,800
			RIGHT-OF-WAY TOTAL (ROUNDED)		**$ 17,000**
201-01	Clearing and Grubbing	LS	1	$ 4,000.00	$ 4,000
			CLEAR AND GRUBBING TOTAL (ROUNDED)		**$ 4,000**
203-01	Road and Drainage Excavation	CY	2,074	$ 10.00	$ 20,741
			EARTHWORK TOTAL (ROUNDED)		**$ 21,000**
202-03.01	Removal of Asphalt Pavement	SY	1,195	$ 10.00	$ 11,947
			PAVEMENT REMOVAL TOTAL (ROUNDED)		**$ 12,000**
607-39.04	30" Sidedrain	LF	40	$ 35.00	$ 2,000
607-39.08	60" Sidedrain	LF	30	$ 35.00	$ 2,000
611-07.01	Endwall Concrete	CY	23	$ 600.00	$ 14,000
611-07.02	Endwall Steel	Lbs	280	$ 3.00	$ 1,000
	Erosion Control	LS	1	$ 40,000.00	$ 40,000
			DRAINAGE TOTAL (ROUNDED)		**$ 59,000**
	UG Telephone	LF	500	$ 40.00	$ 20,000
			UTILITIES TOTAL (ROUNDED)		**$ 20,000**
	New Bridge	SF	1,117	$ 150.00	$ 167,475
	Removal of Existing	SF	448	$ 25.00	$ 11,200
			STRUCTURES TOTAL (ROUNDED)		**$ 179,000**
			RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)		**$ -**
404-01.01	Bituminous Material (DBST)	TON	5	$ 1,000.00	$ 5,400
404-01.02	Min. Agg (DBST)	TON	43	$ 50.00	$ 2,200
303-01	Aggregate	TON	992.4	$ 20.00	$ 20,000
			PAVING TOTAL (ROUNDED)		**$ 28,000**
			ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)		**$ -**
			RETAINING WALLS TOTAL (ROUNDED)		**$ -**
	Traffic Control	LS	1	$ 22,420.00	$ 22,420
			MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)		**$ 23,000**
			TOPSOIL TOTAL (ROUNDED)		**$ -**
			SEEDING TOTAL (ROUNDED)		**$ -**
803-01	Sodding (New Sod)	SY	2,222	$ 5.00	$ 12,000
			SODDING TOTAL (ROUNDED)		**$ 12,000**
713-11.01	"U" Section Steel Posts	144	Lbs	$ 4.00	$ 1,000
713-13.02	Flat Sheet Aluminum (0.080" Thick)	12	SF	$ 15.00	$ 1,000
713-15.36	Remove existing signs	4	EACH	$ 50.00	$ 200
			SIGNING TOTAL (ROUNDED)		**$ 3,000**

716-05.01	Painted Pavement Marking (4" Line)	LM	0.53	$	845.00	$	448
			PAVEMENT MARKINGS TOTAL (ROUNDED)			**$**	**1,000**
			LIGHTING TOTAL (ROUNDED)			**$**	**-**
			SIGNALIZATION TOTAL (ROUNDED)			**$**	**-**
			FENCE TOTAL (ROUNDED)			**$**	**-**
705-01.01	GR at Bridge Ends	LF	108	$	65.00	$	7,020
705-02.02	Single Guardrail (Type 2)	LF	50	$	18.00	$	900
705-04.04	Guardrail Terminal (Type 21)	EA	4	$	2,000.00	$	8,000
			GUARDRAIL TOTAL (ROUNDED)			**$**	**16,000**
709-05.06	Class A-1	TON	49	$	30.00	$	1,458
709-05.08	Class B	TON	81	$	35.00	$	2,836
			RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)			**$**	**5,000**

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0334

MEMORANDUM

TO: Project Planning Division

FROM: Brian Gaffney, P.E.
Alfred Benesch & Company

DATE: November 28, 2012

SUBJECT: TPR Field Review (Special Bridge Replacement Program)
Local Route A300-Auction Lane Bridge Over
Rutherford Fork Obion River (L.M. 1.24)
Carroll County, PIN 116915.00

A field review was held for the above-mentioned project on July 11, 2012.

The existing structure is 16.3 feet wide by 28.0 feet long and consists of a wood deck and steel I-beams on timber pile abutments. The sufficiency rating for the project overflow bridge is 39.3. The 10-year and 100-year discharges and depths of flow for the Rutherford Fork Obion River drainage basin were estimated using the appropriate regression equations. The 10-year and 100-year depth of flow estimates were 9.1 feet and 11.5 feet, respectively. The depth of flow estimates indicated roadway overtopping, which is consistent with information provided by local officials.

The roadway segment of Local Route A300 (Auction Lane) has a base year (2016) AADT of 30 vehicles/day and a design year (2036) AADT of 40 vehicles/day. The proposed structure over the Rutherford Fork Obion River will be designed to meet Road Design Standard RD01-TS-1A. Due to potential debris load, the proposed structure is a single span concrete bridge with a total out to out width of 22.33 feet. The structure is to contain two (2) nine foot (9') lanes and one foot (1') shoulders. The proposed bridge length is approximately 50 feet. The exact size and type of the structure will be determined by the TDOT Structures Division.

The proposed bridge is to maintain the existing horizontal alignment and raise the grade approximately two (2) feet to reduce overtopping. The road will be closed during construction. The proposed detour is State Route 424 to Cook Road to Auction Lane, a total distance of 3.4 miles.

The required approach work, right-of-way, utility relocations, estimated replacement cost, and preliminary engineering are approximately $580,200.

CHECK LIST OF DETERMINANTS FOR LOCATION STUDY

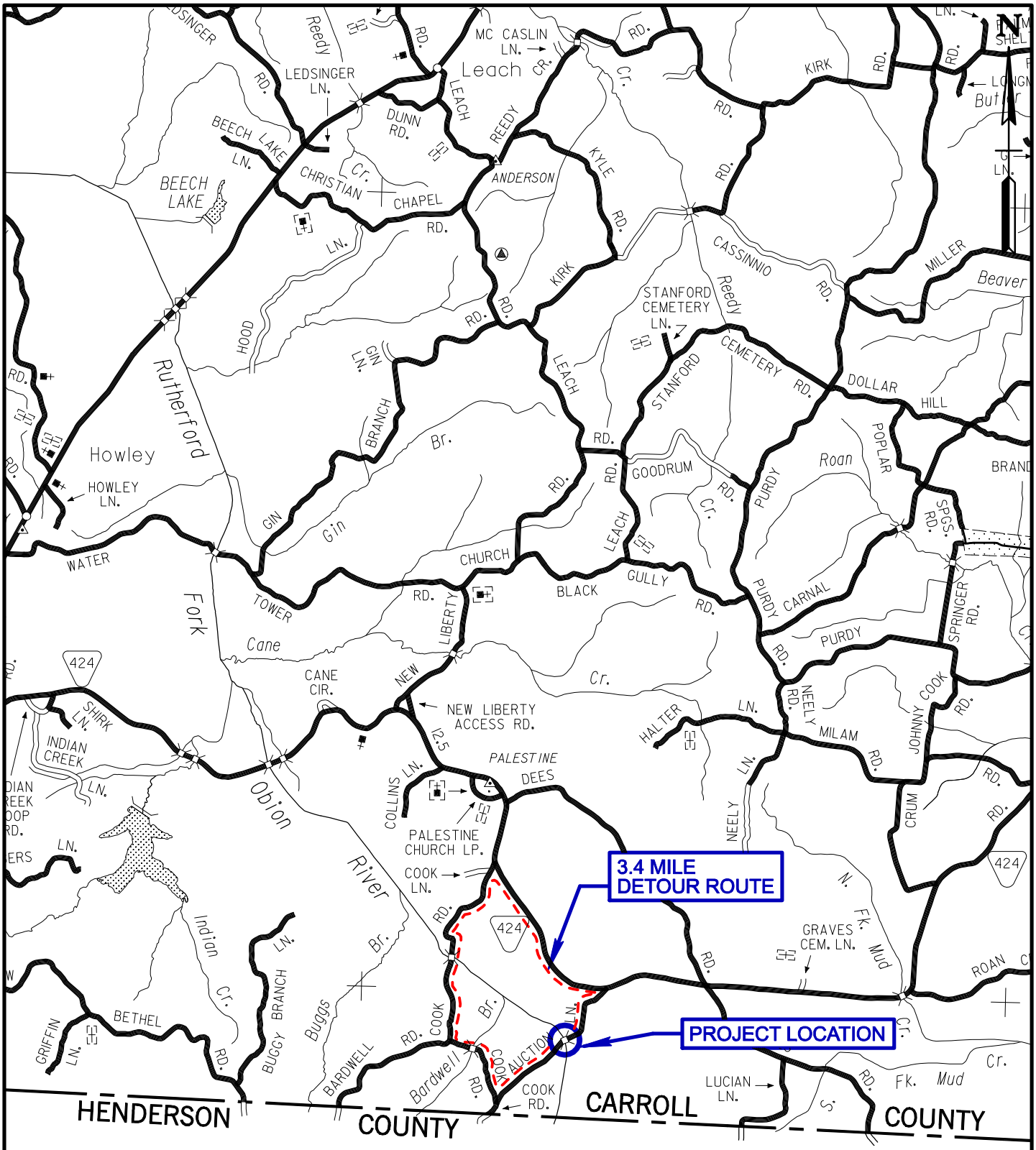
If any of the following facilities or ESE categories are located within the project area or corridor, place an "x" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

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	
	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	



TDOT

DETOUR MAP

COUNTY:	CITY:
CARROLL	N/A
LOCAL ROUTE A300 (AUCTION LN.)	
PIN 116915.00	
SCALE: 1"= 1 MILE	DATE: 06-01-12

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: 99109-1453-04 ROUTE: 0A300 Auction Lane
COUNTY: Carroll CITY: LaFollette
PROJECT PIN NUMBER: 116915.00
PROJECT DESCRIPTION: Bridge Replacement Project Bridge over Obion River
L.M. 1.24

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	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
30	2016	40	5	13	2036	65-35	1	2		

REQUESTED BY: NAME Gena Gilliam DATE 5/11/12
DIVISION Project Planing
ADDRESS 10th Floor, JKP Bldg
Nashville, TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 5-18-12
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: DUDLEY DANIEL Dudley C Daniel DATE 21 May 12
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

This Traffic is based on 2007 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)

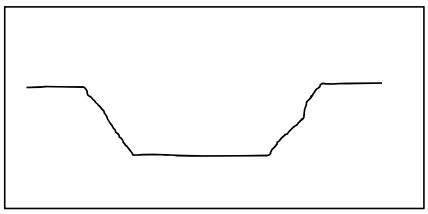
TPR ON SITE INSPECTION REPORT

FOR STREAM CROSSINGS

INSPECTION MADE BY: KM/GF BRIDGE NO.: 090A3000001 COUNTY: Carroll
Date: 6/8/12 Route Name: A300-Auction Lane Stream Name: Rutherford Fork Obion River @ L.M. 1.24

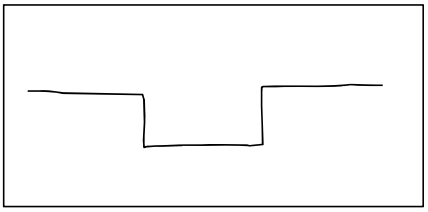
CHANNEL

Approx depth and width of channel: Hor.: 5' Vert: 8' to deck
Depth of normal flow: 1' In Reservoir: _ Yes X No
Depth of Ordinary H.W.: 2'-3'
Type of material in stream bed: Sand, some gravel
Type of vegetation on banks: thick brush upstream, trees downstream
"N" factor of the channel: 0.03
Are channel banks stable: yes
If the streambed is gravel: D_{30} = ---- D_{85} = ----
Skew of the channel with the roadway: 90 °


Channel Shape Sketch

FLOODPLAIN

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


Floodplain Sketch

EXISTING STRUCTURE

Length: 28' No. of spans: 1 Structure type: Steel I-Beam No. of lanes: 1 Skew: 90 °
Width (out to out): 16.33' Width (curb to curb): 16.1' Approach: ☑ paved ☐ graveled
Sidewalks (left,right): N/A Bridgerail type: Wooden Wheel Guard Bridgerail height = N/A
Superstructure depth: Finished Grade to low girder = 24" Girder depth = 18"
Are any substructures in the channel? No Area of opening = 84 FT^2
Indications of overtopping: YES
High water marks: Debris in the superstructure
Local scour: NO
Any signs of stream ☐ aggradation or ☐ degradation NO
Any drift or drift potential? NO
Any obstructions (pipes,stock fences,etc.)? NO

PROPOSED STRUCTURE

☑ Replacement ☐ Rehabilitate ☐ Widening ☐ New Location ☐ Abandon

Bridge length: 50' Bridge type: Conc. Span Span arrangement: Single Span Skew: 90 °
Bridge width: 22.33' Sidewalks: N/A Design Speed (MPH): 30 ADT (2036) = 40
Proposed grade: Raise approx. 2' Proposed alignment: Maintain Existing
Method of maintaining traffic: Stage construction __ On site detour X Close road __ Shift Centerline ( ) FT
Cost of proposed Structure: $150 per FT^2 50 / 22.33 length (ft) / width (ft) Cost = $167,475
Cost of bridge removal: $25 per FT^2 28 / 16.00 length (ft) / width (ft) Cost = $11,200
Detour structure: Type and size = None Cost = $0
Total Structure Cost = $179,000

Bridge APR Flow Calculations
For Hydraulic Area 4
Area > 486 Acres

County	Carroll	By	GF
Bridge No.	090A3000001	Date	6/1/12
Route No.	0A300 Aucion Lane	PIN	116915.00
Feature Crossed	Obion River		
Log Mile	1.24		

Drainage Area	4,230	acres
	6.61	sq. mi.

USGS REGRESSION EQUATIONS FOR FLOW:

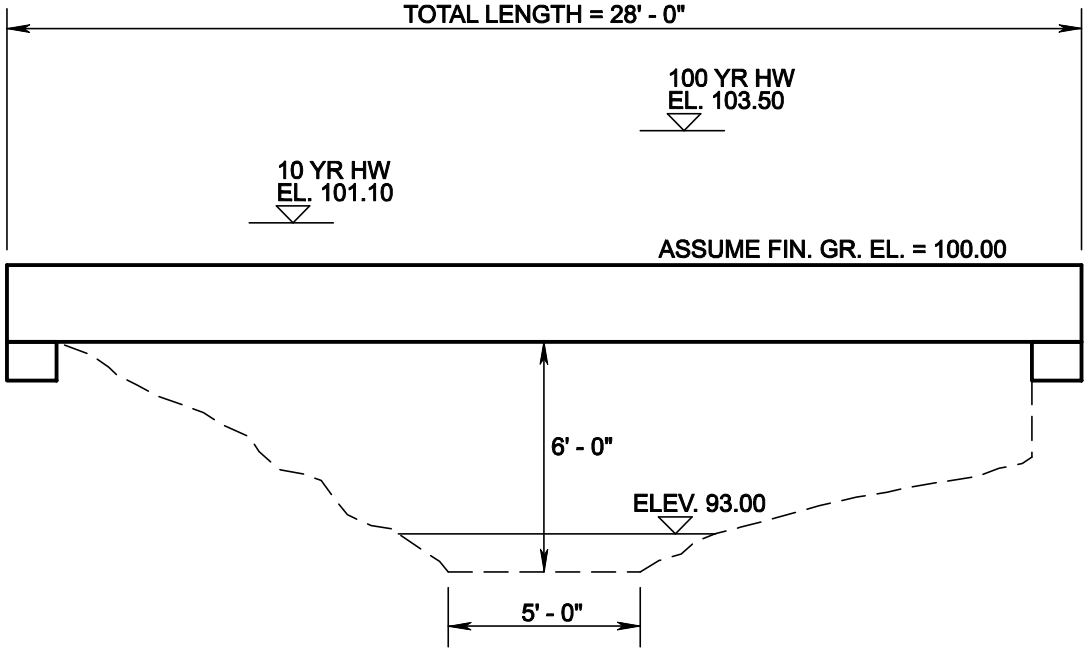
$Q2=436*(CDA)^{0.527}$ =	1,180	cfs
$Q5=618*(CDA)^{0.545}$ =	1,730	cfs
$Q10=735*(CDA)^{0.554}$ =	2,093	cfs
$Q25=878*(CDA)^{0.564}$ =	2,547	cfs
$Q50=981*(CDA)^{0.570}$ =	2,879	cfs
$Q100=1080*(CDA)^{0.575}$ =	3,199	cfs

DEPTH OF FLOW EQUATIONS

10 Year Flood Depth = $6.98(CDA)^{0.142}$ =	9.1 ft.
100 Year Flood Depth = $9.24(CDA)^{0.116}$	11.5 ft.

FLOW CALCULATIONS:
Q10 = 2,093 CFS
Q100 = 3,199 CFS

10 YR FLOW DEPTH = 9.1 FT.
100 YR FLOW DEPTH = 11.5 FT.



TOTAL AREA = 102 SQ. FT.
10 YR AREA = 102 SQ. FT.
100 YR AREA = 102 SQ. FT.

THEORETICAL VELOCITIES: V10 = 20.5 FPS V100 = 31.4 FPS

EXISTING BRIDGE PROFILE

COUNTY:	CITY:
CARROLL	N/A
LOCAL ROUTE A300 (AUCTION LN.)	
PIN 116915.00	
SCALE: 1"= 5'	DATE: 06-25-12

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 1

Bridge Number
9-A300-L24

Photograph 2

Eastern approach

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 3

View looking East from bridge.

Photograph 4

Western approach.

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 5

View looking West from bridge.

Photograph 6

Upstream

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 7

Upstream left.

Photograph 8

Upstream right. Also visible is confluence of second stream.

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 9

Downstream

Photograph 10

Downstream left.

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 11

Downstream right.

Photograph 12

Inlet.

.

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 13

Downstream view from under the bridge.

Photograph 14

Debris in superstructure and western abutment.

Project Photographs
Transportation Planning Report
A300-Auction Lane
Bridge Over Obion River
Carroll County
Date Photos Taken: 06/08/2012

Photograph 15

Right side of eastern abutment.

.

Photograph 16

Weight limit sign posted on both approaches.

.