

TRANSPORTATION PLANNING REPORT

Special Bridge Replacement Program

LOCAL ROUTE OA081
BRIDGE OVER COLD CREEK AT L.M. 4.63
LAUDERDALE COUNTY
PIN: 117276.00



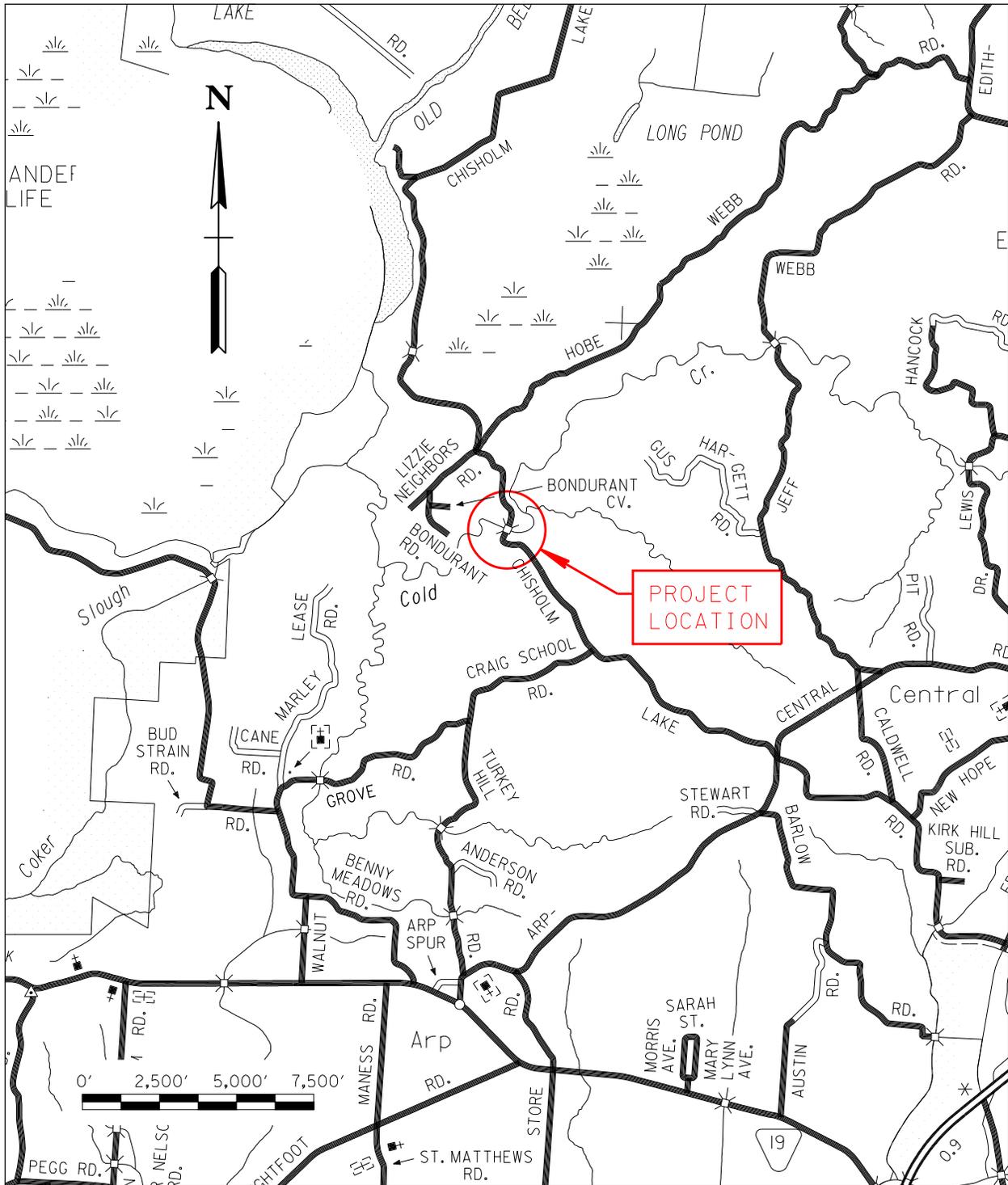
PREPARED BY
TRANSYSTEMS CORPORATION
FOR THE
TENNESSEE DEPARTMENT OF TRANSPORTATION

Approved by [Signature] Date 2/28/13
Chief of Environment and Planning

Approved by [Signature] Date 3/20/13
Deputy Commissioner and Chief Engineer

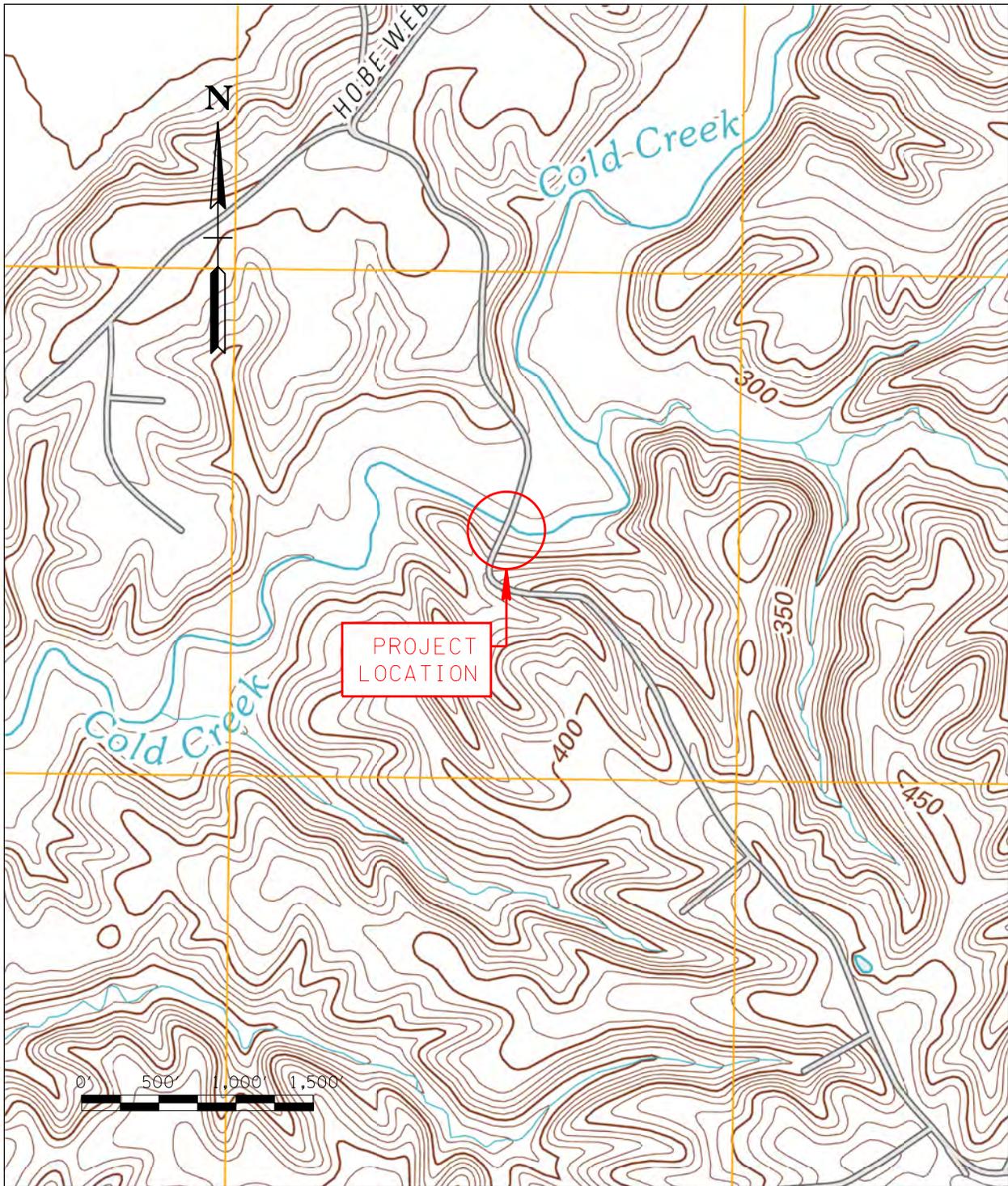
Approved by:	Signature:	Date:
Transportation Director Project Planning Division	<u>[Signature]</u>	1-25-13
Engineering Director Design Division	<u>[Signature]</u>	1-28-13
Engineering Director Structures Division	<u>[Signature]</u>	1-30-13

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



LOCATION MAP

LOCAL ROUTE 0A081 (CHISHOLM LAKE ROAD)
 BRIDGE #490A0810001 OVER COLD CREEK (L.M. 4.63)
 LAUDERDALE COUNTY



PROJECT MAP

LOCAL ROUTE 0A081 (CHISHOLM LAKE ROAD)
BRIDGE #490A0810001 OVER COLD CREEK (L.M. 4.63)
LAUDERDALE COUNTY



AERIAL MAP

LOCAL ROUTE 0A081 (CHISHOLM LAKE ROAD)
BRIDGE #490A0810001 OVER COLD CREEK (L.M. 4.63)
LAUDERDALE COUNTY

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

County: Lauderdale Route: Local Route 0A081 (Chisholm Lake Road) Log Mile: 4.63
 Feature Crossed: Cold Creek System: Local
 Functional Class: Rural Local Bridge ID: 490A0810001

EXISTING CONDITIONS

2016 AADT: 420 App. Cross Section: 18' / 23' / 50' No. Lanes: 2
 Approach Alignment: Tangent Year Built: 1970 Load Limit: 10 tons
 Width (out to out): 26.0 Sidewalks: Right N/A Left N/A Length: 99 ft.
 No. Spans: Approach: 0 Main: 4
 Substructure: Steel / Timber Vertical Clearance: 20 ft. Sufficiency Rating: 49.4
 Other: _____

PROPOSED IMPROVEMENTS

STANDARDS FROM RD01-TS- 1 (Table 1) Type of Work: Replace
 Design Year: 2036 Design AADT: 500 Terrain Rolling ADL (F): — (R): —
 Project Length: 430 ft Bridge Length: 120 ft Approach Length: 330 ft
 Design Speed (MPH): 40 Posted Speed (MPH): 30 Bike/Ped: _____
 Min. Clear Bridge Width: 20' / 26' / As Req. Bridge Width (C to C): 30 ft No. Lanes: 2
 Right-of-Way Required: 0 Ac. Tract(s) 0 Structure Type: Conc. I-beam

MAINTENANCE OF TRAFFIC

Temporary Detour: Temporary Runaround: Stage Construct:
 Alternate Route: 12.9 miles total. From north of bridge: right on Hobe Webb Road, right on Edith–Nankipoo Road, right on Jeff Webb Road, right on Arp–Central Road. From south of bridge: left on Arp–Central Road, left on Jeff Webb Road, left on Edith–Nankipoo Road, left on Hobe Webb Road.
 Remarks: Close roadway and detour traffic. See Detour Map for detour route. Road closure letter required.

ESTIMATED COST

Right-of-Way: \$10,000 Approaches: \$137,400 Structure: \$651,000
 Preliminary Engineering: \$111,900 Utilities: \$35,200 Misc./Cont.: \$236,700
 Mobilization: \$48,400 Total: \$1,230,600
 Remarks: Replace existing bridge with two-span, 120-foot structure. No horizontal or vertical grade change required.

Field investigation by: Glen Blankenship (TDOT Region 4 Survey), Mike Gilbert (TDOT Project Planning), Gena Gilliam (TDOT Project Planning), Jane Jones (TDOT Region 4 Design), Jason Moody (TDOT Region 4 Traffic), Patrick Murray (TranSystems Corporation), Lisa Reaney (TDOT Project Planning), Luke Sullivan (TranSystems Corporation), Andy Vaughan (Lauderdale County Highway Department), Fred Vinson (TDOT Region 4 ROW).

Route:	Local Route 0A081 (Chisholm Lake Road)
Description:	Bridge #490A0810001 over Cold Creek (LM 4.64)
County:	Lauderdale
Length:	0.08 Miles
Date:	August 31, 2012

<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	\$ 3,000		\$ 12,000	\$ 15,000
Earthwork	\$ 3,000		\$ 12,000	\$ 15,000
Railroad Crossing or Separation	\$ -		\$ -	\$ -
Drainage	\$ -		\$ -	\$ -
Utilities	\$ 7,040		\$ 28,160	\$ 35,200
Structures	\$ 130,200		\$ 520,800	\$ 651,000
Pavement Removal	\$ 2,560		\$ 10,240	\$ 12,800
Paving	\$ 10,940		\$ 43,760	\$ 54,700
Roadway and Pavement Appurtenances	\$ -		\$ -	\$ -
Retaining Walls	\$ -		\$ -	\$ -
Topsoil	\$ -		\$ -	\$ -
Seeding	\$ 60		\$ 240	\$ 300
Sodding	\$ -		\$ -	\$ -
Rip-Rap or Slope Protection	\$ 4,500		\$ 18,000	\$ 22,500
Fencing	\$ -		\$ -	\$ -
Signing	\$ 200		\$ 800	\$ 1,000
Pavement Markings	\$ 60		\$ 240	\$ 300
Lighting	\$ -		\$ -	\$ -
Signalization	\$ -		\$ -	\$ -
Guardrail	\$ 3,160		\$ 12,640	\$ 15,800
Pay Item Quantity Adjustment (15%) ¹	\$ 25,010		\$ 100,000	\$ 125,000
Maintenance of Traffic	\$ -		\$ 10,000	\$ 10,000
Mobilization (5%)	\$ 9,600		\$ 38,800	\$ 48,400
CONSTRUCTION COST (rounded)	\$ 201,300		\$ 815,700	\$ 1,017,000
Engineering and Contingency (10%)	\$ 20,100		\$ 81,600	\$ 101,700
TOTAL CONSTRUCTION COST (rounded)	\$ 221,400		\$ 897,300	\$ 1,118,700
Preliminary Engineering (10%)	\$ 22,100		\$ 89,700	\$ 111,900
PROJECT COST (ROUNDED)²	\$ 243,500		\$ 987,000	\$1,230,600

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	\$ 10,000.00	\$ 10,000
RIGHT-OF-WAY TOTAL (ROUNDED)					\$ 10,000
201-01	Clearing and Grubbing	LS	1	\$ 15,000.00	\$ 15,000
CLEAR AND GRUBBING TOTAL (ROUNDED)					\$ 15,000
203-03	Borrow Excavation (Unclassified)	CY	1,000	\$ 15.00	\$ 15,000
EARTHWORK TOTAL (ROUNDED)					\$ 15,000
202-03 01	Removal of Asphalt Pavement	SY	850	\$ 15.00	\$ 12,750
PAVEMENT REMOVAL TOTAL (ROUNDED)					\$ 12,800
DRAINAGE TOTAL (ROUNDED)					\$ -
—	Relocation of Above-Ground Utilities	LF	1,800	\$ 10.00	\$ 18,000
—	Relocation of Underground Utilities	LF	430	\$ 40.00	\$ 17,200
UTILITIES TOTAL (ROUNDED)					\$ 35,200
—	Removal of Existing Structure	SF	2,600	\$ 15.00	\$ 39,000
—	Structure	SF	4,080	\$ 150.00	\$ 612,000
STRUCTURES TOTAL (ROUNDED)					\$ 651,000
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)					\$ -
303-01	Mineral Aggregate, Type A Base, Grading D	TON	590	\$ 20.00	\$ 11,800
307-01 01	ACS Mix (PG64-22) (BPMB-HM) Grading A	TON	29	\$ 100.00	\$ 2,900
307-01 08	ACS Mix (PG64-22) (BPMB-HM) Grading B-M2	TON	16	\$ 90.00	\$ 1,440
402-01	Bituminous Material for Prime Coat (PC)	TON	0.2	\$ 610.00	\$ 122
402-02	Aggregate for Cover Material (PC)	TON	0.9	\$ 25.00	\$ 23
403-01	Bituminous Material with Tack Coat (TC)	TON	0.2	\$ 635.00	\$ 127
411-01.10	ACS Mix (PG64-22) Grading D Roadway	TON	59	\$ 120.00	\$ 7,080
604-03 04	Pavement at Bridge Ends	SY	160	\$ 195.00	\$ 31,200
PAVING TOTAL (ROUNDED)					\$ 54,700
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)					\$ -
RETAINING WALLS TOTAL (ROUNDED)					\$ -
712-01	Traffic Control	LS	1	\$ 10,000.00	\$ 10,000
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)					\$ 10,000
203-07	Furnishing and Spreading Topsoil	CY	150	\$ 15.00	\$ 2,250
TOPSOIL TOTAL (ROUNDED)					\$ -
801-01	Seeding (With Mulch)	UNIT	8	\$ 28.00	\$ 224
801-03	Water (Seeding and Sodding)	MG	1	\$ 5.00	\$ 5
SEEDING TOTAL (ROUNDED)					\$ 300
SODDING TOTAL (ROUNDED)					\$ -
—	Signs	LS	1	\$ 1,000	\$ 1,000
SIGNING TOTAL (ROUNDED)					\$ 1,000
716-05 01	Painted Pavement Marking (4" Line)	LM	0 341	\$ 850.00	\$ 290
PAVEMENT MARKINGS TOTAL (ROUNDED)					\$ 300
LIGHTING TOTAL (ROUNDED)					\$ -
SIGNALIZATION TOTAL (ROUNDED)					\$ -
FENCE TOTAL (ROUNDED)					\$ -
705-01 01	Guardrail at Bridge Ends	LF	110	\$ 65.00	\$ 7,150
705-02 02	Single Guardrail (Type 2)	LF	50	\$ 20.00	\$ 1,000
705-04 04	Guardrail Terminal (Type 21)	EA	4	\$ 1,900.00	\$ 7,600
GUARDRAIL TOTAL (ROUNDED)					\$ 15,800
709-05 06	Machined Rip-Rap (Class A-1)	TON	750	\$ 30.00	\$ 22,500
RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)					\$ 22,500
PAY ITEM TOTAL (ROUNDED)					\$ 843,600



TranSystems

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MEMORANDUM

To: TDOT Project Planning Office
From: TranSystems Corporation
Date: August 31, 2012
Subject: **Project No. 99109-1453-04, PIN 117276.00**
Transportation Planning Report (TPR) Bridge Replacement
Local Route 0A081 (Chisholm Lake Road)
Bridge #490A0810001 over Cold Creek (L.M. 4.63)
Lauderdale County

A field review for the Chisholm Lake Road bridge replacement TPR was held on July 12, 2012. The following table lists attendees present:

Name	Organization	Phone	E-mail
Glen Blankenship	TDOT Region 4 Survey	(731) 935-0137	glen.blankenship@tn.gov
Mike Gilbert	TDOT Project Planning	(615) 741-0772	michael.gilbert@tn.gov
Gena Gilliam	TDOT Project Planning	(615) 253-7692	gena.gilliam@tn.gov
Jane Jones	TDOT Region 4 Design	(731) 935-0140	jane.jones@tn.gov
Jason Moody	TDOT Region 4 Traffic	(731) 935-0183	jason.d.moody@tn.gov
Patrick Murray	TranSystems Corporation	(615) 829-7737	rpmurray@transystems.com
Lisa Reaney	TDOT Project Planning	(615) 741-0967	lisa.reaney@tn.gov
Luke Sullivan	TranSystems Corporation	(615) 829-7734	lrsullivan@transystems.com
Andy Vaughan	Lauderdale County Highway Department	(731) 635-9251	lchd@lctn.com
Fred Vinson	TDOT Region 4 ROW	(731) 935-0115	fred.vinson@tn.gov

The existing bridge, built in 1970, is a four-span, steel I-beam structure with a length of approximately 99 feet and an out-to-out deck width of approximately 26.2 feet. The bridge features a timber deck, piles, and abutments. The most recent sufficiency rating for this bridge, determined during a May 22, 2012 inspection, is 49.4. Based on regression equations supplied by TDOT and the United States Geological Survey (USGS), the estimated 10-year depth of flow for the Cold Creek drainage basin is approximately 10.4 feet and the 100-year depth of flow is approximately 12.8 feet.

Based on the conditions of the existing bridge, it is recommended that the structure be replaced. The design year for the new structure is 2036; the projected average annual daily traffic (AADT) for Chisholm Lake Road at the design year is approximately 500 vehicles per day. The roadway is classified as a rural local road and will feature two 10-



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foot travel lanes with 5-foot shoulders at a design speed of 40 miles per hour, per TDOT standard drawing RD01-TS-1.

The proposed structure is a two-span, prestressed concrete I-beam bridge approximately 120 feet in length and with a deck width of approximately 34 feet. The proposed bridge will be constructed in the same location and have the same vertical and horizontal alignment as the existing structure. No permanent ROW acquisition is necessary. An underground fiber optic line and overhead telephone and electric lines may need to be relocated during construction. The low chord of the proposed bridge provides approximately 5.1 feet of clearance above the 100-year high water elevation. Chisholm Lake Road is recommended to be closed at the construction limits during construction of the proposed bridge; a road closure agreement letter is necessary.

The estimated replacement cost for this bridge is approximately \$997,400, including costs for right-of-way, approaches, structure, preliminary engineering, utilities, mobilization, and miscellaneous costs.

CHECKLIST 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 or shopping center | |
| 4. | Floodplains | X |
| 5. | Forested land | X |
| 6. | Historical, cultural, or natural landmark | |
| 7. | Industrial park or factory | |
| 8. | Institutional usages | |
| | a. School or educational institution | |
| | b. Church, cemetery, or religious institution | |
| | c. Hospital or medical facility | |
| | d. Public building (e.g., fire station) | |
| | e. Defense installation | |
| 9. | Recreational 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, or spring | X |
| | Permits Required: | |
| | Coast Guard | |
| | Section 404 | |
| | 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 TRANSP
PROJECT PLANNING DIVISION**

PROJECT NO.: 99109-1453-04 ROUTE: Chisholm Lake Road
 COUNTY: Lauderdale CITY: Ripley
 PROJECT PIN NUMBER: _____
 PROJECT DESCRIPTION: Bridge over Cold Creek on Chisholm Lake Road
L.M. 4.63

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
420	2016	500	60	12	2036	65-35	2	3		

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

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 5-14-12
 TRANSPORTATION MANAGER 1
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: DUDLEY DANIEL Dudley Daniel DATE 15 May 12
 TRANSPORTATION MANAGER 2
 SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

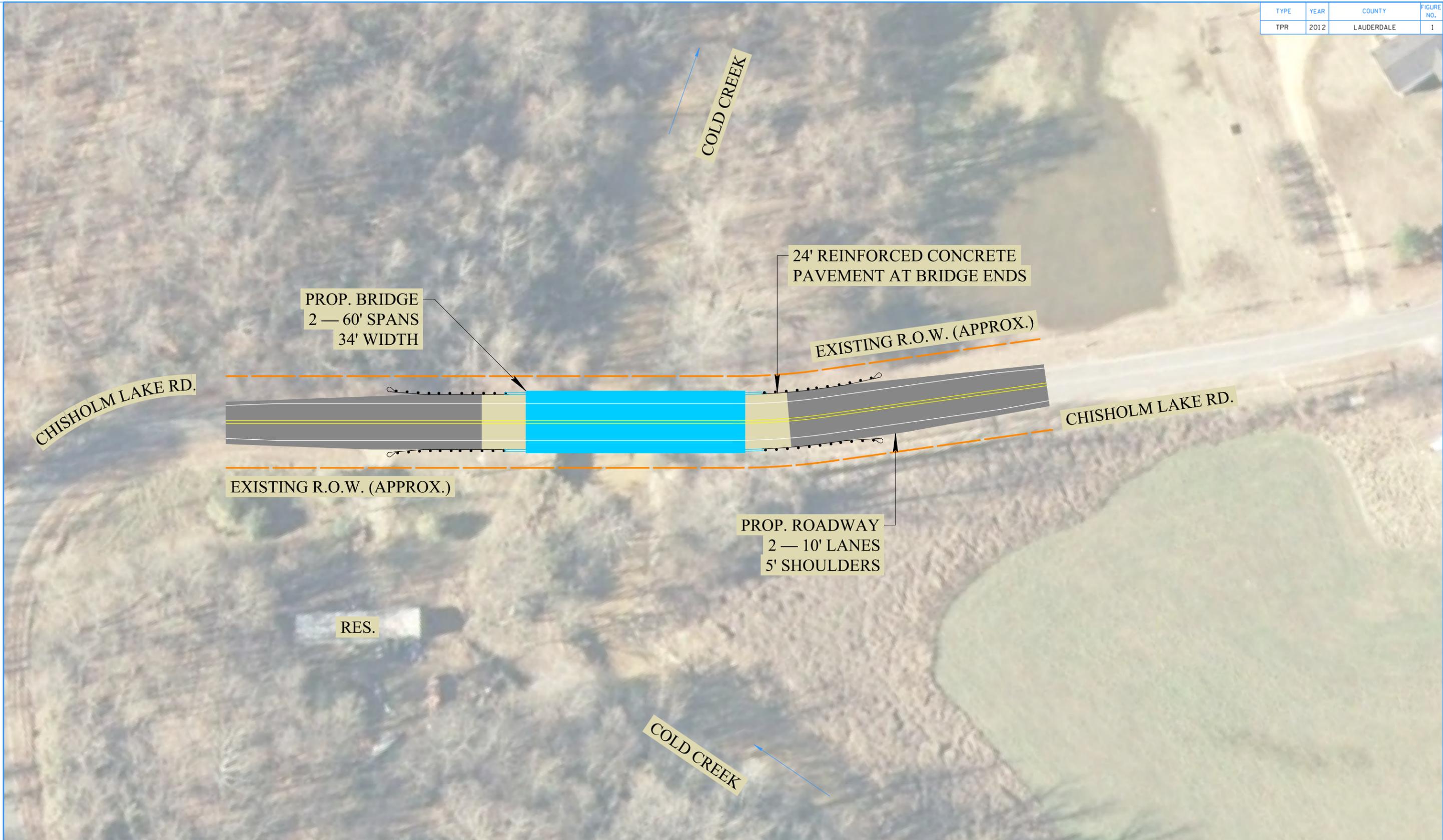
This Traffic is based on 2005 Bridge Count from ADAM. The Future Traffic Count is based on the Growth Rate from the ADAM Computer Program.

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

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADTs 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)



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TRANSPORTATION PLANNING REPORT
 LOCAL ROUTE OA081 (CHISHOLM LAKE ROAD)
 BRIDGE #35F00270001 OVER COLD CREEK (L.M. 4.63)
 LAUDERDALE COUNTY

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

FIGURE 1
 LOCAL OA081
 L.M. 4.63

**Bridge TPR Flow Calculations
for Hydrologic Area 4
Area > 486 Acres**

County:	<u>Lauderdale</u>	By:	<u>TranSystems Corp.</u>
Bridge ID:	<u>35F00270001</u>	Date:	<u>August 31, 2012</u>
Route:	<u>Local Route 0A081 (Chisholm Lake Road)</u>	PIN:	<u>117276.00</u>
Feature Crossed:	<u>Cold Creek</u>		
Log Mile:	<u>4.63</u>		

DRAINAGE BASIN

Measurement from USGS quad =	<u>10,450</u>	ac.
Contributing drainage area (CDA) =	<u>16.33</u>	mi. ²

USGS REGRESSION EQUATIONS FOR FLOW

2-Year Flood Flow Rate = $Q_2 = 436 \times (CDA)^{0.527} =$	<u>1,900</u>	ft. ³ /sec.
5-Year Flood Flow Rate = $Q_5 = 618 \times (CDA)^{0.545} =$	<u>2,832</u>	ft. ³ /sec.
10-Year Flood Flow Rate = $Q_{10} = 735 \times (CDA)^{0.554} =$	<u>3,453</u>	ft. ³ /sec.
25-Year Flood Flow Rate = $Q_{25} = 878 \times (CDA)^{0.564} =$	<u>4,242</u>	ft. ³ /sec.
50-Year Flood Flow Rate = $Q_{50} = 981 \times (CDA)^{0.570} =$	<u>4,820</u>	ft. ³ /sec.
100-Year Flood Flow Rate = $Q_{100} = 1080 \times (CDA)^{0.575} =$	<u>5,381</u>	ft. ³ /sec.

FLOOD DEPTH OF FLOW EQUATIONS

10-Year Flood Depth of Flow (D_{10}) = $6.98 \times (CDA)^{0.142} =$	<u>10.4</u>	ft.
100-Year Flood Depth of Flow (D_{100}) = $9.24 \times (CDA)^{0.116} =$	<u>12.8</u>	ft.

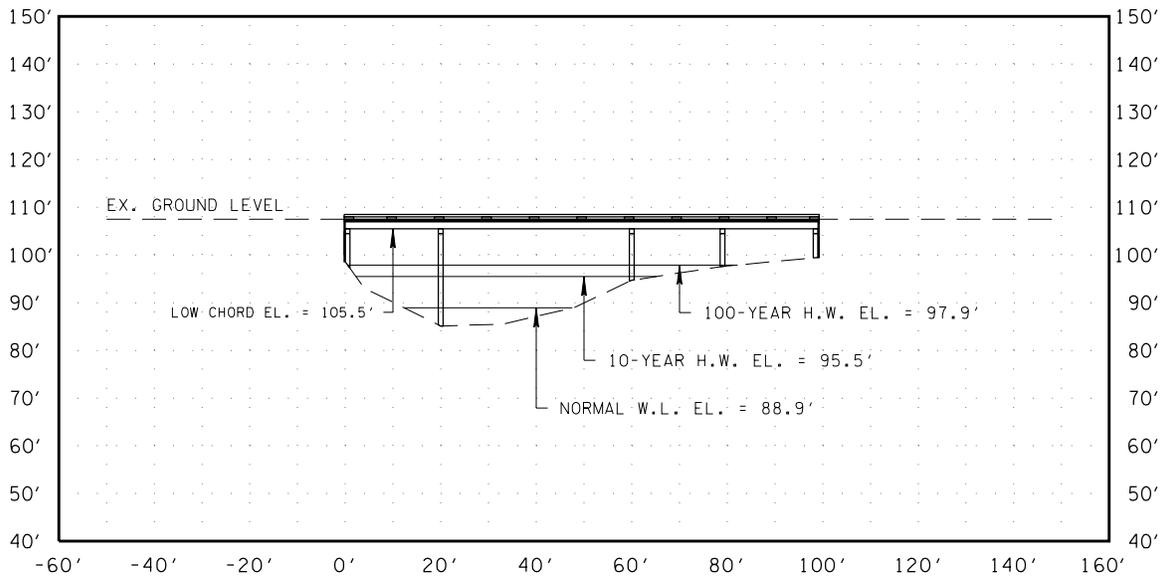
FLOOD AREAS

Existing Area Below Low Chord =	<u>1,269</u>	ft. ²
Proposed Area Below Low Chord =	<u>1,117</u>	ft. ²
Proposed 10-Year Flood Area (A_{10}) =	<u>393</u>	ft. ²
Proposed 100-Year Flood Area (A_{100}) =	<u>571</u>	ft. ²

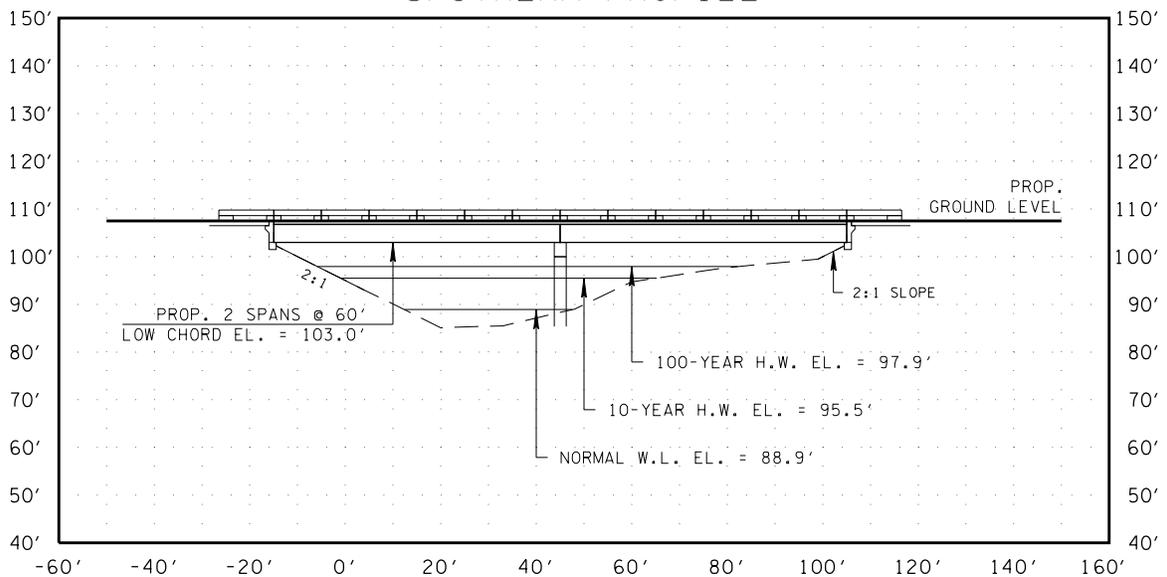
FLOOD VELOCITIES

Proposed 10-Year Flood Velocity (V_{10}) = $Q_{10} / A_{10} =$	<u>8.8</u>	ft./sec.
Proposed 100-Year Flood Velocity (V_{100}) = $Q_{100} / A_{100} =$	<u>9.4</u>	ft./sec.

EXISTING BRIDGE UPSTREAM PROFILE



PROPOSED BRIDGE UPSTREAM PROFILE



BRIDGE PROFILE

LOCAL ROUTE 0A081 (CHISHOLM LAKE ROAD)
BRIDGE #35F00270001 OVER COLD CREEK (L.M. 4.63)
LAUDERDALE COUNTY



View upstream from bridge.



View downstream from bridge.



Right view of downstream floodplain.



Left view of downstream floodplain.



View forwards on route from bridge.



View backwards on route from bridge.



View of bridge inlet.



View of bridge outlet.