

TENNESSEE
DEPARTMENT OF TRANSPORTATION



TRANSPORTATION INVESTMENT REPORT

Special Bridge Replacement Program

Local Route 0C001 – Holly Grove Road
Bridge over Adkinson Creek,
Log Mile 4.74 Tipton County
PIN 121751.00

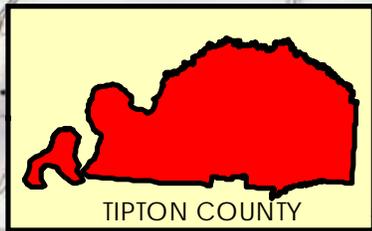
PREPARED BY TENNESSEE DEPARTMENT OF TRANSPORTATION
Strategic Transportation Investments Division

Approved by [Signature] Date 10-20-15
Chief of Environment and Planning

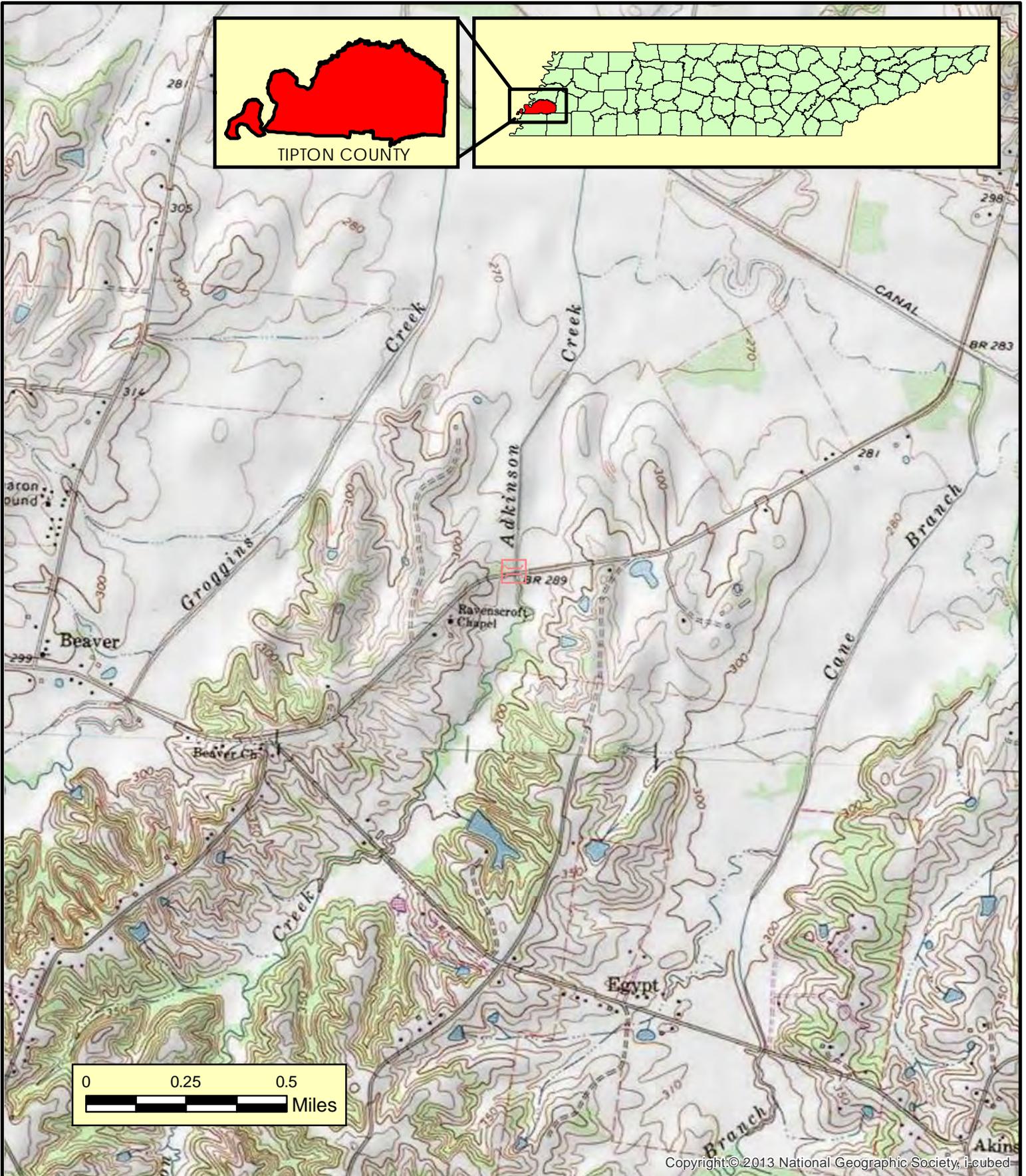
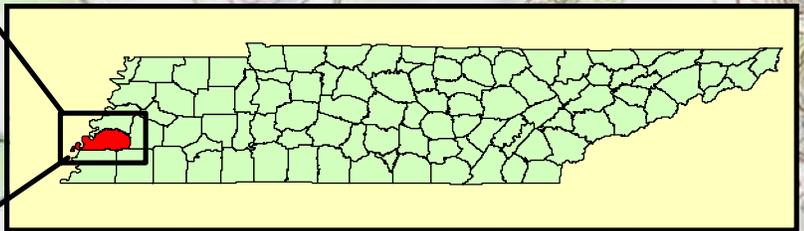
Approved by [Signature] Date 10/22/15
Deputy Commissioner and Chief Engineer

Approved by:	Signature	DATE
TRANSPORTATION DIRECTOR STRATEGIC TRANSPORTATION INVESTMENTS DIVISION	<u>[Signature]</u>	10-8-15
ENGINEERING DIRECTOR STRUCTURES DIVISION	<u>[Signature]</u>	10-12-15
ENGINEERING DIRECTOR DESIGN DIVISION	<u>[Signature]</u>	10/15/15

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



TIPTON COUNTY

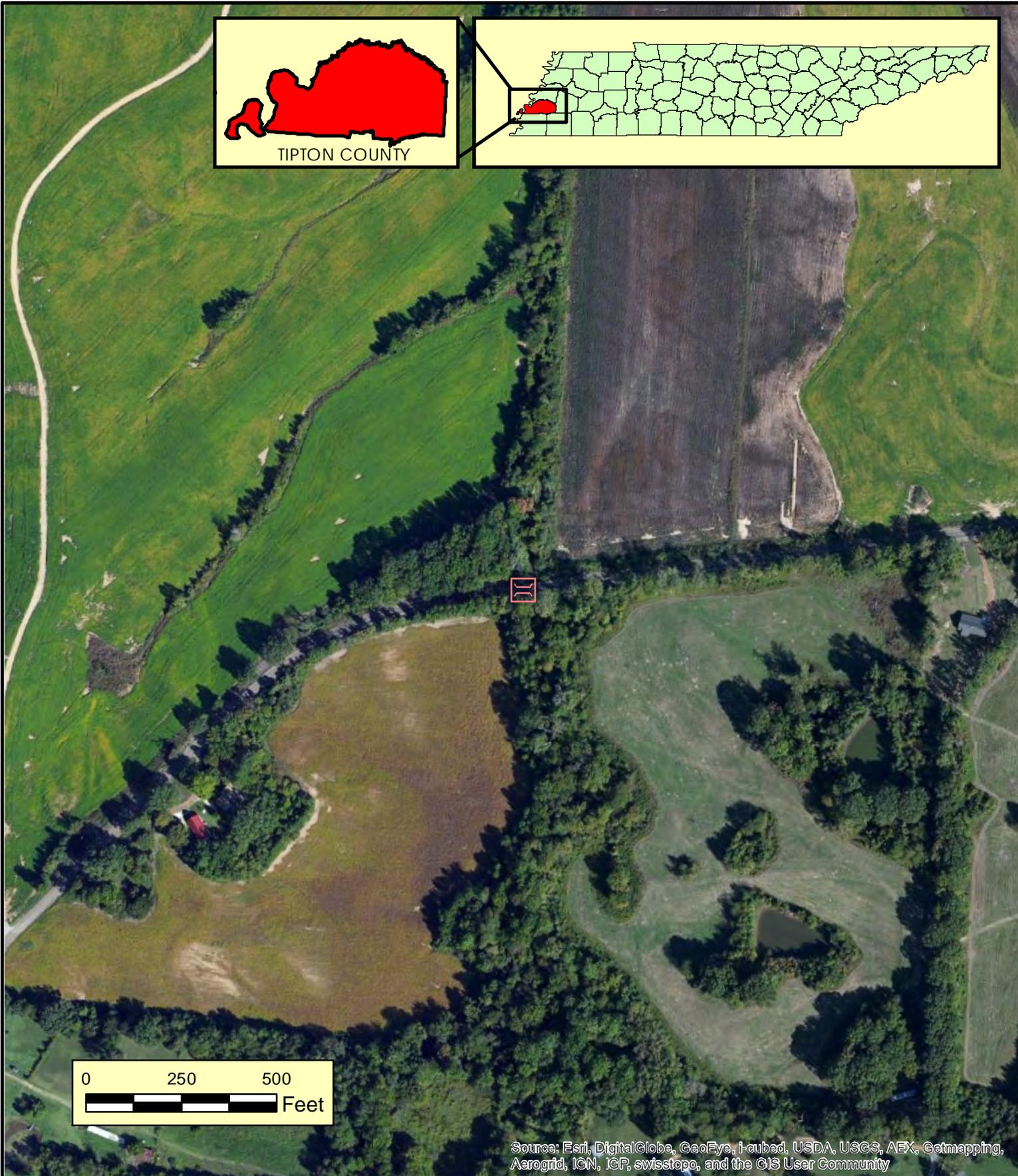
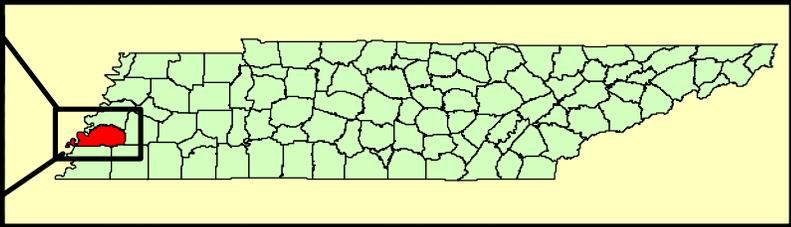


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TOPOGRAPHIC MAP
BRIDGE TIR
LOCAL ROUTE C001 (HOLLY GROVE ROAD)
BRIDGE OVER ADKINSON CREEK LM 4.74
TIPTON COUNTY





Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



LOCATION MAP
BRIDGE TIR
LOCAL ROUTE C001 (HOLLY GROVE ROAD)
BRIDGE OVER ADKINSON CREEK LM 4.74
TIPTON COUNTY



BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS

County: Tipton Route: Holly Grove Road Log Mile: 4.74
Feature Crossed: Creek System: Local Road
Functional Class: Rural Local Bridge ID: 84S81120003

EXISTING CONDITIONS

2020 AADT: 990 App. Cross Section: 20' / 26' / 52' No. Lanes: 2
Approach Alignment: Curve approach to the west/ Straight tangent approach to the east Year Built: 1956 Load Limit: 16 tons
Width (out to out): 24'11" Sidewalks: Right -- Left -- Length: 57'
No. Spans: Approach: -- Main: 3
Substructure: Timber Piers Vertical Clearance: 13'6" Sufficiency Rating: 43.4
Other: _____

PROPOSED IMPROVEMENTS

STANDARDS FROM RD01-TS-1 Type of Work: Replacement
Design Year: 2040 Design AADT: 1,090 Terrain Rolling ADL (F): -- (R): --
Project Length: 1,290 ft Bridge Length: 65 ft Approach Length: west at 950 ft/east at 275 ft
Design Speed (MPH): 50 Posted Speed (MPH): 45
Approach Width: 22 / 28' / 80' Bridge Width (O to O): 31 ft No. Lanes: 2
Right-of-Way Required: 0.83 Acres Tract(s) 4 Structure Type: Single Span, Prestressed Conc.

MAINTENANCE OF TRAFFIC

Temporary Detour: Temporary Runaround: Stage Construct:
Alternate Route: Traffic to use the following 8.2 mile detour during construction of the proposed bridge. Holly Grove Rd. to Candy Ln. to Turkey Scratch Rd to Hazel Grove Rd. back to Holly Grove Rd.. Will require coordination between TDOT and Tipton County.
Remarks: _____

ESTIMATED COST

Right-of-Way: \$25,400 Approaches: \$294,900 Structure: \$292,500
Preliminary Engineering: \$91,700 Utilities: \$190,000 Misc./Cont.: \$180,900
Mobilization: \$38,700 Total: \$1,114,100

Remarks: The grade is to be raised 1' from the existing profile. The proposed alignment will remain the same as the current alignment. The existing structure has a lane and shoulder width of 24 feet. The total pavement width on the approaches and over the proposed structure will have an approach width of 28 feet from TDOT Standard RDO1-TS-1 (Design Standards ADT between 400 to 2,000). A small amount of R.O.W. will be required to widen the bridge approaches and adjust the slopes. Tipton County has requested to manage construction of Bridge 84S81120003 locally.

Field Investigation by: Stephanie Kissel (Region 4 Design), Samuel Reed (R4 Design), Howard Blankenship (R4 Survey), James Boyd (R4 Survey), Shannon Reed (Tipton Co. Public Works), Amy Rauch (S.T.I.D), Zane Pannell (S.T.I.D.), David Duncan (S.T.I.D), Mike Gilbert (S.T.I.D)

Route:	0C001
Description:	Repaving up to Holly Grove Rd. Bridge and replacing Holly Grove Rd. Bridge
County:	Tipton
Length:	1290 feet
Date:	October 13, 2015

<u>DESCRIPTION</u>	<u>LOCAL</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>TOTAL</u>
Right-of-Way	\$ 5,080		\$ 20,320	\$ 25,400
Clearing and Grubbing	\$ -		\$ -	\$ -
Earthwork	\$ 100		\$ 400	\$ 500
Railroad Crossing or Separation	\$ -		\$ -	\$ -
Drainage	\$ 1,860		\$ 7,440	\$ 9,300
Utilities	\$ 38,000		\$ 152,000	\$ 190,000
Structures	\$ 62,760		\$ 251,040	\$ 313,800
Pavement Removal	\$ 6,760		\$ 27,040	\$ 33,800
Paving	\$ 30,060		\$ 120,240	\$ 150,300
Roadway and Pavement Appurtenances	\$ -		\$ -	\$ -
Retaining Walls	\$ -		\$ -	\$ -
Topsoil	\$ -		\$ -	\$ -
Seeding	\$ 220		\$ 880	\$ 1,100
Sodding	\$ -		\$ -	\$ -
Rip-Rap or Slope Protection	\$ 1,840		\$ 7,360	\$ 9,200
Fencing	\$ -		\$ -	\$ -
Signing	\$ -		\$ -	\$ -
Pavement Markings	\$ 860		\$ 3,440	\$ 4,300
Lighting	\$ -		\$ -	\$ -
Signalization	\$ -		\$ -	\$ -
Guardrail	\$ 3,240		\$ 12,960	\$ 16,200
Pay Item Quantity Adjustment (15%) ¹	\$ 22,600		\$ 90,400	\$ 113,000
Maintenance of Traffic	\$ 2,000		\$ 8,000	\$ 10,000
Mobilization (5%)	\$ 8,700		\$ 35,100	\$ 43,800
CONSTRUCTION COST (rounded)	\$ 184,100		\$ 736,600	\$ 920,700
Engineering and Contingency (10%)	\$ 18,400		\$ 73,700	\$ 92,100
TOTAL CONSTRUCTION COST (rounded)	\$ 202,500		\$ 810,300	\$ 1,012,800
Preliminary Engineering (10%)	\$ 20,300		\$ 81,000	\$ 101,300
PROJECT COST ²(rounded)	\$222,800		\$ 891,300	\$1,114,100

¹ For estimating purposes pay items are adjusted for fluxuation of cost based on quantity.

² For estimating future project costs, a compounded inflation rate of 7 % should be applied from the date of this

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
-	Right-of-Way	LS	LS	\$ -	\$ 25,370
RIGHT-OF-WAY TOTAL (ROUNDED)					\$ 25,400
CLEAR AND GRUBBING TOTAL (ROUNDED)					\$ -
203-03	Borrow Excavation (Unclassified)	CY	100	\$ 5.20	\$ 520
EARTHWORK TOTAL (ROUNDED)					\$ 500
202-03.01	Removal of Asphalt Pavement	SY	2,789	\$ 10.56	\$ 29,452
415-01.02	Cold Planing Bituminous Pavement	SY	278	\$ 15.29	\$ 4,251
PAVEMENT REMOVAL TOTAL (ROUNDED)					\$ 33,800
209-08.02	Temporary Silt Fence (w/ backing)	LF	2620	\$ 3.52	\$ 9,222
DRAINAGE TOTAL (ROUNDED)					\$ 9,300
	Underground Utilities (Waterline)	LS	LS	\$ -	\$ 57,022
	Overhead Utilities	LF	1290.00	\$ 10.00	\$ 12,900
	Underground Utilities (Cable)	LS	LS	\$ -	\$ 120,000
UTILITIES TOTAL (ROUNDED)					\$ 190,000
	Removal of Bridge	SF	1,420	\$ 15.00	\$ 21,300
	Bridge @ L.M. 4.74	SF	1,950	\$ 150.00	\$ 292,500
STRUCTURES TOTAL (ROUNDED)					\$ 313,800
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)					\$ -
Asphalt					
411-03.10	ACS Mix (PG76-22) Grading D	TON	198.9	\$ 99.55	\$ 19,805
403-01	Bituminous Material for Tack Coat (TC)	TON	2.0	\$ 777.76	\$ 1,525
411-01.07	ACS Mix (PG64-22) Grading E Shoulder	TON	49.9	\$ 92.01	\$ 4,595
402-01	Bituminous Material for Prime Coat (PC)	TON	3.8	\$ 497.96	\$ 1,880
402-02	Aggregate for Cover Material	TON	13.6	\$ 23.81	\$ 324
307-02.08	Asphalt Conc. Mix (PG70-22) Grading B-M2	TON	392	\$ 85.14	\$ 33,368
307-02.01	Asphalt Conc. Mix (PG70-22) Grading A	TON	470.1	\$ 79.65	\$ 37,442
303-01	Mineral Aggregate, TY A Base, Grading D	TON	2291.0	\$ 22.41	\$ 51,342
PAVING TOTAL (ROUNDED)					\$ 150,300
Concrete					
CONCRETE RAMPS AND ROADWAYS					\$ -
RETAINING WALLS TOTAL (ROUNDED)					\$ -
712-01	Traffic Control	LS		\$ 10,000.00	\$ 10,000
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)					\$ 10,000
TOPSOIL TOTAL (ROUNDED)					\$ -
801-01	Seeding (With Mulch)	UNIT	40	\$ 25.90	\$ 1,036
801-03	Water	MG	3	\$ 7.76	\$ 23
SEEDING TOTAL (ROUNDED)					\$ 1,100
SODDING TOTAL (ROUNDED)					\$ -
SIGNING TOTAL (ROUNDED)					\$ -
716-13.01	Spray Thermo Pvmnt Mkrknq (60 mil)(4" Line)	LM	0.992	\$ 2,160.14	\$ 2,144
PAVEMENT MARKINGS TOTAL (ROUNDED)					\$ 4,300
LIGHTING TOTAL (ROUNDED)					\$ -
SIGNALIZATION TOTAL (ROUNDED)					\$ -
FENCE TOTAL (ROUNDED)					\$ -
705-04.21	Guardrail Delineation Enhancement	LF	324	\$ 5.21	\$ 1,688
705-01.01	Guardrail at Bridge Ends	LF	112	\$ 64.44	\$ 7,217
705-04.04	Guardrail Terminal (Type 21)	EACH	4	\$ 1,814.00	\$ 7,256
GUARDRAIL TOTAL (ROUNDED)					\$ 16,200
709-05.06	Machined Rip-Rap (Class A-1)	TON	250	\$ 36.52	\$ 9,130
RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)					\$ 9,200



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS 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, Transportation Director
Strategic Transportation Investments Division

FROM: Zane Pannell, Transportation Project Specialist
Project Coordination and Investigation Office

DATE: July 16, 2015

SUBJECT: TIR Field Review (Special Bridge Replacement Program)
Holly Grove Road (0C001), Bridge over Adkinson Creek
Log Mile 4.74
Tipton County
PIN: 121751.00

A field review was held for the above-mentioned project on June 10, 2015.

The existing structure is a 3-span concrete channel bridge with timber piers with an out-to-out width of 24.9 feet. The overall bridge length is fifty seven (57) feet with approximately fourteen (14) feet for the vertical clearance. The sufficiency rating for this bridge 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. It was determined that the 100-year flow depth is 8.4 feet and the 10-year flow depth is 6.1 feet.

The proposed alignment for this structure will remain on the existing centerline and elevated one (1) foot above the existing profile. There is a posted speed limit of forty five (45) mph on Holly Grove Road; the proposed bridge will be designed to meet TDOT design standard RD01-TS-1 for a design speed of fifty (50) mph. The proposed structure will be a single span prestressed concrete bridge with a total vertical clearance of 12.7 feet and length of sixty five (65) feet. It is estimated that a small amount of ROW will be required to widen the bridge approaches and adjust the side slopes. Based on evidence in the field, cost for relocating overhead power lines, underground water line, and underground cable has been accounted for within the cost estimate.

The route has a base year 2020 AADT of 990 and a design year 2040 AADT of 1,090. The existing structure has a lane and shoulder width of twenty four (24) feet. The total pavement width on the approaches and over the proposed structure will have an approach width of twenty eight (28) feet from TDOT Standard RDO1-TS-1 (Design Standards ADT between 400 to 2,000). The total bridge width will have an out-to-out width of thirty one (31) feet.

Region 4 Traffic Operations recommends closing Holly Grove Road during construction since detour time will be minimal (See Detour Map); it will also expedite the construction process. TDOT will need to coordinate with Tipton County for detouring traffic. Region 4 Design recommends the project is extended 900 feet west of the bridge to maintain superelevation throughout the approach to the bridge. Tipton County requested to manage the project locally; further coordination will be needed between Tipton County and TDOT Local Programs Office.

The required approach work, estimated replacement, and preliminary engineering costs for this bridge replacement are approximately \$1,114,100. The match for Tipton County will be \$222,800 based on the current 80% and 20% local match Grant Bridge Program.

ZP

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	
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
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: 99109-1453-04 ROUTE: 0C001
 COUNTY: TIPTON CITY: MUNFORD
 PROJECT PIN NUMBER: 121751.00
 PROJECT DESCRIPTION: HOLLY GROVE ROAD BRIDGE OVER ADKINSON CREEK @ L.M. 4.74.

DIVISION REQUESTING:

MAINTENANCE PAVEMENT DESIGN
 S.T.I.D. STRUCTURES
 PROG. DEVELOPMENT & ADM. SURVEY & ROADWAY 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
990	2020	1,090	120	11	2040	65-35	1	2		

REQUESTED BY: NAME GLENDIA TYUS DATE 2/26/15
 DIVISION S.T.I.D.
 ADDRESS 10TH FLOOR J.K. POLK BLDG.
NASHVILLE, TN. 37243

REVIEWED BY: TONY ARMSTRONG *Tony Armstrong* DATE 2-27-15
 TRANSPORTATION MANAGER I
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: MIKE PRESLEY *Mike Presley* DATE 3-2-15
 TRANSPORTATION MANAGER 2
 SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

THIS TRAFFIC BASED ON A 2014 CYCLE COUNT. THE FUTURE TRAFFIC BASED ON A 0.5% PER YEAR GROWTH RATE DUE TO NEGATIVE GROWTH 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.

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2015	TIPTON	1

X:\Projects\Tipton\LocalRoute C001\Holly Grove Rd\Bridge over Adkinson Creek (L.M. 4.74)\Project Files\Microstation\DN Files\Holly grove proposed option 1.dgn
 7/8/2015 10:43:56 AM



11 FOOT LANES
WITH 3 FOOT
SHOULDER
LENGTH = 65 FOOT

ADKINSON CREEK
STREAM DIRECTION

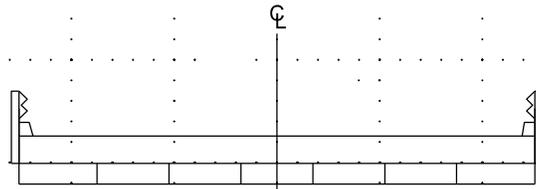
HOLLY GROVE ROAD

BRIDGE REPLACEMENT

HOLLY GROVE RD (OC001)
BRIDGE OVER ADKINSON CREEK @ L.M. 4.74
TIPTON COUNTY

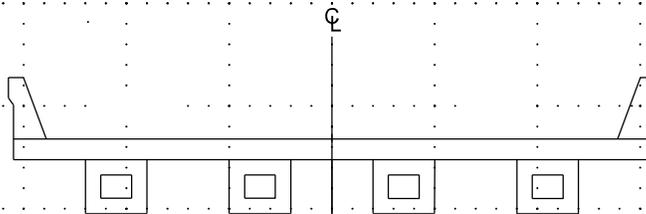


EXISTING STRUCTURE



TOTAL WIDTH: 24.92'

COMPLETED PROPOSED STRUCTURE



TOTAL WIDTH: 31'



SCALE: 1" = 10'

STAGE CONSTRUCTION DETAIL
HOLLY GROVE RD. (0C001) TIPTON COUNTY
BRIDGE OVER ADKINSON CREEK L.M. 4.74
BRIDGE ID 84S81120003

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

County: Tipton
 Bridge ID: 84S81120003
 Route: Holly Grove Road (0C001)
 Feature Crossed: Creek
 Log Mile: 4.74

By: ZP
 Date: 7/16/15
 PIN: 121751.00

DRAINAGE BASIN

Measurement from quad = 1,254 acres
 Contributing Drainage Area, CDA = acres/640 = 1.96 sq. mi.

USGS REGRESSION EQUATIONS FOR FLOW

$Q_2 = 207(CDA)^{0.725} =$ 337 cfs
 $Q_5 = 344(CDA)^{0.715} =$ 557 cfs
 $Q_{10} = 444(CDA)^{0.711} =$ 716 cfs
 $Q_{25} = 578(CDA)^{0.708} =$ 931 cfs
 $Q_{50} = 682(CDA)^{0.706} =$ 1,097 cfs
 $Q_{100} = 788(CDA)^{0.705} =$ 1,266 cfs

DEPTH OF FLOW EQUATIONS

10-Year Flood Depth = $5.33(CDA)^{0.197} =$ 6.1 ft
 100-Year Flood Depth = $7.43(CDA)^{0.181} =$ 8.4 ft

AREAS

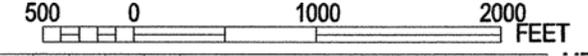
Existing Area Below Low Chord = 566 ft²
 Proposed Area Below Low Chord = 570 ft²
 Proposed 10-Year Flood Area, $A_{10} =$ 183 ft²
 Proposed 100-Year Flood Area, $A_{100} =$ 303 ft²

VELOCITIES

Proposed 10-Year Flood Velocity, $V_{10} = Q_{10}/A_{10} =$ 3.9 fps
 Proposed 100-Year Flood Velocity, $V_{100} = Q_{100}/A_{100} =$ 4.2 fps



MAP SCALE 1" = 1000'



FIRM FLOOD INSURANCE RATE MAP TIPTON COUNTY, TENNESSEE AND INCORPORATED AREAS

PANEL 145 OF 475
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

<u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
TIPTON COUNTY, UNINCORPORATED AREAS	470340	0145	F
BURLISON, TOWN OF	470373	0145	F
GILT EDGE, CITY OF	470190	0145	F

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
47167C0145F

MAP REVISED
DECEMBER 19, 2006

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

PROJECT
LOCATION



39°34'00.00" N

39°33'00.00" N

35°30'00.00"

89°48'45.00"

835000 FT

CANDY LANE

BOSWELL ROAD

ZONE X

ZONE A

ZONE X

ZONE A

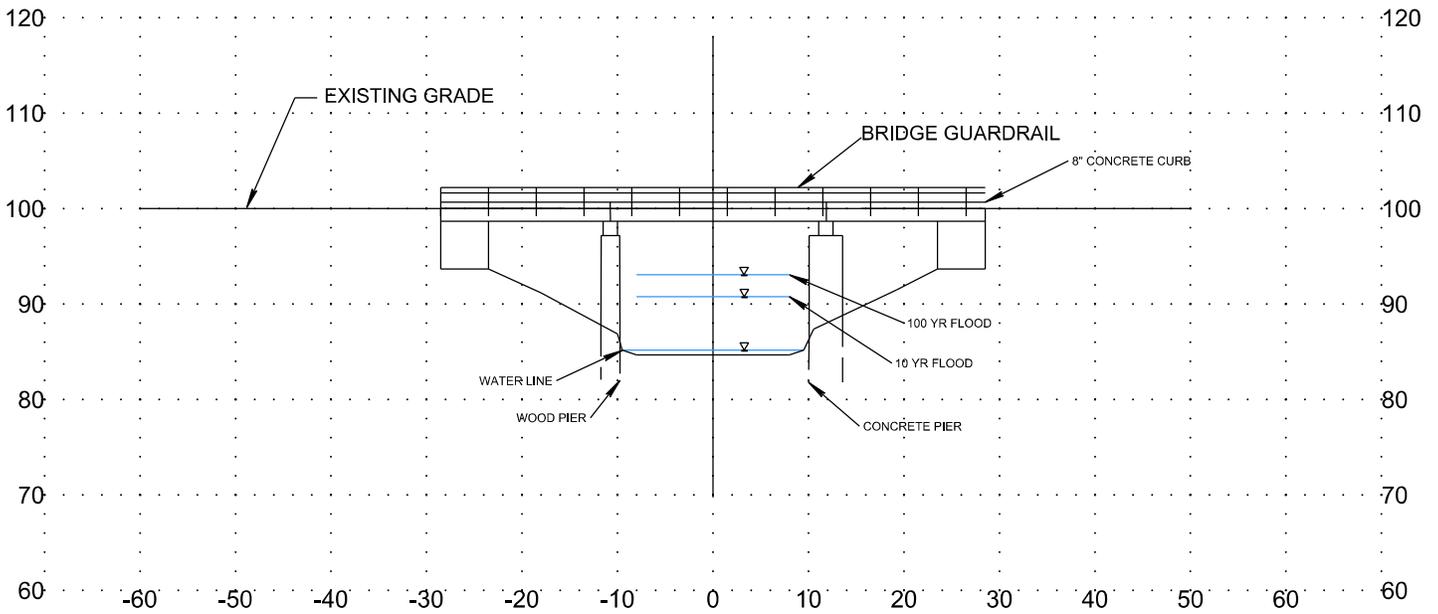
ZONE A

Groggins Creek

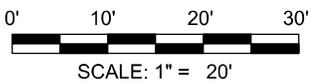
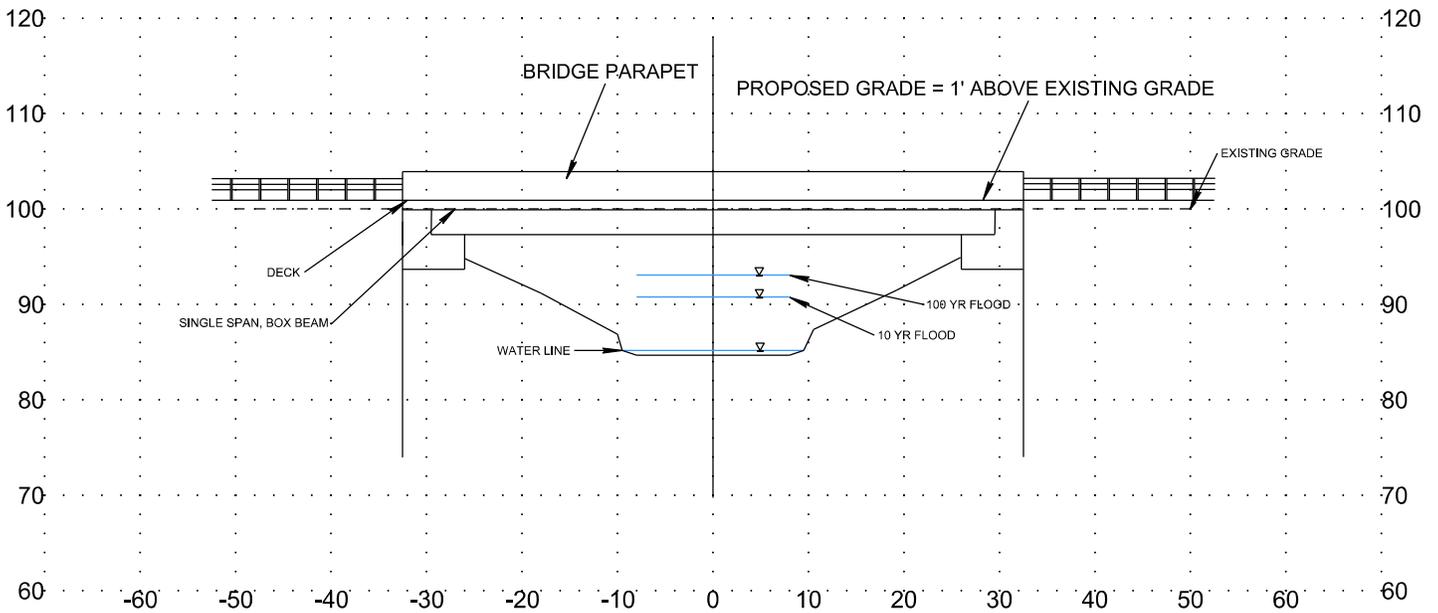
Unnamed Tributary

HOLLY GROVE ROAD

EXISTING STRUCTURE (INLET)



PROPOSED STRUCTURE (INLET)



BRIDGE SECTIONS
HOLLY GROVE RD. (0C001) TIPTON COUNTY
BRIDGE OVER ADKINSON CREEK @ L.M. 4.74
BRIDGE ID: 84S81120003

Bridge ID: 84S81120003
Tipton County



Eastbound Bridge Approach on Local Route 0C001



Westbound Bridge Approach on Local Route 0C001

Bridge ID: 84S81120003
Tipton County



Center of Bridge Looking East on Local Route 0C001



Center of Bridge Looking West on Local Route 0C001

Bridge ID: 84S81120003
Tipton County



Bridge Guardrail



Bridge Guardrail End Terminal

Bridge ID: 84S81120003
Tipton County



Upstream



Upstream Right

Bridge ID: 84S81120003
Tipton County



Upstream Left



Downstream Center

Bridge ID: 84S81120003
Tipton County



Downstream Right



Downstream Left

Bridge ID: 84S81120003
Tipton County



Underneath Bridge Looking Upstream



Underneath Bridge Looking Downstream

Bridge ID: 84S81120003
Tipton County



Underneath Bridge Deck



Bridge Piers

Bridge ID: 84S81120003
Tipton County



Overhead Utilities on the Westbound Side