TRANSPORTATION PLANNING REPORT

Special Bridge Replacement Program

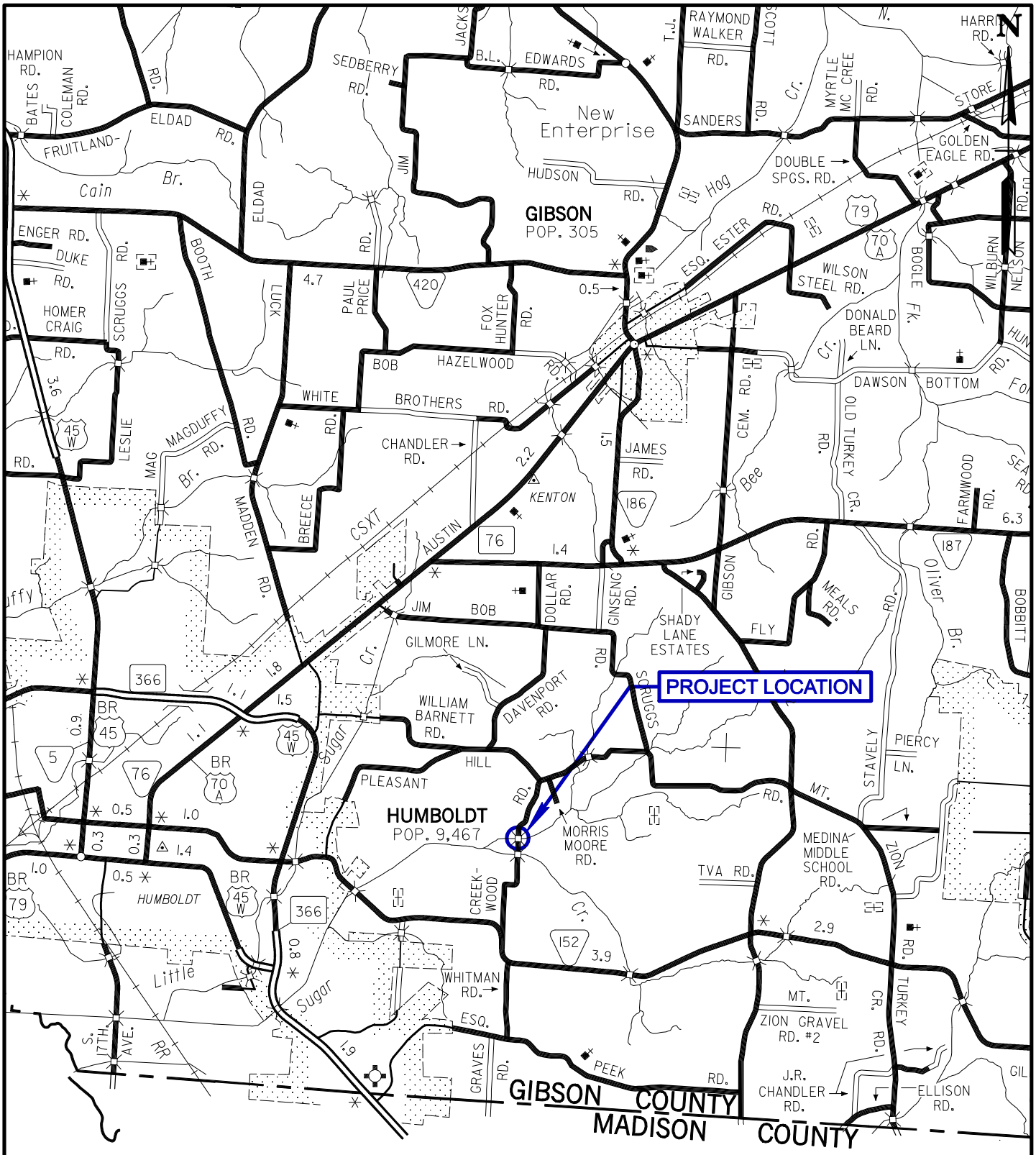
LOCAL ROUTE A752 (CREEKWOOD ROAD)
BRIDGE OVER BRANCH OF SUGAR CREEK
LOG MILE 0.50
GIBSON COUNTY
PIN 116956.00

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

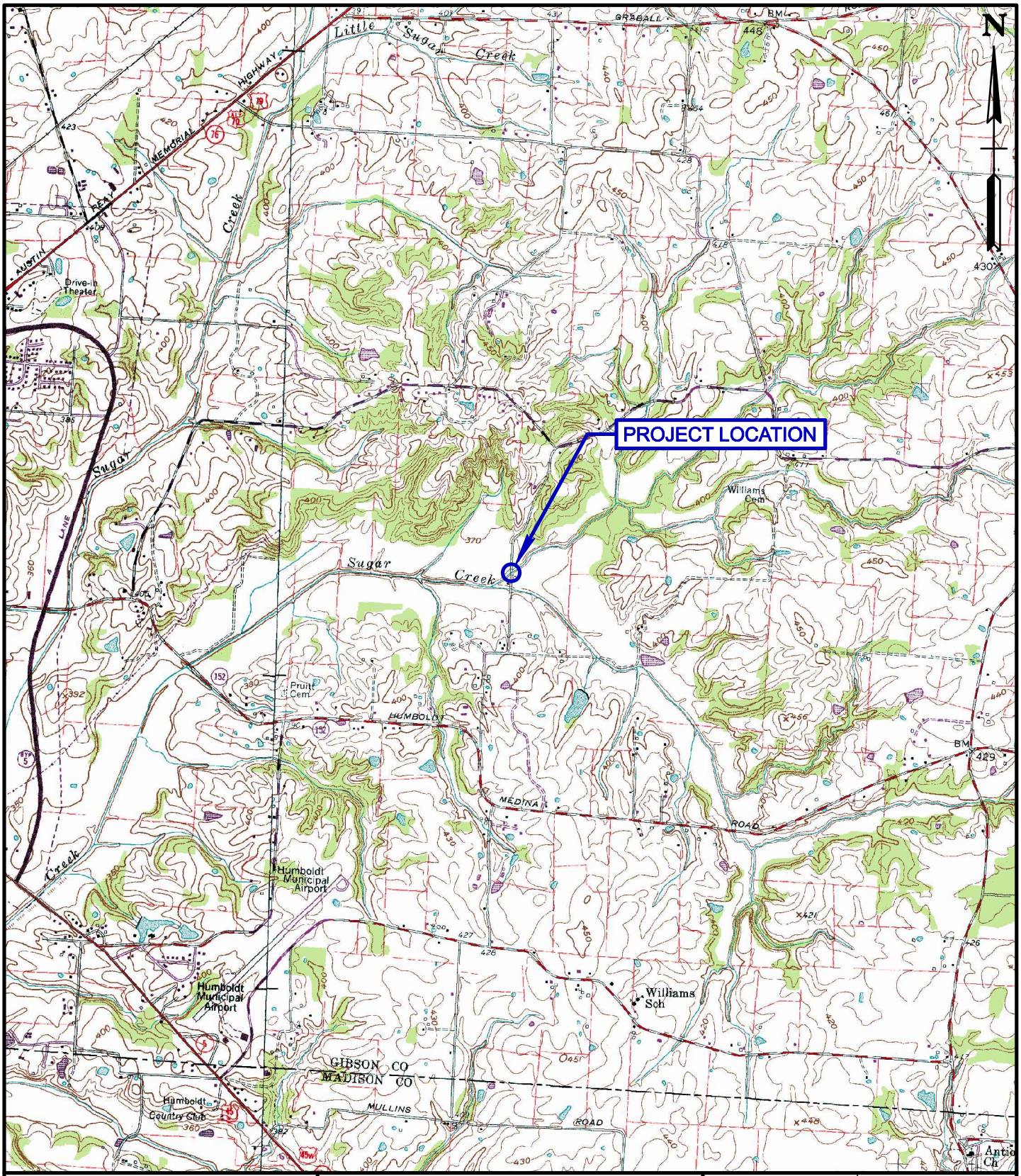
Approved by _____ *Date* 3/20/13
Deputy Commissioner and Chief Engineer

Approved by:	Signature	DATE
Transportation Director **Project Planning Division**		1-23-13
Engineering Director **Design Division**		1-29-13
Engineering Director **Structures Division**		1-30-13



LOCATION MAP

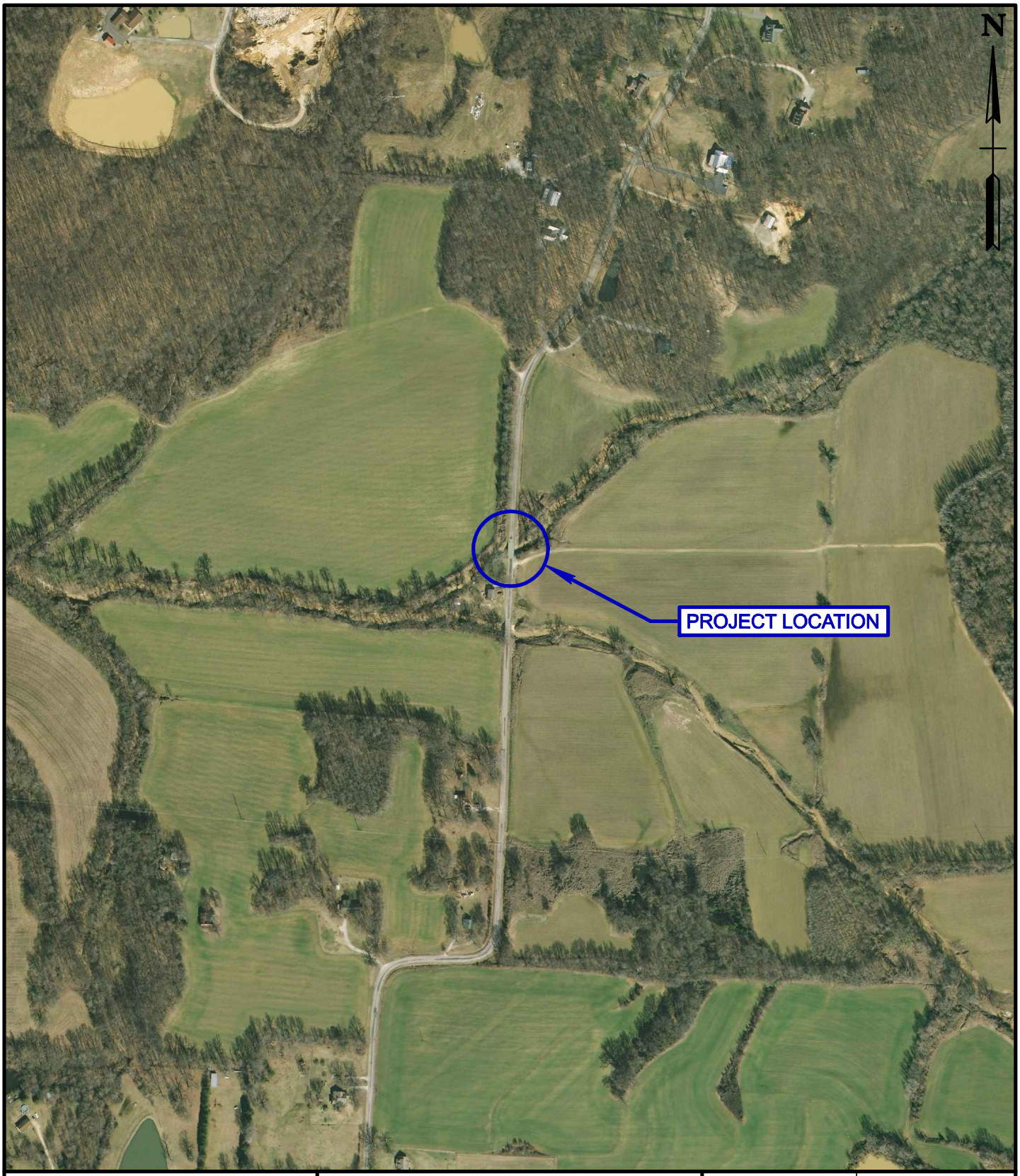
COUNTY:	CITY:
GIBSON	N/A
LR A752 (CREEKWOOD RD.)	
PIN 116956.00	
SCALE: 1"= 1 MILE	DATE: 06-01-12



TDOT

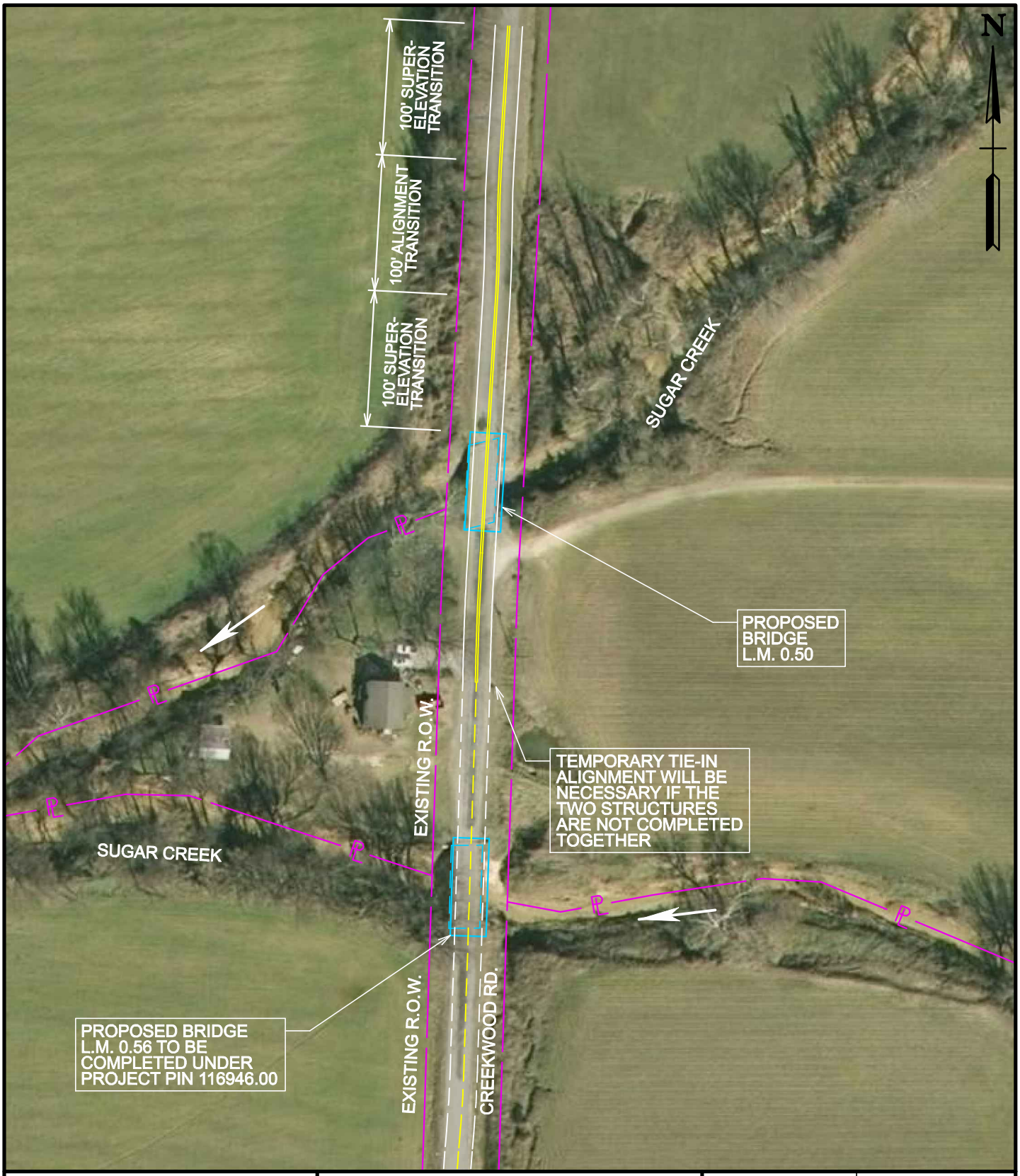
VICINITY MAP

COUNTY:	CITY:
GIBSON	N/A
LR A752 (CREEKWOOD RD.)	
PIN 116956.00	
SCALE:	DATE:
1"= 1/2 MILE	06-01-12



AERIAL

COUNTY:	CITY:
GIBSON	N/A
LR A752 (CREEKWOOD RD.)	
PIN 116956.00	
SCALE: 1"= 500'	DATE: 06-01-12



TDOT

PROPOSED LAYOUT

COUNTY:	CITY:
GIBSON	N/A
LR A752 (CREEKWOOD RD.)	
PIN 116956.00	
SCALE: 1"= 100'	DATE: 06-01-12

TRANSPORTATION PLANNING WORKSHEET

BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS

County Gibson Route A752-Creekwood Road Log Mile 0.50

Feature Crossed Branch of Sugar Creek System Local

Functional Class Rural/Local Bridge I.D. 270A7520001

EXISTING CONDITIONS

2016 ADT 160 App. Cross Section 20'/24'/50' No. Lanes 2

Approach Alignment Tangent north, tangent south Year Built 1969 Load Limit 10 Tons

Width (curb to curb) 21.92' Sidewalks: Right N/A Left N/A Length 62

No. Spans: Approach 0 Main 3

Substructure Timber Vertical Clearance 12' Sufficiency Rating 39.8

Other: No posted speed limit. Gas line west of bridge and power lines east of the bridge. There is a second bridge at L.M. 0.56.

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

Design Year 2036 ADT 200 DHV 28 ADL (F) N/A (R) N/A

Length of Project 600' Structure Length 72' Design Speed (MPH) 30

Approach Width 20'/24'/as required Bridge Width 26.33' No. Lanes 2

Right-of-Way Required 3 Tracts Temporary Detour Yes (3.7 miles)

Alternate Route Pleasant Hill Rd to SR-152 to Creekwood Rd.

Remarks: The adjacent prperty owner's home lies between this bridge and the bridge at L.M. 0.56. Access to this home would be restricted if both bridges are replaced at the same time. The construction phasing of the two bridges must be coordinated. Road will be closed during construction. Proposed structure is a 72' single span concrete bridge. The proposed bridge will raise the grade approximately one and one-half (1.5) feet and the horizontal alignment will be shifted approximately three (3) feet to the east. The actual size and type of structure will be determined by TDOT Structures.

ESTIMATED COST

Right-of-Way	$ 19,000	Approaches	$ 388,200	Structure	$ 320,000
Preliminary Engineering	$ 76,600	Utilities	$ 39,000	Total	$ 842,800

Remarks:

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); Carl Stoppenhagen (Gibson Co.)

Route:	**Local Route A752 (Creekwood Road)**
Description:	**Bridge over Branch of Sugar Creek**
	L.M. 0.50
County:	**Gibson**
Length:	**N/A**
Date:	**August 21, 2012**

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
Right-of-Way	$ 3,800	$ -	$ 15,200	$ 19,000
Clearing and Grubbing	$ 800	$ -	$ 3,200	$ 4,000
Earthwork	$ 7,200	$ -	$ 28,800	$ 36,000
Railroad Crossing or Separation	$ -	$ -	$ -	$ -
Drainage	$ 8,800	$ -	$ 35,200	$ 44,000
Utilities	$ 7,800	$ -	$ 31,200	$ 39,000
Structures	$ 64,000	$ -	$ 256,000	$ 320,000
Pavement Removal	$ 2,800	$ -	$ 11,200	$ 14,000
Paving	$ 5,200	$ -	$ 20,800	$ 26,000
Roadway and Pavement Appurtenances	$ -	$ -	$ -	$ -
Retaining Walls	$ -	$ -	$ -	$ -
Topsoil	$ -	$ -	$ -	$ -
Seeding	$ -	$ -	$ -	$ -
Sodding	$ 2,800	$ -	$ 11,200	$ 14,000
Rip-Rap or Slope Protection	$ 1,600	$ -	$ 6,400	$ 8,000
Fencing	$ -	$ -	$ -	$ -
Signing	$ 200	$ -	$ 800	$ 1,000
Pavement Markings	$ 200	$ -	$ 800	$ 1,000
Lighting	$ -	$ -	$ -	$ -
Signalization	$ -	$ -	$ -	$ -
Guardrail	$ 3,200	$ -	$ 12,800	$ 16,000
Pay Item Quantity Adjustment (15%)[1]	$ 16,300	$ -	$ 65,000	$ 81,300
Maintenance of Traffic	$ 8,000	$ -	$ 32,000	$ 40,000
Mobilization (5%)	$ 6,600	$ -	$ 26,500	$ 33,200
CONSTRUCTION COST (rounded)	$ 139,300	$ -	$ 557,100	$ 696,500
Engineering and Contingency (10%)	$ 13,900	$ -	$ 55,700	$ 69,700
TOTAL CONSTRUCTION COST (rounded)	$ 153,200	$ -	$ 612,800	$ 766,200
Preliminary Engineering (10%)	$ 15,300	$ -	$ 61,300	$ 76,600
PROJECT COST [2] (rounded)	**$ 168,500**	**$ -**	**$ 674,100**	**$ 842,800**

[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	$ 18,600.00	$ 18,600
			RIGHT-OF-WAY TOTAL (ROUNDED)		**$ 19,000**
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	3,556	$ 10.00	$ 35,556
			EARTHWORK TOTAL (ROUNDED)		**$ 36,000**
202-03.01	Removal of Asphalt Pavement	SY	1,333	$ 10.00	$ 13,333
			PAVEMENT REMOVAL TOTAL (ROUNDED)		**$ 14,000**
607-39.02	18" Sidedrain	LF	30	$ 30.00	$ 1,000
611-07.01	Endwall Concrete	CY	2	$ 600.00	$ 2,000
611-07.02	Endwall Steel	Lbs	264	$ 3.00	$ 1,000
	Erosion Control	LS	1	$ 40,000.00	$ 40,000
			DRAINAGE TOTAL (ROUNDED)		**$ 44,000**
	Relocate Pole	EA	2	$ 3,000.00	$ 6,000
	Gas Line	LF	600	$ 55.00	$ 33,000
			UTILITIES TOTAL (ROUNDED)		**$ 39,000**
	New Bridge	SF	1,896	$ 150.00	$ 284,364
	Removal of Existing	SF	1,421	$ 25.00	$ 35,526
			STRUCTURES TOTAL (ROUNDED)		**$ 320,000**
			RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)		**$ -**
404-01.01	Bituminous Material (DBST)	TON	5	$ 1,000.00	$ 4,900
404-01.02	Min. Agg (DBST)	TON	39	$ 50.00	$ 2,000
303-01	Aggregate	TON	902	$ 20.00	$ 19,000
			PAVING TOTAL (ROUNDED)		**$ 26,000**
			ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)		**$ -**
			RETAINING WALLS TOTAL (ROUNDED)		**$ -**
	Traffic Control	LS	1	$ 40,000.00	$ 40,000
			MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)		**$ 40,000**
			TOPSOIL TOTAL (ROUNDED)		**$ -**
			SEEDING TOTAL (ROUNDED)		**$ -**
803-01	Sodding (New Sod)	SY	2,667	$ 5.00	$ 14,000
			SODDING TOTAL (ROUNDED)		**$ 14,000**
713-11.01	"U" Section Steel Posts	Lbs	144.00	$ 4.00	$ 576
713-13.02	Flat Sheet Aluminum (0.080" Thick)	SF	12.00	$ 15.00	$ 180
713-15.36	Remove existing signs	EA	4	$ 50.00	$ 200
			SIGNING TOTAL (ROUNDED)		**$ 1,000**

716-05.01	Painted Pavement Marking (4" Line)	LM	0.46	$	845.00	$	389
			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	24	$	30.00	$	729
709-05.08	Class B	TON	130	$	35.00	$	4,537
709-05.09	Class C	TON	45	$	40.00	$	1,815
			RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)			**$**	**8,000**

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

MEMORANDUM

TO: Project Planning Office

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

DATE: December 28, 2012

SUBJECT: TPR Field Review (Special Bridge Replacement Program)
Local Route A752-Creekwood Road over
Branch of Sugar Creek (L.M. 0.50)
Gibson County, PIN 116956.00

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

The existing structure is 22.9 feet wide by 62.0 feet long and consists of a Double Bituminous Surface treatment over a wood deck with steel I-beams on timber pile abutments. The sufficiency rating for the project overflow bridge is 39.8. Gas pipeline exists along west side of roadway. The 10-year and 100-year discharges and depths of flow for the Branch of Sugar Creek drainage basin were estimated using the appropriate regression equations. The 10-year and 100-year depth of flow estimates were 8.5 feet and 10.8 feet, respectively. The depth of flow estimates did not indicate roadway overtopping, which is not consistent with information provided by local officials. The roadway overtopped in the flood of May 2010.

The roadway segment of Local Route A752 (Creekwood Road) has a base year (2016) AADT of 160 vehicles/day and a design year (2036) AADT of 200 vehicles/day. The proposed structure over the Branch of Sugar Creek will be designed to meet Road Design Standard RD01-TS-1A. The proposed structure is a single span concrete bridge with a total out to out width of 26.33 feet. The structure is to contain two (2) ten foot (10') lanes and two foot (2') shoulders. Though RD01-TS-1A only requires eighteen foot (18') roadway, the proposed width will match existing width of twenty feet (20'). The proposed bridge length is approximately 72 feet. The exact size and type of the structure will be determined by the TDOT Structures Division.

The proposed bridge will raise the grade approximately one and one-half (1.5) feet to maintain the low girder. The horizontal alignment will be shifted approximately three (3) feet to the east to minimize Right-Of-Way impact to the residence on the west side of the roadway. The road will be closed during construction but coordination with the structure at L.M. 0.56 will be necessary to maintain access to the residence. The proposed detour is Pleasant Hill Rd. to SR-152 to Creekwood Rd, a total distance of 3.7 miles.

The required approach work, utility relocations, estimated replacement cost, and preliminary engineering are approximately $842,800.

CHECK LIST OF DETERMINANTS FOR LOCATION STUDY

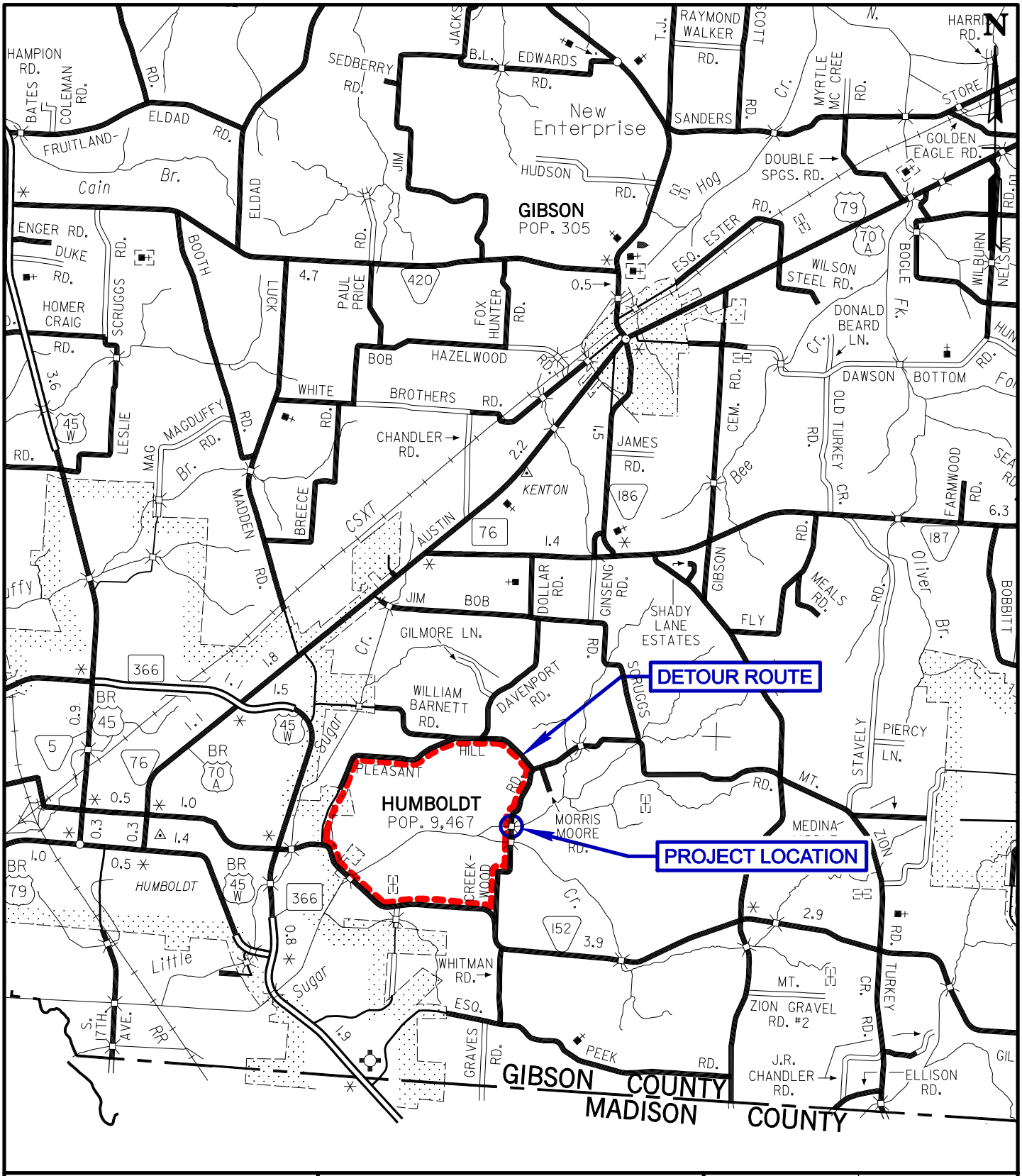
If any of the following facilities or ESE categories are located within the project area or corridor, place an "x" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

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	X
	(Humbolt 9,467)	
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:
GIBSON	N/A
LR A752 (CREEKWOOD RD.)	
PIN 116956.00	
SCALE: 1"= 1 MILE	DATE: 06-01-12

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: 99109-1453-04 ROUTE: Creekwood Road
COUNTY: Gibson CITY: Humbolt
PROJECT PIN NUMBER:
PROJECT DESCRIPTION: Bridge over Branch of Sugar Creek on Creekwood Road
L.M. 0.50

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
160	2016	200	28	14	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 DD 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, 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)

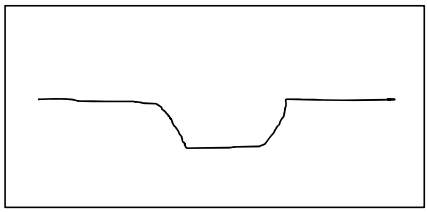
TPR ON SITE INSPECTION REPORT

FOR STREAM CROSSINGS

INSPECTION MADE BY: KM/GF BRIDGE NO.: 270A7520001 COUNTY: Gibson
Date: 6/8/12 Route Name: A752-Creekwood Road Stream Name: Branch of Sugar Creek @ L.M. 0.50

CHANNEL

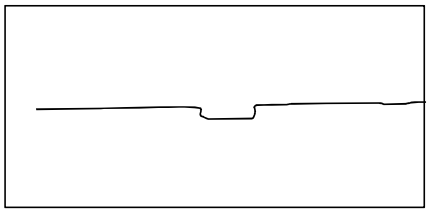
Approx depth and width of channel: Hor.: 18' Vert: 12'
Depth of normal flow: 0 In Reservoir: __ Yes X No
Depth of Ordinary H.W.: 3-4'
Type of material in stream bed: Sand
Type of vegetation on banks: Thick brush
"N" factor of the channel: 0.030
Are channel banks stable: Yes
If the streambed is gravel: D_{30} = -- D_{85} = --
Skew of the channel with the roadway: 75 °



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.: Cultivated field Right U.S.: Cultivated field
Left D.S.: Grass Right D.S.: Cultivated field
Are roadway approaches lower than the structure? NO
Are there any buildings in the floodplain? One farm house
Approx. floor elevations: ± 3' from bridge deck
Flood information from local residents:
(elevations & dates) N/A



Floodplain Sketch

EXISTING STRUCTURE

Length: 62 No. of spans: 3 Structure type: Steel I-Beam No. of lanes: 2 Skew: 75 °
Width (out to out): 22.92' Width (curb to curb): 21.92' Approach: ☑ paved ☐ graveled
Sidewalks (left,right): N/A Bridgerail type: Wheel Guard Bridgerail height = N/A
Superstructure depth: Finished Grade to low girder = 24" Girder depth = 16"
Are any substructures in the channel? NO Area of opening = 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 ☐ Abandon

Bridge length: 72' Bridge type: Concrete Span Span arrangement: Single Span Skew: 75 °
Bridge width: 26.33' Sidewalks: N/A Design Speed (MPH): 30 ADT (2036) = 200
Proposed grade: Raise One and One-half (1.5) Proposed alignment: Shift Three (3) Feet East
Method of maintaining traffic: __ Stage construction __ On site detour X Close road __ Shift Centerline ( ) FT
Cost of proposed Structure: $150 per FT^2 72 / 26.33 length (ft) / width (ft) Cost = $284,364
Cost of bridge removal: $25 per FT^2 62 / 22.92 length (ft) / width (ft) Cost = $35,526
Detour structure: Type and size = NONE Cost = $0
Total Structure Cost = $320,000

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

County	Gibson	By	GF
Bridge No.	270A7520001	Date	6/1/12
Route No.	0A752 Creekwood Road	PIN	116956.00
Feature Crossed	Branch of Sugar Creek		
Log Mile	0.50		

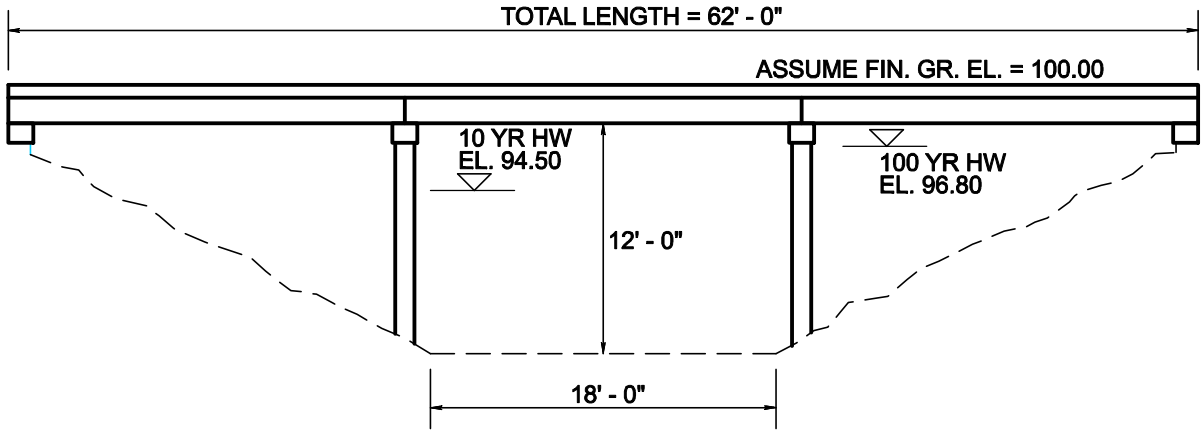
Drainage Area	2,480	acres
	3.87	sq. mi.

USGS REGRESSION EQUATIONS FOR FLOW:

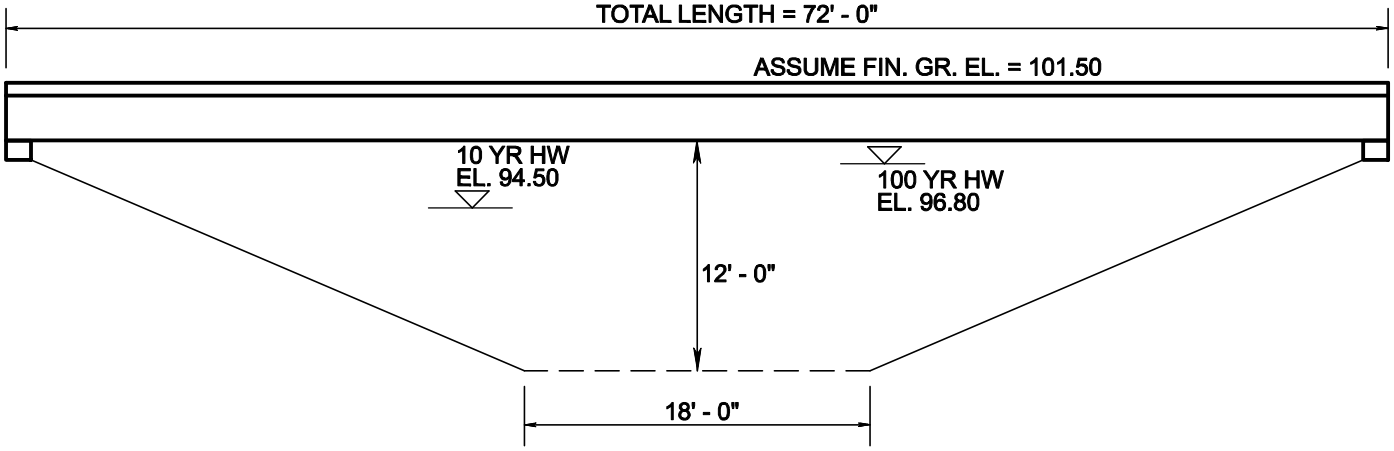
$Q2=436*(CDA)^{0.527}$ =	890	cfs
$Q5=618*(CDA)^{0.545}$ =	1,292	cfs
$Q10=735*(CDA)^{0.554}$ =	1,556	cfs
$Q25=878*(CDA)^{0.564}$ =	1,883	cfs
$Q50=981*(CDA)^{0.570}$ =	2,122	cfs
$Q100=1080*(CDA)^{0.575}$ =	2,352	cfs

DEPTH OF FLOW EQUATIONS

10 Year Flood Depth = $6.98(CDA)^{0.142}$ =	8.5	ft.
100 Year Flood Depth = $9.24(CDA)^{0.116}$	10.8	ft.



EXISTING STRUCTURE



PROPOSED STRUCTURE

BRIDGE PROFILE

COUNTY:	CITY:
GIBSON	N/A
LR A752 (CREEKWOOD RD.)	
PIN 116956.00	
SCALE: N.T.S.	DATE: 06-25-12

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 1

Bridge number
27-A752-0.50

Photograph 2

Southern approach.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 3

View looking south from bridge.

Photograph 4

Northern approach.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 5

View looking north from bridge.

Photograph 6

Upstream.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 7

Upstream left.

Photograph 8

Upstream right.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 9

Downstream.

Photograph 10

Downstream left.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 11

Downstream right.

Photograph 12

Inlet.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 13

Outlet.

Photograph 14

Debris in superstructure.

Project Photographs
Transportation Planning Report
A752-Creekwood Road L.M. 0.50
Bridge Over Branch of Sugar Creek
Gibson County
Date Photos Taken: 06/08/2012

Photograph 15

View of piers and cross-bracing.

Photograph 16

Weight limit sign posted on both approaches.