TRANSPORTATION PLANNING REPORT

Special Bridge Replacement Program

LOCAL ROUTE 0A222 – DOUBLE BRANCH ROAD
BRIDGE OVER DOUBLE BRANCH AT LOG MILE 6.61
WAYNE COUNTY
PIN: 117273.00

PREPARED BY
THE CORRADINO GROUP
FOR THE
TENNESSEE DEPARTMENT OF TRANSPORTATION

Approved by _____ *Date* 1/9/13
Chief of Environment and Planning

Approved by _____ *Date* 1/23/13
Deputy Commissioner and Chief Engineer

Approved by:	Signature	DATE
Transportation Director **Project Planning Division**		12-14-12
Engineering Director **Design Division**	Carolyn Shoemaker	12-19-12
Engineering Director **Structures Division**	Wayne A. Seger	1-7-13

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

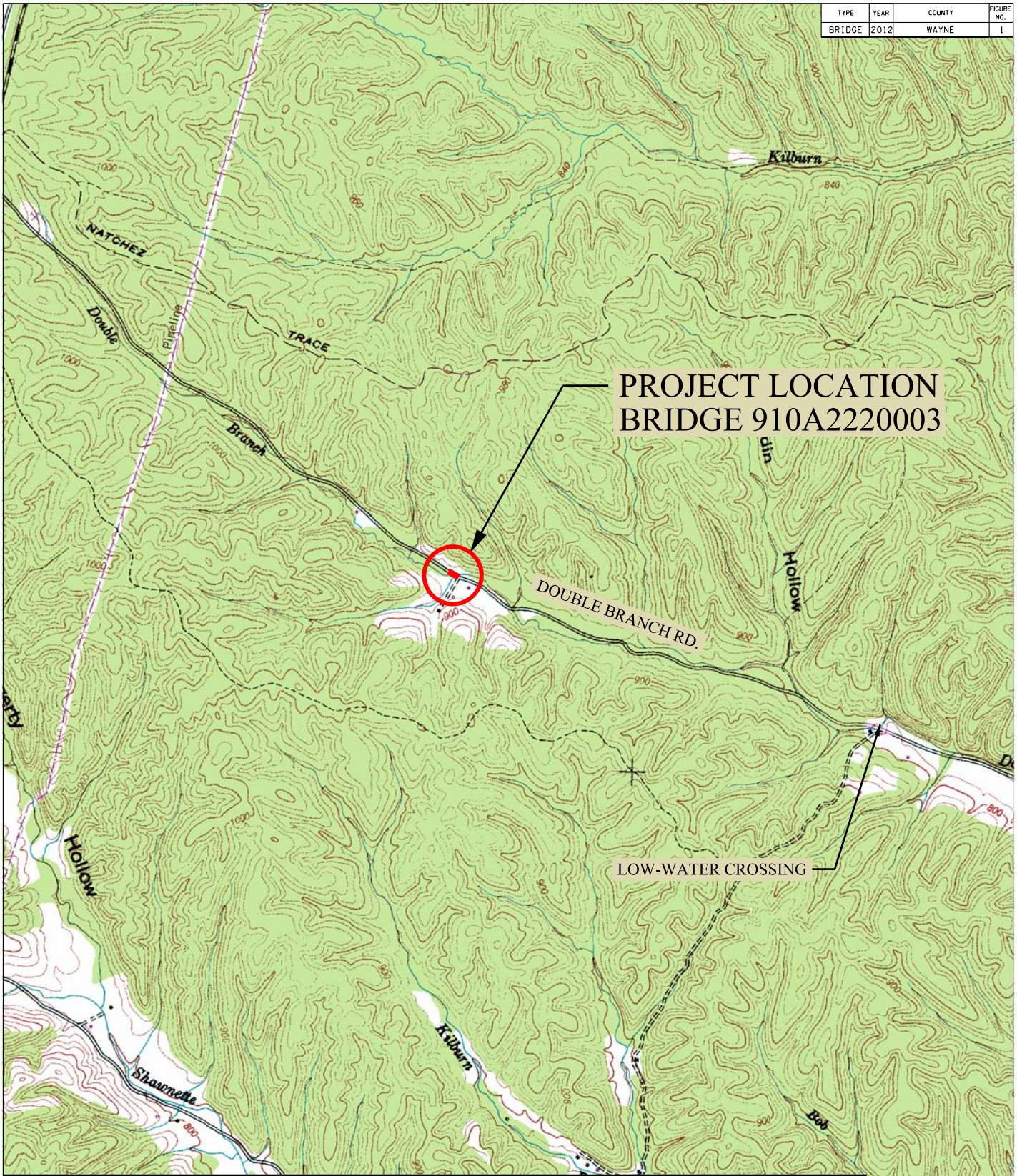
TRANSPORTATION PLANNING REPORT

DOUBLE BRANCH RD. (OA222) OVER DOUBLE BRANCH
L.M. 6.61, BRIDGE 910A2220003
WAYNE COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

LOCATION MAP

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2012	WAYNE	1



N

0 1000' 2000'

SCALE 1 IN. = 2000 FT.

TRANSPORTATION PLANNING REPORT

DOUBLE BRANCH RD. (OA222) OVER DOUBLE BRANCH
L.M. 6.61, BRIDGE 910A2220003
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PROJECT PLANNING DIVISION

PROJECT MAP

N

0 90' 180'

SCALE 1 IN. = 180 FT.

TRANSPORTATION PLANNING REPORT

DOUBLE BRANCH RD. (OA222) OVER DOUBLE BRANCH
L.M. 6.61, BRIDGE 910A2220003
WAYNE COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

AERIAL
MAP

TRANSPORTATION PLANNING WORKSHEET
BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS

County: Wayne Route: Double Branch Rd. (Local Route 0A222) Log Mile: 6.61
Feature Crossed: Double Branch System: Local Route
Functional Class: Rural Local Bridge ID: 910A222003

EXISTING CONDITIONS

2016 AADT: 80 App. Cross Section: 12'/16'/32' No. Lanes: 1
Approach Alignment: Tangent Year Built: 1960 Load Limit: 12 Tons
Width (out to out): 12.75 Sidewalks: Right -- Left -- Length: 30 Ft.
No. Spans: Approach: 0 Main: 1
Substructure: Steel Girder Vertical Clearance: 4'5" Sufficiency Rating: 19.6
Other: Wood riding surface

PROPOSED IMPROVEMENTS

STANDARDS FROM RD01-TS- 1A Type of Work: Replace
Design Year: 2036 Design AADT: 100 Terrain Flat ADL (F): -- (R): --
Project Length: 375 ft Bridge Length: 45 ft Approach Length: 2 @ 165 ft. = 330 ft.
Design Speed (MPH): 30 Posted Speed (MPH): None
Approach Width:* 18'/18'/As Required Bridge Width (O to O): 23.5 ft No. Lanes: 2
Right-of-Way Required: 2 Tract(s) Structure Type: Prefab/Single Span
Acres

MAINTENANCE OF TRAFFIC

Temporary Detour: ☑ Temporary Runaround: ☐ Stage Construct: ☐
Alternate Route: Tie Camp Rd., SR 13, Little Shawntee Creek Rd., Big Shawntee Creek Rd., Factors Fork Rd.

Remarks: Utilize a pre-fabricated bridge to minimize the construction time. Minimized construction time is needed due to a low water crossing (concrete lined stream bed) downstream of the project. The low water crossing would eliminate access to a property in a heavy rain event if this bridge were closed. Constructing on new location is not desired due to an underground fiber optic cable. A short duration detour will be required with the maximum detour length being 15 miles.

ESTIMATED COST

Right-of-Way: $11,000 Approaches: $80,000 Structure: $164,000
Preliminary Engineering: $30,000 Utilities: $0 Misc./Cont.: $30,000
Mobilization: $13,000 Total: $328,000
Remarks: The travel way is to be increased from 12 feet to 18 feet. The proposed alignment will remain the same and the grade will increase 2 feet.

Field Investigation by: Glenda Tyus, Lisa Reaney, David Duncan, Terry Arnold, Casey Pounders, Scott Johnson (TDOT)
Richard Sullivan & Jon Storey (Corradino)

Route:	**Local Route 0A222 (Double Branch Rd.)**
Description:	**Special Bridge Replacement Program**
	L.M. 6.61
County:	**Wayne**
Length:	
Date:	**November 20, 2012**

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
Right-of-Way	$ 2,000	$ -	$ 9,000	$ 11,000
Clearing and Grubbing	$ -	$ -	$ -	$ -
Earthwork	$ -	$ -	$ 2,000	$ 2,000
Railroad Crossing or Separation	$ -	$ -	$ -	$ -
Drainage	$ -	$ -	$ -	$ -
Utilities	$ -	$ -	$ -	$ -
Structures	$ 33,000	$ -	$ 131,000	$ 164,000
Pavement Removal	$ -	$ -	$ -	$ -
Paving	$ 4,000	$ -	$ 15,000	$ 19,000
Roadway and Pavement Appurtenances	$ -	$ -	$ -	$ -
Retaining Walls	$ -	$ -	$ -	$ -
Topsoil	$ -	$ -	$ -	$ -
Seeding	$ -	$ -	$ -	$ -
Sodding	$ -	$ -	$ -	$ -
Rip-Rap or Slope Protection	$ -	$ -	$ -	$ -
Fencing	$ -	$ -	$ -	$ -
Signing	$ -	$ -	$ 1,000	$ 1,000
Pavement Markings	$ -	$ -	$ -	$ -
Lighting	$ -	$ -	$ -	$ -
Signalization	$ -	$ -	$ -	$ -
Guardrail	$ 1,000	$ -	$ 5,000	$ 6,000
Pay Item Quantity Adjustment (15%)[1]	$ 6,000	$ -	$ 24,000	$ 30,000
Maintenance of Traffic	$ 5,000	$ -	$ 20,000	$ 25,000
Mobilization (5%)	$ 3,000	$ -	$ 10,000	$ 13,000
CONSTRUCTION COST (rounded)	$ 54,000	$ -	$ 217,000	$ 271,000
Engineering and Contingency (10%)	$ 5,000	$ -	$ 22,000	$ 27,000
TOTAL CONSTRUCTION COST (rounded)	$ 60,000	$ -	$ 238,000	$ 298,000
Preliminary Engineering (10%)	$ 6,000	$ -	$ 24,000	$ 30,000
PROJECT COST [2, 3] (rounded)	**$ 66,000**	**$ -**	**$ 262,000**	**$ 328,000**

[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 10% should be applied from the date of this estimate.*

[3] *Local agency is responsible for a 20% match (80:20 Funding).*

County: Wayne
Route: Local Route 0A222 (Double Branch Rd.)

Item	Quantity	Unit	2011 Unit Cost	Sub-Total	Total Cost	Rounded Cost	Description/Quantity Calculation
Right-of-Way							
	0.04	Lump Sum	$ 20,000.00		$ 11,000	$ 11,000	0.04 Acres, 2 Tracts: see separate calculations. $5,000 per tract for incidentals
Clear and Grubbing							
201-01	0.0	Acres	$ 1,000.00		$ -	$ -	Area inside prop. R.O.W.
Earthwork							
203-01	0	CY	$ 3.56	$ -			Excavation (Cut)
203-03	730	CY	$ 2.51	$ 1,832			Borrow (Fill)
		Total			$ 1,832	$ 2,000	
Pavement Removal							
202-03.01	0	SY	$ 9.48	$ -	$ -	$ -	
Drainage							
607-05.02	0	FT Pipe	$ 56.59	$ -			24" pipe assumed length of project (C&G)
611-12.02	0	Catchbasins	$ 2,682.51	$ -			Type 12 CB 4-8' depth, 1 every 300' on each side of the street affected
607-09.02	0	FT Pipe	$ 125.01	$ -			48" pipe assummed at each stream crossings
611-12.02	0	Medianbasin	$ 2,682.51	$ -			1 every 800' when have a median, estimate same price as catchbasins
607-03.02	0	Medianpipe	$ 42.17	$ -			18" pipe every 800', length = 80'
		Total			$ -	$ -	
Utilities							
		Lump Sum	N/A	$ -	$ -	$ -	See separate calculations
Structures							
	1057.5	SF	$ 150.00	$ 158,625			Estimate for simple bridges
	390	SF	$ 15.00	$ 5,850			Estimate for bridge removal
		Total			$ 164,475	$ 164,000	
Railroad Crossing or Separation							
	0	Each	$ 50,000.00	$ -			common equipment
	0	FT	$ 200.00	$ -			per foot runaround
	0	SF	$ 70.00	$ -			vehicular bridge
	0	SF	$ 200.00	$ -			RR bridge
	0	LF	$ 200.00	$ -			at grade pad
	0	Each	$ 50,000.00	$ -			gates and signals
		Total			$ -	$ -	

County: Wayne
Route: Local Route 0A222 (Double Branch Rd.)

Item	Quantity	Unit	2011 Unit Cost	Sub-Total	Total Cost	Rounded Cost	Description/Quantity Calculation
Paving							
	0	SF	$ 5.96	$ -			arterial street asphalt paving - see separate calcs
	5300	SF	$ 3.51	$ 18,601			local street asphalt paving - see separate calcs
	0	SF	$ 7.44	$ -			concrete ramp - see separate calcs
	0	SF	$ 3.17	$ -			arterial and ramp asphalt shoulder - see separate calcs
	0	SF	$ 1.94	$ -			local street shoulder - see separate calcs
	0	SF	$ 1.24	$ -			city street overlay - see separate calcs
406-04.02	0	SY	$ 27.20	$ -			High friction surface treatment
401-01.02	0	SY	$ 0.95	$ -			Cold planing (milling) asphalt pavement
		-15% Factor		$ -			Widening Reduction Factor (if widening, cost = 85% of total paving)
		Total			$ 18,601	$ 19,000	Note: Doubled due to grade change and extra pavement for the lifts.
Roadway and Pavement Appurtenances							
701-01.01	0	SF	$ 2.71	$ -			4" Sidewalks
702-03	0	FT	$ 189.72	$ -			Curb and Gutter concrete cost, 0.06409 CY/LF (DWG RP-NMC-10) Unit price in CY
202-03	0	SY	$ 4.41	$ -			Removal of Sidewalk
202-08.1	0	LF	$ 2.62	$ -			Removal of Curb
604-01.01	0	CY	$ 345.62	$ -			4" Island
701-02.01	0	SF	$ 16.38	$ -			Handicap Ramp (Retrofit)
					$ -	$ -	
Retaining Walls							
	0	SF			$ -	$ -	See pg 41-42 TDOT Retaining Structures Manual
Maintenance of Traffic							
	1	Each	$ 25,000.00		$ 25,000	$ 25,000	Estimate $25,000 per existing road crossed
Topsoil							
203-07	0	CY	$ 14.48		$ -	$ -	
Seeding							
801-01	0	SF	$ 22.68		$ -	$ -	sq. ft to be seeded/1000 x 1.25 = units. Unit price in units

County: Wayne
Route: Local Route 0A222 (Double Branch Rd.)

Item	Quantity	Unit	2011 Unit Cost	Sub-Total	Total Cost	Rounded Cost	Description/Quantity Calculation
Sodding							
803-01	0	SY	$ 2.08		$ -	$ -	
Signing							
	1	Mile	$ 1,000.00	$ 1,000.00			$1000/mile rural or $2000/mile urban (or $250/sign for
713-13.02	0	SF	$ 11.62	$ -			0.08" Sheeting
713-13.03	0	SF	$ 12.79	$ -			0.10" Sheeting
713-11.01	0	LB	$ 2.64	$ -			"U" Post
713-11.02	0	LB	$ 3.94	$ -			"P" Post
713-02.21	0	LF	$ 4.74	$ -			Sign post delineation enhancement
713-15.02	0	Each	$ 20.57	$ -			Remove Existing Signs
					$ 1,000	$ 1,000	
Pavement Marking							
716-13.06	0	L.M.	$ 1,687.17	$ -			Edgelines & Centerlines, Spray Thermo 40 mil (4")
716-13.06	0	L.M.	$ 2,030.80	$ -			Edgelines & Centerlines, Spray Thermo 60 mil (4")
716-12.01	0	L.M.	$ 3,274.92	$ -			Edgelines & Centerlines, Enhanced Flatline Thermo (4")
716-02.05	0	LF	$ 10.94	$ -			Stop Lines
716-13.04	0	LM	$ 2.01	$ -			4" Dotted Line (Spray Thermo 60 mil)
716-14.01	0	L.M.		$ -			Profiled Thermo Audible
716-02.13	0	SF	$ 9.50	$ -			Crosswalk
716-02.06	0	Each	$ 132.99	$ -			Turn Lane Arrow
716-01.21	0	Each	$ 25.31	$ -			Snowplowable Markers (bi-direction)
716-01.22	0	Each	$ 27.38	$ -			Snowplowable Markers (mono-direction)
713-02.14	0	Each	$ 31.22	$ -			Flexible Delineator (white)
713-02.20	0	SF	$ 14.00	$ -			Roadside Obstacle Delineation
713-02.21	0	Each		$ -			Delineation of Utility Poles
					$ -	$ -	
Lighting							
714-08.09	0	Each	$ 7,768.86		$ -	$ -	
Signalization							
	0	Each	$ 100,000.00		$ -	$ -	per signalized intersesction
Fence							
707-01.11	0	LF	$ 8.57		$ -	$ -	Chain Link 6'

County: Wayne
Route: Local Route 0A222 (Double Branch Rd.)

Item	Quantity	Unit	2011 Unit Cost	Sub-Total	Total Cost	Rounded Cost	Description/Quantity Calculation
Guardrail							
705-02.02	50	LF	$ 16.11	$ 806			Guardrail (End Terminals Not Included in Price)
705-04.07	0	Each	$ 2,119.59	$ -			Guardrail Terminal (Type 38)
705-04.09	0	Each	$ 1,055.94	$ -			Type 38 Earth Pad
705-11.09	4	Each	$ 1,200.00	$ 4,800			Guardrail Terminal (Type 21)
705-04.04	0	Each	$ 1,982.61	$ -			Guardrail Terminal (Type In Line)
706-01	0	LF	$ 1.29	$ -			Guardrail Removed
711-05.70	0	LF	$ 69.45	$ -			Median Barrier (single slope concrete barrier wall)
705-04.21	0	LF	$ 4.59	$ -			Guardrail Delineation Enhancement
		Total			$ 5,606	$ 6,000	
Rip Rap or Slope Protection							
709-05.06	0	Ton	$ 24.43		$ -	$ -	1.5 ft deep, 1.75 Tons/CY
Total:						**$ 228,000**	

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0350

MEMORANDUM

To: Project Planning Division

From: Jonathan Storey, PE
The Corradino Group

Date: November 20, 2012

Subject: Transportation Planning Report (TPR) Field Review
(Special Bridge Replacement Program)
Double Branch Rd. (Local Route 0A222) Bridge over Double Branch
Log Mile 6.61, Bridge ID 910A2220003
Wayne County, TN
PIN 117273.00

A field review was held for the above referenced project on July 5, 2012. Those in attendance included:

Name	Agency	Phone	E-mail
Glenda Tyus	TDOT Planning	615-741-1816	Glenda.Tyus@tn.gov
Lisa Reaney	TDOT Planning	615-741-0967	Lisa.Reaney@tn.gov
Casey Pounders	TDOT R.O.W.	615-350-4214	Casey.Pounders@tn.gov
Scott Johnson	TDOT Design	615-350-4263	Scott.Johnson@tn.gov
David Duncan	TDOT Planning	615-532-6131	David.A.Duncan@tn.gov
Terry Arnold	TDOT Design	615-350-4274	Terry.Arnold@tn.gov
Richard Sullivan	The Corradino Group	615-372-6972	rsullivan@corradino.com
Jonathan Storey	The Corradino Group	615-372-6972	jstorey@corradino.com

The existing structure consists of a single span steel girder bridge with a single lane wood deck. The overall bridge length is thirty (30) feet with an approximate four-foot five-inch (4'5") vertical clearance. The out-to-out bridge width is twelve-feet nine-inches (12'9"). The sufficiency rating for this bridge is 19.6. 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 10-year flow depth is 5.2 feet and the 100-year flow depth is 7.3 feet. Both of these depths are higher than the available vertical clearance of 4’ 5”.

The proposed alignment for this structure will remain on the existing centerline and will be designed to meet the TDOT design standard RD01-TS-1A for a Design Speed of 30 miles per hour with no posted speed limit along Double Branch Road, which is a single lane gravel road. As per TDOT Hydraulic Design Section’s recommendations, the grade will be increased approximately two (2) feet to better accommodate the design-year flows.

The Wayne County Highway Superintendent was contacted to discuss maintenance of traffic and construction methodology. It is recommended to utilize a pre-fabricated bridge with a short-duration detour at this location to minimize construction time and cost. The Wayne County Highway Department approved a temporary road closure in order to utilize a pre-fabricated bridge. Due to the potential conflicts with a fiber optic line located adjacent to Double Branch Road and added right-of-way and construction costs, utilization of a temporary runaround or shifted alignment is not desirable. The existing bridge is too narrow to utilize phased construction. Because of the presence of a low-water crossing east of this bridge location, it is not recommended to close the road for a long period of time. The low-water crossing is a concrete lined stream bottom along Double Branch Road. Properties between the closed bridge location and the low-water crossing would not be accessible during a heavy rain event. The bridge and approaches should be constructed during the summer or when heavy rainfalls are less frequent. Acceptable detour routes utilizing Tie Camp Road, State Route 13, Little Shawntee Creek Road, Big Shawntee Creek Road, and Factors Fork Road are available. The maximum detour length is fifteen (15) miles, with an estimated travel time of approximately 45 minutes.

Double Branch Road has a base year (2016) AADT of 80 vehicles per day (vpd) and a design year (2036) AADT of 100 vpd. On a site visit, the majority of vehicles observed were logging trucks. The proposed bridge over Double Branch will consist of an out-to-out width of twenty-three and a half (23.5) feet to accommodate a proposed approach roadway width of eighteen (18) feet, as specified in Standard Drawing RD01-TS1A for a rural local road. Because Double Branch Road is a single lane gravel road, it is not recommended to provide lane delineation pavement markings on the bridge or the proposed paved approaches. On both approaches of the bridge, the roadway will transition to match the existing twelve (12)-foot roadway cross section. The proposed structure is a forty-five (45)-foot long single-span bridge. Based on the regression equations, the 100-year flow depth of 7.3 feet will overtop the proposed structure. However, if this were to occur, the surrounding roadway and area around the bridge would be overtopped as well. Approximately 0.04 acres of right-of-way will be acquired due to the increase in roadway width and grade.

The required approach work, estimated replacement, and preliminary engineering costs for this bridge are approximately $328,000. Wayne County will be responsible for matching funds of twenty percent (20%), which is equal to approximately $66,000.

JHS

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	
5.	Forested land	X
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	X
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	X
	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: Double Branch Road
COUNTY: Wayne CITY: Collinwood
PROJECT PIN NUMBER:
PROJECT DESCRIPTION: Bridge over Double Branch on Double Branch Road
L.M. 6.61

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
80	2016	100	14	14	2036	65-35	1	2		

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 DATE 15 May 12
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

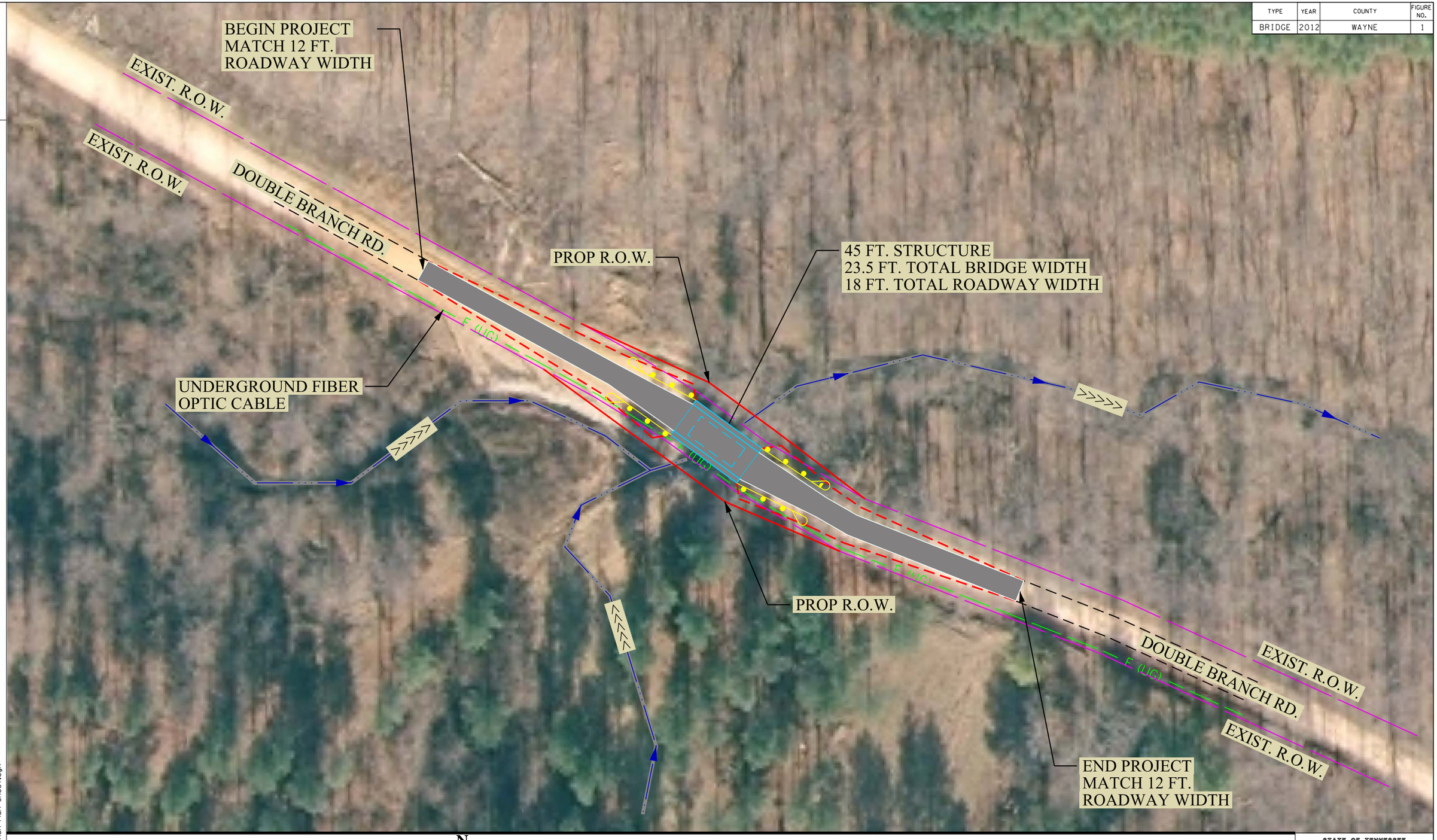
COMMENTS:

This Traffic is based on 1999 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)

TENNESSEE D.O.T.
PROJECT PLANNING DIVISION
FILE NO.

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2012	WAYNE	1



0′ 50′ 100′ 150′

N

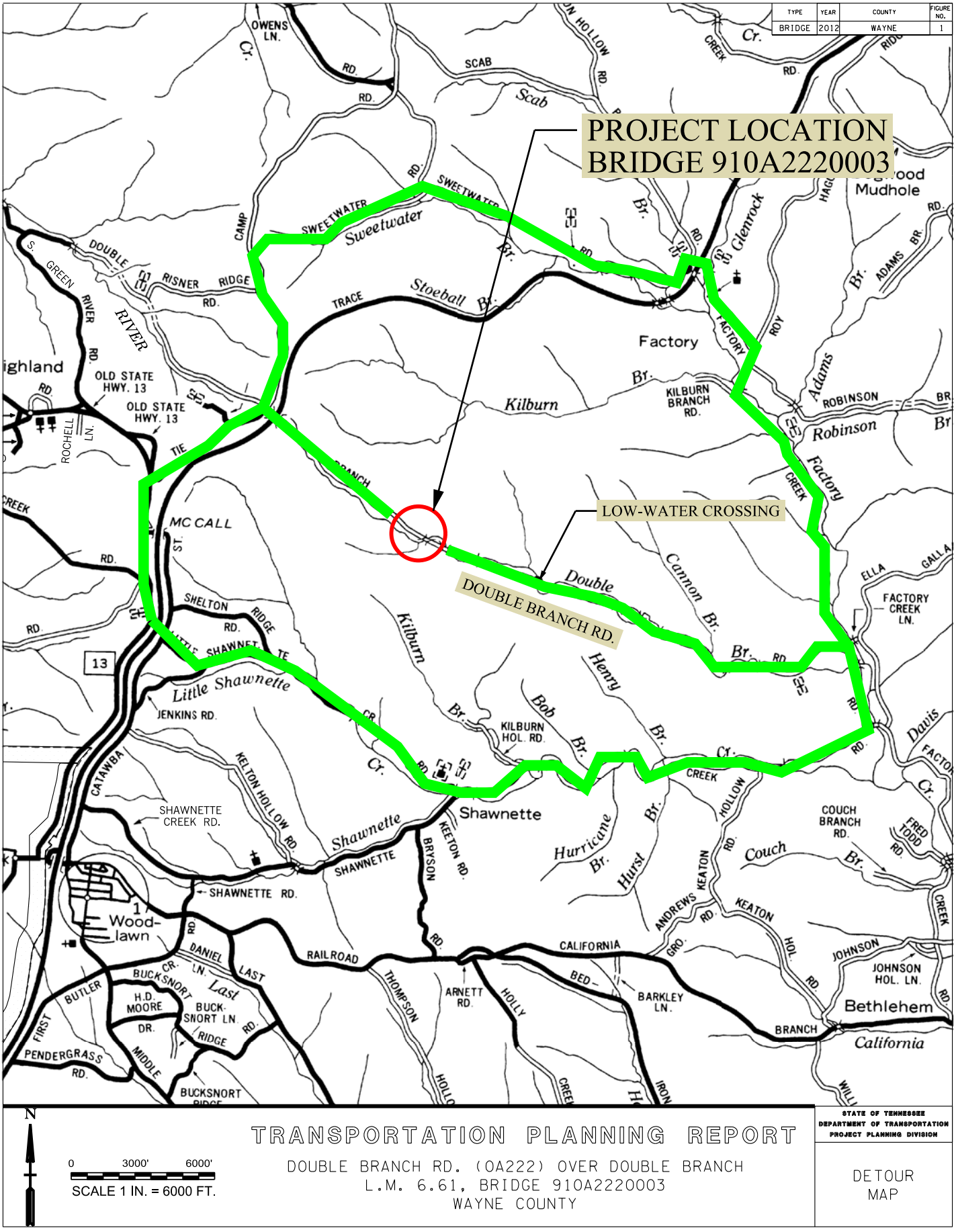
TRANSPORTATION PLANNING REPORT

DOUBLE BRANCH RD. (0A222) OVER DOUBLE BRANCH
L.M. 6.61
WAYNE COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

FIGURE 1
RT. 0A222
L.M. 6.61

H:\4044\WO 18\dgn\Double Branch Plan Sheet.dgn
1/28/2012 6:32:16 PM

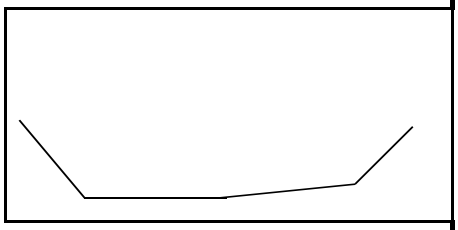

PROJECT LOCATION
BRIDGE 910A2220003
LOW-WATER CROSSING
DOUBLE BRANCH RD.
TYPE | YEAR | COUNTY | FIGURE NO.
BRIDGE | 2012 | WAYNE | 1
N
0 3000' 6000'
SCALE 1 IN. = 6000 FT.
TRANSPORTATION PLANNING REPORT
DOUBLE BRANCH RD. (OA222) OVER DOUBLE BRANCH
L.M. 6.61, BRIDGE 910A2220003
WAYNE COUNTY
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION
DETOUR MAP

SITE INSPECTION

INSPECTION MADE BY: Jon Storey BRIDGE ID: 910A2220003 COUNTY: Wayne
Date: 6/26/11 Route Name: Double Branch Rd. (Local Route 0A222) Stream Name: Double Branch @ L.M. 6.61

CHANNEL

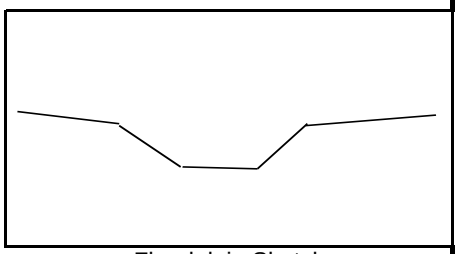
Approx depth and width of channel: Horizontal: 20' Vertical: 4'5"
Depth of normal flow: 1' In Reservoir: ☐ Yes ☑ No
Depth of Ordinary High Water: 1'
Type of material in stream bed: Gravel
Type of vegetation on banks: Trees, Bushes
"N" factor of the channel: 0.035
Are channel banks stable: ☑ Yes ☐ No
If the streambed is gravel: D_{30} = -- D_{85} = --
Skew of the channel with the roadway: 70 °



Channel Shape Sketch

FLOODPLAIN

Is the skew same as the channel? ☑ Yes ☐ No
Is it symmetrical about the channel? ☑ Yes ☐ No
Type of vegetation in the floodplain and "N" factors
Left U.S.: Woods (0.150) Right U.S.: Woods (0.150)
Left D.S.: Woods (0.150) Right D.S.: Woods (0.150)
Are roadway approaches lower than the structure? ☐ Yes ☑ No
Are there any buildings in the floodplain? ☐ Yes ☑ No
Approx. floor elevations: 850'
Flood information from local residents:
(elevations & dates) --



Floodplain Sketch

EXISTING STRUCTURE

Length: 30 No. of spans: 1 Structure type: Steel No. of lanes: 1 Skew: 70 °
Width (out to out): 12'9" Width (curb to curb): 11'1" Approach: ☐ paved ☑ graveled
Sidewalks on Structure: ☐ Yes ☑ No Bridgerail type: Wood Bridgerail height = 6"
Superstructure depth: 2'1" Finished Grade to low girder = 1'3" Girder depth = 12"
Are any substructures in the channel? ☐ Yes ☑ No Vertical Clearance= 4'5"
Indications of overtopping: No
High water marks: None, drought conditions on site visit
Local scour: ☐ ☑ No
Any signs of stream ☐ aggradation or ☐ degradation? None
Any drift or drift potential? ☐ Yes, ☑ No
Any obstructions (pipes,stock fences,etc.)? None observed

PROPOSED STRUCTURE

☑ Replacement ☐ Rehabilitate ☐ Widening ☐ New Location
Bridge length: 45 ft Bridge type: Prefab/Single Span Span arrangement: Single Span Skew: 70 °
Bridge width: 18.0 ft Sidewalks: None Design Speed (MPH): 30 ADT (2036) = 100
Proposed grade: Raise 2 ft. Proposed alignment: Same
Method of maintaining traffic: ☐ Stage construction ☐ On site detour ☑ Close road ☐ Shift Centerline
Cost of proposed Structure: $150 per ft^2 X 45 / 23.5 length (ft) / width (ft) Cost = $158,600
Cost of bridge removal: $15 per ft^2 X 30 / 12.8 length (ft) / width (ft) Cost = $5,700
Detour structure: Type and size = Temporary road closure Cost = $25,000

Total Structure Cost = $189,300

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

County: Wayne
Bridge ID: 910A2220003
Route: Double Branch Rd. (Local Route 0A222)
Feature Crossed: Double Branch
Log Mile: 6.61

By: JHS
Date: 6/29/12
PIN: 117273.00

DRAINAGE BASIN

Measurement from quad =	582	acres
Contributing Drainage Area, CDA = acres/640 =	0.91	sq. mi.

USGS REGRESSION EQUATIONS FOR FLOW

Q_2 = 207(CDA)^0.725 =	193	cfs
Q_5 = 344(CDA)^0.715 =	322	cfs
Q_{10} = 444(CDA)^0.711 =	415	cfs
Q_{25} = 578(CDA)^0.708 =	541	cfs
Q_{50} = 682(CDA)^0.706 =	638	cfs
Q_{100} = 788(CDA)^0.705 =	737	cfs

DEPTH OF FLOW EQUATIONS

10-Year Flood Depth = 5.33(CDA)^0.197 =	5.2	ft
100-Year Flood Depth = 7.43(CDA)^0.181 =	7.3	ft

AREAS

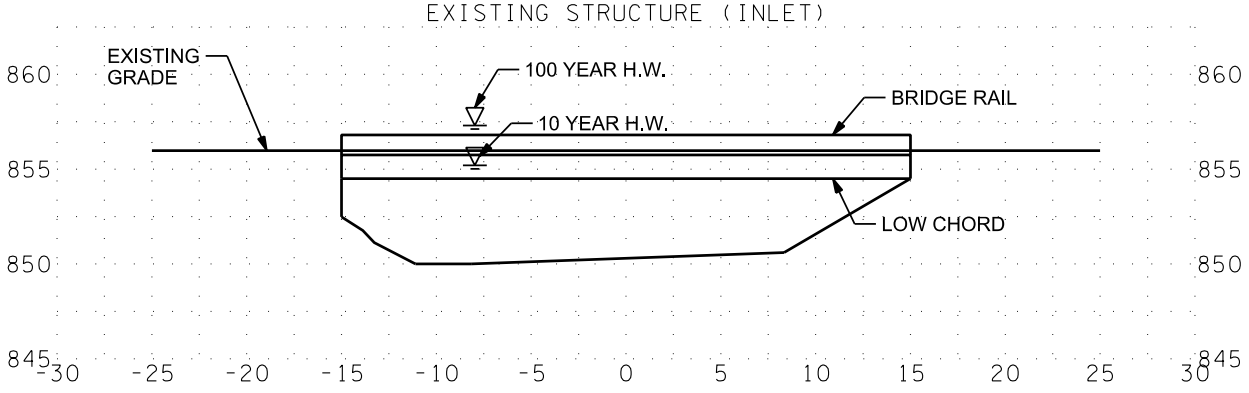
Existing Area Below Low Chord =	109	ft^2
Proposed Area Below Low Chord =	171	ft^2
Proposed 10-Year Flood Area, A_{10} =	171	ft^2
Proposed 100-Year Flood Area, A_{100} =	171	ft^2

VELOCITIES

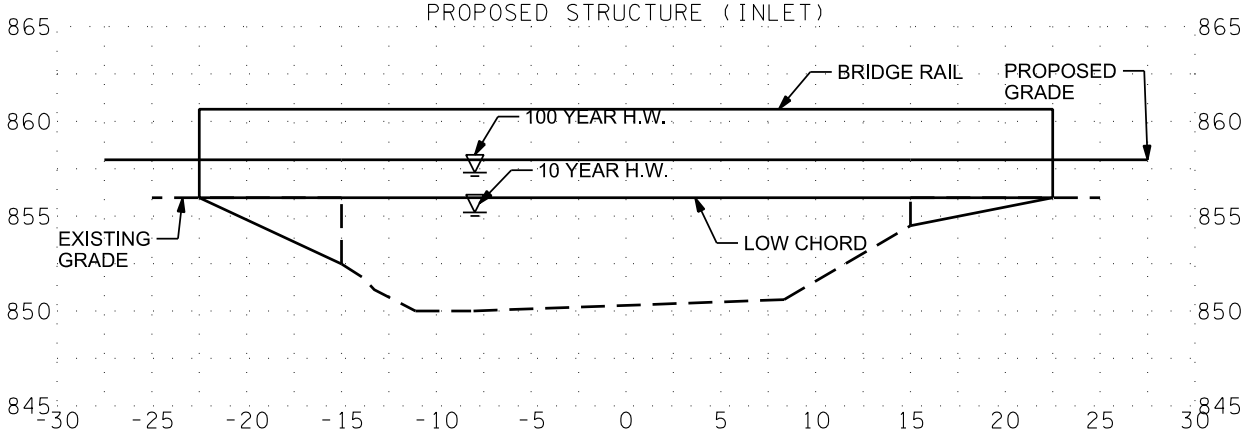
Proposed 10-Year Flood Velocity, $V_{10} = Q_{10}/A_{10}$ =	2.4	fps
Proposed 100-Year Flood Velocity, $V_{100} = Q_{100}/A_{100}$ =	4.3	fps

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2012	WAYNE	1

EXISTING STRUCTURE (INLET)



PROPOSED STRUCTURE (INLET)



N

0 5' 10'

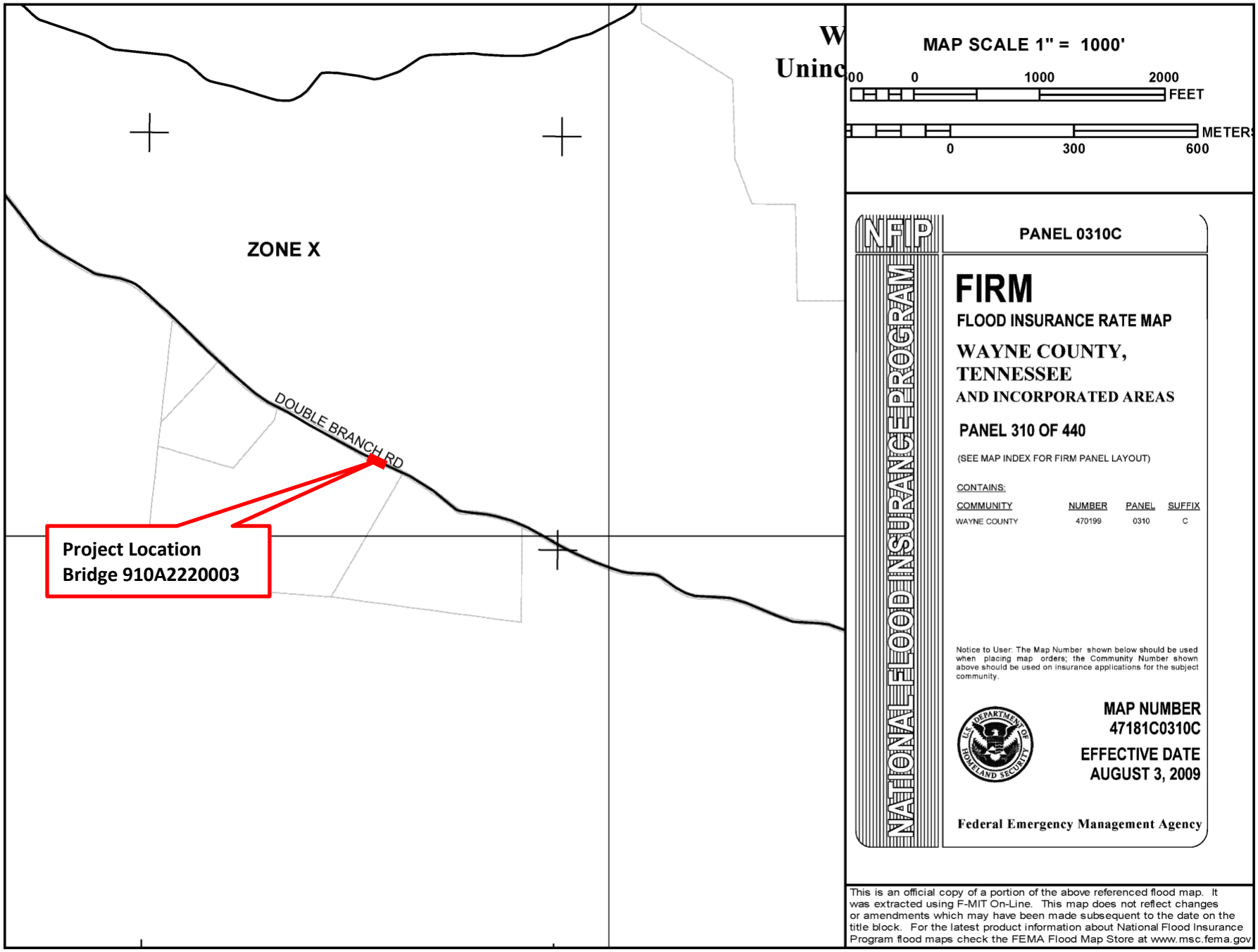
SCALE 1 IN. = 10 FT.

TRANSPORTATION PLANNING REPORT

DOUBLE BRANCH RD. (OA222)
L.M. 6.61 BRIDGE 910A222003
WAYNE COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

BRIDGE SECTIONS


ZONE X
DOUBLE BRANCH RD
Project Location
Bridge 910A2220003
MAP SCALE 1" = 1000'
00 0 1000 2000
FEET
METERS
0 300 600
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0310C
FIRM
FLOOD INSURANCE RATE MAP
WAYNE COUNTY, TENNESSEE
AND INCORPORATED AREAS
PANEL 310 OF 440
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
WAYNE COUNTY 470199 0310 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
47181C0310C
EFFECTIVE DATE
AUGUST 3, 2009
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

BRIDGE NUMBER

BRIDGE NUMBER

INLET SIDE LOOKING NORTH TOWARDS THE BRIDGE

INLET SIDE LOOKING SOUTH AWAY FROM THE BRIDGE

OUTLET SIDE LOOKING SOUTH TOWARDS THE BRIDGE

OUTLET SIDE LOOKING NORTH AWAY FROM THE BRIDGE

WEST APPROACH LOOKING EAST TOWARDS THE BRIDGE

WEST APPROACH LOOKING WEST AWAY FROM THE BRIDGE

EAST APPROACH LOOKING WEST TOWARDS THE BRIDGE

EAST APPROACH LOOKING EAST AWAY FROM THE BRIDGE

LOOKING SOUTH

LOOKING NORTH

FIBER OPTIC CABLE MARKER

WEIGHT LIMIT SIGN