

TRANSPORTATION PLANNING REPORT

Special Bridge Replacement Program

LOCAL ROUTE 0A317 (COLUMBUS ROAD), BRIDGE OVER CSX RAILROAD, L.M. 1.13
POLK COUNTY
PIN 117922.00

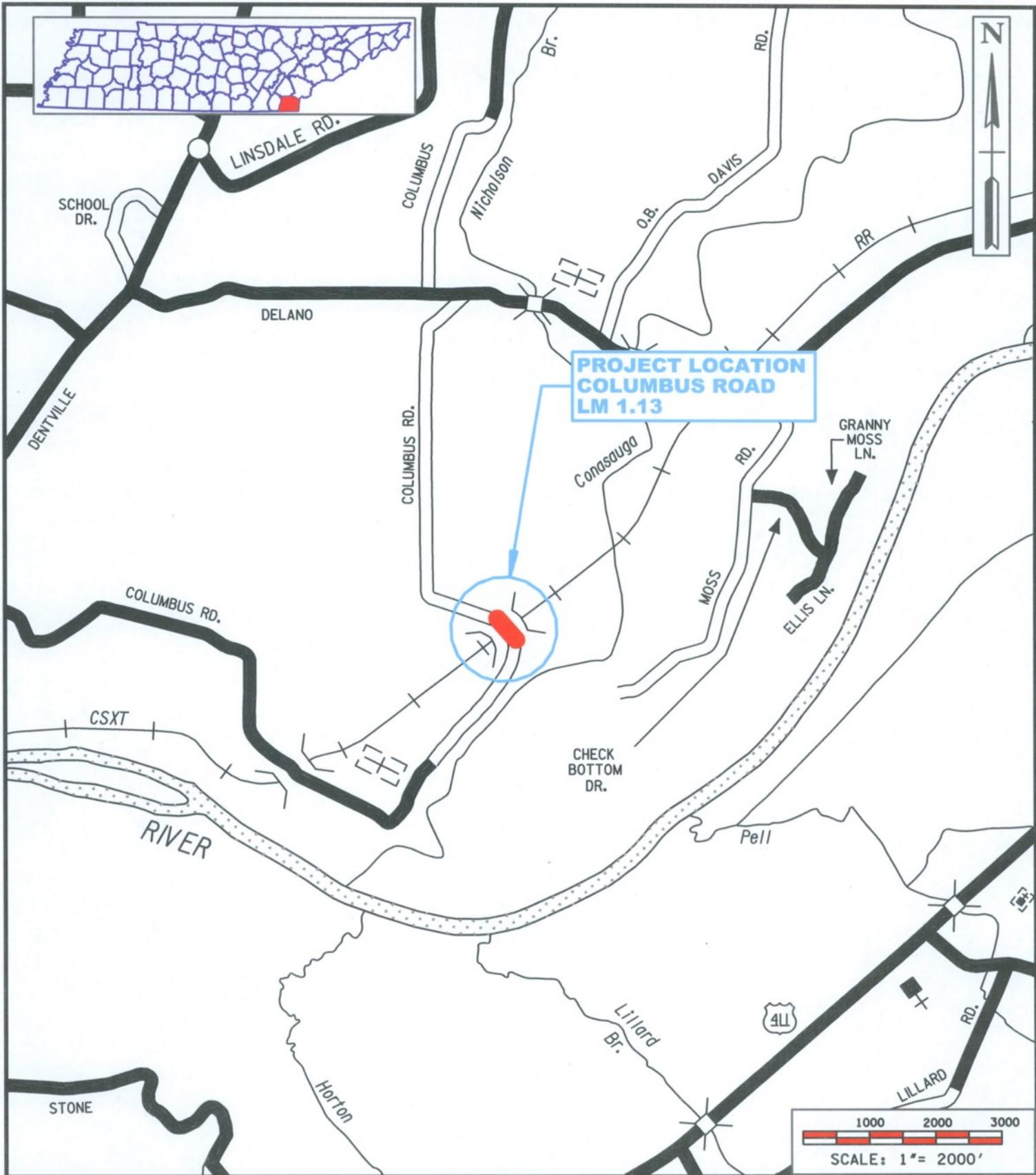


PREPARED BY
ARCADIS
FOR THE
TENNESSEE DEPARTMENT OF TRANSPORTATION

Approved by [Signature] Date 7/29/13 Approved by Paul Deegan Date 8/12/13
Chief of Environment and Planning Deputy Commissioner and Chief Engineer

Approved by:	Signature:	Date:
Transportation Director Project Planning Division	<u>[Signature]</u>	7-1-13
Engineering Director Design Division	<u>Carolyn Stonecipher</u>	7-8-13
Engineering Director Structures Division	<u>Wayne J. Sigur</u>	7-23-13

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 0A317 (COLUMBUS ROAD)
BRIDGE OVER CSX RAILROAD
L.M. 1.13
BRIDGE NUMBER 700A3170001
POLK COUNTY, TN

DRAWN BY:

BJH

CHECKED BY:

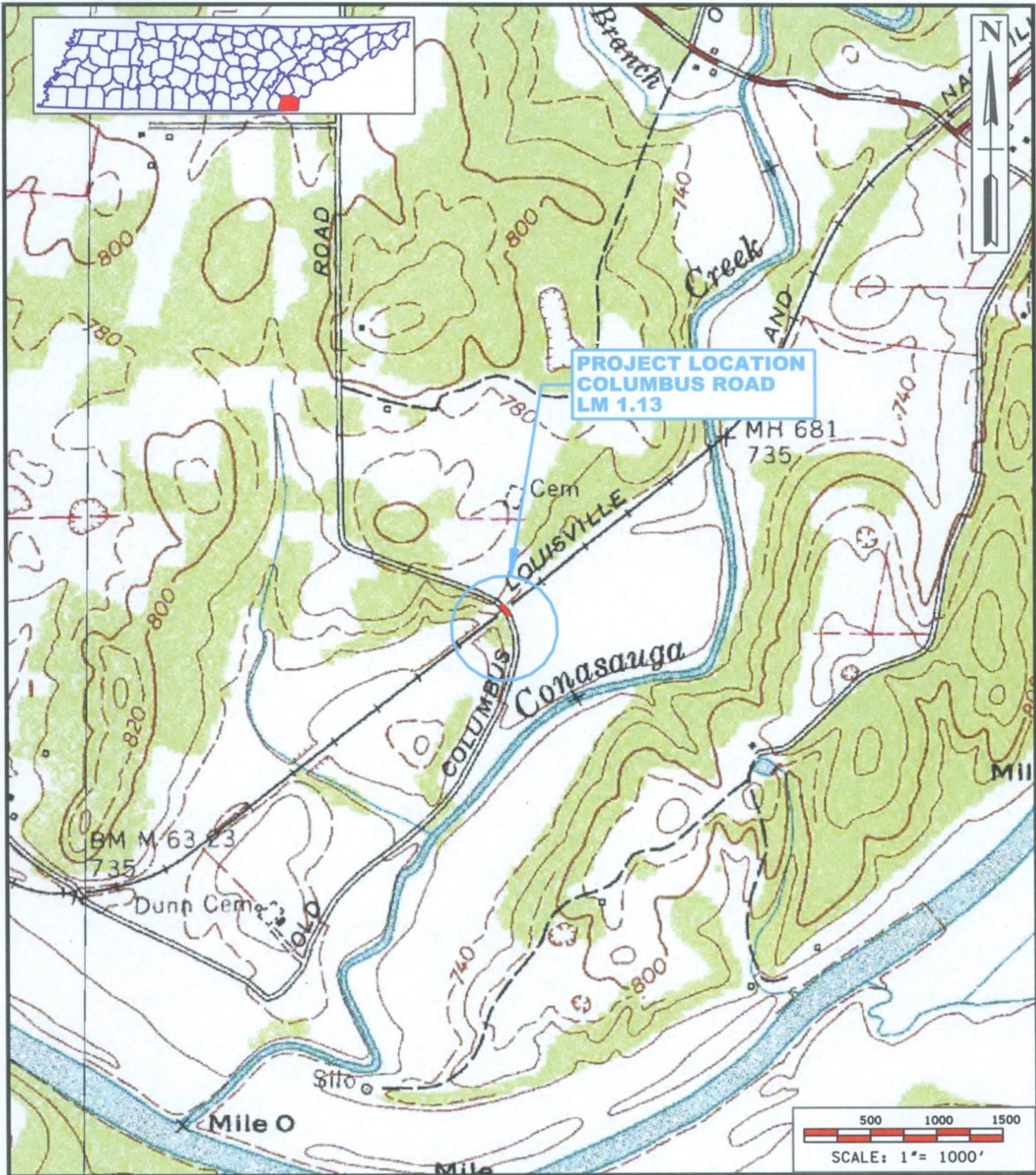
HAM

LOCAL ROUTE 0A317 L.M. 1.13

PIN 117922.00

DATE:

06-20-2013



VICINITY MAP
 LOCAL ROUTE 0A317 (COLUMBUS ROAD)
 BRIDGE OVER CSX RAILROAD
 L.M. 1.13
 BRIDGE NUMBER 700A3170001
 POLK COUNTY, TN

DRAWN BY:

BJH

CHECKED BY:

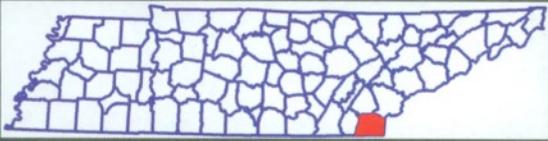
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LOCAL ROUTE 0A317 L.M. 1.13

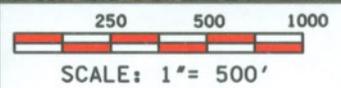
PIN 117922.00

DATE:

06-20-2013



**PROJECT LOCATION
COLUMBUS ROAD
LM 1.13**



**AERIAL MAP
LOCAL ROUTE 0A317 (COLUMBUS ROAD)
BRIDGE OVER CSX RAILROAD
L.M. 1.13
BRIDGE NUMBER 700A3170001
POLK COUNTY, TN**

DRAWN BY: BJH	CHECKED BY: HAM
LOCAL ROUTE 0A317 L.M. 1.13	
PIN 117922.00	
	DATE: 06-20-2013

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

County: Polk Route: 0A317 (Columbus Road) Log Mile: 1.13
 Feature Crossed: CSX Railroad System: Local
 Functional Class: Local (Rural) Bridge ID: 700A3170001

EXISTING CONDITIONS

2016 AADT: 50 App. Cross Section: 16'/18'/30' No. Lanes: 1
 Approach Alignment: In Curve Year Built: 1915 Load Limit: 10 Tons
 Width (out to out): 17' Sidewalks: Right -- Left -- Length: 92'
 No. Spans: Approach: 4 Main: 1
 Substructure: Steel I-Beam/Timber Beam Vertical Clearance: 22' Sufficiency Rating: 48.2
 Other: Cracks in the timber beams were observed.

PROPOSED IMPROVEMENTS

STANDARDS FROM RD01-TS- 1A Type of Work: Replace
 Design Year: 2036 Design AADT: 60 Terrain Rolling ADL (F): -- (R): --
 Proj. Length: 335' Bridge Length: 135' Approach Length: 2@100'
 Design Speed (MPH): 15 Posted Speed (MPH): None
 Approach Width: 18'/18'/As Req'd Bridge Width (O to O): 21 ft No. Lanes: 2
 Right-of-Way Req.: 4 Tract(s) Structure Type: Prestressed Concrete

MAINTENANCE OF TRAFFIC

Temporary Detour: Temporary Runaround: Stage Construct:
 Alternate Route: All through traffic will be detoured west on Delano Road then south on Dentville Road (See Figure 2 - Detour Map). Approximate five (5) mile detour.
 Remarks: Single phase construction utilizing above detour route.

ESTIMATED COST

Right-of-Way: \$5,000 Approaches: \$87,200 Structure: \$396,200
 Preliminary Engineering: \$71,000 Utilities: \$6,000 Misc./Cont.: \$181,000
 Mobilization: \$35,000 Total: \$782,000

Remarks: Lane widths to be increased to nine (9) foot and no shoulders over the structure and the approaches in order to meet design standard RD01-TS-1A. Also install single slope concrete barrier walls on both sides of the structure. Current alignment to remain the same and grade to be increased 2.5 ft. R.O.W. will be required. Underground utility relocation will be required.

Field Investigation by: Glenda Tyus (Planning), Lisa Reaney (Planning), Alan Wolfe (Reg. 2 Traffic), Gary Chapman (Reg. 2 Survey), Landon Castleberry (Reg. 2 Traffic), Amber Thornton (Reg. 2 Traffic), Barry McClendon (Reg. 2 Survey) Roy Thomason (Polk Co. Hwy Official), Harvey McKaig and Karen Anderson (ARCADIS)

Route:	0A317 (Columbus Road)
Description:	Bridge over CSX Railroad (700A3170001)
	L.M. 1.13
County:	Polk
Length:	335 FT
Date:	March 11, 2013

<u>DESCRIPTION</u>	<u>LOCAL</u>	<u>STATE</u>	<u>FEDERAL</u>	<u>TOTAL</u>
Right-of-Way	\$ 1,000	\$ -	\$ 4,000	\$ 5,000
Clearing and Grubbing	\$ 1,000	\$ -	\$ 4,000	\$ 5,000
Earthwork	\$ 7,200	\$ -	\$ 28,800	\$ 36,000
Railroad Crossing or Separation	\$ -	\$ -	\$ -	\$ -
Drainage	\$ 440	\$ -	\$ 1,760	\$ 2,200
Utilities	\$ 1,200	\$ -	\$ 4,800	\$ 6,000
Structures	\$ 79,200	\$ -	\$ 317,000	\$ 396,200
Pavement Removal	\$ -	\$ -	\$ -	\$ -
Gravel Roadway	\$ 2,400	\$ -	\$ 9,800	\$ 12,200
Roadway and Pavement Appurtenances	\$ 5,400	\$ -	\$ 21,600	\$ 27,000
Retaining Walls	\$ -	\$ -	\$ -	\$ -
Topsoil	\$ 300	\$ -	\$ 1,200	\$ 1,500
Seeding	\$ -	\$ -	\$ -	\$ -
Sodding	\$ 1,020	\$ -	\$ 4,080	\$ 5,100
Rip-Rap or Slope Protection	\$ 2,500	\$ -	\$ 9,800	\$ 12,300
Fencing	\$ -	\$ -	\$ -	\$ -
Signing	\$ -	\$ -	\$ -	\$ -
Pavement Markings	\$ -	\$ -	\$ -	\$ -
Lighting	\$ -	\$ -	\$ -	\$ -
Signalization	\$ -	\$ -	\$ -	\$ -
Guardrail	\$ 4,300	\$ -	\$ 17,300	\$ 21,600
Other Construction Items (15%)	\$ 15,900	\$ -	\$ 63,600	\$ 79,500
Maintenance of Traffic	\$ 1,000	\$ -	\$ 4,000	\$ 5,000
Mobilization (5%)	\$ 6,200	\$ -	\$ 24,600	\$ 30,700
CONSTRUCTION COST (rounded)	\$ 129,100	\$ -	\$ 516,300	\$ 645,300
Engineering and Contingency (10%)	\$ 13,000	\$ -	\$ 52,000	\$ 65,000
TOTAL CONSTRUCTION COST (rounded)	\$ 142,000	\$ -	\$ 568,000	\$ 710,000
Preliminary Engineering (10%)	\$ 14,000	\$ -	\$ 57,000	\$ 71,000
PROJECT COST ¹(rounded)	\$ 156,000	\$ -	\$ 625,000	\$ 781,000

¹ For estimating future project costs, a compounded inflation rate of 10 % should be applied from the date of this estimate.

0A317 (Columbus Road)
LM 1.13 (Bridge Replacement)

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
-	Right-of-Way	LS	LS	\$ 5,000.00	\$ 5,000
RIGHT-OF-WAY TOTAL (ROUNDED)					\$ 5,000
201-01	Clearing and Grubbing	LS	LS	\$ 5,000.00	\$ 5,000
CLEAR AND GRUBBING TOTAL (ROUNDED)					\$ 5,000
203-03	Borrow Excavation (Unclassified)	CY	2000	\$ 18.00	\$ 36,000
EARTHWORK TOTAL (ROUNDED)					\$ 36,000
PAVEMENT REMOVAL TOTAL (ROUNDED)					\$ -
209-08.02	Temporary Silt Fence (w/ backing)	LF	675	\$ 3.25	\$ 2,194
DRAINAGE TOTAL (ROUNDED)					\$ 2,200
	Underground Utilities	LF	150	\$ 40.00	\$ 6,000
UTILITIES TOTAL (ROUNDED)					\$ 6,000
	Removal of Existing Bridge	SF	1656	\$ 15.00	\$ 24,900
	135' Prestressed Concrete Bridge	SF	2,970	\$ 125.00	\$ 371,250
STRUCTURES TOTAL (ROUNDED)					\$ 396,200
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)					\$ -
303-01	Mineral Aggregate, TY A Base, Grading D	TON	812	\$ 14.93	\$ 12,123
PAVING TOTAL (ROUNDED)					\$ 12,200
711-05.71	Single Slope Concrete Barrier Wall	LF	270	\$ 100.00	\$ 27,000
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)					\$ 27,000
RETAINING WALLS TOTAL (ROUNDED)					\$ -
712-01	Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)					\$ 5,000
203-07	Furnishing & Spreading Topsoil	CY	150	\$ 10.00	\$ 1,500
TOPSOIL TOTAL (ROUNDED)					\$ 1,500
SEEDING TOTAL (ROUNDED)					\$ -
803-01	Sodding (New Sod)	SY	1,265	\$ 4.00	\$ 5,060
SODDING TOTAL (ROUNDED)					\$ 5,100
SIGNING TOTAL (ROUNDED)					\$ -
PAVEMENT MARKINGS TOTAL (ROUNDED)					\$ -
LIGHTING TOTAL (ROUNDED)					\$ -
SIGNALIZATION TOTAL (ROUNDED)					\$ -
FENCE TOTAL (ROUNDED)					\$ -
705-02.02	Single Guardrail (Type 2)	LF	200	\$ 15.55	\$ 3,110
705-04.04	Guardrail Terminal (Type 21)	EACH	4	\$ 1,773.47	\$ 7,094
705-01.01	Guardrail at Bridge Ends	LF	200	\$ 56.85	\$ 11,370
GUARDRAIL TOTAL (ROUNDED)					\$ 21,600
709-05.09	Machined Rip-Rap (Class A1)	TON	600	\$ 20.34	\$ 12,204
RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)					\$ 12,300



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

PROJECT PLANNING 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: Project Planning Office
FROM: ARCADIS
DATE: June 21, 2013
SUBJECT: TPR Field Review (Special Bridge Replacement Program)
Local Route 0A317 (Columbus Road), Bridge over CSX Railroad, Log Mile 1.13,
Polk County
PIN 117922.00

A field review was held for the above-mentioned project on January 17, 2013.

The existing structure consists of five (5) span timber and steel girders with an out-to-out width of 17 feet. Overall bridge length is 92 feet with approximately 22 feet of vertical clearance. Bridge sufficiency rating is 48.2.

Construction will consist of replacing the structure. The proposed horizontal alignment for this structure will follow existing. The proposed vertical alignment for this structure will increase 2.5 feet. The structure will be designed to meet the TDOT design standard RD01-TS-1A for a design speed of 15 mph. Construction of the proposed structure is to be completed in a single phase.

Based on low traffic volume, it is recommended that through traffic be detoured west on Delano Road, then south on Dentville Road for approximately five (5) miles during bridge construction. See Figure 2 for detour map.

The route has a base year (2016) AADT of 50 and a design year (2036) AADT of 60. The proposed bridge over CSX Railroad will consist of an out-to-out width of twenty-two (22) feet with two (2) nine (9) foot lanes. The proposed structure is to be a prestressed concrete bridge or approved equal with a total length of approximately 135 feet. The proposed vertical clearance shall be twenty-three (23) feet with horizontal clearance of twenty-five (25) feet from center of the tracks in accordance with CSX Railroad requirements. Right-of-way (approximately 0.25 acres) is expected to be acquired on four (4) tracts of land for the proposed structures (See Figure 1). Underground utilities are expected to be relocated during construction. No utilities are attached to existing structure.

The required approach work, right-of-way, estimated replacement and preliminary engineering costs for this bridge are approximately \$781,000 of which a local match of \$156,000 will be required.

KA

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) | X |
| 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) | X |
| 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 | |
| Permit required: | |
| Coast Guard | |
| Section 404 | |
| TVA Section 26a review | |
| NPDES | |
| Aquatic Resource Alteration | |
| 13. Other | |
| 14. Location coordinated with local officials | X |
| 15. Railroad crossings | X |
| 16. Hazardous materials site | |

**TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION**

PROJECT NO.: 99109-145-04 ROUTE: 0A317
 COUNTY: Polk CITY: _____
 PROJECT PIN NUMBER: 117922.00
 PROJECT DESCRIPTION: Bridge over CSX Railroad on Columbus Road
LM 1.13

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
50	2016	60	8	13	2036	65-35	1	1		

REQUESTED BY: NAME Lisa Reaney DATE 11/1/12
 DIVISION Planning
 ADDRESS 10th Floor, JK Polk Bldg.
Nashville, TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 11.2.12
 TRANSPORTATION MANAGER 1
 SUITE 1000, JAMES K. POLK BUILDING

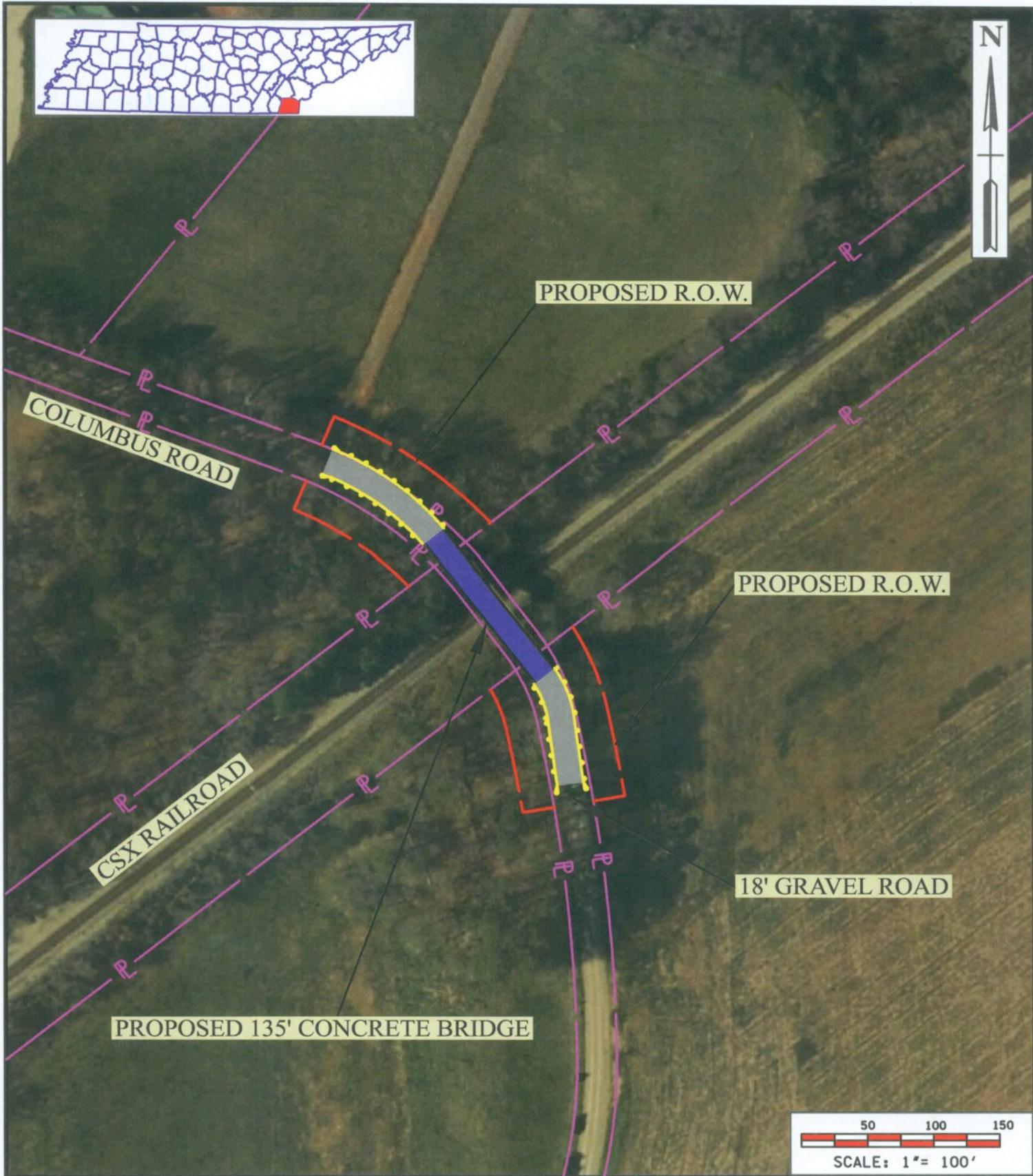
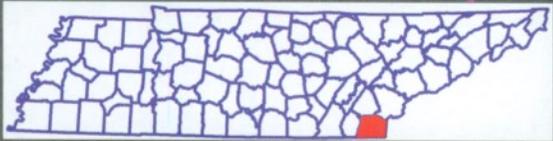
APPROVED BY: DUDLEY DANIEL Dudley Daniel DATE 2 Nov 12
 TRANSPORTATION MANAGER 2
 SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

This Traffic is based on 1999 Bridge Count and County 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.



BRIDGE REPLACEMENT
LOCAL ROUTE 0A317 (COLUMBUS ROAD)
BRIDGE OVER CSX RAILROAD
L.M. 1.13
BRIDGE NUMBER 700A3170001
POLK COUNTY, TN

DRAWN BY:

BJH

CHECKED BY:

HAM

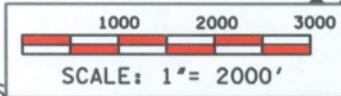
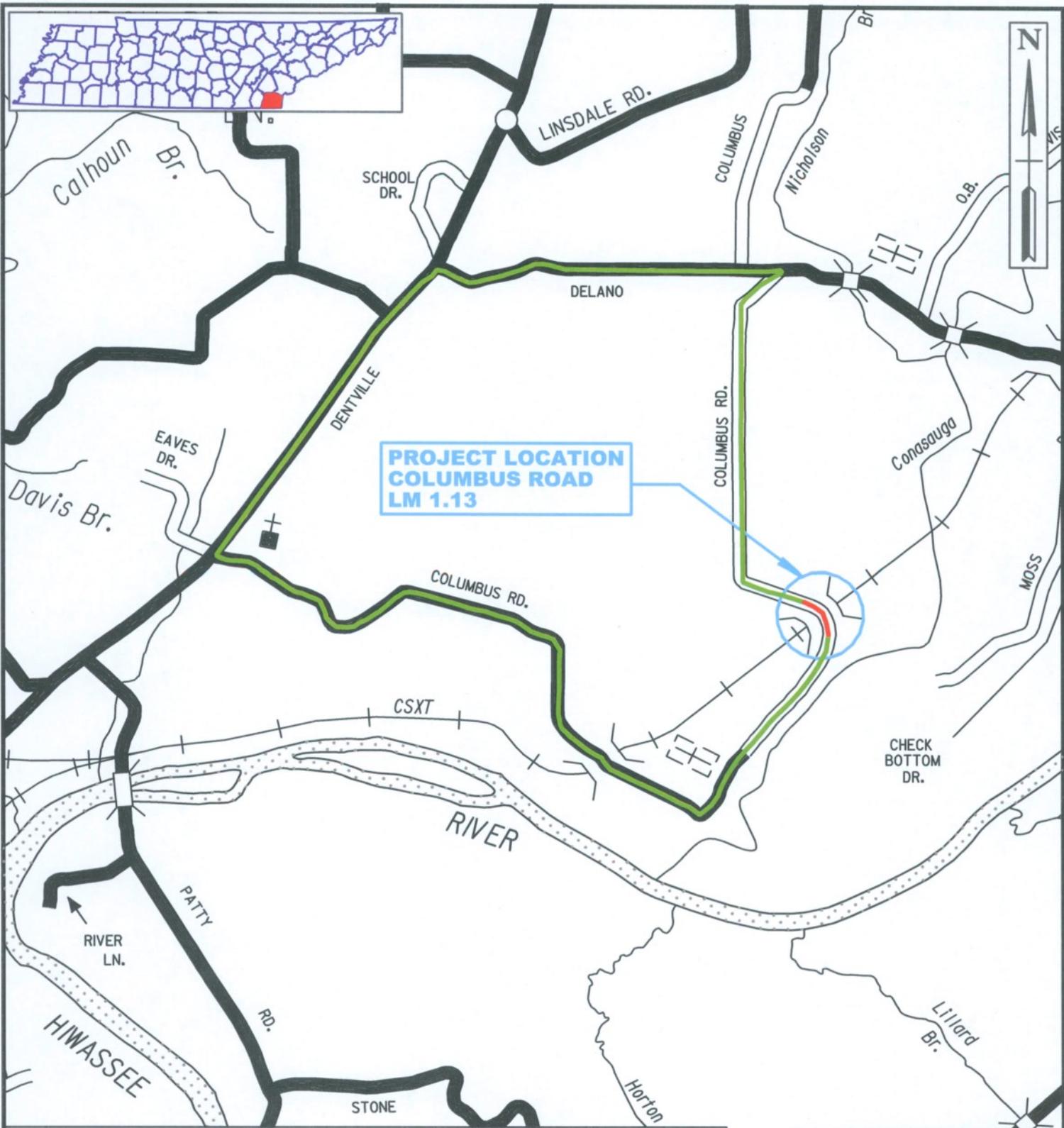
LOCAL ROUTE 0A317 L.M. 1.13

PIN 117922.00

FIGURE 1

DATE:

06-20-2013



**DETOUR MAP
LOCAL ROUTE 0A317 (COLUMBUS ROAD)
BRIDGE OVER CSX RAILROAD
L.M. 1.13
BRIDGE NUMBER 700A3170001
POLK COUNTY, TN**

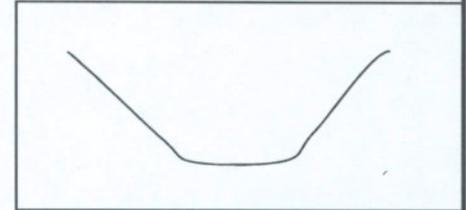
DRAWN BY: BJH	CHECKED BY: HAM
LOCAL ROUTE 0A317 L.M. 1.13	
PIN 117922.00	
FIGURE 2	DATE: 06-20-2013

SITE INSPECTION

INSPECTION MADE BY: Karen Anderson and Harvey McKaig BRIDGE ID: 700A3170001 COUNTY: Polk
 Date: 1/17/13 Route Name: 0A317 (Columbus Road) Stream Name: CSX Railroad @ L.M. 1.13

CHANNEL

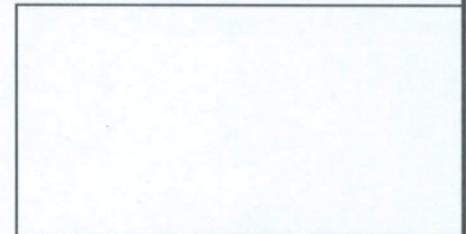
Approx depth and width of channel: Horizontal: _____ Vertical: _____
 Depth of normal flow: _____ In Reservoir: Yes No
 Depth of Ordinary High Water: _____
 Type of material in stream bed: _____
 Type of vegetation on banks: _____
 "N" factor of the channel: _____
 Are channel banks stable: Yes No
 If the streambed is gravel: $D_{30} =$ _____ $D_{85} =$ _____
 Skew of the channel with the roadway: _____°



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.: _____ Right U.S.: _____
 Left D.S.: _____ Right D.S.: _____
 Are roadway approaches lower than the structure? Yes No
 Are there any buildings in the floodplain? Yes No
 Approx. floor elevations: _____
 Flood information from local residents:
 (elevations & dates) _____



Floodplain Sketch

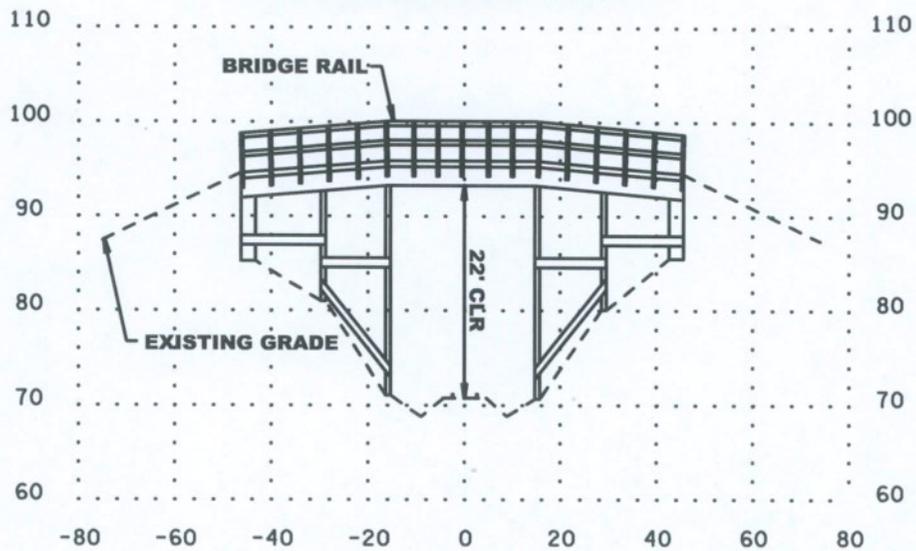
EXISTING STRUCTURE

Length: 92' No. of spans: 5 Structure type: Timber/SIB No. of lanes: 1 Skew: 90°
 Width (out to out): 17' Width (curb to curb): 16' Approach: paved graveled
 Sidewalks on Structure: Yes No Bridgerail type: Timber Bridgerail height = 4'2"
 Superstructure depth: 2'2" Finished Grade to low girder = 2" Girder depth = 2'
 Are any substructures in the channel? Yes No Vertical Clearance = 22.0 ft
 Indications of overtopping: NA
 High water marks: NA
 Local scour: Yes, NA No
 Any signs of stream aggradation or degradation? NA
 Any drift or drift potential? Yes, _____ NA No
 Any obstructions (pipes, stock fences, etc.)? NA

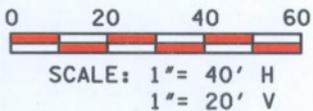
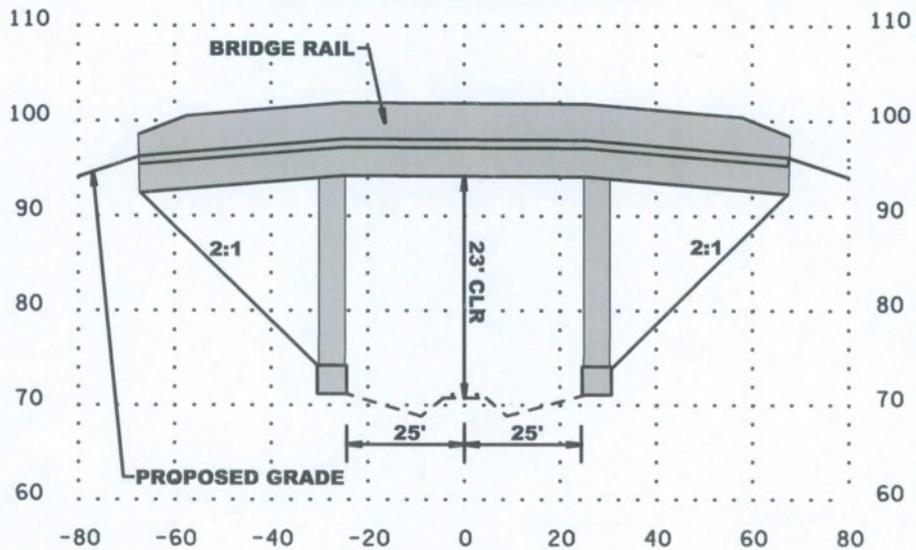
PROPOSED STRUCTURE

Replacement Rehabilitate Widening New Location
 Bridge length: 135 ft Bridge type: Concrete Span arrangement: 3 Skew: 90°
 Bridge width: 22.0 ft Sidewalks: NA Design Speed (MPH): 15 ADT (2036) = 60
 Proposed grade: Increase 2' 6" Proposed alignment: _____ Maintain Existing _____
 Method of maintaining traffic: Stage construction On site detour Close road Shift Centerline _____
 Cost of proposed Structure: \$125 per ft² X 135 / 22 length (ft) / width (ft) Cost = \$371,300
 Cost of bridge removal: \$15 per ft² X 92 / 18 length (ft) / width (ft) Cost = \$24,900
 Detour structure: Type and size = NA Cost = \$0
Total Structure Cost = \$396,200

EXISTING STRUCTURE



PROPOSED STRUCTURE



BRIDGE SECTIONS
LOCAL ROUTE 0A317 (COLUMBUS ROAD)
BRIDGE OVER CSX RAILROAD
L.M. 1.13
BRIDGE NUMBER 700A3170001
POLK COUNTY, TN

Bridge ID: 700A3170001
Polk County



View of Structure from East



View of Structure from West



Southbound Bridge Approach on Columbus Road



Northbound Bridge Approach on Columbus Road



South Approach Left



South Approach Right

Bridge ID: 700A3170001
Polk County



East View from Bridge on Columbus Road



West View from Bridge on Columbus Road

Bridge ID: 700A3170001
Polk County



East View Right from Columbus Road



East View Left from Columbus Road

Bridge ID: 700A3170001
Polk County



West View Right from Columbus Road



West View Left from Columbus Road

Bridge ID: 700A3170001
Polk County



North View from Bridge



South View from Bridge