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: Rick Pack, Transportation Manager II
Program Development and Scheduling Office

FROM: Chris Armstrong, Transportation Manager I CA
Project Planning Division

DATE: October 17, 2012

SUBJECT: Transportation Planning Report, Special Bridge Replacement Program

REGION	PIN	COUNTY	ROUTE	TERMINI
1	115677.00	Campbell	State Route 297	Bridge over Elk Fork Creek

I am enclosing a copy of the subject report bearing the signatures of the appropriate department personnel. In addition, a PDF file of the Transportation Planning Report (TPR) will be available on the Planning Office TPR Database, PPRM and Transportal.

This report is being provided for your use in determining priorities, establishing future scheduling, and initiating further development of the project.

If you need further information, please contact me.

CBA:lr

CC: Paul Degges, Toks Omishakin, Wayne Seger, Jeff Jones, Carolyn Stonecipher, Steve Allen, Jim Moore, Tanisha Hall, Liza Joffrion, Steve Borden, Jeff Hoge, Mike Tugwell, Jennifer Lloyd, Bill Hart, Terry Gladden, Terry Leatherwood, Angie Midgett, Paul Beebe, Jon Zirkle, Nathan Vatter, Deborah Fleming, Oliver Farris, Ronnie Walker, TDOT.EnvironmentalDoc@tn.gov, File

CC/Enc: Don Brown (East Tennessee RPO Coordinator), Leigh Ann Tribble (FHWA)

TRANSPORTATION PLANNING REPORT

Special Bridge Replacement Program

STATE ROUTE 297
BRIDGE OVER ELK FORK CREEK
CAMPBELL COUNTY
PIN 115677.00

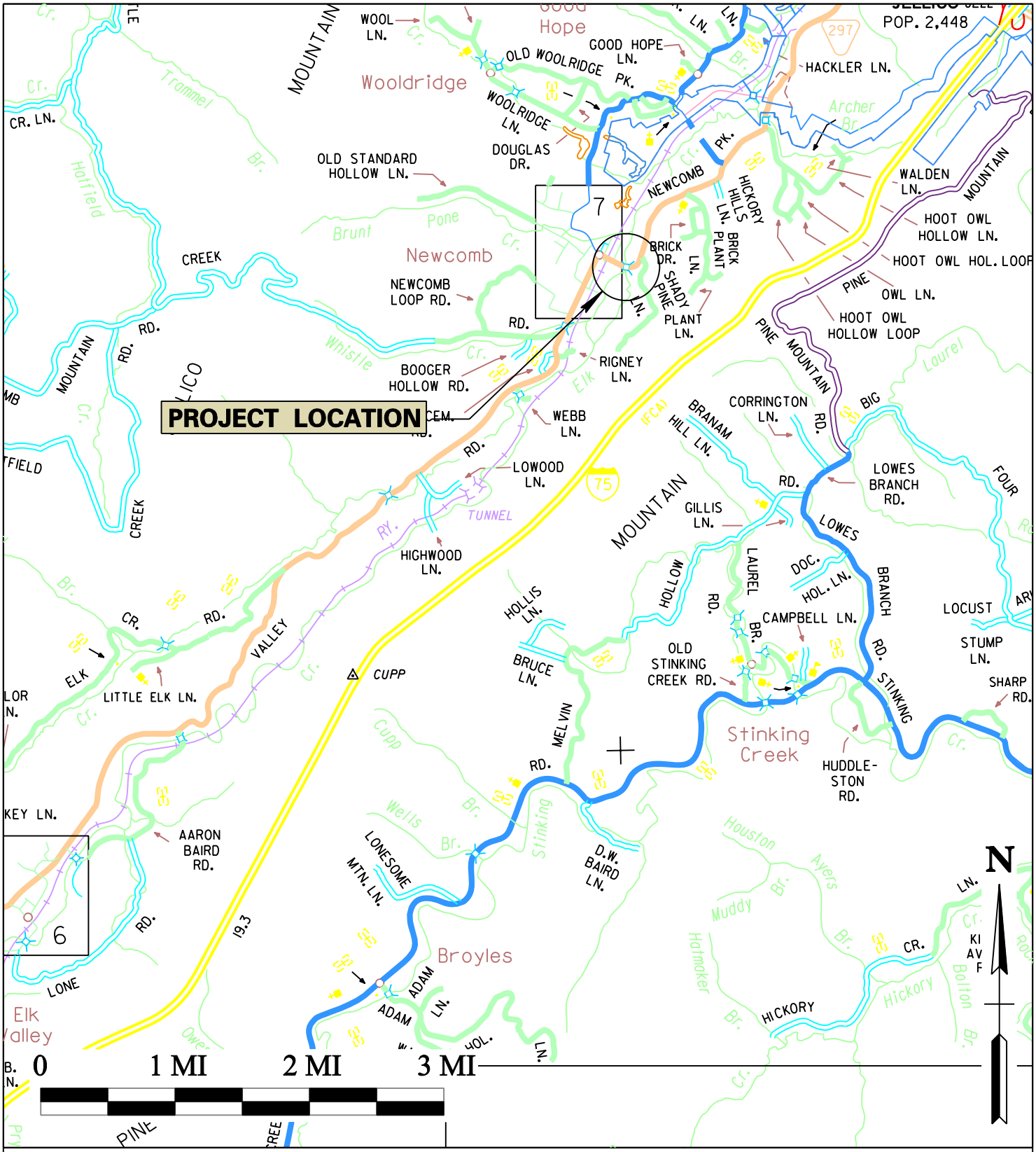
PREPARED BY THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Approved by _____ *Date* 8/22/12
Chief of Environment and Planning

Approved by _____ *Date* 10/8/12
Chief Engineer

Approved by:	Signature	DATE
Transportation Director **Project Planning Division**		7-17-12
Engineering Director **Design Division**		7/18/12
Engineering Director **Structures Division**		7/20/12

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



AREA MAP

STATE ROUTE 297 (SR297) CAMPBELL COUNTY

BRIDGE OVER ELK FORK CREEK @ L.M. 14.79

BRIDGE ID 07S23450013

PROJECT MAP

STATE ROUTE 297 (SR297) CAMPBELL COUNTY

BRIDGE OVER ELK FORK CREEK @ L.M. 14.79

BRIDGE ID 07S23450013

0' 100' 200' 300'

SCALE: 1" = 200'

AERIAL MAP

STATE ROUTE 297 (SR297) CAMPBELL COUNTY

BRIDGE OVER ELK FORK CREEK @ L.M. 14.79

BRIDGE ID 07S23450013

TRANSPORTATION PLANNING WORKSHEET
BRIDGE REPLACEMENT ANALYSIS, NEEDS, AND COSTS

County: Campbell Route: State Route 297 Log Mile: 14.79
Feature Crossed: Elk Fork Creek System: STP
Functional Class: Rural Major Collector Bridge ID: 07S23450013

EXISTING CONDITIONS

2016 AADT: 2,060 App. Cross Section: 22' / 24' / 50' No. Lanes: 2
Approach Alignment: Tangent Year Built: 1950 Load Limit: H14
Width (out to out): 28.5 Sidewalks: Right -- Left -- Length: 313
No. Spans: Approach: -- Main: 11
Substructure: Concrete Abutments / Piers Vertical Clearance: 18.6' Sufficiency Rating: 40.3
Other: Existing utilites attached to bridge structure do not appear functional.

PROPOSED IMPROVEMENTS

STANDARDS FROM RD01-TS- 2 Type of Work: Replace
Design Year: 2036 Design AADT: 2,470 Terrain Rolling ADL (F): -- (R): --
Project Length: 1434 ft Bridge Length: 384 ft Approach Length: 1 @ 750' & 1 @ 300'
Design Speed (MPH):* 40 Posted Speed (MPH): 45
Approach Width:* 24' /40'/ As Req'd Bridge Width (O to O): 43 ft No. Lanes: 2
Right-of-Way Required: 2 (0.3 acres) Tract(s) Structure Type: Prestressed Conc.
* Design Exception Required due to Radius of Curve

MAINTENANCE OF TRAFFIC

Temporary Detour: ☐ Temporary Runaround: ☐ Stage Construct: ☑
Alternate Route: None

Remarks: The centerline is to be shifted approximately 68 ft, allowing the existing structure to remain open until the proposed sturcture is completed.

ESTIMATED COST

Right-of-Way: $20,000 Approaches: $689,600 Structure: $2,610,600
Preliminary Engineering: $446,200 Utilities: $43,000 Misc./Cont.: $906,400
Mobilization: $193,200 Total: $4,909,000

Remarks: Lane width's to be increased to 12 ft and shoulders to be increased to 8 ft with the centerline to be shifted to the North approximately 68 ft. The current elevation of the roadway is to be increased by 2 ft in order to maintain the clearance above the 100 yr estimated flood elevation. A design exception will be req'd due to the proposed radius falling below the allowable for a 50 MPH design speed (See Safety Recommendations sheet for safety improvements).

Field Investigation by: Jay Morgan (Reg. 1 Design), Christie Brown (Reg. 1 Design), Gena Gilliam (Short Range Plan), David Duncan (Conceptual Planning), Mike Gilbert (Conceptual Planning), Henry Reid IV (Reg. 1 Design)

Route:	**SR 297**
Description:	**Bridge over Elk Fork Creek (07S23450013)**
	L.M. 14.79
County:	**CAMPBELL**
Length:	**0.1 Miles**
Date:	**January 10, 2012**

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
Right-of-Way	$ -	$ 4,000	$ 16,000	$ 20,000
Clearing and Grubbing	$ -	$ 8,000	$ 32,000	$ 40,000
Earthwork	$ -	$ 15,600	$ 62,200	$ 77,800
Railroad Crossing or Separation	$ -	$ -	$ -	$ -
Drainage	$ -	$ 1,300	$ 5,200	$ 6,500
Utilities	$ -	$ 8,600	$ 34,400	$ 43,000
Structures	$ -	$ 522,100	$ 2,088,500	$ 2,610,600
Pavement Removal	$ -	$ 2,300	$ 9,000	$ 11,300
Paving	$ -	$ 33,800	$ 135,200	$ 169,000
Roadway and Pavement Appurtenances	$ -	$ -	$ -	$ -
Retaining Walls	$ -	$ -	$ -	$ -
Topsoil	$ -	$ -	$ -	$ -
Seeding	$ -	$ 20	$ 80	$ 100
Sodding	$ -	$ 4,000	$ 16,000	$ 20,000
Rip-Rap or Slope Protection	$ -	$ 60,000	$ 240,000	$ 300,000
Fencing	$ -	$ -	$ -	$ -
Signing	$ -	$ 600	$ 2,500	$ 3,100
Pavement Markings	$ -	$ 700	$ 3,000	$ 3,700
Lighting	$ -	$ -	$ -	$ -
Signalization	$ -	$ -	$ -	$ -
Guardrail	$ -	$ 6,600	$ 26,500	$ 33,100
Other Construction Items (15%)	$ -	$ 100,100	$ 400,600	$ 500,700
Maintenance of Traffic	$ -	$ 5,000	$ 20,000	$ 25,000
Mobilization (5%)	$ -	$ 38,600	$ 154,600	$ 193,200
CONSTRUCTION COST (rounded)	$ -	$ 811,300	$ 3,245,800	$ 4,057,100
Engineering and Contingency (10%)	$ -	$ 81,100	$ 324,600	$ 405,700
TOTAL CONSTRUCTION COST (rounded)	$ -	$ 892,400	$ 3,570,400	$ 4,462,800
Preliminary Engineering (10%)	$ -	$ 89,200	$ 357,000	$ 446,200
PROJECT COST [1] (rounded)	**$ -**	**$981,600**	**$3,927,400**	**$4,909,000**

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

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
-	Right-of-Way	LS	LS	$ 20,000.00	$ 20,000
			RIGHT-OF-WAY TOTAL (ROUNDED)		**$ 20,000**
201-01	Clearing and Grubbing	LS	LS	$ 40,000.00	$ 40,000
			CLEAR AND GRUBBING TOTAL (ROUNDED)		**$ 40,000**
203-03	Borrow Excavation (Unclassified)	CY	5185	$ 15.00	$ 77,775
			EARTHWORK TOTAL (ROUNDED)		**$ 77,800**
202-03.01	Removal of Asphalt Pavement	SY	1,867	$ 5.00	$ 9,335
415-01.02	Cold Planning Bituminous Pavement	SY	533	$ 3.50	$ 1,866
			PAVEMENT REMOVAL TOTAL (ROUNDED)		**$ 11,300**
209-08.02	Temporary Silt Fence (w/ backing)		2000	$ 3.25	$ 6,500
			DRAINAGE TOTAL (ROUNDED)		**$ 6,500**
	Above Ground Utilities	LF	500	$ 10.00	$ 5,000
	Underground Utilites	LF	700	$ 40.00	$ 28,000
770-18.10	35FT Wood Pole	EA	2	$ 5,000.00	$ 10,000
			UTILITIES TOTAL (ROUNDED)		**$ 43,000**
	Removal of Existing Bridge	SF	8920.5	$ 15.00	$ 133,808
	384 ft Prestressed Concrete Bridge	SF	16,512	$ 150.00	$ 2,476,800
			STRUCTURES TOTAL (ROUNDED)		**$ 2,610,600**
Asphalt					
--	Full Depth Paving	SY	2900	$ 45.00	$ 130,500
411-03.10	ACS Mix (PG76-22) Grading D	TON	18.4	$ 85.00	$ 1,564
403-01	Bituminous Material for Tack Coat (TC)	SY	1.9	$ 480.00	$ 900
303-01	Mineral Aggregate, TY A Base, Grading D	TON	2407.4	$ 14.93	$ 35,943
			PAVING TOTAL (ROUNDED)		**$ 169,000**
			RETAINING WALLS TOTAL (ROUNDED)		**$ -**
712-01	Traffic Control	LS		$ 25,000.00	$ 25,000
			MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)		**$ 25,000**
203-07	Furnishing & Spreading Topsoil	CY	0	$ 10.00	$ -
			TOPSOIL TOTAL (ROUNDED)		**$ -**
801-03	Water	MG	5	$ 7.00	$ 35
			SEEDING TOTAL (ROUNDED)		**$ 100**
803-01	Sodding (New Sod)	SY	5,000	$ 4.00	$ 20,000
			SODDING TOTAL (ROUNDED)		**$ 20,000**
713-99.91	Signs (Curve Ahead & Chevrons)	S.F.	42.0	$ 40.00	$ 1,680
713-16.05	Railroad Cross-Buck Sign Support	EACH	2	$ 224.24	$ 448
713-02.21	Sign Post Delineation	LF	104	$ 5.03	$ 523
713-16.09	Railroad Advance Warning Sign and Support	EACH	2.0	$ 209.50	$ 419
			SIGNING TOTAL (ROUNDED)		**$ 3,100**
716-02.05	Plastic Pavement Marking (Stop Line)	LF	72	$ 12.41	$ 894
716-01.21	Snowplowable Pvmnt Mrkrs (BI-Dir, 1 Color)	EACH	24	$ 27.47	$ 659
411-12.03	Scoring Rumble Strip (8")	LM	0.83	$ 679.50	$ 564
716-03.02	Plastic Word Pavement Marking (RXR)	EACH	2	$ 320.96	$ 642
716-11.01	Spray Thermo Pvmt Mrkng (4" Line)	LM	0.83	$ 1,100.00	$ 913
			PAVEMENT MARKINGS TOTAL (ROUNDED)		**$ 3,700**
			SIGNALIZATION TOTAL (ROUNDED)		**$ -**
705-04.21	Guardrail Delineation Enhancement	LF	1700	$ 1.50	$ 2,550
705-02.02	Single Guardrail (Type 2)	LF	675	$ 15.55	$ 10,496
705-04.21	Guardrail Delineation Enhancement	LF	1,665	$ 1.50	$ 2,498
706-01	Guardrail Removed	LF	625	$ 2.00	$ 1,250
705-04.07	Type 38 End Terminal	EACH	4	$ 2,500.00	$ 10,000
705-01.01	Guardrail at Bridge Ends	LF	110	$ 56.85	$ 6,254
			GUARDRAIL TOTAL (ROUNDED)		**$ 33,100**
709-05.06	Machined Rip-Rap (Class A-1)	TON	10,000	$ 30.00	$ 300,000
			RIP-RAP OR SLOPE PROTECTION TOTAL (ROUNDED)		**$ 300,000**

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

MEMORANDUM

TO: Project Planning Office

FROM: Mike Gilbert, Roadway Specialist II
Conceptual Planning Office

DATE: July 16, 2012

SUBJECT: TPR Field Review (Special Bridge Replacement Program)
State Route 297 over Elk Fork Creek
Log Mile 14.79
Campbell County

A field review was held for the above-mentioned project on September 20, 2011.

The existing structure consists of eleven (11) spans with concrete T beams, and an out-to-out width of 28.5 feet. The overall bridge length is 313 feet. The sufficiency rating for this bridge is 40.3. 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 14.5 feet and the 10-year flow depth is 11.1 feet.

The proposed alignment for this structure will be shifted to the north approximately sixty-eight (68) feet in order for traffic to be able to traverse across the existing bridge until the proposed structure is completed. It was determined that due to the existing structure lying in a curve and being super elevated, phasing construction would be difficult, and there was also no viable detour to accommodate the current traffic in order to detour traffic. The shift will begin at the start of the curve west of the bridge and tie back into the existing alignment at the tangent section just east of the bridge. The grade will be increased by two (2) feet to account for the proposed structures increase in beam depth. In order to keep the construction limits as small as possible and prevent residents from having to relocate, a design exception will be required due to the proposed radius of the curve on the structure. The current radius is approximately 365 feet and the proposed radius will be approximately 500 feet, which is below the minimum allowable radius of 760 feet for a 50 mph design speed according to Design Standard RD01-TS-2. Safety recommendations to be installed due to the design exception include installing chevrons along outside of the curve, guardrail and barrier delineation along the guardrail and

parapet, eight (8) inch rumble stripes, and reflective, snowplowable centerline pavement markers. (Refer to sheet two (2) for the recommended safety improvements as a result of the design exception.) There will be a small amount of right-of-way (approximately 0.3 acres) to be acquired due to the new alignment of the proposed structure. Some utilities will also have to be relocated; however, the utilities that are attached to the structure appear to have been abandoned. The railroad crossing that lies west of the bridge will be within 200 feet of the project; therefore the Shanklin Law upgrades will be required at this crossing. Refer to Appendix A included in the back of the TPR for the specified updates.

The route has a base year (2016) AADT of 2,060 and a design year (2036) AADT of 2,470. The bridge over Elk Fork Creek will be designed to meet Road Design Standard RD01-TS-2. The proposed structure is to consist of a seven (7) span, Pre-Stressed Concrete Bridge, with a total width of forty-three (43) feet. The structure is to contain two (2), twelve (12) foot lanes with two (2), eight (8) foot shoulders. The total length of the proposed structure is to be 384 feet with a total clearance of approximately 17.8 feet, which is above the 100-year flood depth of 14.5 feet.

The required approach work, utility relocations, estimated replacement, and preliminary engineering costs for this bridge are approximately $4,909,000.

MG

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		X
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		
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		
15.	Railroad crossings		
16.	Hazardous materials site		

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: _____ ROUTE: SR-297
COUNTY: CAMPBELL CITY: NEWCOMB
PROJECT PIN NUMBER: 115677.00
PROJECT DESCRIPTION: SPECIAL BRIDGE REPLACEMENT PROGRAM
BRIDGE OVER ELK FORK CREEK (LM 14.79)

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
2,060	2016	2,470	247	10	2036	65-35	3	4		

REQUESTED BY: NAME TYLER KING DATE 4/5/11
DIVISION PLANNING
ADDRESS 9th FLOOR
J.K. POLK BLDG.

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 4-26-11
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: BILL HART Bill Hart DATE 4/26/11
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

THIS TRAFFIC BASED ON A 2010 CYCLE COUNT. FUTURE TRAFFIC BASED ON GROWTH TRENDS 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 AADT's OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 9/20/07)

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

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2011	CAMPBELL	1

REFER TO STANDARD T-RR-1 & T-S-16
(SEE APPENDIX "A" FOR R.R. UPGRADE RECOMMENDATIONS)

716 FT RADIUS (50 MPH DESIGN SPEED)

200'

C.L.

C.L.

12 FT LANES W/ 8 FT SHOULDERS

500 FT RADIUS (40 MPH DESIGN SPEED)

384 FT BRIDGE

>>ELK FORK CREEK>>

0' 100' 200' 300'

N

BRIDGE REPLACEMENT

STATE ROUTE 297
BRIDGE I. D. 07S23450013 (L.M. 14.79)
CAMPBELL COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

FIGURE 1 OF 2
S.R. 297
L.M. 14.79

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

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2011	CAMPBELL	2

REFER TO STANDARD T-RR-1 & T-S-16
(SEE APPENDIX "A" FOR R.R. UPGRADE RECOMMENDATIONS)

W1-2

W1-2

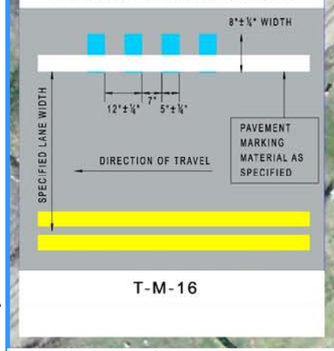
8" EDGELINE RUMBLE STRIPES

SNOWPLOWABLE PAVEMENT MARKERS (40' SPACING)

GUARDRAIL & BARRIER DELINEATION ENHACNEMENT

200'

RUMBLE STRIPE DETAIL



T-M-16

W1-8

120'

W1-8

120'

120'

W1-8

120'

120'

W1-8

120'

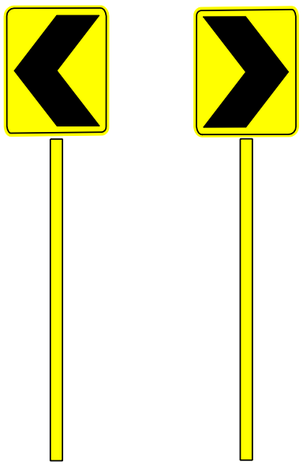
W1-8

W1-8

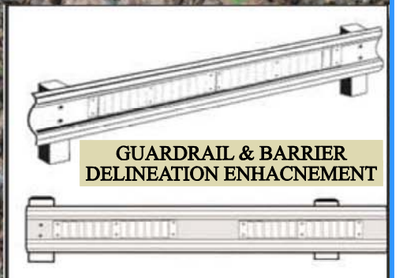
W1-8

W1-8

W1-8



2" YELLOW REFLECTIVE STRIPS



GUARDRAIL & BARRIER DELINEATION ENHACNEMENT

0' 100' 200' 300'

N

SAFETY RECCOMMENDATIONS

STATE ROUTE 297
BRIDGE I. D. 07S23450013 (L.M. 14.79)
CAMPBELL COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

FIGURE 2 OF 2
S.R. 297
L.M. 14.79

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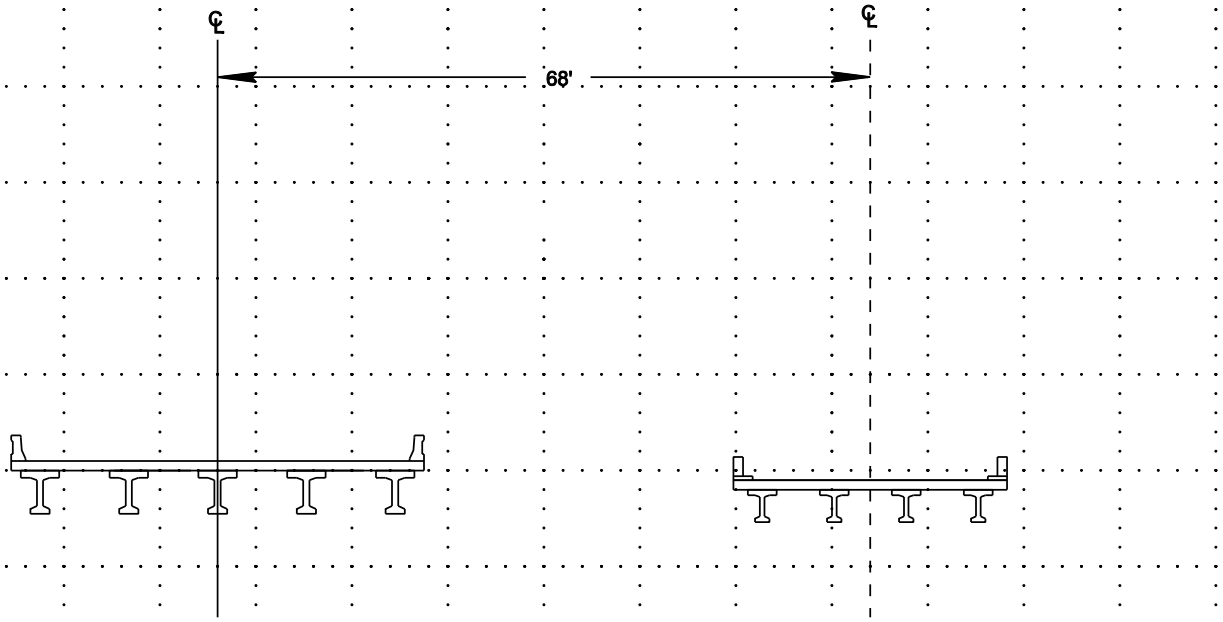


0' 10' 20' 30'

SCALE: 1" = 10'

STAGE CONSTRUCTION DETAIL

STATE ROUTE 297 (SR297) CAMPBELL COUNTY

BRIDGE OVER ELK FORK CREEK @ L.M. 14.79

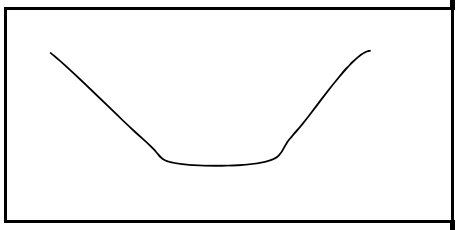
BRIDGE ID 07S023450013

SITE INSPECTION

INSPECTION MADE BY: Mike Gilbert BRIDGE ID: 07S23450013 COUNTY: Campbell
Date: 6/26/11 Route Name: State Route 297 Stream Name: Elk Fork Creek @ L.M. 14.79

CHANNEL

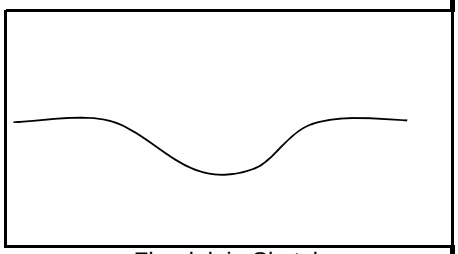
Approx depth and width of channel: Horizontal: 47' Vertical: 3.6'
Depth of normal flow: 3.6' In Reservoir: ☐ Yes ☑ No
Depth of Ordinary High Water: N/A
Type of material in stream bed: Clean and Straight
Type of vegetation on banks: Heavy Brush / Trees
"N" factor of the channel: 0.03
Are channel banks stable: ☑ Yes ☐ No
If the streambed is gravel: D_{30} = -- D_{85} = --
Skew of the channel with the roadway: 90 °



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.: Heavy Brush (0.075) Right U.S.: Trees (0.15)
Left D.S.: Trees (0.15) Right D.S.: Trees (0.15)
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: 313 No. of spans: 11 Structure type: Conc. Tee-Beam No. of lanes: 2 Skew: 90 °
Width (out to out): 28.5' Width (curb to curb): 23.9' Approach: ☑ paved ☐ graveled
Sidewalks on Structure: ☐ Yes ☑ No Bridgerail type: Conc. Parapet Bridgerail height = 3.1'
Superstructure depth: 5.7' Finished Grade to low girder = 2.6' Girder depth = 1.6'
Are any substructures in the channel? ☑ Yes ☐ No Vertical Clearance= 18.6 ft
Indications of overtopping: None
High water marks: N/A
Local scour: ☐ Yes, ☑ No
Any signs of stream ☐ aggradation or ☐ degradation? None
Any drift or drift potential? ☐ Yes, None ☑ No
Any obstructions (pipes,stock fences,etc.)? None

PROPOSED STRUCTURE

☑ Replacement ☐ Rehabilitate ☐ Widening ☐ New Location
Bridge length: 384 ft Bridge type: Prestressed Conc. Span arrangement: 6 @ 44' & 1 @ 120' Skew: 90 °
Bridge width: 43.0 ft Sidewalks: No Design Speed (MPH): 40 ADT (2036) = 2,470
Proposed grade: Increase 2 ft Proposed alignment: Shift Approximately 68 ft
Method of maintaining traffic: ☐ Stage construction ☐ On site detour ☐ Close road ☑ Shift Centerline
Cost of proposed Structure: $150 per ft^2 X 384 / 43 length (ft) / width (ft) Cost = $2,476,800
Cost of bridge removal: $15 per ft^2 X 313 / 28.5 length (ft) / width (ft) Cost = $133,800
Detour structure: Type and size = N/A Cost = $0

Total Structure Cost = $2,610,600

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

County:	Campbell	By:	MG
Bridge ID:	07S23450013	Date:	8/29/11
Route:	State Route 297	PIN:	115677.00
Feature Crossed:	Elk Fork Creek		
Log Mile:	14.79		

DRAINAGE BASIN

Measurement from quad =	25,920	acres
Contributing Drainage Area, CDA = acres/640 =	40.50	sq. mi.

USGS REGRESSION EQUATIONS FOR FLOW

Q_2 = 207(CDA)^0.725 =	3,030	cfs
Q_5 = 344(CDA)^0.715 =	4,852	cfs
Q_{10} = 444(CDA)^0.711 =	6,170	cfs
Q_{25} = 578(CDA)^0.708 =	7,943	cfs
Q_{50} = 682(CDA)^0.706 =	9,304	cfs
Q_{100} = 788(CDA)^0.705 =	10,710	cfs

DEPTH OF FLOW EQUATIONS

10-Year Flood Depth = 5.33(CDA)^0.197 =	11.1	ft
100-Year Flood Depth = 7.43(CDA)^0.181 =	14.5	ft

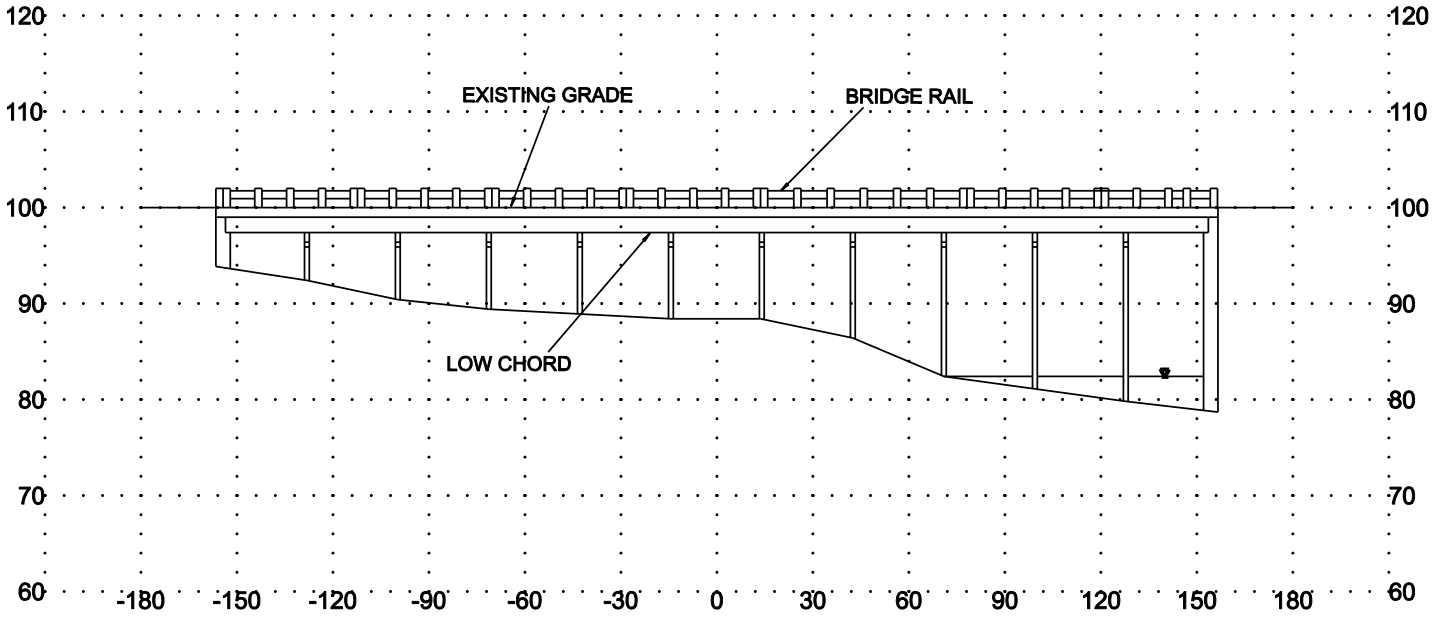
AREAS

Existing Area Below Low Chord =	566	ft^2
Proposed Area Below Low Chord =	570	ft^2
Proposed 10-Year Flood Area, A_{10} =	183	ft^2
Proposed 100-Year Flood Area, A_{100} =	303	ft^2

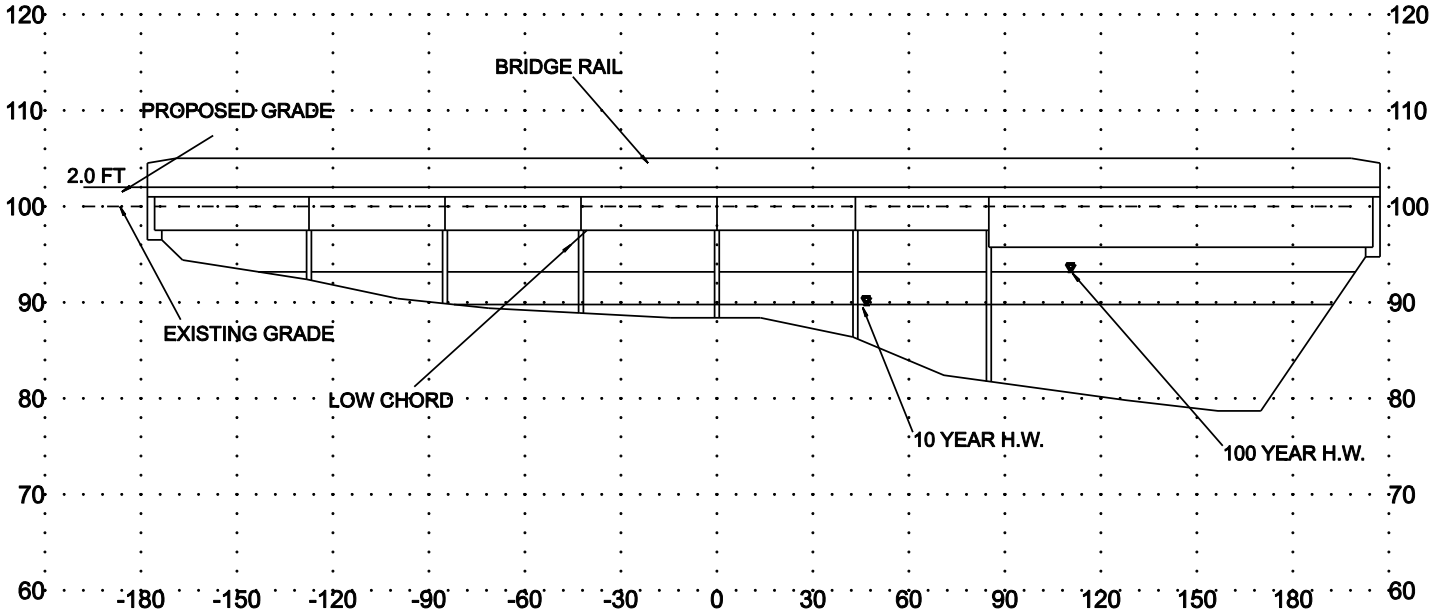
VELOCITIES

Proposed 10-Year Flood Velocity, $V_{10} = Q_{10}/A_{10}$ =	33.7	fps
Proposed 100-Year Flood Velocity, $V_{100} = Q_{100}/A_{100}$ =	35.3	fps

EXISTING STRUCTURE (INLET)



PROPOSED STRUCTURE (INLET)



0' 20' 40' 60'

SCALE: 1" = 40'

BRIDGE SECTIONS

STATE ROUTE 297 CAMPBELL COUNTY

BRIDGE OVER ELK FORK CREEK @ L.M. 14.79

BRIDGE ID 07S23450013

Bridge ID: 07S23450013
Campbell County

View of Structure

Bridge Number

Bridge ID: 07S23450013
Campbell County

Eastbound Bridge Approach on SR 297

Westbound Bridge Approach on SR 297

Bridge ID: 07S23450013
Campbell County

Bridge Looking East on SR 297

Bridge Looking West on SR 297

Bridge ID: 07S23450013
Campbell County

Bridge Rail

Structure

Bridge ID: 07S23450013
Campbell County

Substructure

Damaged Parapet

Debris at Bridge Pier

Inlet

Bridge ID: 07S23450013
Campbell County

Outlet

Upstream

Bridge ID: 07S23450013
Campbell County

Upstream Right

Upstream Left

Bridge ID: 07S23450013
Campbell County

Downstream

Downstream Right

Bridge ID: 07S23450013
Campbell County

Downstream Left

Overhead Utilities

Bridge ID: 07S23450013
Campbell County

Underground Utilities

Abandoned Bridge Utilities

Railroad At-Grade Crossing West of Bridge (Pic #1)

Railroad At-Grade Crossing West of Bridge (Pic #2)

Bridge ID: 07S23450013
Campbell County

Railroad At-Grade Crossing Number

Appendix A

Railroad Recommendations

Michael Gilbert

From: Jennifer Rose
Sent: Monday, January 23, 2012 1:38 PM
To: Jim Byrd
Cc: Brian Hurst; Michael Gilbert; Brandon Darks; Mary D. McFarlin
Subject: SR-297 730957G Shanklin Upgrade Recommendations
Attachments: T-RR-1.pdf; T-S-16.pdf

Jim,

This project probably has not made it down to you yet, but it is an in-house bridge TPR and its project limits are within 200' of a NS grade crossing. It is on State Route 297 in Campbell County, and the bridge ID number is 07S23450013. The crossing is not a current Section 130 project.

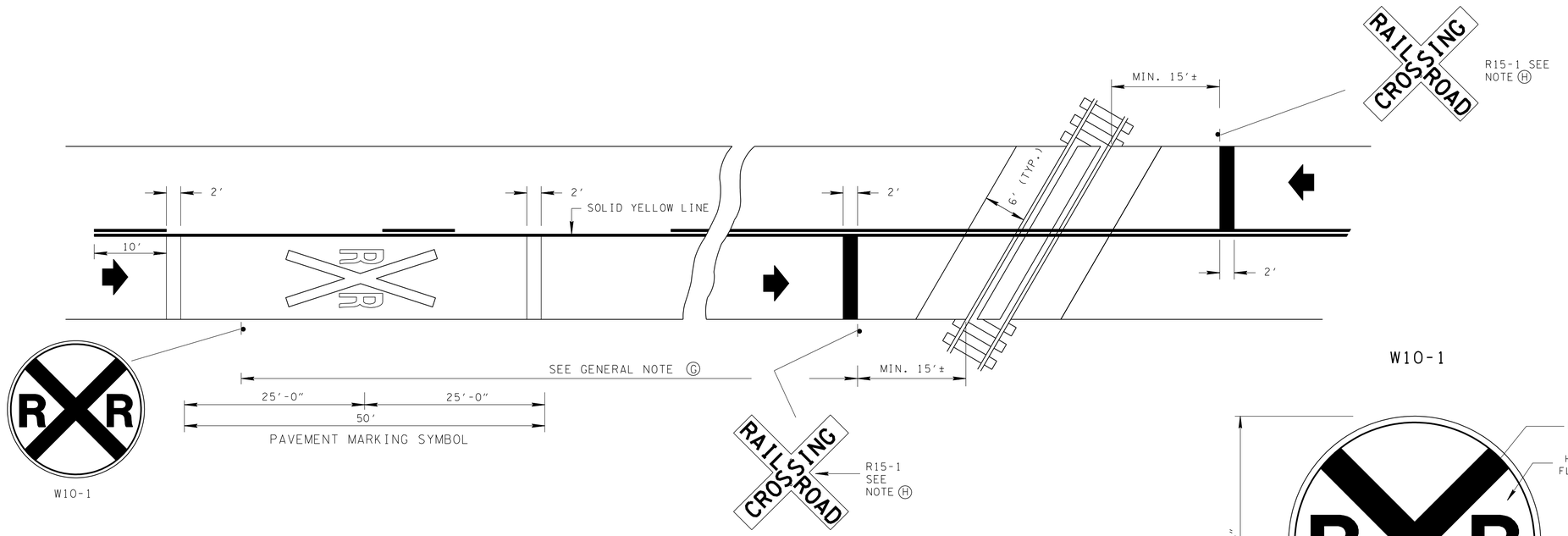
 # 730957G, Newcomb Rd., SR-297, Campbell County
AADT: 2289 Vehicles
Daily Train Count: 5 Trains
Maximum Train Speed: 25 mph
School Bus Crossing: Yes
Past Accidents: None
Existing Warning Devices:

- 2 R15-1
- 2 Automatic Gates
- 4 Mast-Mounted Flashing Light Pairs
- 4 Cantilevered Flashing Light Pairs
- 1 R15-2P
- 2 W10-1
- 2 RXR Pavement Markings

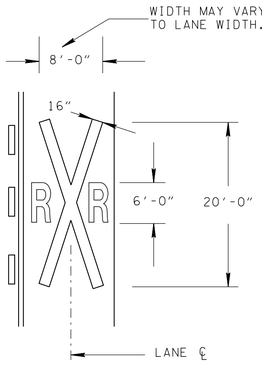
Recommendations: I recommend adding/upgrading the signing and pavement markings so that they meet the 2009 MUTCD standards as needed. Please refer to the attached TDOT standard drawings T-RR-1 and T-S-16.

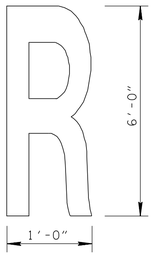
Please let me know if you have any questions or need anything else concerning this.

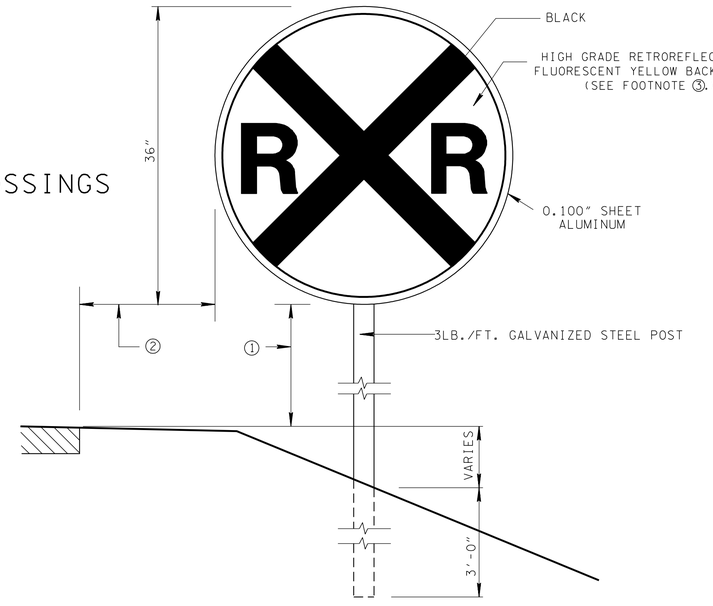
Jenna



TYPICAL PAVEMENT MARKINGS AT RAILROAD-HIGHWAY GRADE CROSSINGS







TO BE PAID FOR UNDER ITEM 713-16.09 RAILROAD ADVANCE WARNING SIGN AND SUPPORT.

(36 INCH DIAMETER SIGN)

RAILROAD ADVANCE WARNING SIGN

GENERAL NOTES

Ⓐ A PORTION OF PAVEMENT MARKING SYMBOL SHOULD BE DIRECTLY OPPOSITE THE ADVANCE WARNING SIGN (W10-1).

Ⓑ A THREE LANE ROADWAY SHOULD BE MARKED WITH A CENTERLINE FOR TWO LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING.

Ⓒ ON MULTI-LANE ROADS THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL "RxR" SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.

Ⓓ PAVEMENT MARKINGS MATERIAL CAN BE EITHER PAINT OR PLASTIC AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.

Ⓔ REFER TO STANDARD ALPHABET FOR HIGHWAY SIGNS AND MARKINGS FOR RxR SYMBOLS DETAILS.

Ⓕ THE COST OF ALL TRANSVERSE BANDS SHALL BE IN THE PRICE BID FOR THE "RxR" SYMBOLS AT EACH RAILROAD CROSSING.

Ⓖ PLACEMENT OF THE RAILROAD ADVANCE WARNING SIGN SHALL GENERALLY BE IN ACCORDANCE WITH SECTION 2C-06 TABLE 2C-4 CONDITION B OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

Ⓗ RAILROAD CROSS-BUCK SIGN AND SUPPORT SHALL BE INSTALLED IN ACCORDANCE WITH T-S-16. REFER TO T-S-16A AT PASSIVE RAILROAD GRADE CROSSINGS FOR YIELD SIGN INSTALLATION.

FOOTNOTES

① SIGNS ERECTED AT THE SIDE OF THE ROAD IN RURAL DISTRICTS SHALL BE MOUNTED AT A HEIGHT OF AT LEAST 5 FEET, MEASURED FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVEMENT. IN BUSINESS, COMMERCIAL AND RESIDENTIAL DISTRICTS WHERE PARKING AND/OR PEDESTRIAN MOVEMENT IS LIKELY TO OCCUR OR WHERE THERE ARE OTHER OBSTRUCTIONS TO VIEW, THE CLEARANCE TO THE BOTTOM OF THE SIGN SHALL BE AT LEAST 7 FEET.

② NORMALLY, SIGNS SHOULD NOT BE CLOSER THAN 6 FEET FROM THE EDGE OF THE SHOULDER, OR IF NONE, 12 FEET FROM THE EDGE OF THE TRAVELED WAY. IN URBAN AREAS A LESSER CLEARANCE MAY BE USED WHERE NECESSARY. ALTHOUGH 2 FEET IS RECOMMENDED AS A WORKING URBAN MINIMUM, A CLEARANCE OF 1 FOOT FROM THE CURB FACE IS PERMISSABLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.

③ SEE TDOT SPECIAL PROVISION 713A REGARDING SPECIFICATIONS FOR HIGH GRADE REFLECTIVE SHEETING.

REV. 5-16-75: ADDED NOTE PERTAINING TO HEIGHT OF RAILROAD ADVANCE WARNING SIGN IN RURAL, BUSINESS, COMMERCIAL & RESIDENTIAL DISTRICTS.

REV. 10-10-75: ADDED NOTE REGARDING PAVEMENT MARKING MATERIAL.

REV. 5-9-78: ADDED RAILROAD ADVANCED WARNING SIGN NUMBER AND REQUESTED DISTANCES FOR SIGN AND PAVEMENT MARKINGS.

REV. 9-14-78: ADJUSTED STOP BARS AT TRACK.

REV. 7-30-79: ADDED TABLE SHOWING DIMENSION C. ADDED DIMENSIONS TO TYPICAL PAVEMENT MARKINGS DRAWING. DELETED TABLE SHOWING DISTANCES FOR WARNING DEVICES. DELETED NOTE REGARDING WARNING SIGNS IN RURAL AREAS AND NOTE REGARDING DISTANCE FROM MARKINGS TO TRACKS BASED ON SPEED AND SIGHT DISTANCE.

REV. 4-3-80: CHANGED DIMENSION BETWEEN CROSS BARS TO THE CENTER OF THE R/R "X" SYMBOL TO 25′-0". CHANGED THE HEIGHT OF THE "R" TO 6′-0". CARRIED THE CENTER LINE STRIPES THRU THE CROSSING. DELETED THE "12′ MINIMUM" DIMENSION FROM THE CENTER LINE OF THE TRACK TO THE STOP BAR.

REV. 4-10-80: UPDATE TO CONFORM WITH THE M.U.T.C.D.

REV. 4-10-80: CHANGED DRAWING NUMBER FROM AW-01 TO T-RR-1.

REV. 6-15-82: CORRECTED NOTE REGARDING OFFSET DISTANCE TO WARNING SIGN. ADDED NOTE REGARDING PAYMENT FOR TRANSVERSE LINES AT EACH CROSSING.

REV. 5-22-84: WIDTH OF "R" CORRECTED TO 1′-0".

REV. 8-5-85: CHANGED DIMENSION "C". ADDED GENERAL NOTE. CHANGED PAVEMENT MARKING NOTE AND SIGN NOTE.

REV. 6-22-88: CHANGED WEIGHT OF STEEL POST.

REV. 11-1-88: ADDED SIGN SHEET THICKNESS.

REV. 8-22-91: RELOCATED PLACEMENT OF W10-1 SIGN. ADDED NOTE Ⓐ AND REVISED NOTE Ⓖ.

☐ REV. 7-29-96: CHANGED MATERIAL ON BACKGROUND OF RAILROAD ADVANCE WARNING SIGN

☐ REV. 1-19-99: ADDED FOOTNOTE ③.

☐ REV. 7-29-04: CHANGED PLAN VIEW TO CLARIFY DETAIL.

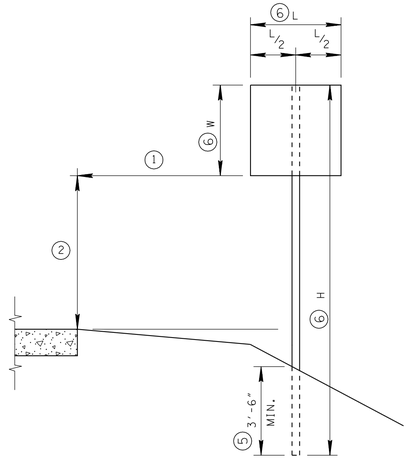
☐ REV. 10-23-06: ADDED CROSSBUCK SIGN AND GENERAL NOTE Ⓗ.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

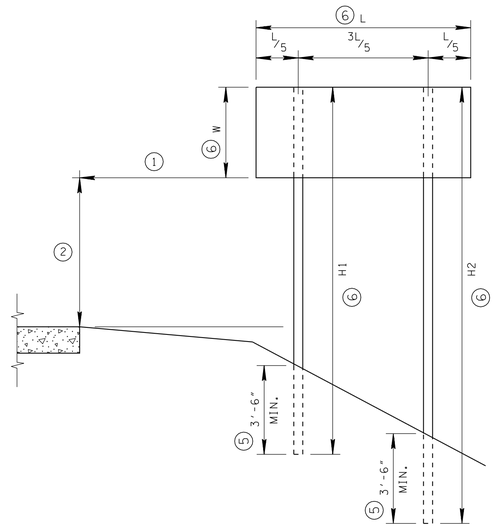
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING AT RAILROAD HIGHWAY GRADE CROSSINGS AND RAILROAD ADVANCE WARNING SIGN

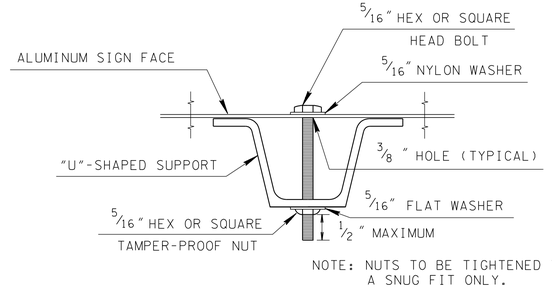
T-RR-1



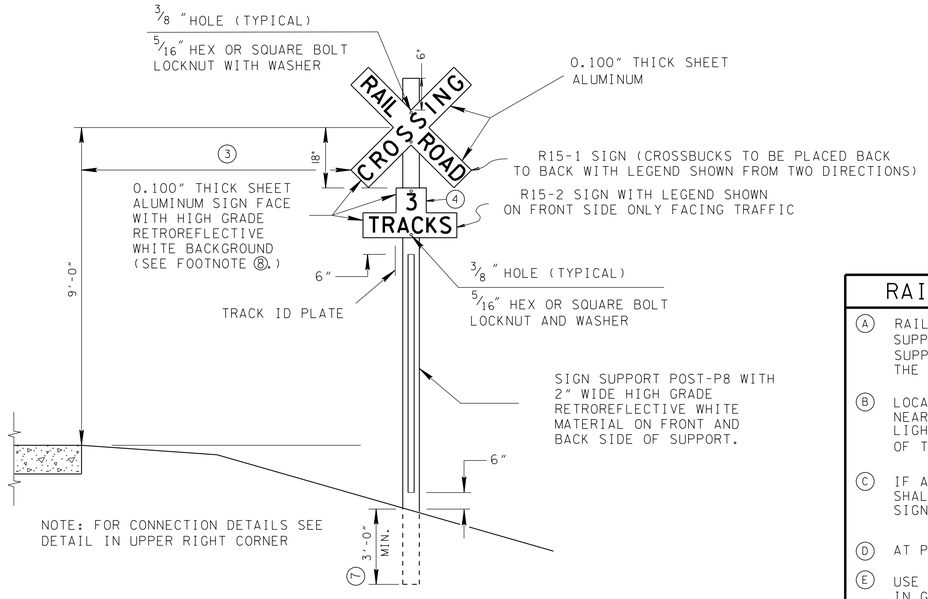
SHOULDER INSTALLATION
FOR ONE "U" POST SUPPORT



SHOULDER INSTALLATION
FOR TWO "U" POST SUPPORTS



CONNECTION DETAIL FOR
"U" POST



RAILROAD CROSSBUCK SIGN
AND SUPPORT DETAIL

LEGEND

W-HEIGHT OF SIGN FACE
L-LENGTH OF SIGN FACE
H-HEIGHT OF SIGN SUPPORT

RAILROAD CROSSBUCK SIGN AND SUPPORT GENERAL NOTES

Ⓐ RAILROAD CROSS-BUCK SIGN, NUMBER OF TRACKS AUXILIARY SIGN, TRACK ID PLATE, AND SUPPORT IS TO BE PAID FOR UNDER ITEM NO. 713-16.05, RAILROAD CORSS-BUCK SIGN AND SUPPORT PER EACH. THIS PAY ITEM SHALL INCLUDE THE FURNISHING AND INSTALLING OF THE SIGNS, SUPPORT AND HARDWARE.

Ⓑ LOCATION OF THE CROSSBUCK SIGN AND SUPPORT WITH RESPECT TO THE CENTERLINE OF THE NEAREST TRACK SHALL BE IN ACCORDANCE WITH THE TYPICAL LOCATION PLAN FOR FLASHING LIGHT SIGNAL LOCATIONS AS SHOWN ON FIGURE 8-7 (PAGE 8C-6) OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

Ⓒ IF AN EXISTING CROSSBUCK SIGN AND SUPPORT IS TO BE REMOVED, THE CONTRACTOR SHALL REMOVE AND INSTALL THE EXISTING TRACK ID PLATE ON THE PROPOSED CROSS-BUCK SIGN. ALL COST ARE TO BE INCLUDED IN THE PRICE BID FOR ITEM NO. 713-16.05.

Ⓓ AT PASSIVE RAILROAD CROSSINGS REFER TO T-S-16A FOR STOP OR YIELD SIGN INSTALLATION.

Ⓔ USE SIGN SUPPORT POST-P6 FOR STOP OR YIELD SIGN ATTACHMENTS P POST EMBEDMENT IN GROUND SHALL BE MIN. 3'-6".

FOOTNOTES

(1) FOR STANDARDIZATION OF LOCATION AND LATERAL CLEARANCE SEE SUBSECTIONS 2A-16 AND 2A-19 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

(2) FOR HEIGHT SEE SUBSECTION 2A-18 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

(3) FOR LATERAL CLEARANCE OF CROSSBUCK SIGN SEE SUBSECTION 2A-19 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

(4) IF THERE ARE TWO OR MORE TRACKS, INCLUDING SIDINGS, THE NUMBER OF TRACKS SHALL BE INDICATED ON AN AUXILIARY SIGN OF INVERTED T-SHAPE MOUNTED BELOW THE CROSSBUCK.

(5) IF ROCK IS ENCOUNTERED DURING THE INSTALLATION OF SUPPORT POSTS, THE HOLES FOR THE SUPPORTS SHALL BE DRILLED TO PROVIDE THE MINIMUM 3'-6" DEPTH IN GROUND.

(6) SEE SIGN SCHEDULE SHEET IN THE PLANS FOR DIMENSIONS L, H, H1, H2, H3 AND W.

(7) IF ROCK IS ENCOUNTERED DURING THE INSTALLATION OF SUPPORT POSTS, THE HOLES FOR THE SUPPORTS SHALL BE DRILLED TO PROVIDE THE MINIMUM 3'-0" DEPTH IN GROUND.

(8) SEE TDOT SPECIAL PROVISION 713A REGARDING SPECIFICATIONS FOR HIGH GRADE REFLECTIVE SHEETING.

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 7-26-73: CORRECT VERTICAL AND LATERAL CLEARANCES AND RAILROAD CROSSBUCK SIGN TO AGREE WITH 1971 MUTCD. ELIMINATED USE OF WOOD POST SUPPORTS AND CHANGEABLE NUMERAL DETAIL.

REV. 8-24-73: BREAKAWAY ADDED TO SQUARE TUBE POST DESCRIPTION. REFERENCE ARROWS ADDED FROM RI5-2 TO THE APPROPRIATE SIGNS.

REV. 2-21-74: PAY ITEM AND NOTE ADDED REGARDING RAILROAD CROSS-BUCK SIGN AND SUPPORT.

REV. 1-1-76: CHANGED DWG. NO. FROM RD-S-16 (68) TO T-S-16.

REV. 3-15-76: DELETED REFERENCE TO OLD DWG. NO., SUBSTITUTED NEW DWG. NO.

REV. 2-25-77: THE WORD "STEEL" ELIMINATED FROM U-POST.

REV. 10-24-79: U-POST CONNECTION DETAIL REVISED.

REV. 12-12-83: CONNECTION DETAIL U-POST CHANGED.

REV. 5-28-84: CONNECTION DETAIL U-POST AND RAILROAD CROSSBUCK SIGN AND SUPPORT CHANGED.

REV. 10-31-84: ADDED TAMPER PROOF NUT TO CONNECTION DETAIL U-POST.

REV. 2-12-85: ADDED POP-RIVET ALTERNATE TO U-POST CONNECTION DETAIL.

REV. 4-10-86: ADDED REFERENCE TO SECTION 2A-21 OF MUTCD.

REV. 7-8-86: REDREW SHEET. DELETED POP-RIVET ALTERNATE. ADDED NOTES.

REV. 10-15-90: REDREW AND REORGANIZED SHEET. CHANGED MINIMUM DEPTH OF "U" POST IN GROUND FROM 3'-0" TO 3'-6".

REV. 1-16-91: ELIMINATED SHOULDER INSTALLATION USING THREE SUPPORTS.

REV. 2-12-91: CORRECTED FOOTNOTE NUMBERS IN BOTH SHOULDER INSTALLATION DETAILS.

REV. 7-29-92: CHANGED U7 POST TO P8 POST IN RAILROAD CROSSBUCK SIGN AND SUPPORT DETAIL.

REV. 7-29-96: CHANGED MATERIAL ON CROSSBUCK AND TRACK NUMBER SIGN. ADDED WHITE RETROREFLECTIVE STRIP TO CROSSBUCK SUPPORT.

REV. 1-19-99: ADDED FOOTNOTE Ⓑ.

REV. 5-27-01: CHANGED DESCRIPTION IN ITEM NO. 713-16.05.

REV. 7-29-04: IN RAILROAD CROSSBUCK SIGN AND SUPPORT DETAIL MOVED 18" DIMENSION LINE.

REV. 10-23-06: ADDED GENERAL NOTE Ⓓ, Ⓔ AND TRACK ID PLATE.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

GROUND MOUNTED ROADSIDE SIGN AND DETAILS

T-S-16