

First Look Study  
Replace Bridge and Approaches  
Over Turtle Creek

Long Stretch Road  
Item No. 6-1068.00  
Bracken County, CR-1023



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Prepared By:  
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March 1, 2011

## TABLE OF CONTENTS

I.	INTRODUCTION.....	1
	A. Study Purpose.....	1
	B. Location.....	1
II.	PROJECT PURPOSE AND NEED.....	1
	A. Legislation.....	1
	B. Project Status.....	2
	C. System Linkage.....	2
	D. Transportation Demand.....	2
	E. Roadway and Bridge Deficiencies.....	2
III.	PRELIMINARY ENVIRONMENTAL OVERVIEW.....	3
IV.	PRELIMINARY PROJECT INFORMATION.....	3
	A. Existing Conditions/Roadway and Bridge Data.....	3
	B. Right of Way.....	4
	C. Utilities.....	4
V.	PROJECT PURPOSE AND NEED STATEMENT.....	4
VI.	POSSIBLE ALTERNATES.....	4
	A. No Build.....	5
	B. Build In Place.....	5
	C. Alternate 3.....	6
	D. Alternate 4.....	6
VII.	Summary.....	7

## LIST OF APPENDICES

- Appendix A: Exhibits
- Appendix B: Topographic Map
- Appendix C: Common Geometric Practices for Rural Local Roads
- Appendix D: 1959 Roadway Plans
- Appendix E: KYTC Bridge and Culvert Inspection Reports
- Appendix F: FIRM, Flood Insurance Map
- Appendix G: PVA Map
- Appendix H: Cost Summaries
- Appendix I: Photographs

## I. INTRODUCTION

This study is a First Look Study for a bridge project over Turtle Creek in Bracken County, Item Number 6-1068.00. The study presents a number of alternates and their cost estimates.

### A. Study Purpose

The purpose of this First Look Study is to address the applicable elements of Purpose and Need as defined by the National Environmental Policy Act (NEPA) in order to develop a draft Purpose and Need Statement for the project. It also provides data that will be of assistance in the project development phase.

- B. This bridge replacement project is located in northern Bracken County approximately ½ miles west of the City of Augusta. Bracken County is bordered by Clermont County Ohio, on the northwest; Brown County Ohio on the northeast; Mason County Kentucky on the east; Robertson County Kentucky on the south; Harrison County Kentucky on the southwest, and Pendleton County on the west. See Exhibits in Appendix A, and Appendix B. The coordinates of the project are 38-46-09.56 N, 84-01-26.09 W.

## II. PROJECT PURPOSE AND NEED

### A. Legislation

The following is a description of the project as it is listed in the Kentucky Transportation Cabinets SYP8160.

Bracken	06-1068	CR-1023	.100
<u>PHASE</u>	<u>FUND</u>	<u>YEAR</u>	<u>ESTIMATE</u>
D:	BRZ	2011	125,000
R:	BRZ	2013	25,000
U:	BRZ	2013	5,000
C:	BRZ	2014	175,000

LONG STRETCH ROAD; REPLACE BRIDGE AND APPROACHES  
OVER TURTLE CREEK 400 FEET NORTH OF KY-8 (C03). (SR=17.7)  
SCOPE BRIDGE REPLACEMENT (P)



B. Project Status

The bridge is structurally deficient with a Sufficiency Rating of 23.9.

The Sufficiency Rating has increased from the Kentucky Transportation Cabinet's SYP8160 as identified above due to work performed on the structure in 2007 by county forces.

C. System Linkage

Long Stretch Road is classified as a local road, and within the city limits the posted speed is 25 mph. Long Stretch Road primarily serves as an emergency access road to farms and residences, and connects KY 8 to Ferry Street in the City of Augusta. KY 8 is the main access route into the city, and traffic can use KY 8 when Long Stretch Road is closed to traffic.

D. Transportation Demand

Long Stretch Road is a low volume local road with estimated traffic volumes between 50 and 250 ADT. Actual 2010 traffic counts were not available at the time this study was compiled.

E. Roadway and Bridge Deficiencies

The existing bridge is structurally deficient, and is within the flood plain. Currently the pool channel is only 8" from the bottom chord element of the bridge. See KYTC Bridge Inspection Report Appendix E.

A new bridge will require at least one foot of clearance between the bottom of the bridge and the water surface as freeboard to mitigate any ice buildup. A new 63 ft span girder bridge will require the bridge deck to be raised at least 5 ft above the water surface. Smaller spans will require raising the bridge less than 5 ft. Raising the bridge will require raising the tunnel and relocating the railroad tracks. Impacting the railroad tracks should be avoided if at all possible. The cost for going under the railroad and relocating the tracks is estimated to exceed \$837,000.

The roadway is a one 12 ft lane with earth shoulders. Common Geometric Practices for Rural Roads requires 2-9 ft lanes with 2 ft shoulders. Widening the road and bridge will require widening the tunnel pavement to match the roadway's cross section. See Exhibit 700-01 in Appendix C for the Common Geometric Practices for Rural Roads.

There are two culverts upstream from the bridge. One is a 14 ft X 14 ft double reinforced concrete culvert on the bridges inventory list.

See Culvert Inspection Report in Appendix E. The culvert is submerged, and both barrels are blocked with debris. There are cracks in the vertical members, and in both roof sections near the mid-point. The second culvert is newer, and it is estimated to be a single 12 ft X 12 ft culvert.

### III. Preliminary Environmental Overview

A biological assessment should be completed prior to construction to assess the potential impact to threatened and endangered species. If habitats exist cutting restriction will be imposed.

The bridge is located in a special flood hazard zone AE. See Appendix F for the FIRM, Flood Insurance Map. The area is subject to flooding by the 1% annual chance flood (100 year flood). A flood insurance study is available at <http://msc.fema.gov/>.

Turtle Creek is designated as a Blue Line Stream, and impacting a Blue Line Stream requires permits. Permits are anticipated for this project.

### IV. Preliminary Project Information

#### A. Existing Conditions/ Roadway and Bridge Data

County: Bracken  
Road Name: Long Stretch Road  
Route: CR-1023  
Item No.: 6-1068  
BMP: .467  
EMP: .488  
Project Length: .012 miles  
Roadway Classification: Rural Local Road  
Terrain: Level  
Funding Type: BRZ

Roadway Data:

	Existing Conditions	Design Criteria*
Number of Lanes	1	2
Lane Width	12 ft	9 ft
Shoulder Width	earth	2 ft
Minimum Radius	—	205 ft
Maximum Grade	—	8%

\*25mph Design Speed

Bridge Data: 012C00003N

Length	62.99 ft
Width, out to out	12.14 ft
Sufficiency Rating	23.9

B. Right of Way

The PVA Map is located in Appendix G. Owner information, property information, assessment information, and land information are available, but not included in this study's documentation.

C. Utilities

There are no electric, telephone, water, gas or sewer utilities within the project limits.

V. Project Purpose And Need Statement

The purpose of this project is to address the structural deficiencies of the bridge over Turtle Creek in order to provide emergency access to the downtown business district of Augusta.

VI. Possible Alternates

The following is a description of the alternates analyzed in the development of this study. The study looks at bridge alternates as opposed to culverts because the rock is deep within the reach, and the bridge lies within the backwater of the Ohio River. Costs are based on similar projects from 2009-2010 in Project Manager Toolbox.

A. No Build- Scenic Walkway

This alternate closes the road, and uses the existing bridge and railroad tunnel as part of a scenic walkway into the City of Augusta and neighboring farms and residences.

The costs are minimal.

The alternate does nothing to correct the structural deficiency of the bridge or the tunnel. It creates an opportunity for the bridge and roadway to fail, and or to be washed away by high waters.

The costs are minimal.

B. Build In Place- Alternate 2

This alternate replaces the existing bridge with a Pre-Cast Steel Truss Bridge or a Pre-Fab Single Span Bridge. It addresses the purpose and need of the project by replacing the structure with a new one. It does nothing to address the railroad tunnel. The bridge would still be inundated by high waters, and the railroad tunnel would be too small, and too difficult for larger vehicles to maneuver through.

Pre-Cast Steel Truss Bridge- 2(a).

Design-	\$164,000
Right of Way-	\$ 25,000
Construction-	<u>\$411,000</u>
Total Cost-	\$600,000

Pre-Fab Single Span-2(b).

Design-	\$125,000
Right of Way-	\$ 25,000
Construction-	<u>\$350,000</u>
Total Cost-	\$500,000



C. Alternate 3 - A New 1100 ft Elevated Roadway Over Railroad

This alternate avoids the \$837,000 cost for relocating the railroad tracks. It raises the bridge 30ft from the existing bridge's elevation and corrects the problem of flood waters inundating the bridge and roadway.

This alternate involves constructing retaining walls and building large embankment fills. The space for constructing the road is limited. Currently the roadway is a one 12 foot lane with earth shoulders. The rest of the area is surrounded by water. The elevated roadway must be at least 2-9 ft lanes to provide adequate sight distance for traveling vehicles. The cost of constructing this roadway in a rural area, in the outskirts of town with low traffic volumes may not be cost effective.

Design-	\$ 1,000,000
Right of Way-	\$ 50,000
Railroad-	\$ 360,000
Construction-	<u>\$10,260,000</u>
Total Cost-	\$11,670,000

D. Alternate 4 - Two Lane, Bridge, and Tunnel

This alternate correct the out of alignment problem that exists between the roadway and tunnel. Only a 63 ft bridge would be required to cross the creek. The bridge, tunnel, and roadway would be raised; a wider tunnel, bridge, and roadway would be constructed. Due to the limitation of available land, it will be difficult.

The alternate would require the railroad tracks to be relocated, and a new railroad tunnel installed. The cost for this alternate given the location and traffic volumes may not be cost effective.

Design-	\$1,000,000
Railroad-	\$ 837,000
Right of Way-	\$ 50,000
Construction-	<u>\$4,800,000</u>
Total Cost-	\$6,687,000


## VII. Summary

The purpose of this project is to provide safe and reliable access to the City of Augusta by replacing the structurally deficient bridge over Turtle Creek. The No Build Alternate would not meet the Purpose and Need of this project. The Build In Place Alternates 2(a) and 2(b) would construct a Precast Steel Truss or a Pre-Fab Single Span Bridge at the same location and elevation as the existing bridge. Other alternates are discussed as well, some of which may not be cost effective. The alternate that addresses the Purpose and Need, and has the least expected cost is Alternate 2(b). It constructs the bridge and approaches with a Pre-Fab Single Span Bridge. The cost of this alternate is \$500,000.

Alternate 2(a), the installation of the Pre-Cast Steel Truss Bridge is the recommended alternate from this study. A Pre-Cast Steel Truss Bridge will provide more under bridge clearance. It will sit on the abutments, no extra distance for girders will be needed, and it will require less approach work. The cost of this alternate is \$600,000.

## APPENDIX A: Exhibits





## KYTC PROJECTS ARCHIVE (1909 - Present)

provided by OIT

### LAYERS









☒ All Layers

☒ Transportation
 

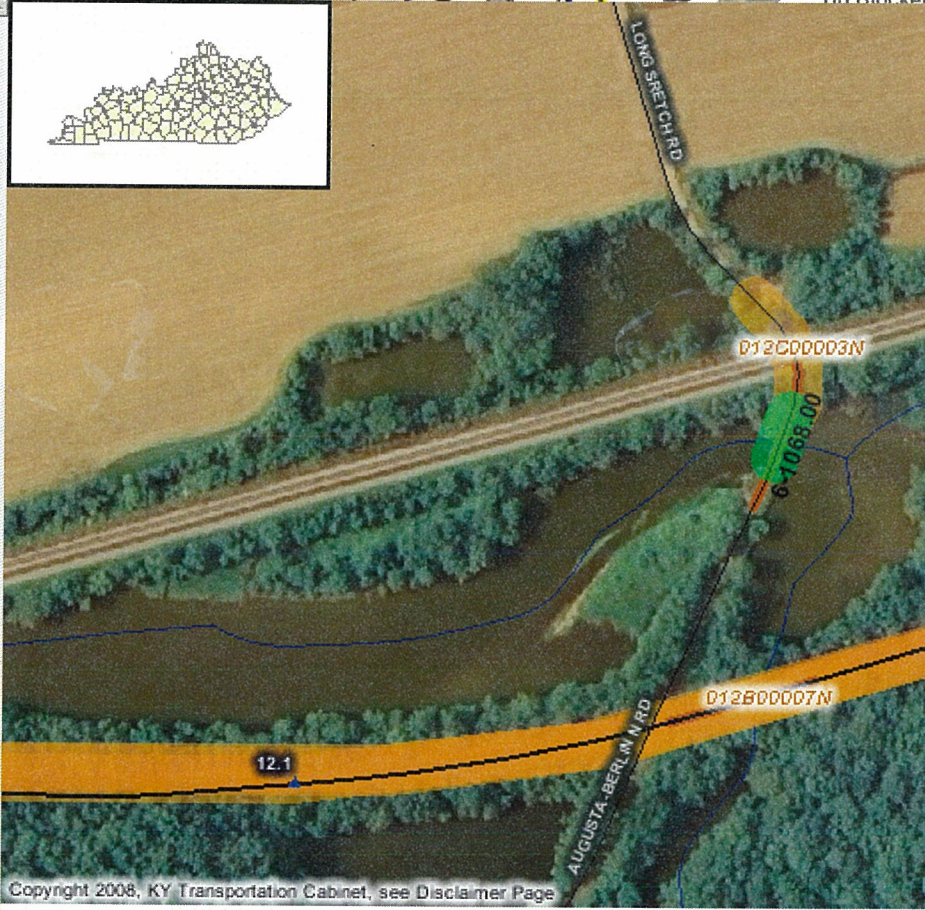
- ☐ Route Log
- ☐ Local Road Milepoi
- ☐ State Road Milepoi
- ☒ Interstate
- ☒ Parkway
- ☒ US Highway
- ☒ State Road
- ☒ Local Road
- ☐ Local Road Route Name
- ☒ Current SYP Project
- ☒ SYP PROJS CONS
- ☒ SYP PROJS CONS
- ☒ KYTC Projects Arch
- ☒ Bridge
- ☐ Truck Network
- ☐ National Highway S
- ☐ Railroad
- ☐ KYTC District

☒ Base Map
   
☒ Base Imagery

**Help:**

-  A closed group, click to open.
-  An open group, click to close.
-  A map layer.
-  A hidden group/layer, click to make visible.
- ☒ A visible group/layer, click to hide.
-  A visible layer, but not at this scale.
-  A partially visible group, click to make visible
-  An inactive layer, click to make active.
-  The active layer.

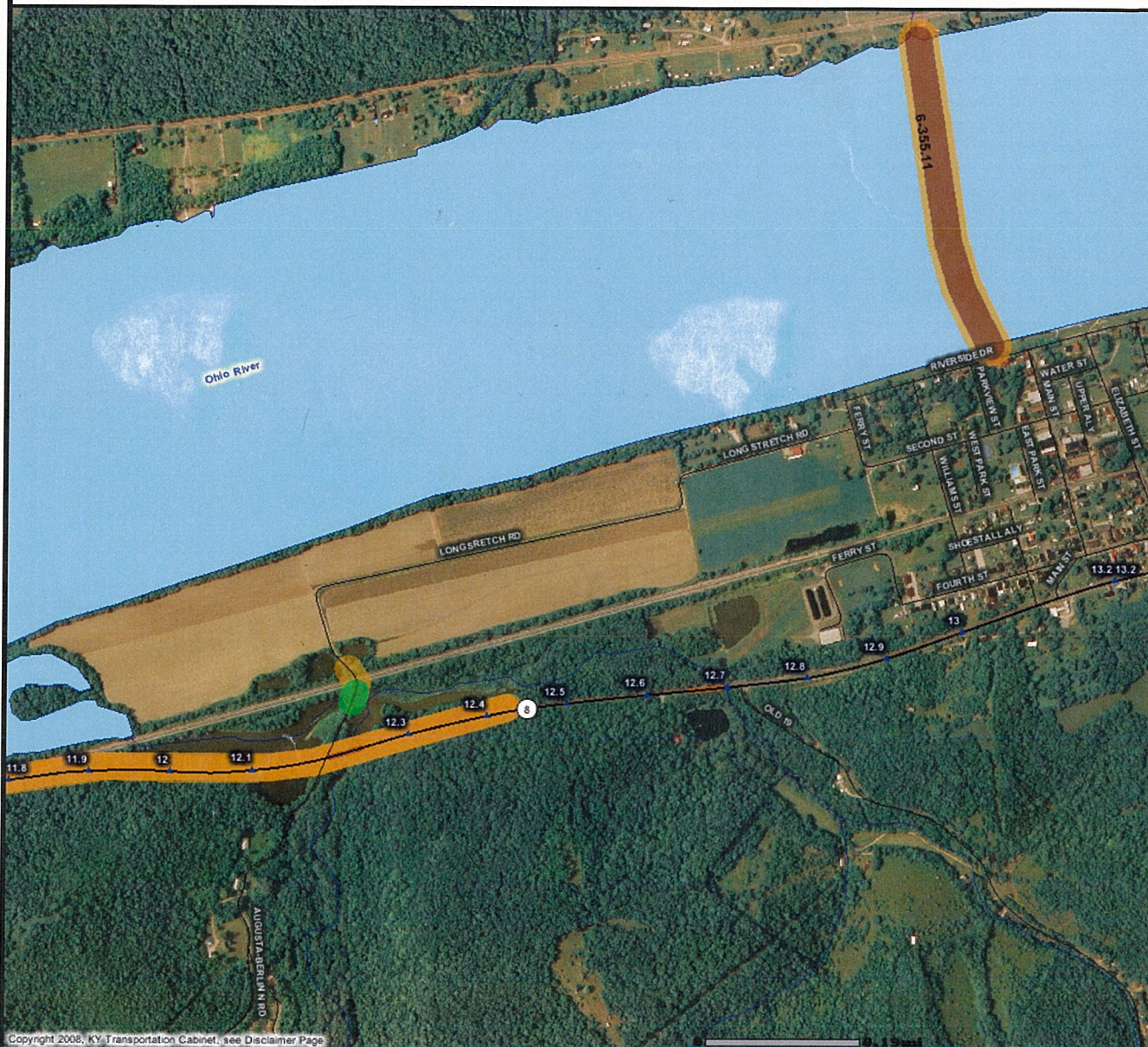




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# Bracken\CR-1023\6-1068



## KYTC Division of Highway Design

200 Mero Street,  
Frankfort, KY 40601

Phone: (502) 564-3280



### Legend

#### Transportation

- ▲ Route Log
- ▲ Local Road Milepoint
- ▲ State Road Milepoint
- Interstate
- Parkway
- US Highway
- State Road
- Local Road
- SYP Road Improvement Projects
- SYP Projs Const In Process
- SYP Projs Const Awarded
- KYTC Projects Archive
- Bridge
- Truck Network
- National Highway System
- Railroad
- KYTC District

#### Base Map

- Major Cities
- City Boundary
- County Boundary
- Zip Code Area
- Rivers
- Streams
- Lakes
- USGS Quadrangle
- US House District
- KY Senate District
- KY House District

DISCLAIMER : KYTC Division of Highway Design provides this map as a reference only. Users are to validate information independently.

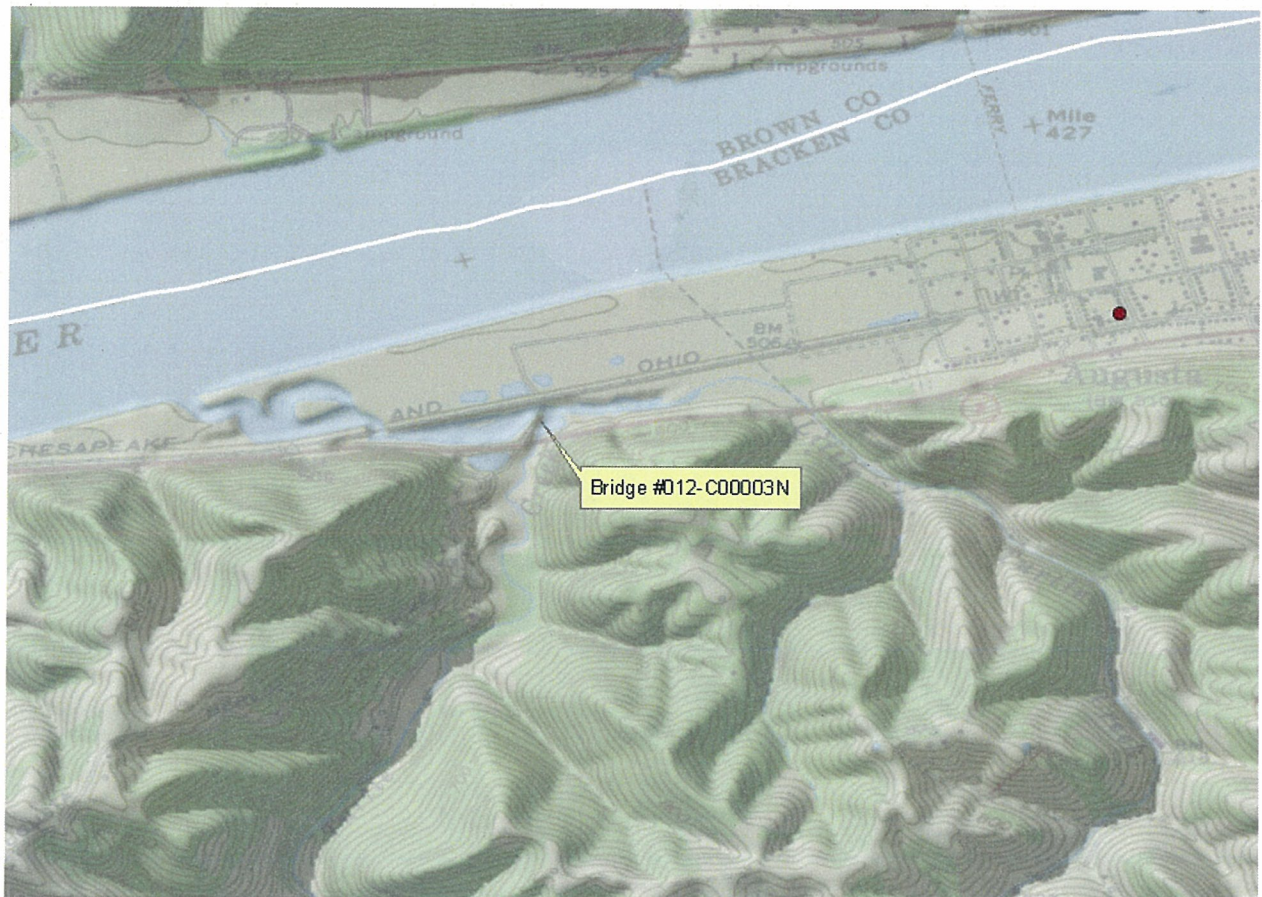


## APPENDIX B: Topographic Map

# TOPOGRAPHIC MAP

## KYGEONET

### BRACKEN COUNTY, 6-1068



## APPENDIX C: Common Geometric Practices for Rural Local Roads



# **COMMON GEOMETRIC PRACTICES RURAL LOCAL ROADS**

		TRAFFIC VOLUME							
	TERRIAN	UNDER 50 A.D.T.	50-250 A.D.T.	250-400 A.D.T.	400-1500 A.D.T.	1500-2000 A.D.T.	OVER 2000 A.D.T.		
MINIMUM DESIGN SPEED (M.P.H.)	⑥ LEVEL	30		40	50				
	⑦ ROLLING	20	30		40				
	MOUNTAIN	20			30				
PAVEMENT WIDTH (FEET)  ④ ⑧		DESIGN SPEED	UNDER 400 A.D.T.		400-1500 A.D.T.	1500-2000 A.D.T.	OVER 2000 A.D.T.		
		15 MPH	18		20 ⑨	20	22		
		20 MPH				22	24 ⑪		
		25 MPH							
		30 MPH							
		40 MPH							
		45 MPH	20		22	24 ⑪	24 ⑪		
		50 MPH	22						
		55 MPH							
60 MPH	22								
MIN. GRADED SHOULDER WIDTH (FEET) ⑤		ALL SPEEDS	2		5 ⑨ ⑩	6	8		
MIN. CLEAR ROADWAY WIDTH OF NEW AND RECONSTRUCTED BRIDGES		ALL SPEEDS	APPROACH ROADWAY WIDTH						
MINIMUM RADIUS (FEET)		DESIGN SPEED	eMAX. 4%		eMAX. 6%		eMAX. 8%		
		20 MPH	125		115		105		
		25 MPH	205		185		170		
		30 MPH	300		275		250		
		35 MPH	420		380		350		
		40 MPH	565		510		465		
		45 MPH	730		660		600		
		50 MPH	930		835		760		
NORMAL PAVEMENT CROSS SLOPES ③		RATE OF CROSS SLOPE = 2%							
NORMAL SHOULDER CROSS SLOPES		EARTH = 8%					PAVED = 4%		
MAXIMUM GRADE (PERCENT)		M.P.H.	20	25	30	35	40	45	50
		LEVEL	8			7			6
		ROLLING	11		10			9	8
		MOUNTAIN	16	15	14		13	12	10
MINIMUM STOPPING SIGHT DISTANCE ①		(FEET)	115	155	200	250	305	360	425
MINIMUM PASSING SIGHT DISTANCE ②		(FEET)	710	900	1090	1280	1470	1625	1835

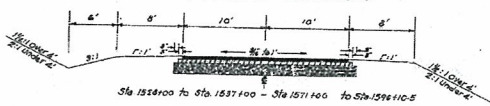
- ① MINIMUM STOPPING SIGHT DISTANCE BASED ON HEIGHT OF EYE OF 3.5 FT AND HEIGHT OF OBJECT OF 2.0 FT. CONSIDER BOTH HORIZONTAL AND VERTICAL ALIGNMENT.
- ② MINIMUM PASSING SIGHT DISTANCE BASED ON HEIGHT OF EYE OF 3.5 FT AND HEIGHT OF OBJECT OF 3.5 FT. CONSIDER BOTH HORIZONTAL AND VERTICAL ALIGNMENTS.
- ③ NORMAL PAVEMENT CROSS SLOPES ON BRIDGES IS 2%.
- ④ CONSIDER CURVE WIDENING ON PROJECTS WITH SIGNIFICANT TRUCK VOLUMES.
- ⑤ WIDEN 3 FT FOR GUARDRAIL.
- ⑥ WHERE SELECTED DESIGN SPEED IS > 50 MPH, USE COMMON GEOMETRIC PRACTICES EXHIBIT 500-02 FOR RURAL COLLECTOR ROADS.
- ⑦ DOCUMENT AND RETAIN JUSTIFICATION FOR A DESIGN SPEED LESS THAN THE REGULATORY OR POSTED SPEED IN THE PROJECT FILES.
- ⑧ FOR ROADS < 400 ADT, REFER TO AASHTO'S "GEOMETRIC DESIGN GUIDELINES FOR VERY LOW-VOLUME LOCAL ROADS (ADT ≤ 400)".
- ⑨ FOR ROADS IN MOUNTAINOUS TERRAIN WITH DESIGN VOLUME OF 400 TO 600 VEH/DAY, USE 18 FT TRAVELED WAY WIDTH AND 2 FT SHOULDER WIDTH.
- ⑩ MAY BE ADJUSTED TO ACHIEVE A MINIMUM ROADWAY WIDTH OF 30 FT FOR DESIGN SPEEDS > THAN 40 MPH.
- ⑪ WHERE THE WIDTH OF THE TRAVELED WAY IS SHOWN AS 24 FT, THE WIDTH MAY REMAIN AT 22 FT ON RECONSTRUCTED HIGHWAYS WHERE SAFETY RECORDS AND ALIGNMENT ARE SATISFACTORY.

## APPENDIX D: 1959 Roadway Plans

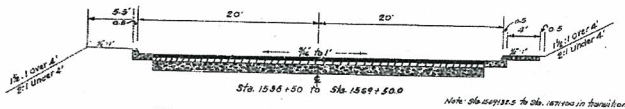
SURVEY AND PLAN APPROVED April 2nd 1902 W. H. Wilson  
STATE FOREST ENGINEER



## TYPICAL SECTIONS



Note: Sta. 1556+00 to Sta. 1571+00 in transition

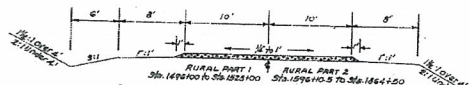


Note: Sta. 1536+50 to Sta. 1556+50 in transition

### NEW CONSTRUCTION: Grade, Drain and Surface USING BITUMINOUS CONCRETE SURFACE CLASS I DENSE GRADED AGGREGATE BASE

- 11' Base
  - 5" Compacted Dense Graded Aggregate Base
  - 3" Compacted Dense Graded Aggregate Base (Top Course)
  - 1/2" 100 per Sq Yd Calcium Chloride (Top Course only)
  - 1/2" Bituminous Concrete Base (Class I Modified)
- Prime (Top)
  - 0.50 Gal. per Sq Yd Emulsified Asphalt RS-1. Apply by fogging
- 16" Surface
  - Bituminous Concrete Surface, Type B.

Top of cuts, toe of fill ditches and shoulders shall be rounded in conformity with Std. Draw. No. 10-03



### NEW CONSTRUCTION: Grade, Drain and Low Type Surfacing USING

#### TRAFFIC BOUND LIMESTONE

Crushed Limestone Sizes No. 6 and No. 10, applied loose equal to 2" compacted depth

#### OR

#### TRAFFIC BOUND RIVER GRAVEL

River Gravel applied loose equal to 2" compacted depth

River Gravel shall conform to Specification 7-4.4-B-3, River Gravel Maintenance Floater Course. Gradation shall meet the requirements for Size No. 10. Top of cuts shall be rounded in conformity with Std. Draw. No. 10-03

BASES FOR CLASS I ESTIMATE		
COURSE	LIMESTONE 100 PER SQ. YD.	GRAVEL
5"	305	305
11"	151	153

## NOTES FOR BITUMINOUS CONCRETE CLASS I

When natural sand fine aggregate is used in the manufacturing of Class I bituminous concrete any material collected in the dust collector may be returned, all or in part, to the mix, provided that the accumulated material is added by a uniform method approved by the Engineer, or in smaller quantities within the percentage limits of the gradation Specifications. Only the material collected by the dry type of dust collector may be fine aggregate used in Class I bituminous concrete mixtures that are to be used for riding surface shall be natural sand fine aggregate used in Class I bituminous concrete mixtures for other courses shall be natural sand or crushed limestone sand.

Prime (Base) between Base and Surface to be used only if directed on construction.

Asphalt Cement PAC-5 shall be used in all Class I mixtures.

Each completed course of the 1" Dense Graded Aggregate Base shall be wetted and rolled as necessary to prevent raveling until overlying course is applied. In addition to quantities set up the Contractor shall use Calcium Chloride as a surface treatment. To reduce the amount of wetting and rolling provided satisfactory results are obtained. No direct payment will be made for Calcium Chloride used for this purpose.

Extra compaction in conformity with Article 5-5-0-2 of the Department's 1966 Standard Specifications will be required throughout the project.

All Dense Graded Aggregate shall be Plant Mixed and constructed in the number of courses necessary to obtain required density.

## GENERAL NOTES

All curves to be banked and widened according to Standard or as directed. Super-elevation for special cases to be authorized by the Area Engineer.

The Contractor is not to order material for drainage structures until the quantities have been checked by the Engineer for typical sections in solid rock cuts. See Standard Drawings on Sheet No. 10-02 of these plans.

Drawings for standard warning signs for the protection of traffic will be furnished by the Area Engineer.

The location of inlet structures shown on the plans is approximate and the structures are to be shifted to the low point as directed to obtain proper drainage.

The Contractor shall use all possible care in excavating on this project so as not to disturb any existing pipe lines, whether shown on the plans or not shown on the plans. Elevations and locations of existing pipes are approximate. Only one pipe disturbed or damaged by the Contractor through carelessness during his construction operations shall be replaced by the Contractor at no extra cost to the Department.

Waste material in excess of that needed as directed by the Engineer within the right-of-way limits shall be disposed of at the right-of-way or area acquired by the Contractor and approved by the Engineer at no additional cost to the Department. No direct payment will be allowed for removal of waste material.

Unsanitary waste material passing from slides shall either be washed within the right-of-way limits as directed by the Engineer or disposed of off the right-of-way at areas acquired by the Department. Payment for necessary removal of this material will be allowed.

All buildings within the right-of-way limits on this project are to be removed by others, provided, however, that any remaining foundations or debris shall be removed by the Contractor. Payment for this work shall be included in the unit price bid per acre for clearing and grubbing.

Flagging will be required under embankment sections as indicated on the Cross Sections. No direct payment will be allowed for this operation, same being considered incidental to other items of work.

The Standard Specifications for Road and Bridge Construction, edition of 1956, as amended by the amendments and revisions published in Supplement No. 1 of 1960, approved amendments, provisions and Specifications with the following "Special Specifications and additional Amendments and Provisions" will apply on this project:

- Special Provision for Removal of Hazardous Structures
- Special Provision for Seal Penetration Test
- Special Provision for Bituminous Concrete Base (Class I Modified)

Special Specification No. 12-See Timber Guard Posts.

Section Control Signs

## SELECTED SOILS

Low bearing soils, identified herein as Soils Nos. 1, 2, 10, 15, and 16, shall not be used in the top 12" of subgrade in all sections and when encountered within the top 12" of subgrade in cut sections shall be removed and replaced with Selected Soils having a C.B.R. value of 5.0 or greater, identified herein as Soils Nos. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16.

When profile continued from preceding project.

The Contractor shall conduct grading operations in such manner as to allow ample quantities of Selected Soils to be held in reserve or stockpiled as necessary to provide the required typing for lifts and subgrade replacement in cuts. No direct payment will be allowed for such necessary manipulation as double handling or hauling between points.

## TRAFFIC NOTE

The road shall be kept open to all traffic at all times.



BRACKEN Co.		S198(4)		
1980 ROAD DIST. NO.	STATE	FISCAL YEAR	BURET NO.	TOTAL IMPETS
7	KY.	1989	5	266

NEWPORT-HAYVILLE ROAD

⑥ Crib Wall may be either Metal Bin type wall or Reinforced Concrete Crib Wall (closed face)

# BRIDGE & CULVERT SUMMARY

STATION	SIZE	INLET	OUTLET	GRADE	SPACING	REINFORCEMENT	CONCRETE	STEEL	STRENGTH	CHAMFER	ENTRANCE	REINFORCEMENT	12" INCHES	SLOPE	BRIDGE	REINFORCEMENT
TO	FROM	ELEV	LENGTH	ELEV	LENGTH	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS
1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78	1504+78
RURAL PART 1																
MUNICIPAL																
RURAL PART 2																
TOTAL RURAL																
TOTAL PROJECT																

BRIDGE & CULVERT SUMMARY  
SHEET 1 OF 1  
DATE: 11/11/78  
BY: [Signature]

## SURFACING QUANTITIES

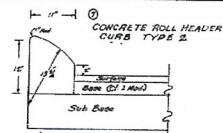
ITEM	UNIT	RURAL PART 1	RURAL PART 2	TOTAL RURAL	TOTAL PROJECT
<b>BITUMINOUS CONCRETE SURFACE CLASS I</b>					
Gravel Graded Aggregate Base	TON	1706.8	240	240	1730.8
Calcium Chloride	TON	19.5	—	—	19.5
Emulsified Asphalt RS-1 Prime (Type A)	TON	511.8	208	208	720
Emulsified Asphalt RS-1 Prime (Type B)	TON	2720	185	185	2905
Placing and Compacting Private Entrances	SP. YD.	145	—	—	145
Curb and Gutter	LINEAL FT.	6069	—	—	6069
Concrete Roll Header Curb, Type 2	LINEAL FT.	77	—	—	77
Gravel Limestone Size No. 40 for Entrances and Approaches	TON	608	—	—	608
<b>TRAFFIC BOUND LIMESTONE</b>					
Gravel Limestone Size No. 40 for Entrances and Approaches	TON	1706.8	240	240	1730.8
Gravel Limestone Size No. 40 for Entrances and Approaches	TON	19.5	—	—	19.5
Gravel Limestone Size No. 40 for Entrances and Approaches	TON	511.8	208	208	720
Gravel Limestone Size No. 40 for Entrances and Approaches	TON	2720	185	185	2905
Gravel Limestone Size No. 40 for Entrances and Approaches	SP. YD.	145	—	—	145
Gravel Limestone Size No. 40 for Entrances and Approaches	LINEAL FT.	6069	—	—	6069
Gravel Limestone Size No. 40 for Entrances and Approaches	LINEAL FT.	77	—	—	77
Gravel Limestone Size No. 40 for Entrances and Approaches	TON	608	—	—	608
<b>TRAFFIC BOUND RIVER GRAVEL</b>					
River Gravel	TON	1735	—	—	1735
River Gravel for Entrances and Approaches	TON	19.5	—	—	19.5

## FOR SURFACING

COUNTY	PROJECT NUMBER	DESCRIPTION	CROSS LENGTH	NET LENGTH	AREA FOR CURVE	TOTAL AREA
			LINEAL FT.	LINEAL FT.	SQ. YD.	SQ. YD.
BRADSHAW	1178(9)	RURAL PART 1	3200.0	0.406	3887	11078 - 21'
		MUNICIPAL	6810.5	1.189	8008	2500' - 21' 11078 - 21'
		RURAL PART 2	5074.5	0.574	2909	2500' - 21' 11078 - 21'
		TOTAL RURAL	14085.0	2.169	16805	2500' - 21' 11078 - 21'
		TOTAL PROJECT	14085.0	2.169	16805	2500' - 21' 11078 - 21'

Includes sufficient material for surfacing Entrances and Approaches as follows:

- Gravel Graded Aggregate Base
- Emulsified Asphalt RS-1 Prime (Type A)
- Emulsified Asphalt RS-1 Prime (Type B)
- Placing and Compacting Private Entrances
- Curb and Gutter
- Concrete Roll Header Curb, Type 2
- Gravel Limestone Size No. 40 for Entrances and Approaches

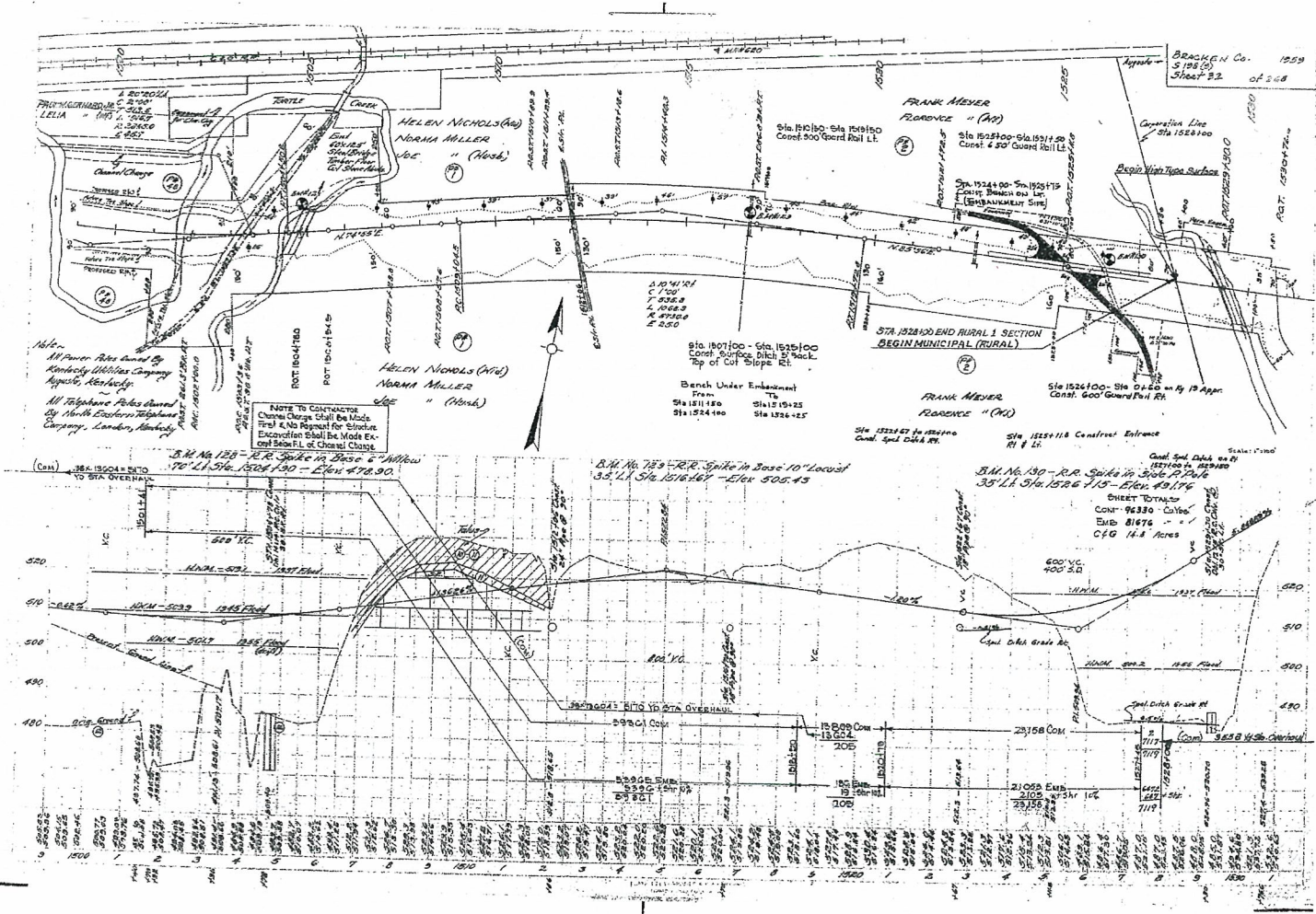


### PIPE SUMMARY

ITEM			L.I.N. FT.			
			RURAL PART 1	RURAL PART 2	TOTAL RURAL	TOTAL PROJECT
<b>CULVERT PIPE</b>						
15'	Alternate A	Reinforced Concrete Class III	—	728	—	728
	Alternate B	16 Gage B.C.C.M.	—	728	—	728
18'	Alternate A	Reinforced Concrete Class III	182	1104	3080	3262
	Alternate B	16 Gage B.C.C.M.	182	1104	3080	3262
24'	Alternate A	Reinforced Concrete Class III	22	1496	450	1618
	Alternate B	14 Gage B.C.C.M.	22	1496	450	1618
30'	Alternate A	Reinforced Concrete Class III	—	392	228	620
	Alternate B	14 Gage B.C.C.M.	—	392	228	620
36'	Alternate A	Reinforced Concrete Class III	—	180	166	346
	Alternate B	12 Gage B.C.C.M.	—	180	166	346
42'	Alternate A	Reinforced Concrete Class III	—	96	263	359
	Alternate B	12 Gage B.C.C.M.	—	96	263	359
48'	Alternate A	Reinforced Concrete Class III	—	188	188	376
	Alternate B	12 Gage B.C.C.M.	—	188	188	376
<b>ENTRANCE PIPE</b>						
15'	Alternate A	Reinforced Concrete Class III	—	550	100	650
	Alternate B	16 Gage B.C.C.M.	—	550	100	650
18'	Alternate A	Reinforced Concrete Class III	—	50	100	150
	Alternate B	16 Gage B.C.C.M.	—	50	100	150

Such pipe culverts as may be specifically designated by the Engineer on construction shall be built using Camber in the flow line of the culvert as directed. No additional payment will be allowed for this work.





BRACKEN Co. 1959  
S 198 (S)  
Sheet 32 of 348

NOTE TO CONTRACTOR  
Channel Change shall be made  
Final & No Repeat for Similar  
Excavation shall be Made Ex-  
cept Section of Channel Change

SHEET TOTAL  
CUBIC YARDS 96330  
CUBIC FEET 81676  
CFG 14.8 Acres



## APPENDIX E: KYTC Bridge and Culvert Inspection Reports

012C00003N

## KYTC Bridge Inspection Report

## Summary:

Inspection Date: 2/22/2010  
 Inspector: GCOCHRAN (23)  
 Primary Type: Substandard (12 Months)

## Types of Inspections Performed:

National Bridge Inventory: Y  
 Element: Y  
 Fracture Critical: N  
 Underwater: N  
 Other Special: N

Inspector Signature: 

District Review Date: 2/24/2010

District Reviewer: BSEITER (55)

## IDENTIFICATION

Bridge ID (8): 012C00003N MAP BRIDGE District Number: 6  
 Route Carried (7): LONG SRETCH RD County (3): 23 Bracken  
 Mile Point: 0.48 Feature Intersected (6): TURTLE CREEK  
 Location (9): .1 MI N OF JCT KY 8 Road Name: LONG SRETCH RD  
 Structure Description: 62.99 Foot - Single Span Steel Truss - Thru

## NBI CONDITION

## SCHEDULE TAB

Deck (58):	7	Schedule:	Required (Y/N)	Last Date	Frequency	Next Date
Superstructure (59):	6	NBI (90):		2/22/2010	(91): 6 mos	8/22/2010
Substructure (60):	4	Fracture Critical (92A):	N	(93A): 2/1/2006	(92A): mos	2/1/2008
Culverts (62):	N	Underwater (92B):	N	(93B): 1/1/1901	(92B): mos	1/1/1901
Channel/Protection (61):	7	Other Special (92C):	N	(93C): 2/1/2006	(92C): mos	1/1/1901
		Elemental:	NA		6 mos	8/22/2010

## Load Rating and Posting

Truck Type	Typ I	Typ II	Typ III	Typ IV	Gross	WATERWAY
Recomm. Posting:	12	12	12	12	12	Scour Critical (113): 8
Field Posting:	12	12	12	12	12	Observed 113 Rating: U
Posting Status (41):	P Posted for load					Waterway Adeq. (71): 6
Signs Posted:	Cardinal:	N	Non-Cardinal:	Y		

## DECK/WEARING SURFACE

Deck Type (107): 1 Concrete-Cast-In-Place  
 Wearing Surface/Protective System (108): Type: 1 Membrane: 0 Protection: 0  
 Traffic Safety Features (36): Bridge Rail: 0 Transition: 0 Appr. Rail: 0 Rail Ends: 0  
 Overlay: N  
 Overlay Type: -1  
 Overlay Thickness: 0.00

## Vertical Clearances

Minimum Vertical Overclearance (53): 99.99  
 Minimum Vertical Underclearance (54): 0.00  
 Maximum Vertical Clearance (10): 99.99  
 Minimum Vertical Clearance:

## Sufficiency Ratings

SR: 23.90 SD/FO: 1 Structurally Deficient

## Element Condition State Data

Elm/Env	Description	Units	Total Qty.	Qty. CS1	Qty. CS2	Qty. CS3	Qty. CS4	Qty. CS5
112/1	Unpnt Stl Stringer	LF	184.50	184.50	0.00	0.00	0.00	0.00
121/3	P/Stl Thru Truss/Bot	LF	0.00	0.00	0.00	0.00	0.00	0.00
12/3	Bare Concrete Deck	SF	738.00	738.00	0.00	0.00	0.00	0.00



## KYTC Bridge Inspection Report

## Summary:

Inspection Date: 2/22/2010

Inspector: GCOCHRAN (23)

Primary Type: Substandard (12 Months)

## Types of Inspections Performed:

National Bridge Inventory: Y  
 Element: Y  
 Fracture Critical: N  
 Underwater: N  
 Other Special: N

## Element Condition State Data

Elm/Env	Description	Units	Total Qty.	Qty. CS1	Qty. CS2	Qty. CS3	Qty. CS4	Qty. CS5
126/3	P/Stl Thru Truss/Top	LF	0.00	0.00	0.00	0.00	0.00	0.00
152/3	Palnt Stl Floor Beam	LF	42.00	0.00	0.00	0.00	0.00	42.00
215/3	R/Conc Abutment	LF	12.50	0.00	4.50	8.00	0.00	0.00
217/3	Other Mtl Abutment	LF	46.50	0.00	22.50	24.00	0.00	0.00
312/3	Enclosed Bearing	EA	4.00	0.00	0.00	4.00	0.00	0.00
359/3	Soffit Smart Flag	EA	1.00	1.00	0.00	0.00	0.00	0.00
361/1	Scour Smart Flag	EA	1.00	0.00	1.00	0.00	0.00	0.00
362/1	Traf Impact SmFlag	EA	1.00	1.00	0.00	0.00	0.00	0.00
601/1	MisAlign/ot of plane	EA	1.00	1.00	0.00	0.00	0.00	0.00
605/1	Transitions	EA	1.00	0.00	0.00	1.00	0.00	0.00
610/1	Chan Drift	FA	1.00	0.00	1.00	0.00	0.00	0.00

## Element Condition State Data

Str Unit	Elm/Env	Description	Description
1	112/1	Unpnt Stl Stringer	<p>Steel Stringers-</p> <p>Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (abutments, deck soffit area, STEEL STRINGERS, steel floor beams, bearings, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time.</p> <p>Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010)</p> <p>Only exterior fascia of exterior most steel stringers could be viewed for inspection at this time.</p> <p>Note that both exterior stringer elements have vertical welds located at mid span area, which is splicing steel members together. Location of splice welds should be closely watched during inspections.</p> <p>(See Photos)</p>
1	121/3	P/Stl Thru Truss/Bot	<p>Truss Bottom Chord-</p> <p>As determined by KYTC Central Office Load Analysis Staff, structural elements throughout Steel Pony Truss are no longer functioning as a load carrying unit and was not inspected at this time. (02/05/2009 and 02/22/2010)</p>
1	12/3	Bare Concrete Deck	<p>Deck-</p> <p>Note that this structure had old timber planking deck design removed during the year of 2007 and a new cast-in-place concrete deck placed during project (approximately 5" to 7" in depth).</p> <p>Hairline diagonal cracking was found in random locations typical throughout deck surface area.</p> <p>Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (abutments, DECK SOFFIT AREA, steel stringers, steel floor beams, bearings, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time.</p> <p>Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010)</p> <p>(See Photos)</p>
1	126/3	P/Stl Thru Truss/Top	<p>Truss Top Chord-</p> <p>As determined by KYTC Central Office Load Analysis Staff, structural elements throughout Steel Pony Truss are no longer functioning as a load carrying unit and was not inspected at this time. (02/05/2009 and 02/22/2010)</p>



## KYTC Bridge Inspection Report

## Summary:

Inspection Date: 2/22/2010

Inspector: GCOCHRAN (23)

Primary Type: Substandard (12 Months)

## Types of Inspections Performed:

National Bridge Inventory: Y

Element: Y

Fracture Critical: N

Underwater: N

Other Special: N

## Element Condition State Data

Str Unit	Elm/Env	Description	Description
1	152/3	Paint Stl Floor Beam	<p>Floor Beams- Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (abutments, deck soffit area, steel stringers, STEEL FLOOR BEAMS, bearing, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time. Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010)</p> <p>During construction rehab project in the year of 2007 of new steel stringer element placement, note that floorbeam's at top flanges were notched out (cut) at bearing union of stringer to floorbeam locations. Center stringer is the only stringer that appears to be bearing on top flange of floorbeam elements. Areas need to be closely watched during inspections.</p>
1	215/3	R/Conc Abutment	<p>Concrete Abutments- Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (ABUTMENTS, deck soffit area, steel stringers, steel floor beams, bearings, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time. Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010) Rating for this abutment is for what could be viewed for inspection this date (Top Most Section). (See Photos)</p>
1	217/3	Other Mtl Abutment	<p>Stone Abutments- Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (ABUTMENTS, deck soffit area, steel stringers, steel floor beams, bearings, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time. Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010) Rating for this abutment is for what could be viewed for inspection this date (Top Most Section Only). Top edge of random stone masonry abutment is showing deterioration throughout with stone displacement detected in random areas. (See Photos)</p>
1	312/3	Enclosed Bearing	<p>Bearings- Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (abutments, deck soffit area, steel stringers, steel floor beams, BEARINGS, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time. Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010)</p>
1	359/3	Soffit Smart Flag	<p>Soffit- Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (abutments, DECK SOFFIT AREA, steel stringers, steel floor beams, bearings, etc.) that require entering channel and or under structure for review could not be and were not viewed for inspection at this time. Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010)</p>
1	361/1	Scour Smart Flag	<p>Scour- Scour conditions at this structure remain unknown at this time. Note that this structure is in backwater area of the Ohio River and at normal pool channel is only a few inches from bottom of structure at all times. During time of this inspection channel was approximately 8.0 inches from bottom of lower chord element; therefore any structural elements (abutments, deck soffit, steel stringers, steel floor beams, etc.) that require entering channel and or under structure could not be and were not viewed for inspection at this time. Depth of channel remains unknown. Underwater dive inspection is needed and should be considered as soon as possible. (02/05/2009 and 02/22/2010)</p>
1	362/1	Traf Impact SmFlag	<p>Traffic Impact- As determined by KYTC Central Office Load Analysis Staff, structural elements throughout Steel Pony Truss are no longer functioning as a load carrying unit and was not inspected at this time. (02/22/2010) Past inspection notes were left in place from past inspection reports and are as follows: Several vertical members showing traffic impact damage. Random panel point vertical showing repair by threaded rod placed as a new vertical member. (See Photos)</p>

## KYTC Bridge Inspection Report

## Summary:

Inspection Date: 2/22/2010  
 Inspector: GCOCHRAN (23)  
 Primary Type: Substandard (12 Months)

## Types of Inspections Performed:

National Bridge Inventory: Y  
 Element: Y  
 Fracture Critical: N  
 Underwater: N  
 Other Special: N

## Element Condition State Data

Str	Unit	Elm/Env	Description	Description
1	601/1	MisAlign/ot of plane	Out-of-Plane- As determined by KYTC Central Office Load Analysis Staff, structural elements throughout Steel Pony Truss are no longer functioning as a load carrying unit and was not inspected at this time. (02/22/2010) <del>Past inspection notes were left in place from past inspection reports and are as follows:</del> Pony Truss bowstring members showing moderate to heavy misalignment (out-of-plane) throughout. (See Photos)	
1	605/1	Transitions	Transitions- Note that both the rear and forward approach transitions to structure are causing unwanted impact on structure from traffic flow. Cast-in-place concrete design to newer deck is ramping traffic onto structure. (See Photos)	
1	610/1	Chan Drift	Channel Drift- Note that a moderate amount of channel drift debris was found hung on under side of structure during time of inspection. (See Photos)	

## BRIDGE.Notes

\*During the year of 2007 this structure had a new concrete deck placement (5" to 7" in depth) and new steel stringer floor beam elements placed throughout. Note that this construction was performed by unknown forces with unknown design. Since last inspection a load analysis (performed by KYTC Central Office Staff) has determined that Pony Truss is no longer functioning as load carrying unit, but does still remain in place. Under that determining, structural elements of Pony Truss structure as well as element descriptions Traffic Impact and Out-of-Plane were not considered in this inspection at all; therefore 123.0 LF of Pony Truss structural elements were zeroed out (0.001) during this inspection with impact to truss and out-of-plane not considered. (02/22/2010)

## Work Candidates

## Inspector Candidates:

Candidate ID:	Status	Priority	Assigned	Action	Elem	Date Recommended
012-C00003N-1	Approved	High	Unassigned	60	0	2/22/2010
012-C00003N-2	Approved	High	Unassigned	60	0	2/22/2010
012-C00003N-3	Approved	High	Unassigned	31	610	2/22/2010
012 C00003N 4	Approved	High	Unassigned	31	605	2/22/2010



012C00003N (02/22/2010)  
Forward to Rear





012C00003N



Weight Limit Sign at the forward approach (10 tons)



Vertical misalignment noted in Pony Truss Elements



Approach transition at the forward location



Right side view of structure, note clearance between lower chord and surface of stream

012C00003N



Left side view of structure, note  
channel drift debris

Rear to Forward





# BRIDGE INSPECTION REPORT

Reviewed By:   
Review Date:

Two Yr ☐ Substd ☐ Underwater ☒ In-Depth ☐ Fracture Critical ☐

Project No: 12-0008-B00007 NBI-Location: KY 8 over Turtle Creek - Bracken County

Structure Description Double Barreld 14 x 14 R.C.B.C.

Milepoint: 12.2 Inspectors Initials AAC

Inspector's Signature \_\_\_\_\_ Date: 10/2/2007

58	DECK	
1	Structural Condition	
2	Wearing Surface	
3	Joints	
4	Drains	
5	Expansion Devices	
6	Curbs, Sidewalks, Medians	
7	Railings	
8	Lighting and/or Utilities	

59	SUPERSTRUCTURE	
1	Stringers, Girders, Beams	
2	Floor Beams	
3	Trusses - Main Members	
3a	Trusses - Bracing, Portals	
4	Bearing Devices	
5	Alignment/Structural Members	
6	Deflection/Vibration under load	
7	Debris on Members	

59A	PAINT CONDITION	
Color:	Date Painted:	

60	SUBSTRUCTURE	
1	Abutments, Wingwalls	
2	Piers and/or Bents:	
3	Alignment and/or Settling	
4	Scour, Erosions	
5	Debris on Seats, Caps	
6	Protection Systems	
7	Abutments, Wingwalls (S.Z.D.)	
8	Piers /or Bents (S.Z.D.)	
9	Alignment or Settling Due to Scour	

61	CHANNEL/CHANNEL PROTECTION	
1	Channel Scour	
2	Embankment Erosion	
3	Drift	
4	Channel Alignment	
5	Vegetation	
6	Erosion	
7	Rip-Rap	

62	CULVERT RETAINING WALLS	
1	Barriers	
2	Wingwalls, Headwalls	
3	Debris	
4	Scour Under Footings (Underwater)	8
5	Erosion At Wingwalls (Underwater)	7
6	Drainage Adequacy (Underwater)	3

10 INVENTORY ROUTE VERTICAL CLEARANCES  
Over \_\_\_\_\_ ft \_\_\_\_\_ in. 36. TRAFFIC SAFETY  
Under \_\_\_\_\_ ft \_\_\_\_\_ in.

71	WATER ADEQUACY	
72.	APPROACH ROADWAY ALIGNMENT	

113	SCOUR CRITICAL BRIDGE RATING	6
-----	------------------------------	---

108 WEARING SURFACE/PROTECTIVE SYSTEM  
Type ☐ Membrane ☐ Protection ☐  
OVERLAY ☒ Yes ☐ No Date: \_\_\_\_\_  
TYPE: LATEX ☐ P.C.C. ☐ ASPHALT ☐

DEPTH OF ASPHALT

RECOMMENDED LOAD CAPACITIES (tons) I II III IV GROSS  
FIELD POSTINGS NE SW I II III IV GROSS

Additional Comments

A series of cracks were noted on all three vertical members and on both roof sections near the mid-point of the culvert. These cracks widened as they approach the culvert floor. The cracks in the west barrel floor measured 3" wide. There is a 2" gap between the northeast wingwall and the headwall and a 3" gap between the southwest wingwall and the headwall. The south end of the east barrel was 60% blocked and the south end of the west barrel ws 60% blocked.



## FMSM UNDERWATER BRIDGE INSPECTION FORM

1. Bridge Number: 12-0008-B00007  
County: Bracken  
Description: KY 8 - Turtle Creek (Structure 35)  
Water Body: Turtle Creek
2. Date Tuesday, October 02, 2007
3. FMSM Project No: LX2006003
4. Weather Temperature: 80  
☒ Sunny ☐ Partly Cloudy ☐ Other  
☐ Cloudy ☐ Windy  
Arrive: \_\_\_\_\_ Depart: \_\_\_\_\_  
Arrive: \_\_\_\_\_ Depart: \_\_\_\_\_
5. Supervisor: AAC Crew: JCG, RBC, TCB  
Visitors: \_\_\_\_\_  
Visitors: \_\_\_\_\_
6. Bridge Type:  
☐ Continuous Plate Girder ☐ Suspension ☐ Reinforced Concrete Beam  
☐ Steel Truss ☐ Wood Truss ☒ Other Double Barrel Culvert
7. Element Type:  
☒ Reinforced Concrete ☐ Closed Web ☐ Open Web ☐ Steel Piles  
☐ Masonry ☐ Timber Piles ☐ Other \_\_\_\_\_
8. Foundation Type  
☐ Pile with pile cap ☐ Pile without pile cap Pier founded on rock ☐ or soil ☐  
☐ Caisson ☐ Spread footing ☐ Other \_\_\_\_\_
9. Previous Report Available ☒ Dates of Report: 1990, 1995, 2000, 04  
Originator: FMSM
- 10 Construction or As-Built Plans and/or Reports Available ☒ Dates: 1959
- 11 Water surface reference point on Pier or Bridge  
Bottom of headwall north end on Barrel B to water surface  
Reference Point Elevation: 485.4 Distance to Water 1.3 Water Elevation: 484.1
12. Pictures Taken  
1. North Looking South  
2. South Looking North

## FMSM UNDERWATER BRIDGE INSPECTION FORM

Bridge Number: 12-0008-B00007

Date: Tuesday, October 02, 2007

## 13. Cross Sections:

<input type="checkbox"/> Upstream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5'	10'	25'	50'	100'
<input type="checkbox"/> Downstream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GPS Data No Sections Taken

View Point L to R Looking: ☐ Upstream ☐ Downstream

Benchmark Location: \_\_\_\_\_

Benchmark Coordinates Northing \_\_\_\_\_ Easting \_\_\_\_\_ Elevation \_\_\_\_\_

## 14. Scour:

- a. Scour pockets or troughs ☒ No ☐ Yes \_\_\_\_\_
- b. Footing or Foundation Element Exposed ☒ No ☐ Yes \_\_\_\_\_
- c. Scour increased since last inspection ☒ No ☐ Yes ☐ No Previous Report Available
- d. Comments: \_\_\_\_\_

## 15. Pier/Element Conditions: (see field notes for detailed description)

- ☒ Biological Growth See notes ☐ Zebra Mussel Growth \_\_\_\_\_
- ☐ Spalling \_\_\_\_\_ ☐ Honeycombing \_\_\_\_\_
- ☒ Scaling See notes ☐ Reinforcing Steel Exposed \_\_\_\_\_
- ☒ Vertical Cracks ☒ Hairline ☐ Measurable See notes \_\_\_\_\_
- ☐ Horizontal Cracks ☐ Hairline ☐ Measurable \_\_\_\_\_
- ☐ Impact Damage ☐ Minor ☐ Major \_\_\_\_\_
- ☒ Pier Faces not Inspected List Piers Tree blockage of both barrels on south side
- Reason for not inspecting Tree debris located in both barrels
- ☐ Other: \_\_\_\_\_

16. Heavy debris located around element ☐ No ☒ Yes, elements Barrel A and Barrel B southside

## 17. Bottom Conditions:

- |  |  |  |                               |  |
|--|--|--|-------------------------------|--|
| <input checked="" type="checkbox"/> Silt | <input checked="" type="checkbox"/> Gravel | <input type="checkbox"/> Boulders            | <input type="checkbox"/> Clay | <input checked="" type="checkbox"/> Debris |
| <input type="checkbox"/> Sand            | <input type="checkbox"/> Cobbles           | <input type="checkbox"/> Bedrock, type _____ |                               |  |

Debris:

- ☒ Sticks ☒ Tree Limbs ☒ Trees ☐ Timbers ☐ Steel Beam
- ☐ Construction Debris ☐ Waste Concrete ☐ Other: \_\_\_\_\_

## FMSM UNDERWATER BRIDGE INSPECTION FORM

Bridge Number: 12-0008-B00007

## 18. Inspection Method

Date: Tuesday, October 02, 2007

☒ Surface Supplied Air ☐ Scuba ☐ Wading ☐ Other

## 19. Bridge Access

a. Boat: ☐ Skiff ☐ Whaler ☐ Jonboat ☐ Monark ☒ Other: Land AccessRamp: ☐ Concrete ☐ Gravel ☐ Dirt ☐ None ☐ Ramp feeLocked Through ☒ No ☐ Yes

Distance from ramp to bridge: Travel time:

Comments / Directions: Gravel road on the north side of KY 8.

b. Bank/Shore: ☒ Grass ☐ Rock ☐ Gravel ☒ Dirt/Mud ☐ Other

## 20. Boat Traffic

a. Recreational: ☐ Heavy ☐ Moderate ☐ Light ☒ N/Ab. Fishing: ☐ Heavy ☐ Moderate ☐ Light ☒ N/Ac. Barge: ☐ Heavy ☐ Moderate ☐ Light ☒ N/A

Comments:

## 21. Water Conditions:

Temperature: 75 Degrees F Visibility: 0.0

Current: ☐ Heavy ☐ Moderate ☐ Light ☒ None

## 22. General Comments (Include any unusual conditions encountered):



Structure 12-0008-B00007 County Bracken Date 10/2/2007

Description North Looking South Crew AAC, JCG, RBC, TCB



Photos



Structure 12-0008-B00007 County Bracken Date 10/2/2007

Description South Looking North Crew AAC, JCG, RBC, TCB

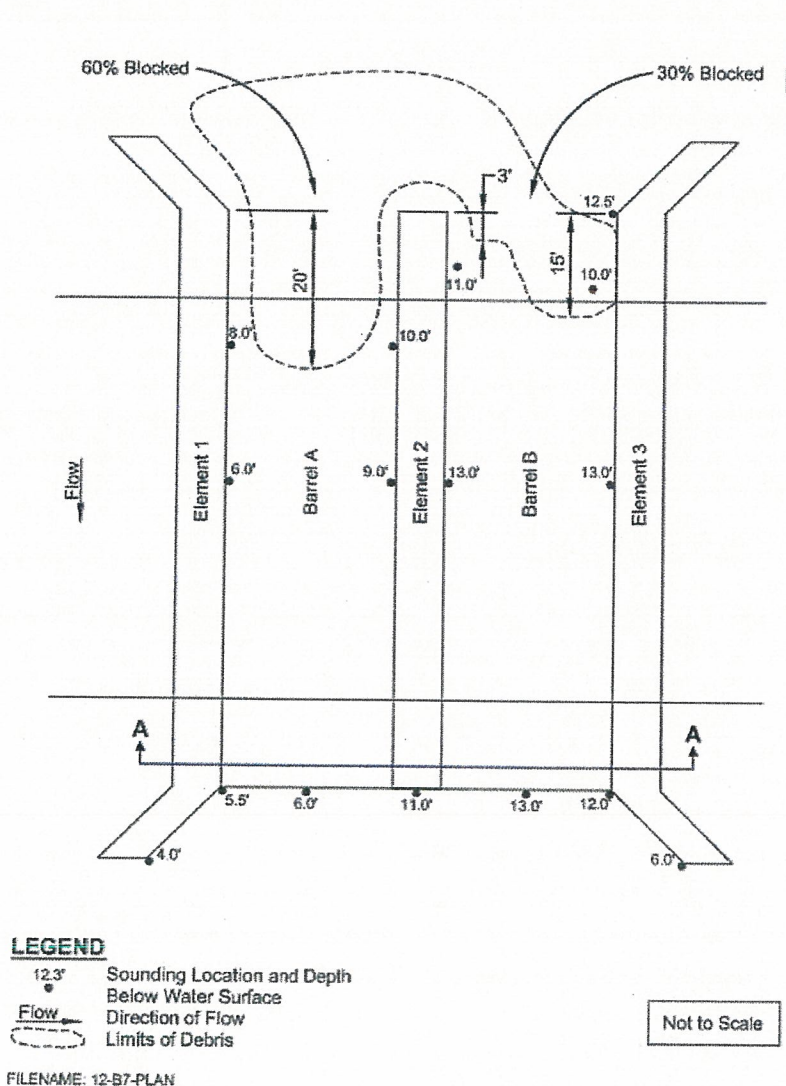




Structure 12-0008-B00007 County Bracken Date 10/2/2007

Description Plan View Crew AAC, JCG, RBC, TCB

**NOTE:** All depths refer to depth below water surface at time of inspection



FILENAME: 12-B7-PLAN

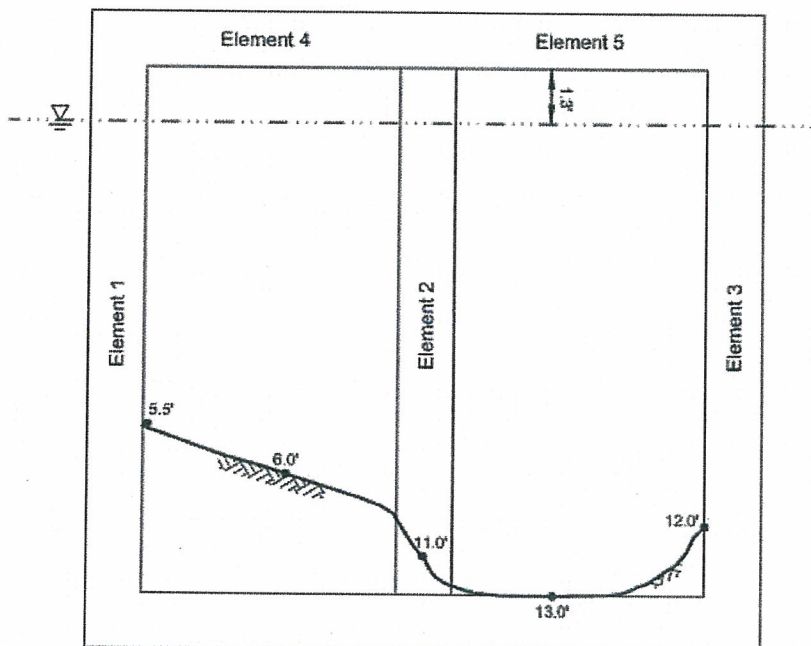
Plan View



Structure 12-0008-B00007 Element Culvert Date 10/2/2007

Individual Pier  
Rating \_\_\_\_\_

*NOTE: All depths refer to depth below water surface at time of inspection*



**LEGEND**

- 12.3' Sounding Location and Depth Below Water Surface
- Flow Direction of Flow
- Limits of Debris
- Soil Channel Bottom

Not to Scale

FILENAME: 12-B7-XS-A

Section A-A

Structure 12-0008-B00007 County Bracken Date 10/2/2007Crew AAC. JCG. RBC. TCBTurtle Creek Culvert**General Notes**

1. There is light scaling on the culvert below the water surface.
2. There is very light biological growth on the culvert below the water surface.
3. The bottom material at the end of the wingwalls consists of soft silt and twigs.
4. The bottom material is rocky extending 10.0 feet off north entrance.
5. The silt extends from the bottom to 5.0 feet of the surface on the east wingwall.
6. There is 6.0 feet of sediment within Barrel A, only 4 to 6 inches of sediment located within Barrel B.

**Barrel A**

1. There is 2 inches of separation between the northeast wingwall and headwall.
2. There is a crack located 70.0 feet south of the north face, the crack extends in the transverse direction on Element 1, 2 and 4. The crack varies across the elements from hairline to 1 inch on the east side of Element 2, the maximum penetration is 2 1/2 inches.
3. The diver could not pass all the way through the barrel. The upstream end is blocked approximately 60 percent by debris with a penetration into the culvert of 20 feet.

**Barrel B**

1. There is a 3 inch gap between southwest wingwall and headwall.
2. The floor is exposed with very little sediment on approximately 90 percent of the culvert.
3. The bottom of the culvert is 13.0 feet below the water surface.
4. There is a crack located 70 feet south of the north face, extending from Element 2 across Element 5 and down Element 3. The crack varies from hairline across the roof to 6 inches wide at the floor on Element 3 with 6 inches of penetration.
5. At 3 feet off the bottom of the culvert on the east wall of the culvert is a spall 6 inches tall and 1 foot wide with 3 inches of penetration.
6. The diver could not pass all the way through the barrel. The upstream end is blocked approximately 30 percent by debris with a penetration into the culvert of 35 feet.
7. The roof cracks show some efflorescence and branching.

## APPENDIX F: FIRM, Flood Insurance Map



## LEGEND



### SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.



### FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.



### OTHER FLOOD AREAS

- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.



### OTHER AREAS

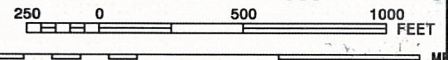
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.



National Flood Insurance Program at 1-800-638-6629



MAP SCALE 1" = 500'



NFIP

PANEL 0044E

## FIRM FLOOD INSURANCE RATE MAP BRACKEN COUNTY, KENTUCKY AND INCORPORATED AREAS

PANEL 44 OF 205

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

### CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUGUSTA, CITY OF	210022	0044	E
BRACKEN COUNTY	210021	0044	E

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  
21023C0044E

EFFECTIVE DATE  
SEPTEMBER 16, 2004

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](http://www.msc.fema.gov)

**ZONE D** Areas in which flood hazards are undetermined, but possible.







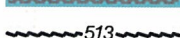


COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS



OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

-  1% annual chance floodplain boundary
-  0.2% annual chance floodplain boundary
-  Floodway boundary
-  Zone D boundary
-  CBRS and OPA boundary
-  Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
-  Base Flood Elevation line and value; elevation in feet\*  
(EL 987)

\*Referenced to the National Geodetic Vertical Datum of 1929



Cross section line



Transect line

97° 07' 30", 32° 22' 30"

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4276000 M

1000-meter Universal Transverse Mercator grid values, zone 17

600000 FT

5000-foot grid ticks: Kentucky State Plane coordinate system, north zone (FIPSZONE 1601), Lambert Conformal Conic projection

DX5510 X

Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5

River Mile

MAP REPOSITORY

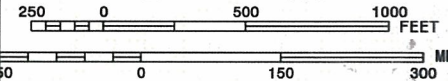
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE  
FLOOD INSURANCE RATE MAP  
September 16, 2004

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL



MAP SCALE 1" = 500'



NFIP

PANEL 0044E

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
BRACKEN COUNTY,  
KENTUCKY  
AND INCORPORATED AREAS

PANEL 44 OF 205

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUGUSTA, CITY OF	210022	0044	E
BRACKEN COUNTY	210021	0044	E

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

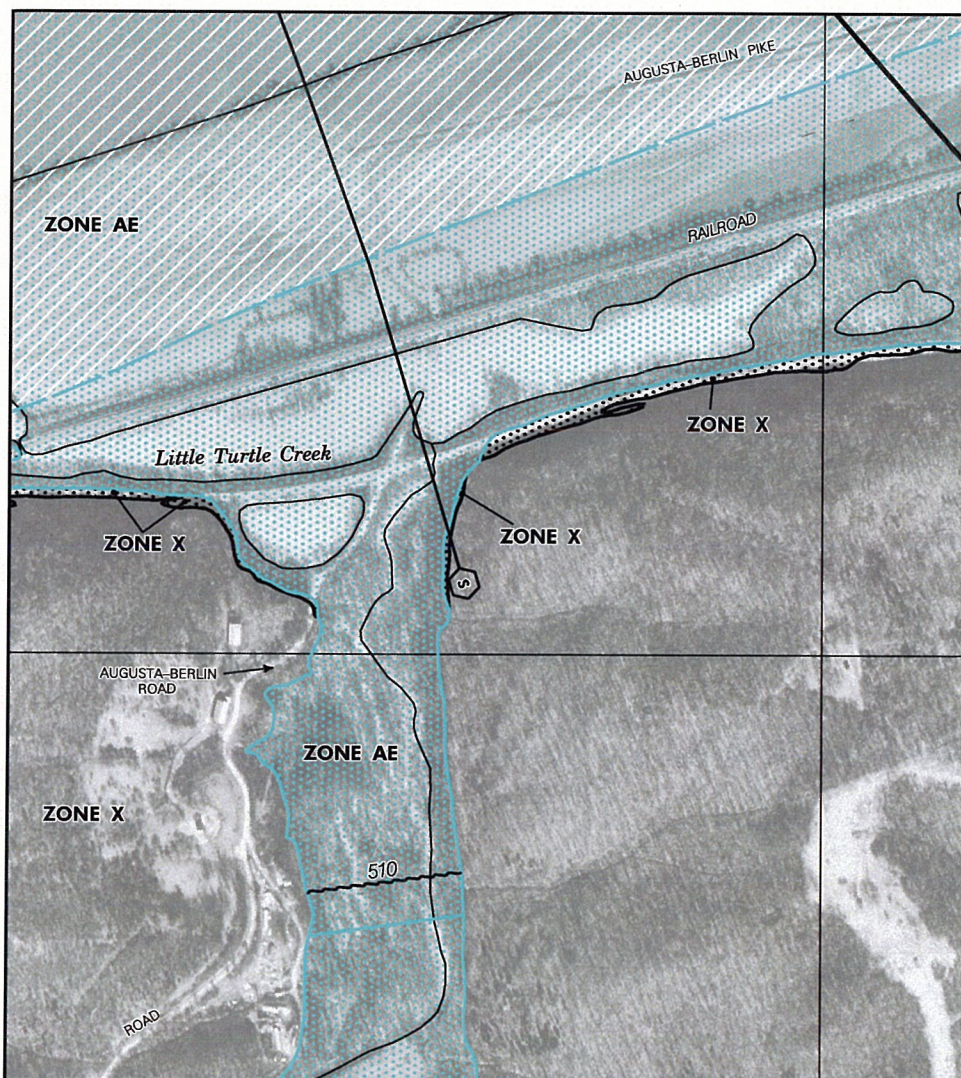
21023C0044E

EFFECTIVE DATE  
SEPTEMBER 16, 2004

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](http://www.msc.fema.gov)

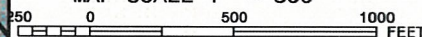




National Flood Insurance Program at 1-800-638-6620.



MAP SCALE 1" = 500'



NFIP

PANEL 0044E

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 BRACKEN COUNTY,  
 KENTUCKY  
 AND INCORPORATED AREAS

PANEL 44 OF 205

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUGUSTA, CITY OF	210022	0044	E
BRACKEN COUNTY	210021	0044	E

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EFFECTIVE DATE  
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## APPENDIX G: PVA Map



MAP A1

MAP 050





## APPENDIX H: Cost Summaries



## CONSTRUCTION COST SUMMARY

Bridge Length  (ft)	Alternate	Total Construction Cost (\$)
63	2b	350000
63	2a	411000
63	4	4800000
250	3	10260000

## PROJECT COST SUMMARY

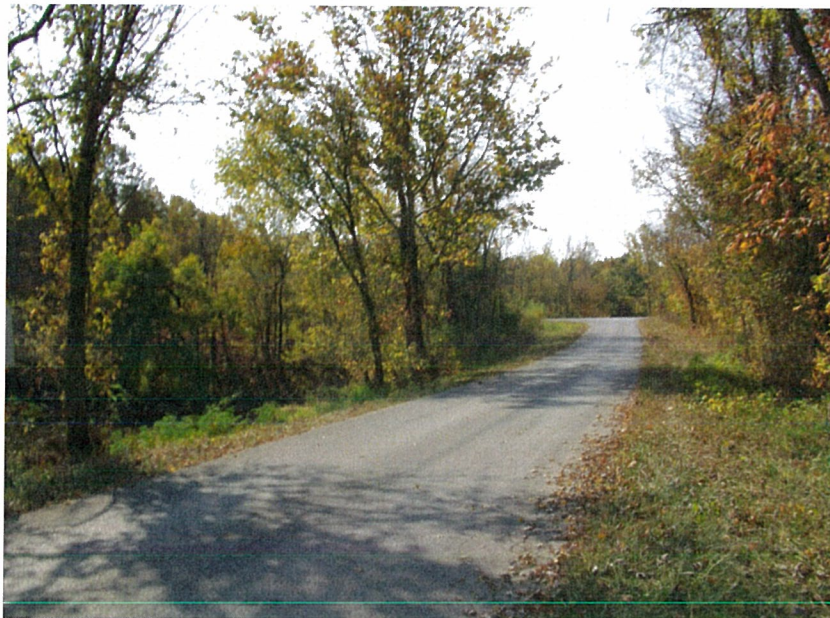
Bridge Length  (ft)	Alternate	Total Project Cost (\$)
63	2b	500000
63	2a	600000
63	4	6687000
250	3	11670000

## APPENDIX I: Photographs





Bridge over Turtle Creek looking north



Long Stretch Road Entrance at KY 8



Estimated Single 12 ft X 12 ft Reinforced Concrete Culvert and Double 14 ft X 14 ft Reinforced Concrete Culvert at KY 8



View of Turtle Creek





View of C&O Railroad looking south