

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 280055

Date: 09/28/2016

County: Davidson Stream: Flat Swamp Creek

Road #: NC 47 Road Name: NC 47

Division: 9 Location: 0.3 Mi. W. Jct. SR-2346

Latitude: 35.68640 Longitude: -80.15140 Decimal degrees, a min of 5 decimal points

Assigned to: wgc

Prepared By: ldc

Hydro Reviewer:

Project Type: DB

Existing Structure

Structure Type: RC Deck/ I Beams Yr Built: 1950

Span Arrangement: 3@30' OAL (ft): 90.0 Skew: 90 Abutment Type: Spill Through

Number of Barrels: @ Span (ft): x Rise (ft):

Bed to Crown (ft): 15.0 Clear Roadway (ft): 24.0 Water Depth (ft): 1.0 Superstructure Depth:

ADT: 1,200 Year ADT: 2013 Scour Code (item113): Prior Survey Completed: No Survey Date:

Drainage Area: 15.5 Sq. Mi. Drainage Area Source: USGS Stream Stats Roadway Overtops at Q100: No

Discharge Method: USGS Regression Equations USGS Region: 1- Piedmont Stream Gage Number(if applicable):

Q10 (cfs): 2,160.0 Q25 (cfs): 2,800.0 Q50 (cfs): 3,420.0 Q100 (cfs): 3,960.0 QBFE (cfs): 4,134.0

Structure in Flood Hazard Zone: Yes Panel #: 6740 Panel Date: 03/16/2009 Type of FIS: LIMITED Date of FIS:

Enviromental

Quad Map: GRIST MOUNTAIN, NC River Basin: Yadkin-Pee Dee Buffer Rule: N/A

Primary Stream Classification

☐ Class B ☒ Class C ☐ SA ☐ SB

☐ SC ☐ SWL ☐ WL ☐ WS I

☐ WS II ☐ WS III ☐ WS IV ☐ WS V

Supplemental Stream Classification

☐ FWS ☐ HQW ☐ NSW ☐ ORW

☐ Sw ☐ Tr ☐ UWL ☐ w/in 0.5mi. of CA

Other Stream Classification

☐ Anadromous Fish ☐ Area of Environmental Concern

☐ CAMA County ☐ Federal Wild & Scenic Rivers

☐ HSB Required ☐ NC Natural & Scenic Rivers

☐ Impaired [303d] ☐ Primary Nursery Area

☐ TVA ☐ Designated Shellfish Harvesting Area

☐ Designated Public Mountain Trout Waters

Up/Down Stream Features

Upstream Feature: Culvert

Location: 0.2 Mi. W. Jct. SR-2274

Structure #: 280225 Route: SR-2318

Latitude: 35.70890 Longitude: 80.13580

Prior Survey Completed: Yes Survey Date:

Bed to Crown (ft): 17.0 Year Built: 1997

Downstream Feature: Confluence w/ Stream(s)

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date: Bed to Crown (ft) Year Built:

Structure Type: RCBC

Span Arrangement: OAL (ft):

Number of Barrels: 3 @ Span (ft): 12.0 x Rise (ft): 12.0

Structure Type:

Span Arrangement: OAL (ft):

Number of Barrels: @ Span (ft): x Rise (ft):

Preliminary Structure Estimate [Office Estimate]

Structure Type: Skew:

Dimensions/Spans:

Notes

1.0' +/- Below low steel



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: **PRIORITY MAINTENANCE-BEAMS; UPDATES MADE
TO APPROACH ROADWAY SKETCH AND TYPICAL
SECTION SKETCH**

Structure Safety Report

Routine Element Inspection - Contract

COUNTY: DAVIDSON STRUCTURE NUMBER: 280055 FREQUENCY: 24 MONTHS
FACILITY CARRIED: NC47 MILE POST: _____
LOCATION: 0.3 MI. W. JCT. SR2346
FEATURE INTERSECTED: FLAT SWAMP CREEK
LATITUDE: 35° 41' 11" LONGITUDE: 80° 9' 5.13"
SUPERSTRUCTURE: REINFORCED CONCRETE DECK ON I-BEAMS
SUBSTRUCTURE: E.BENTS:RC CAP ON TIMBER PILES,INT.BENTS:2COL.RC POST & BEAM
SPANS: 3@30'1"
☐ FRACTURE CRITICAL ☐ TEMPORARY SHORING ☐ SCOUR CRITICAL ☐ SCOUR PLAN OF ACTION
PRESENT CONDITION: Poor INSPECTION DATE: 01/07/2016
POSTED SV: 22 POSTED TTST: 29
OTHER SIGNS PRESENT: 4 DELINEATORS



LOOKING EAST

Sign noticed issued for		Number Required
<u>NO</u>	WEIGHT LIMIT	<u>0</u>
<u>NO</u>	DELINEATORS	<u>0</u>
<u>NO</u>	NARROW BRIDGE	<u>0</u>
<u>NO</u>	ONE LANE BRIDGE	<u>0</u>
<u>NO</u>	LOW CLEARANCE	<u>0</u>

INSPECTED BY MATTHEW MOYER	SIGNATURE <i>Matthew Moyer</i>	ASSISTED BY DAVID WAGNER
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NATIONAL BRIDGE INVENTORY----- STRUCTURE INVENTORY AND APPRAISAL

Run Date: 05/26/2016

IDENTIFICATION							
(1) STATE NAME -NORTH CAROLINA	BRIDGE	280055		SUFFICIENCY RATING =		36.16	
(8) STRUCTURE NUMBER(FEDERAL)		00000000570055		STATUS =	Structurally Deficient		
(5) INVENTORY ROUTE (ON/UNDER) - ON		31000470					
(2) STATE HIGHWAY DEPARTMENT DISTRICT		1		CLASSIFICATION		CODE	
(3) COUNTY CODE 57	(4) PLACE CODE	0		(112)NBIS BRIDGE SYSTEM -		YES	
(6) FEATURE INTERSECTED - FLAT SWAMP CREEK				(104)HIGHWAY SYSTEM	Is not on NHS	0	
(7) FACILITY CARRIED NC47				(26) FUNCTIONAL CLASS -	Major Collector	07	
(9) LOCATION 0.3 MI. W. JCT. SR2346				(100)STRAHNET HIGHWAY -	Not a STRAHNET Route	0	
(11)MILEPOINT		0		(101)PARALLEL STRUCTURE -	No Parallel Structure	N	
(16)LAT 35° 41' 11.00"	(17)LONG 80° 9' 5.13"			(102)DIRECTION OF TRAFFIC -	2-way Traffic	2	
(98)BORDER BRIDGE STATE CODE	PCT SHARE			(103)TEMPORARY STRUCTURE -			
(99)BORDER BRIDGE STRUCTURE NO				(110)DESIGNATED NATIONAL NETWORK -	Not on the National Network	0	
				(20) TOLL	On Free Road	3	
STRUCTURE TYPE AND MATERIAL				(31) MAINTAIN -	State Highway Agency	01	
(43) STRUCTURE TYPE MAIN: Steel				(22) OWNER -	State Highway Agency	01	
TYPE - Stringer Multibeam or Girder	CODE	302		(37) HISTORICAL SIGNIFICANCE -	Not Eligible	5	
(44) STRUCTURE TYPE APPR :				CONDITION		CODE	
TYPE -	CODE	000		(58) DECK		4	
(45) NUMBER OF SPANS IN MAIN UNIT		3		(59) SUPERSTRUCTURE		4	
(46) NUMBER OF APPROACH SPANS				(60) SUBSTRUCTURE		7	
(107)DECK STRUCTURE TYPE - 1	CODE			(61) CHANNEL & CHANNEL PROTECTION		7	
(108)WEARING SURFACE / PROTECTIVE SYSTEM :				(62) CULVERTS		N	
(A) TYPE OF WEARING SURFACE -	CODE			LOAD RATING AND POSTING		CODE	
(B) TYPE OF MEMBRANE -	CODE			(31) DESIGN LOAD	HS 15	3	
(C) TYPE OF DECK PROTECTION -	CODE			(63) OPERATING RATING METHOD -	Load Factor	1	
				(64) OPERATING RATING -	HS-20	36	
(27) YEAR BUILT		1950		(65) INVENTORY RATING METHOD -	Load Factor	1	
(106)YEAR RECONSTRUCTED				(66) INVENTORY RATING -	HS-12	21	
(42) TYPE OF SERVICE : ON - Highway				(70) BRIDGE POSTING -	Posting Required	2	
UNDER - Waterway	CODE	15		(41) STRUCTURE OPEN, POSTED, OR CLOSED		P	
(28) LANES: ON STRUCTURE 2 UNDER STRUCTURE		0		DESCRIPTION -	Posted for Load		
(29) AVERAGE DAILY TRAFFIC		1200		APPRAISAL		CODE	
(30) YEAR OF ADT 2013	(109) TRUCK ADT PCT	7%		(67) STRUCTURAL EVALUATION		4	
(19) BYPASS OR DETOUR LENGTH		2 MI		(68) DECK GEOMETRY		4	
GEOMETRIC DATA				(69) UNDERCLEARANCES, VERTI & HORIZ		N	
(48) LENGTH OF MAXIMUM SPAN		29 FT		(71) WATERWAY ADEQUACY		7	
(49) STRUCTURE LENGTH		90 FT		(72) APPROACH ROADWAY ALIGNMENT		8	
(50)CURB OR SIDEWALK: LEFT 1 FT RIGHT		1 FT		(36) TRAFFIC SAFETY FEATURES		0000	
(51) BRIDGE ROADWAY WIDTH CURB TO CURB		24 FT		(113)SCOUR CRITICAL BRIDGES		8	
(52) DECK WIDTH OUT TO OUT		28.167 FT		PROPOSED IMPROVEMENTS			
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)		21 FT		(75) TYPE OF WORK -		CODE	
(33) BRIDGE MEDIAN - No Median	CODE	0		(76) LENGTH OF STRUCTURE IMPROVEMENT			
(34) SKEW 0°	(35) STRUCTURE FLARED	0		(94) BRIDGE IMPROVEMENT COST			
(10) INVENTORY ROUTE MIN VERT CLEAR		999.9 FT		(95) ROADWAY IMPROVEMENT COST			
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR		24 FT		(96) TOTAL PROJECT COST			
(53) MIN VERT CLEAR OVER BRIDGE RDWY		999.9 FT		(97) YEAR OF IMPROVEMENT COST ESTIMATE			
(54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad		0 FT		(114)FUTURE ADT 2400	(115) YEAR FUTURE ADT 2025		
(55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad		000 FT		INSPECTIONS			
(56) MIN LAT UNDERCLEAR LT REF -		000 FT		(90) INSPECTION DATE		01/07/2016	
NAVIGATION DATA				(92) CRITICAL FEATURE INSPECTION :	(93) CFI DATE		
(38) NAVIGATION CONTROL - No Navigational Control	CODE	0		A) FRACTURE CRIT DETAIL -	NO	A)	
(111)PIER PROTECTION -	CODE			B) UNDERWATER INSP -	NO	B)	
(39) NAVIGATION VERTICAL CLEARANCE		0		C) OTHER SPECIAL INSP	NO	C)	
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR	FT			SCOUR			
(40) NAVIGATION HORIZONTAL CLEARANCE		0 FT					

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 05/26/2016

COUNTY :	DIVISION :	DISTRICT :	STRUCTURE NUMBER :	LENGTH :	
DAVIDSON	9	1	280055	90	FEET

ROUTE CARRIED :	FEATURE INTERSECTED :
NC47	FLAT SWAMP CREEK

LOCATED :	BRIDGE NAME :	CITY :
0.3 MI. W. JCT. SR2346		

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
07	FA	NFA	1200 2013	LT 181 RT 181

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1950	SHPWC	6-156	S-378(1)	HS 15

REHAB :	BY :	PROJ :	ALIGNMENT :	SKEW :	LANES :
			TAN	90	ON 2 UNDER 0

NAVIGATION :	HT. CRN. TO BED :	WATER DEPTH :
VC 0 FT HC 0 FT	15 FT	1 FT

SUPERSTRUCTURE :	REINFORCED CONCRETE DECK ON I-BEAMS
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SUBSTRUCTURE :	E.BENTS:RC CAP ON TIMBER PILES,INT.BENTS:2COL.RC POST & BEAM
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SPANS :	3@30'1"
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BEAMS OR GIRDERS :	4 LINES OF W21X68 I-BEAMS @ 6'9" CENTERS
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FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
5.75"RC,3.0"AWS		28.167 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
24 FT	26 FT	LT 1 FT RT 1 FT

VERT.CL.OVER :
999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :	TTST	DATE
HS-12	HS-20	Span B Int	SV 22	29	02/11/2009

SYSTEM :	GREEN LINE ROUTE :
Primary N.C. Route	N

UNDER ROUTES AND CLEARANCES

REMARKS :



LOOKING EAST



POSTING SIGN AT SOUTHWEST CORNER



DOWNSTREAM PROFILE



NORTH BRIDGE RAIL, SOUTH BRIDGE RAIL SIMILAR



UPSTREAM PROFILE



LOOKING UPSTREAM, NORTH



LOOKING DOWNSTREAM, SOUTH



LOOKING WEST



POSTING SIGN AT NORTHEAST CORNER



END BENT 1



BENT 2, BENT 1 SIMILAR



TYPICAL SUPERSTRUCTURE, SPAN 2 SHOWN



TYPICAL BEARING, BEAM 3 AT BENT 1 SHOWN

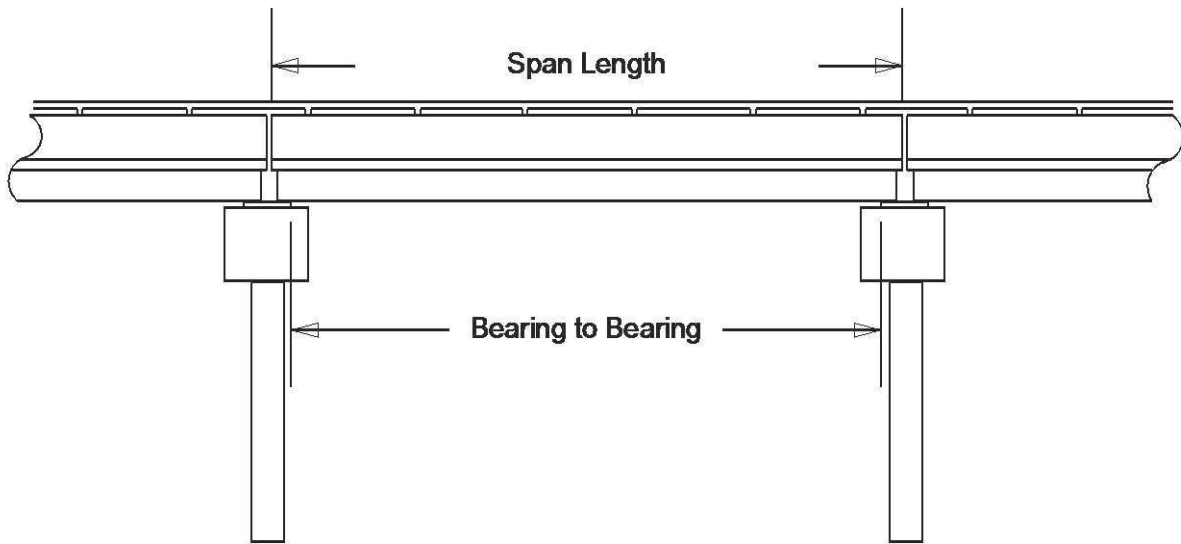


END BENT 2

Structure Data Worksheet

Spans

County: DAVIDSON Structure No: 280055 Date: Inspected By: MJM



Span No	Span Length	Bearing to Bearing	Comments
1	30.083	28.5	NBIS BRIDGE LENGTH = 85.75 FT.
2	30.083	29.25	MEASUREMENTS VERIFIED 1/7/2015 BY MJM
3	30.083	28.5	

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 280055 County: DAVIDSON Date: _____ By: MJM

Record sounding from top of rail. Other location if needed: _____

Distance from Highwater Mark to top of rail: _____ Location of Highwater Mark: _____

DOWNSTREAM			UPSTREAM		
Distance (Station) (ft)	Sounding (ft)	Description	Distance (Station) (ft)	Sounding (ft)	Description
0	2.5	TOP OF DECK			
1	4.7	Top of Cap			
2	6.5	END BENT 1	2	5.8	END BENT 1
7	7.3				
24	13.5				
25	14.3				
30.1	17.6	BENT 1	30.1	14.3	BENT 1
30.11	17.6	Water Surface/Water Edge (WSWE)			
42	17.8				
53	17.6	Water Surface/Water Edge (WSWE)			
60.2	15.5	BENT 2	60.2	15.3	BENT 2
69	12.4				
70	11.4				
83	7.7				
89	6.9	END BENT 2	89	6.5	END BENT 2
90	4.7	Top of Cap			
91	2.5	TOP OF DECK			

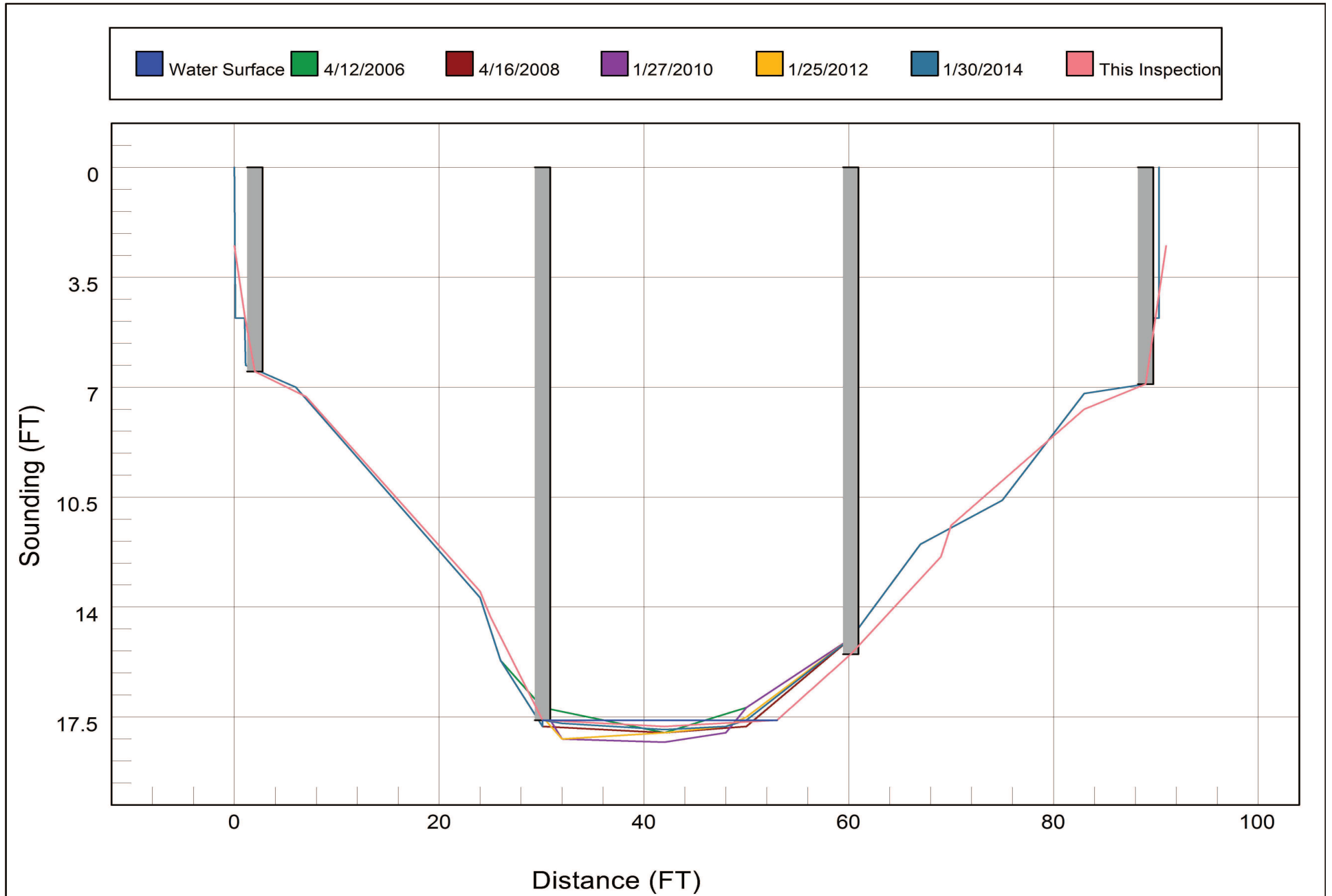
Bridge: 280055

County: DAVIDSON

Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



Bridge Inspection Field Sketch

NC-47

Roadway	21ft Wide	2 Paved Lanes	Looking East
Left Shoulder	4ft Wide		4ft Unpaved
Right Shoulder	4ft Wide		4ft Unpaved
Left Guardrail			
Right Guardrail			

MEASUREMENTS UPDATED 1/7/2015 BY MJM

Title

APPROACH ROADWAY

Description

SHEET 1

Bridge No: 280055

Drawn By: BTH

Date: 04/16/08

File Name: S0090001112

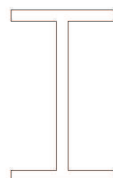
Bridge Inspection Field Sketch

Deck Width/Out to Out	28.167ft	Between Rails		26ft
Clear Roadway	24ft	Wearing Surface		0.25ft
Median Width		Median Height		
Curb Height		Left	0.583ft	Right 0.583ft
Sidewalk Width		Left		Right
Clear Roadway (Rail to Median)		Left		Right
Guardrail Width		Left	0.875ft	Right 0.875ft
Top of Rail to Deck/Wearing Surface		Left	2.5ft	Right 2.5ft
Bridge Rail		Left	Type 18	Right Type 18

Measurements for Span #	1		
Deck Thickness	0.48	Left Overhang	3.959
Top of Rail to Bottom of Beam	4.75	Right Overhang	3.959

Beam Number	Beam Type	Spacing	Comments
1	Steel I Beam	6.75ft	
2	Steel I Beam	6.75ft	
3	Steel I Beam	6.75ft	
4	Steel I Beam	ft	

ABUTS: RC CAPS & TIMBER PILES. PIERS: 2 COL. RCP&B PIERS.

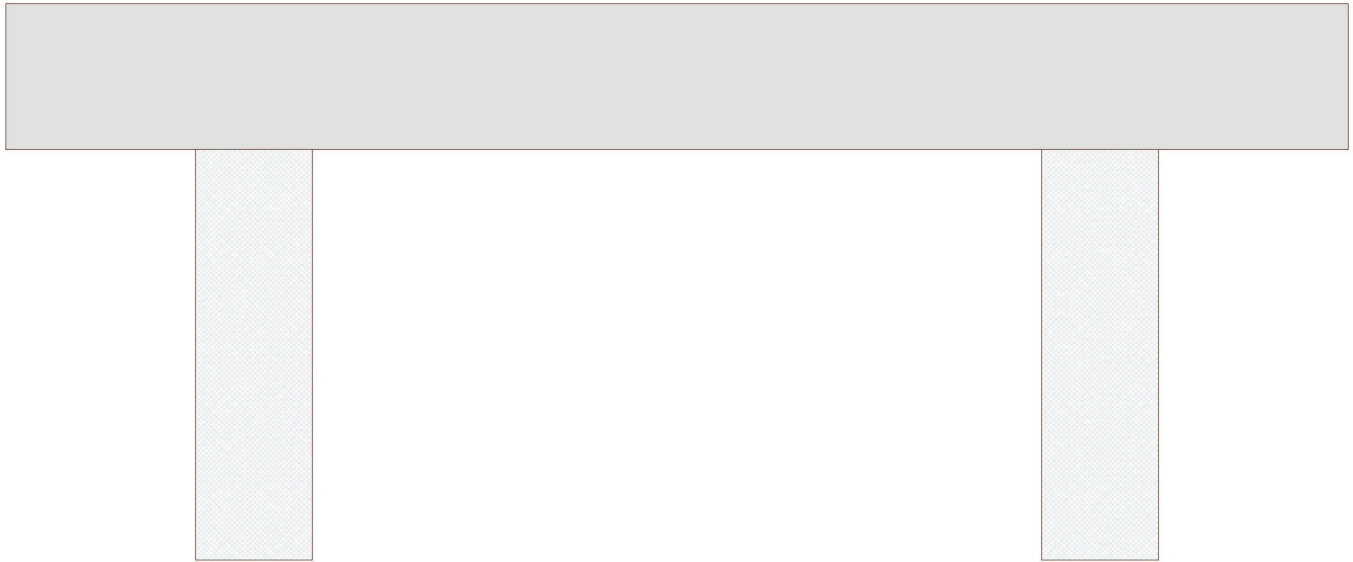


I-BEAMS	WIDTH	HEIGHT	WEB	FLANGE
ALL	0.687 ft.	1.771 ft.	0.450"	0.735"

MEASUREMENTS UPDATED 1/7/2015 BY MJM

Title SUPERSTRUCTURE		Description SHEET 2	
Bridge No: 280055	Drawn By: BTH	Date: 04/16/08	File Name: S0090001113

Bridge Inspection Field Sketch



Cap Information			Material Cast-in-Place Concrete							
Length	Width	Height	Left Overhang	Right Overhang	Left Beam to End of Cap.	Right Beam to End of Cap.				
23.000 ft.	2.500 ft.	2.500 ft.	4.250 ft.	4.250 ft.	1.417 ft.	1.417 ft.				
Subcap Information			Material							
Length	Width	Height	Left Overhang	Right Overhang	Left Pile to Splice.					
Sill Information			Material							
Length	Width	Height								
Pile #	Material	Spacing	Width/Dia.	Height	Length	Orientation	Driven?	Replacement?	Removed?	Collar?
1	Concrete	14.5 ft.	2.0 ft.	2.0 ft.		Vertical	No	No	No	No
2	Concrete		2.0 ft.	2.0 ft.		Vertical	No	No	No	No
MEASUREMENTS VERIFIED 1/7/2015 BY MJM										
Bent/Abutment #: 1			Similar Bents: 1							

Title

PIERS

Description

SHEET 3

Bridge No: 280055

Drawn By: BTH

Date: 4/16/2008

File Name: S0090002766

Flat Swamp Creek Limited Detail Study Plan: Floodway Run 10/6/2016
 NC-47 (FSC) for Structure ID: LDS_FSC_02 Approximate Survey Stru

