

PRELIMINARY HYDRAULICS STUDY
FOR
ENVIRONMENTAL IMPACT

NCDOT TIP NO. R-3410
Widening of NC 42 from US 70 Business to NC 50
Johnston County, NC



2-13-2018

PREPARED BY:



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HYDRAULIC ASPECTS OF ENVIRONMENTAL IMPACT OF THE PROPOSED WIDENING OF NC 42 FROM US 70 BUSINESS TO NC 50

I. Project Background

This purpose of this report is to evaluate the hydraulic and environmental impact of the proposed widening of NC 42 from US 70 Business to NC 50 in Johnston County. The preliminary alternatives for the proposed improvements include the following symmetrical and asymmetrical widening.

The following report includes data and preliminary hydraulic recommendations for five (5) stream crossings with each site labeled on the provided map.

II. Data Collection

Sungate obtained and reviewed available GIS data, USGS topographic mapping, LIDAR contour data, aerial orthophotography, Johnston County Soil Surveys and FEMA flood maps, as well as local zoning and planning maps.

III. Future Land Use

The eastern portion of the project is located within the Town of Clayton extraterritorial jurisdiction. The western portion of the project is located in Johnston County's jurisdiction. Future Land Use maps have been obtained from both and are included in this report. The Johnston County future land use shows the project corridor as Primary Growth Area with the area near the interchange with I-40 as a Regional Center. The intersections with NC 50 and Cornwallis Road (SR 1525) are listed as Community Center. Clayton's future land use map shows areas of Medium and High Density Residential. The intersection with US 70 Bypass is shown as a Community Center with the intersections at Amelia Church Road (SR 1552), Guy Road (SR 1551), and Barber Mill Road (SR 1555) shown as Neighborhood Center.

IV. Hydrology

According to the USGS Hydrologic Regions map, the project major structures are located along the border of Regions 1 and 4. There is a significant increase in discharges when using Region 1 when compared to Region 4. USGS Stream Stats uses SIR 2014-5030 equations associated with Region 4. However, the entire drainage areas for all sites are located within Region 1. During our field investigations, significant scour holes were observed at the culvert outlets for Sites 1 and 1A which leads to the conclusion that the culverts are likely undersized. If the discharges from Region 4 are used, the existing culverts appear to be significantly oversized which leads to the conclusion that the Region 4 discharges are too low. For these reasons, the discharges using the Region 1 equations were used for this report.

V. FEMA Requirements

Johnston County is a participant in the National Flood Insurance Program (NFIP). According to the FIS and DFIRMs obtained from North Carolina Floodplain Mapping Program (NCFMP), Buffalo Creek West, Swift Creek, White Oak Creek, and Little Creek are located in FEMA Detailed Study Areas.

Currently, NCDOT and NCFMP have a Memorandum of Agreement (MOA) dated 8/12/2016 which streamlines the review of projects in FEMA study areas. All NCDOT MOA submittals must be submitted through NCFMP. Since several of the proposed alternatives impact floodways due to encroachment of the roadway fill, it is anticipated that MOAs or Conditional Letters of Map Revision (CLOMRs) will be required at all sites. In the case that an MOA is achievable, the Hydraulics Unit will coordinate with NCFMP. Should a CLOMR and subsequent final Letter of Map Revision (LOMR) be required, the Hydraulics Unit will coordinate with NCFMP. Upon completion of project construction, the Division shall submit sealed as-built construction plans to the Hydraulics Unit certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

VI. Stormwater Management

This project is located in the Neuse River Basin and will be subject to the Neuse River Riparian Buffer Rules. According to NCDEQ-DWR, Buffalo Branch (27-43-15-11), Swift Creek (27-43-8), White Oak Creek (27-43-11), and Little Creek (27-43-12) are classified as C and Nutrient Sensitive Waters (NSW).

Class C Waters are protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquatic life including propagation, survival and maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. **Nutrient Sensitive Waters** is a supplemental classification intended for waters needing additional nutrient management due to being subject to excessive growth of microscopic or macroscopic vegetation.

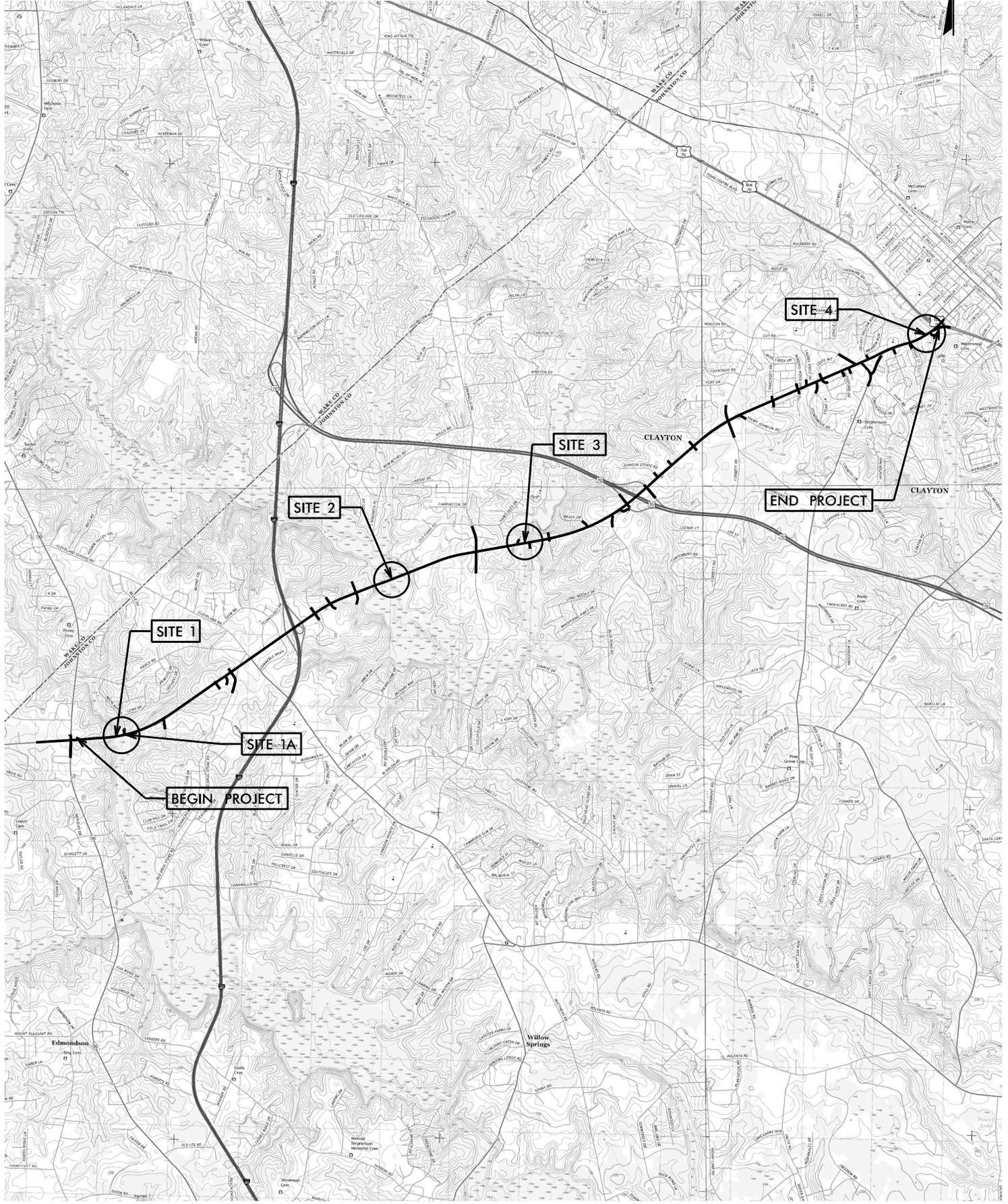
Post-construction structural Stormwater Control Measures (SCMs) should be designed to provide treatment of stormwater quality as well as control potential increases in peak flow rates caused by added impervious area.

Siltation of adjacent areas and streams due to project construction should be kept to a minimum with stringent use and maintenance of the standard erosion control measures and devices. Existing drainage patterns should be maintained to the extent practicable. The proposed project corridor is not located in a Water Supply Watershed Protected or Critical Area.

VII. Environmental Permits

It is anticipated that the construction of the project can be authorized under a United States Army Corps of Engineers (USACOE) Section 404 Individual Permit. Additional permits that will be required are NCDEQ-DWR Section 401 Water Quality Certification and Buffer Authorization. NCDOT will coordinate with the USACOE, NCDEQ-DWR and other governmental regulatory agencies to ensure that all environmental concerns are appropriately addressed.

R-3410
USGS SITES
JOHNSTON COUNTY
1" = 6000'



PRELIMINARY HYDRAULIC RECOMMENDATIONS FOR MAJOR⁽¹⁾ CROSSINGS

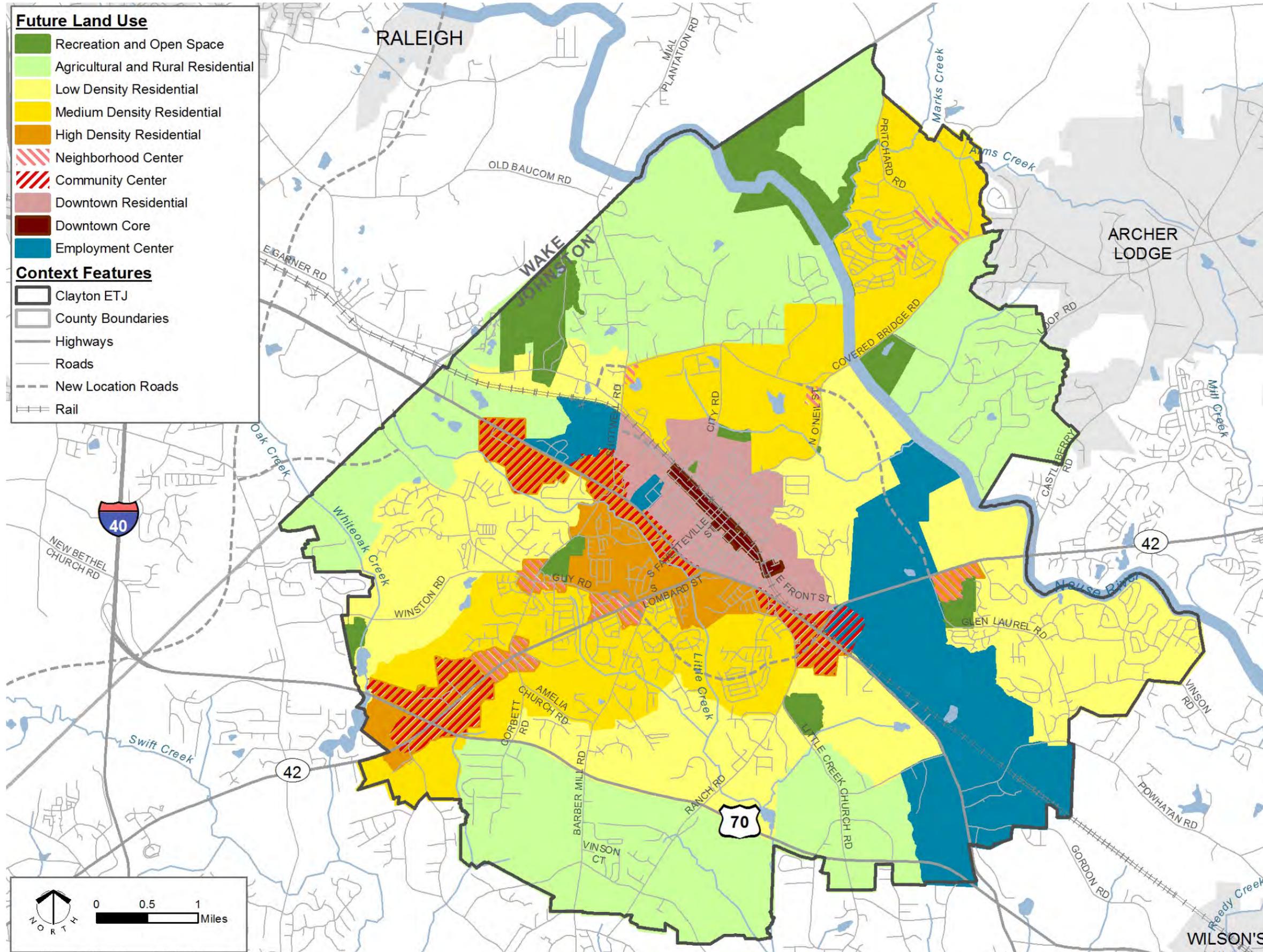
DATE: 2/3/2018
PROJECT NUMBER: R-3410
WBS ELEMENT #:
PROJECT DESCRIPTION: NC 42 Widening from NC 50 to US 70 Business in Clayton

SITE NUMBER	ALT ID ⁽²⁾	ROUTE	STATION	LAT	LONG	STREAM/ WETLAND ID	STREAM NAME	FEMA STUDY TYPE	DRAINAGE AREA (Mi ²)	EXISTING STRUCTURE	MINIMUM RECOMMENDED STRUCTURE	Notes
										Number, Size, Structure Type	Number, Size, Structure Type	
1	All	NC 42	54+72 -L-	35.59317	-78.59217		Buffalo Creek (West)	Detailed	3.0	2 @ 9' x 8' RCBC	2 @ 11' x 10' RCBC	
1A	All	NC 42	62+00 -L-	35.59359	-78.58979		UT to Buffalo Creek	None	1.0	1 @ 7' x 7' RCBC	1 @ 11' x 8' RCBC	
2	All	NC 42	203+35 -L-	35.6133	-78.5488		Swift Creek	Detailed	86.5	6 @ 37.5' Bridge	400' Bridge	
3	All	NC 42	267+75 -L-	35.6178	-78.5282		White Oak Creek	Detailed	13.5	3 @ 37.5' Bridge	160' Bridge	
4	All	NC 42	481+70 -L-	35.64424	-78.46489		Little Creek	Detailed	5.5	2 @ 35' Bridge	150' Bridge	100-yr overtops

NOTES:

(1) Major Crossings - conveyance greater than 72" pipe (This table should be used for Merger CP2A concurrence.)

(2) Provided in planning document



Future Land Use Map

Description of Future Land Uses

Ten future land use categories are depicted on the map. Each category is intended to indicate a predominant land use—or set of uses—as well as other features that define the character of the category. A brief description of each category is provided below. Each is consistent with the community’s ideas and vision for the future development pattern. Furthermore, these descriptions do not propose a change to existing development within each category; instead, they suggest a direction for moving forward.

RESIDENTIAL LAND USES

Agricultural/Rural Residential (ARR)

Agricultural/Rural Residential areas are primarily located outside of existing and future sewer service areas. Most of these areas rely on septic systems for wastewater treatment, have a limited road network and, in some cases, lie within the watershed protection overlay of the Neuse River. The predominate existing land uses in these areas include low-density residential uses, as well as large tracts of agriculture land. The lack of utility and transportation infrastructure, the established low-density development pattern and ongoing agricultural activities in these areas contribute to their rural character. This character can be enhanced by encouraging only low-intensity uses and context-sensitive rural design. Single family residential at gross densities up to two units per acre are appropriate.

Typical Uses: Agriculture, Large Lot Single-family Residential, Clustered Single-family Residential (dependent on soils or utility availability), Parks and Conservation

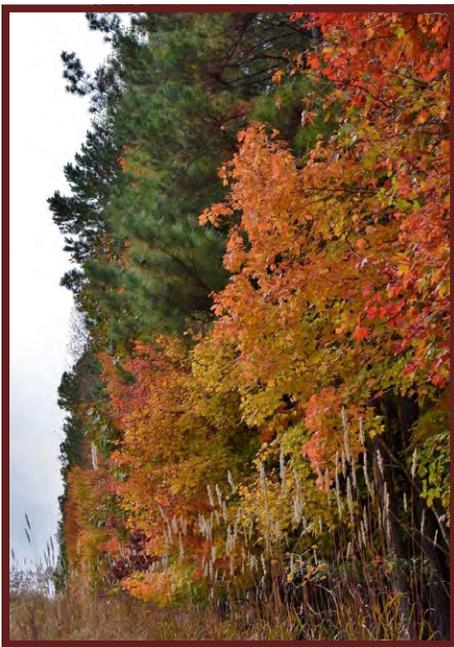
Gross Residential Density: up to 2 dwelling units/acre

Low-Density Residential (LDR)

Areas designated as Low-Density Residential are intended to remain predominantly suburban in character and provide for low-density, single-family residential development on lots smaller than those in Rural Residential areas. Low Impact Development (LID) techniques such as clustering of dwellings to the degree that soils and/or available water and sewer infrastructure allows and flexibility to allow for innovative street cross sections that improve stormwater filtration via swales or other features are appropriate. However, mixed-residential uses may occur under a Planned Development - Residential District to support conservation of open space, so long as a density of 3 units per acre is not exceeded.

Typical Uses: Single-family Residential, Agriculture, Parks and Conservation

Gross Residential Density: up to 3 dwelling units/acre



Example: Agriculture/Rural Residential



Example: Low Density Residential



Top: Example: High Density Residential; Bottom Example: Downtown Core; Right Example: Neighborhood Commercial

Medium Density Residential (MDR)

The Medium Density Residential area is comprised predominantly of neighborhoods with housing units that are more urban in character and in closer proximity to commercial services and centers. This area provides a transition from the more suburban areas of the Town to more developed areas. The density of development in this area will vary based on the presence of utilities, topography and environmental features. This designation is applied to land which is developed, or is to be developed, at a density between three and five units per acre. Densities as high as seven units per acre may occur under a Planned Development - Residential District.

Typical Uses: Residential (all forms)

Gross Residential Density: up to 5 dwelling units/acre. Densities up to 7 dwelling units/acre may be approved as part of a Planned Development - Residential District.

High Density Residential (HDR)

The High Density Residential area provides for housing options located in close proximity to major transportation corridors, existing commercial areas and Downtown services. These areas have a connected street network, adequate pedestrian and bicycle facilities, and are served by public water and sewer. High Density Residential is designed to include all housing types. In some instances, this designation provides for a transition between lower-density residential use and commercial uses. In other instances, this designation allows the establishment of neighborhood commercial uses such as a grocery store or neighborhood services which are compatible with higher-

density residential uses. When neighborhood-serving commercial uses are placed within or adjacent to a residential area, such uses shall be limited to a size which is sufficient to accommodate the needs of an immediate residential neighborhood. These transitional areas will have opportunities for slightly higher-density development than the other residential categories.

Typical Uses: Residential (all forms), Limited Neighborhood Commercial Services
Gross Residential Density: up to 12 dwelling units/acre. Densities greater than 10 dwelling units/acre may be approved as part of a Planned Development.

Downtown Residential (DR)

The Downtown area provides for housing options and office-residential uses located in close proximity to the Downtown Core. The Downtown category is designed to retain established neighborhoods and maintain the historic character while allowing a variety of higher-density housing types that support and foster growth of the Downtown Core. Higher-density development should be directly bordering the Downtown Core or along US 70 Business Highway West. The Downtown area should have a connected street network with short block lengths, a grid-style street system, and adequate pedestrian and bicycle facilities.

Typical Uses: Residential (single-family, with higher density residential uses limited to areas as described above); Neighborhood Commercial in appropriate locations

Gross Residential Density: up to 12 units/acre, up to 20 units/acre with PD

NON-RESIDENTIAL LAND USES

Downtown Core (DC)

This designation is applied to the Town’s Downtown Core area where the highest-density commercial, employment, residential and other uses are located. It is intended to foster an urban environment characterized by a sensitive blending of carefully preserved older structures, high-quality and context-sensitive new construction, and public spaces all working together and integrated with surrounding neighborhoods. The Downtown Core is the most flexible category and accommodates a variety of uses including commercial services (restaurants, retail, professional services, and entertainment), office, high-density residential, upper-story apartments, and older homes renovated to accommodate commercial uses. A mix of uses that creates a regional draw as well as serving the immediate community is desired. The Downtown Core provides a convenient road network with future transit opportunities and a pedestrian friendly system of sidewalks or greenways for non-motorized accessibility.

Gross Residential Density: up to 30 units/acre

Neighborhood Center (NC)

A Neighborhood Center is generally located near concentrations of existing or planned residences, and areas with access to major thoroughfares and utilities. These areas incorporate neighborhood-serving commercial uses including grocery stores, retail establishments, restaurants and services. A limited amount of office, civic and institutional uses are also appropriate. Higher-density residential including small-lot, single-family, townhouses and apartments should be located in close proximity to shopping and service destinations to provide more walking opportunities to internal and external pedestrian facilities and destinations. The scale of the Neighborhood Center varies depending on the market and competition. Typical Neighborhood Centers have a service area of one to two miles.

Community Center (CC)

Compared to the Neighborhood Center category, a Community Center typically serves a larger population and includes a typical

trade area of three-to-six miles, and is located adjacent to major thoroughfares or situated at a major intersection. A Community Center includes at least one major anchor such as a grocery store or retailer and incorporates community-serving commercial uses and opportunities for office, civic, and institutional uses. Where the market permits, multi-family housing opportunities may be integrated as part of a mix of uses. As with Neighborhood Centers, apartments and townhouses should be located in close proximity to shopping and services. All portions of the development should be accessible by both a convenient road network and a system of sidewalks or greenways.

Employment Center (EC)

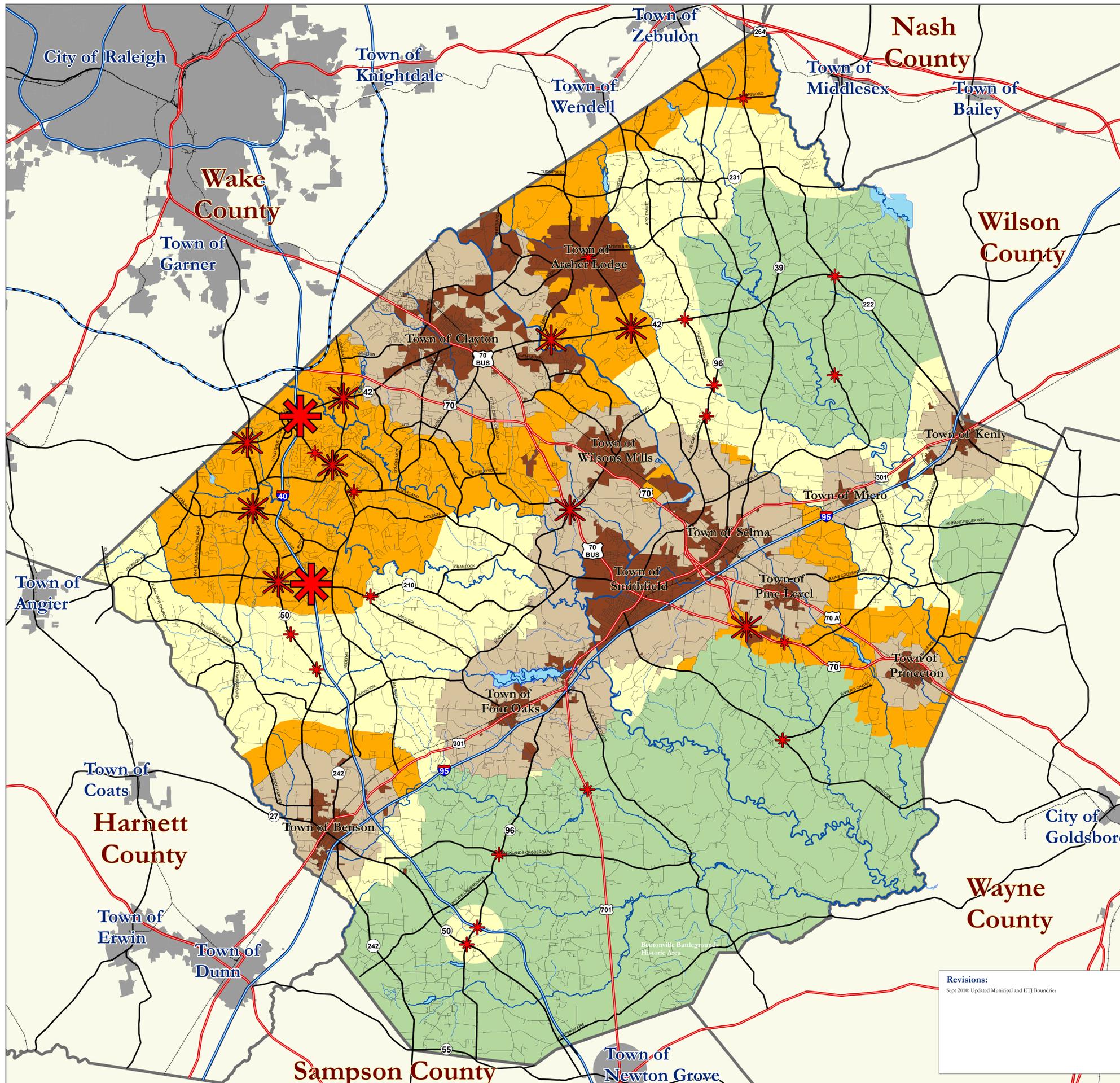
Clayton’s Employment Center is designated on the Future Land Use Map to provide locations for primary employment and economic development opportunities. The Employment Center is located along a major transportation corridor, and has adequate levels of infrastructure along access to rail and parcels large enough to accommodate future employment growth. Uses encouraged in the Employment Center include but are not limited to, industrial, warehouse, office, research and development, tech-flex, hospital, renewable energy, recycling, fabrication, assembly, and technology. Employment Center use may also include a limited amount of supporting commercial uses, such as restaurants and convenience retailers to serve employees. However, these uses should only be situated where not in conflict with existing employment land uses and should not be built in such a way as to jeopardize the use of those lands most suitable for office or industrial development.

Recreation and Open Space (ROS)

The Recreation and Open Space designation applies to public recreational areas and open-space areas. Uses include wildlife management, active and passive recreation, environmental restoration/mitigation/preservation, open space, and educational uses. Structures that support or are associated with the intended uses shall be permitted. Land shown under this designation shall not be used for any purpose other than recreation, open space, or conservation.

The following table identifies which zoning districts are consistent with the Future Land Use Map categories (designations).

Future Land Use Designation	COMPATIBLE ZONING DISTRICTS												
	R-E	R-10	R-8	R-6	O-R	O-I	B-1	B-2	B-3	I-1	I-2	PF	PDD
ARR	X											X	
LDR	X	X										X	
MDR		X	X	X								X	
HDR			X	X								X	
DR			X	X	X	X	X					X	X
NC						X	X	X				X	X
CC								X	X			X	X
DC							X					X	X
EC									X	X	X	X	X
ROS												X	



Land Use Plan

Legend

-  Town Limits
-  Town Planning Jurisdiction
-  Future Municipal Area

Future Land Use

-  Primary Growth Area
-  Agricultural / Rural Conservation Area
-  Secondary Growth Area

Commercial Activity Nodes

-  Regional Center
-  Community Center
-  Neighborhood Center

Note:
Primary Growth Area denotes areas in which high levels of growth pressures currently exist or are anticipated near term.
Agricultural / Rural Conservation Area denotes areas in which low levels of growth pressures are anticipated over the next 20 years. These areas should be considered for rural conservation and agricultural preservation programs.
Secondary Growth Area denotes areas in which low to moderate levels of growth pressures are anticipated over the next 20 years.
Commercial Activity Nodes denote the vicinity and scale of commercial development. The node types are Regional Centers such as big-box retailers, Community Centers such as grocery stores, and Neighborhood Centers such as convenient stores.

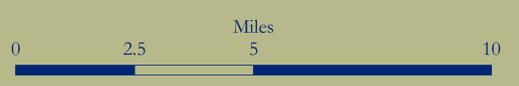
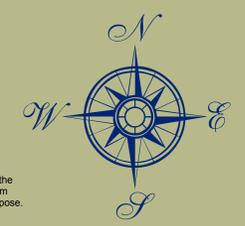
Revisions:
 Sept 2010: Updated Municipal and ETJ Boundaries

Map Date: March 02, 2009

Map Prepared By:
 Johnston County Planning and Zoning Department

Map Prepared In Association With:
CLARION

Declaration of Map Intent:
 Johnston County and its planning consultant do not warrant the accuracy of the displayed information and specifically disclaim any warranty for merchantability or fitness for a particular purpose.



Point	Northing	Easting	Elevation	Description	Layer Name
1	678,464.0009	2,134,037.6148	185.61	NAIL	POINTS
2	678,495.5200	2,134,218.4700	196.30	BM	POINTS
3	678,497.2399	2,134,217.3115	195.99	T ABUT	POINTS
4	678,496.5844	2,134,217.8338	198.24	TR	POINTS
5	678,497.4022	2,134,216.9008	191.06	B ABUT	POINTS
6	678,494.8447	2,134,218.5023	195.71	GUT	POINTS
7	678,496.4479	2,134,216.7911	192.60	SEAT	POINTS
8	678,496.0592	2,134,212.1914	190.88	T BERM	POINTS
9	678,493.0927	2,134,198.2187	183.80	TOE	POINTS
10	678,480.3627	2,134,172.6680	183.19	NG	POINTS
11	678,473.8663	2,134,157.1914	185.03	NG	POINTS
12	678,465.5250	2,134,129.9030	186.02	TB	POINTS
13	678,468.3033	2,134,122.2608	180.13	WS	POINTS
14	678,463.6957	2,134,127.4262	179.61	WE	POINTS
15	678,480.8330	2,134,184.3991	183.83	NG AT BENT	POINTS
16	678,466.6905	2,134,149.5766	184.71	NG AT BENT	POINTS
17	678,454.9394	2,134,116.8422	174.07	BED AT WG	POINTS
18	678,453.6717	2,134,114.0836	196.26	BENT AT WG	POINTS
19	678,448.0831	2,134,100.0665	174.66	BED AT WG	POINTS
20	678,410.7033	2,134,011.2490	195.73	GUT	POINTS
21	678,411.9377	2,134,011.1362	198.24	TR	POINTS
22	678,413.6959	2,134,010.2506	195.93	T ABUT	POINTS
23	678,413.7343	2,134,010.3532	191.76	B ABUT	POINTS
24	678,412.5742	2,134,010.7128	192.57	SEAT	POINTS
25	678,415.9897	2,134,014.6532	191.38	T BERM	POINTS
26	678,417.4850	2,134,019.0440	188.80	TOE	POINTS
27	678,426.4424	2,134,035.0622	184.82	NG	POINTS
28	678,423.7150	2,134,045.7332	183.95	NG AT BENT	POINTS
29	678,444.2722	2,134,077.6421	184.02	TB	POINTS
30	678,446.2849	2,134,081.1278	179.53	WE	POINTS
31	678,434.8938	2,134,081.5806	180.82	BED AT BENT	POINTS
32	680,150.3135	2,140,241.9093	182.32	NAIL	POINTS
33	680,137.4400	2,140,284.5200	199.00	BM	POINTS
34	680,136.7942	2,140,284.4708	198.42	GUT	POINTS
35	680,138.6132	2,140,283.5987	200.96	TR	POINTS
36	680,140.0963	2,140,283.5149	198.68	T ABUT	POINTS
37	680,140.7490	2,140,283.1044	195.31	B ABUT	POINTS
38	680,138.3327	2,140,280.9877	194.88	SEAT	POINTS
39	680,132.1099	2,140,267.9527	195.32	LC	POINTS
40	680,136.7255	2,140,262.0881	184.20	TOE	POINTS
41	680,132.0288	2,140,252.4881	182.44	TB	POINTS
42	680,130.0346	2,140,248.1561	179.57	BENT	POINTS
43	680,130.2086	2,140,245.1880	177.90	WE WS	POINTS
44	680,130.1359	2,140,241.4048	175.61	BED	POINTS

Point	Northing	Easting	Elevation	Description	Layer Name
45	680,151.8319	2,140,228.7439	181.05	TB	POINTS
46	680,151.9216	2,140,227.0186	177.73	WE	POINTS
47	680,117.0490	2,140,174.8708	198.41	GUT	POINTS
48	680,118.9790	2,140,174.6987	200.94	TR	POINTS
49	680,120.5813	2,140,174.6238	198.64	T ABUT	POINTS
50	680,120.3767	2,140,174.5348	194.26	B ABUT	POINTS
51	680,119.3454	2,140,175.3533	195.04	SEAT	POINTS
52	680,122.8818	2,140,200.7877	180.90	TB	POINTS
53	680,123.6745	2,140,206.8801	177.78	WE	POINTS
54	680,123.3610	2,140,211.1892	176.17	BED AT BENT	POINTS
55	680,143.0578	2,140,207.5198	181.13	TB	POINTS
56	680,144.2566	2,140,211.3074	177.84	WE	POINTS
57	680,147.3443	2,140,215.1089	175.45	BED	POINTS
58	689,827.2066	2,158,928.0903	240.84	NAIL	POINTS
59	689,894.4800	2,159,045.6700	240.50	NAIL	POINTS
60	689,865.4368	2,158,984.2342	241.08	WG	POINTS
61	689,835.3233	2,158,932.5414	241.00	WG	POINTS
62	689,818.6722	2,158,936.3770	241.79	GUT	POINTS
63	689,820.4803	2,158,937.2446	239.95	SEAT	POINTS
64	689,827.8636	2,158,945.7284	237.22	TB	POINTS
65	689,833.4388	2,158,954.2639	233.08	WEWS	POINTS
66	689,836.1152	2,158,963.0006	232.07	BED	POINTS
67	689,837.2661	2,158,966.2053	240.00	BENT	POINTS
68	689,854.0172	2,158,996.7527	241.62	GUT	POINTS
69	689,854.1355	2,158,996.2856	243.98	TR	POINTS
70	689,853.9387	2,158,995.3830	240.04	SEAT	POINTS
71	689,846.2652	2,158,979.0739	237.04	TB	POINTS
72	689,842.1245	2,158,971.2159	233.21	WE	POINTS
73	689,864.6008	2,158,983.8035	238.76	SEAT	POINTS
74	689,835.3356	2,158,932.9464	238.69	SEAT	POINTS
75	689,819.9414	2,158,937.5542	243.94	TR	POINTS

R3410 JOB

R-3410
JOHNSTONS CO.
1-25-2018

✕ RCH
Ø JGD

SITE 1

(SOUTH OF SR 1603)

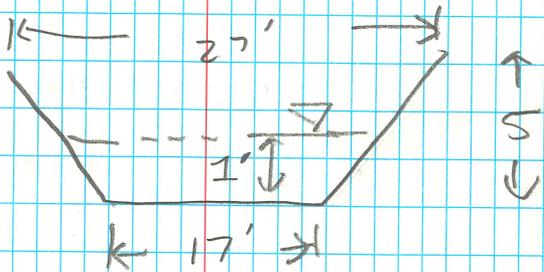
2 @ 9' x 8' RCBC

NOT BURIED

NO BEVEL

SCOUR AT OUTLET

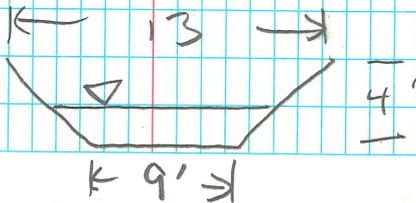
WS XSC



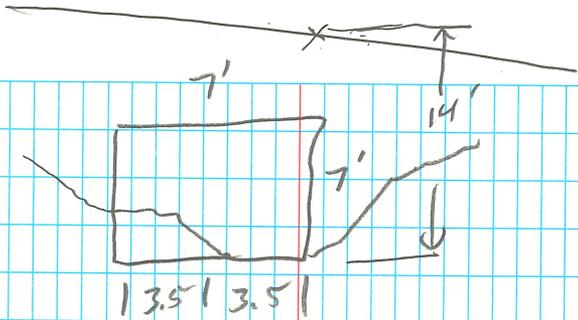
SITE 1A

(NORTH OF SR 1603)

1 @ 7' x 7' RCBC



----- CONSTRAINED



$\frac{1}{2}$ BUTTERED

NO BEVEL

14' INV to CROWN
SCOUR AT OUTLET

SITE 1 U/S STR.

2 @ 6' x 8' RCBC
ON NC 50

SITE 1 DIS STR.

3 @ 11.7' x 7.6'
STR. PLT. PIPE ARCH

SITE 1A U/S STR.

1 @ 60" RCP (NEAR 42)
2 @ 30" RCP'S (NEAR 50)
BOTH ON SR 1546 (PIERCE RD)

SITE 1A DIS STR.

SAME AS SITE 1
DIS STR.

π	1	HI	5.31	
∅	2	HIR	5.25	
	1	NAZL		
	2	BM		
	3	T ABUT		
	4	TR	Δ Dose. in D.C.	✓
	5	B ABUT		
	6	GUT		
	7	SEAT		
	8	^{BERM} T ABUT		
	9	TOE		
	10	NG		
	11	"		
	12	TB		✓
	13	WS	CHECK BOOST HT.	Ⓞ
	14	DED WE	Δ IN D.C.	✓
	15	NG @ BENT		
	16	"		
	17	DED @ WG	} Δ DISE. IN D.C.	✓
	18	DED @ WG		
	19	DED @ WG		
	20	GUT		
	21	TR		
	22	T ABUT		

SOUNDING : BED - 22.2' ← ADJ.

SOUNDING : BED - 21.6' ← IN

D.C.

RCH

23 BABUT

24 SEAT

25 T BERM

26 TOE

27 NG

28 NG @ BENT

29 ~~NG @ B~~

30 WE

EN @ C @ BOOST

①

✓

31 BED @ BENT

NOTE: OVERHEAD LINES
ALONG U/S SIDE,
WATER MAIN ON DIS
SIDE.

STR. DESC.

STEEL I-BEAM
ON CONC. CAPS
ON CONC. PIERS
W/ CONC. SLOPING
ABUTMENTS

PIERS = 2' SQUARE

U/S + DIS STR'S

SEE BIR'S IN PROJ. FOLDER

CLEAR RSWY = 26.0'

32	NAIL	N 10,000 E	5000	2 100
33	BM	40 DRD		
34	TR	WZ	5.27	
35	TR	WR	5.25	
36	GWT			
37	TR			
38	T ABUT			
39	B ADUT			
40	SEAT	Δ IN DL		✓
41	LC	= LOW CHOIR		
42	TBG			
43	TB			
44	BENT			
45	NEWS			
46	BED			①
47	TB			
48	WE			①
49	GWT			
50	TR			
51	T ABUT			
52	B ADUT			
53	SEAT			
54	TB			
55	WE			

STR. DESC.

STEEL I-BEAM ON CONC.
CAPS w/ CONC. PIERS
AND RIPRAP/CONC. SLOPING
ABUTMENTS

PIER WIDTH = 2'

CLEAR ROADWAY = 26.0'

U/S + D/S STR.^{'s}

SEE BIR^{'s} IN PROS. FOLDER

54 BED @ DENT

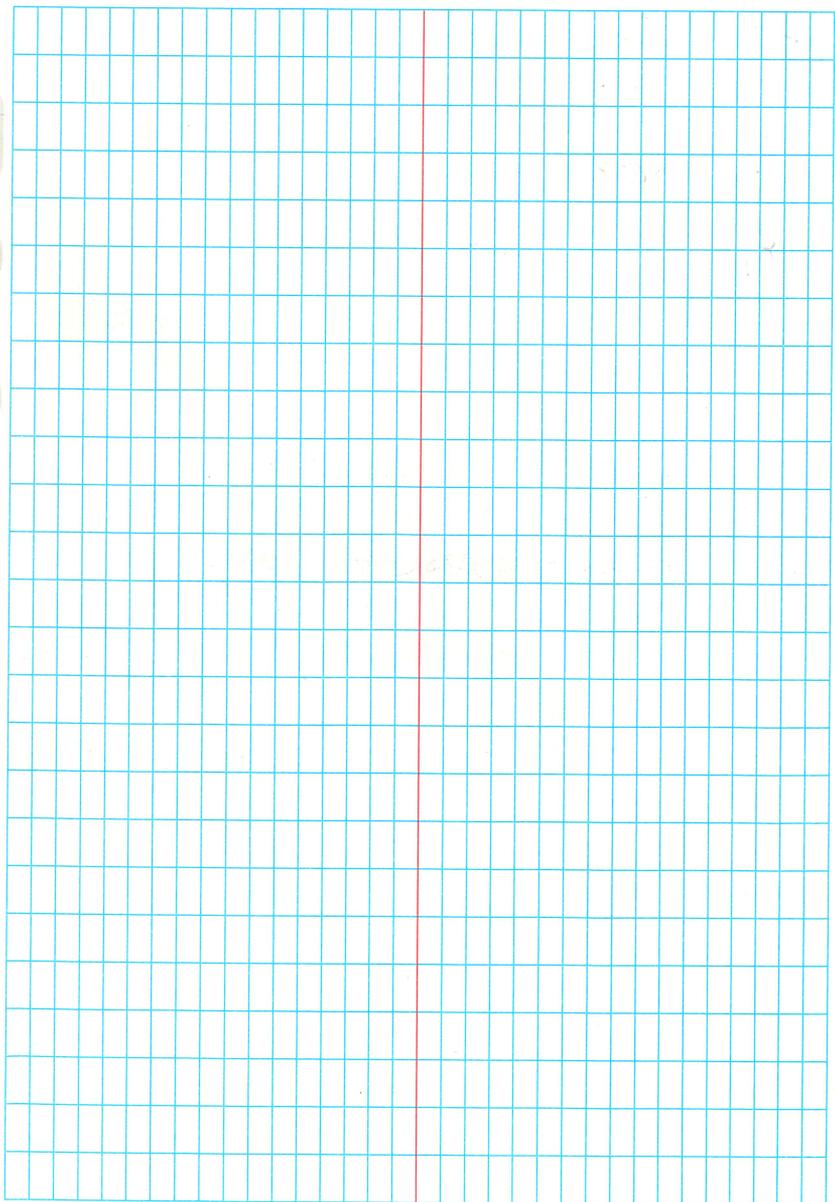
55 TO

56 WE

57 BED

①

* TR to BED @ & STREAM
= 27.8' (4/3 SIDE)



58 NAIL N 15000 E 5000 Z 101

59 NAIL

↑ 58 HI 5.27

∅ 59 HIR 5.25

60 WG

61 WG

62 GUT

63 SEAT

64 TB

65 WEWS

66 DED

Δ to (2) Boost

(2)

67 BENT

(TOP CAP)

68 GUT

69 TR

70 SEAT

71 TB

72 WE

73 SEAT

74 SEAT

75 TR

REN

PEDESTRIAN BRG.

7.5' OUT-OUT
CONC. BEAM ON
CONC. CAPS w/
TIMBER PILES

STR. DESC.

CONC. BOX BEAM ON
CONC. CAPS w/
I-BEAM CRUTCH PILES
ON CONC. FTNG'S
RIPRAPS SLOPING ABUTS

NOTE: HIGH VOLTAGE
TRANSMISSION LINES
SOUTH OF BRG.
PARALLEL TO STREAM.
MAY LIMIT PROP.
GRD. HEIGHT

DIS STR

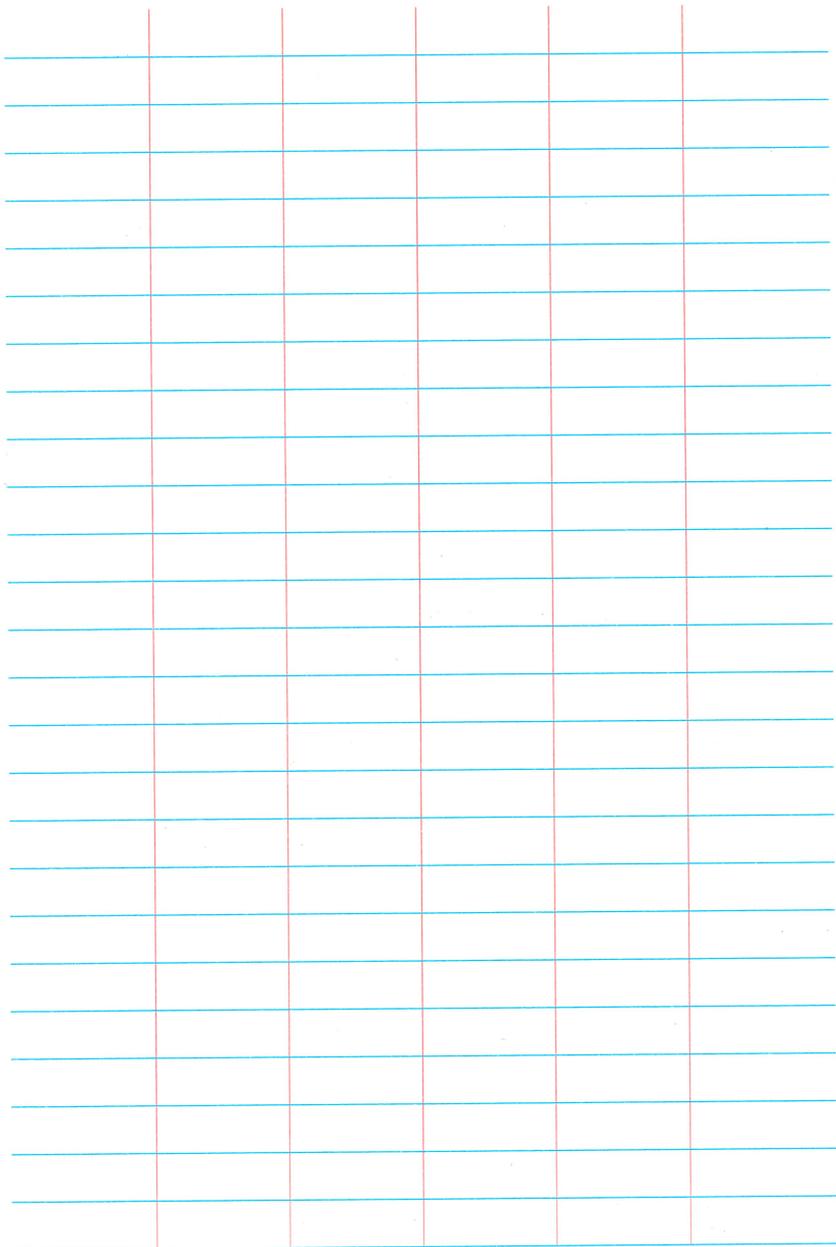
3 @ 61' ON SR 1560
CONC. GIRDER BRG.

30' CLEAR RDWY.

19.5' BED-CROWN

WS STR.

2 @ 12' x 7' RCBC
ON SR 1552



Site 1

Buffalo Creek West

All Alternatives

Site 1**Stream: Buffalo Creek (West)****Alignment: All**

Site 1 is located at Buffalo Creek (West) and is crossed by existing NC 42 and all alternatives. The existing crossing is a 2 @ 9' x 8' RCBC. The existing culvert was open and free of sediment accumulation and appeared to be in fair condition. There was a significant scour hole that extended approximately 100 feet downstream from the culvert. The existing culvert does not have a Bridge Inspection Report and the date of construction is unknown.

Buffalo Creek is located in the Neuse River Basin and is subject to the Neuse River Riparian Buffer Rules. According to NCDEQ, Buffalo Creek (Index #27-43-15-11) is classified as Class C and Nutrient Sensitive Waters and is not included on the 2014 303d list of impaired streams.

Johnston County is a participant in the Federal Flood Insurance Program. The proposed crossing is located in a Detailed Study Area. An MOA will be required for this stream crossing. Based on the available mapping, there is an insurable structure in the floodplain located upstream of the culvert.

The drainage area at this location is approximately 3.0 square miles. The drainage basin currently consists of low to medium density residential and agricultural. It is anticipated that the drainage basin will become primarily low to medium density residential in the future. Below are the flow rates obtained from the USGS SIR 2014-5030 (region 1) using an impervious percentage of 20% compared with the FEMA Effective and Preliminary discharges:

<u>USGS</u>	<u>FEMA Effective</u>	<u>FEMA Preliminary</u>
Q10= 1170 cfs		Q10=339 cfs
Q50= 1710 cfs		Q50=591 cfs
Q100 = 1930 cfs	Q100=1530 cfs	Q100=723 cfs
Q500 = 2480 cfs		Q500=1033 cfs

Based on the available information and the existing scour hole, the existing box culvert appears to be under sized (50-year HW/D=1.5). Based on the age, condition, and size, the culvert should be replaced. The proposed culvert should be a 2 @ 11' x 10' RCBC with a beveled headwall (50-year HW/D=1.05). The culvert invert should be buried 1' below the stream bed and a low flow channel provided in one barrel. The minimum shoulder point elevation should be approximately elevation 223.0 so that adequate freeboard above the design storm and cover over the proposed culvert is provided.

The length and size of the proposed culvert and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

County: Stream:

Road #: Road Name:

Division: Location:

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

Assigned to:

Prepared By:

Hydro Reviewer:

Project Type:

Existing Structure

Structure Type: Yr Built:

Span Arrangement: OAL (ft): Skew: Abutment Type:

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

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

ADT: Year ADT: Scour Code (item113): Prior Survey Completed: Survey Date:

Drainage Area: Sq. Mi. Drainage Area Source: Roadway Overtops at Q100:

Discharge Method: USGS Region: Stream Gage Number(if applicable):

Q10 (cfs): Q25 (cfs): Q50 (cfs): Q100 (cfs): QBFE (cfs):

Structure in Flood Hazard Zone: Panel #: Panel Date: Type of FIS: Date of FIS:

Environmental

Quad Map: River Basin: Buffer Rule:

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:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

Bed to Crown (ft): Year Built:

Downstream Feature:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

Bed to Crown (ft): Year Built:

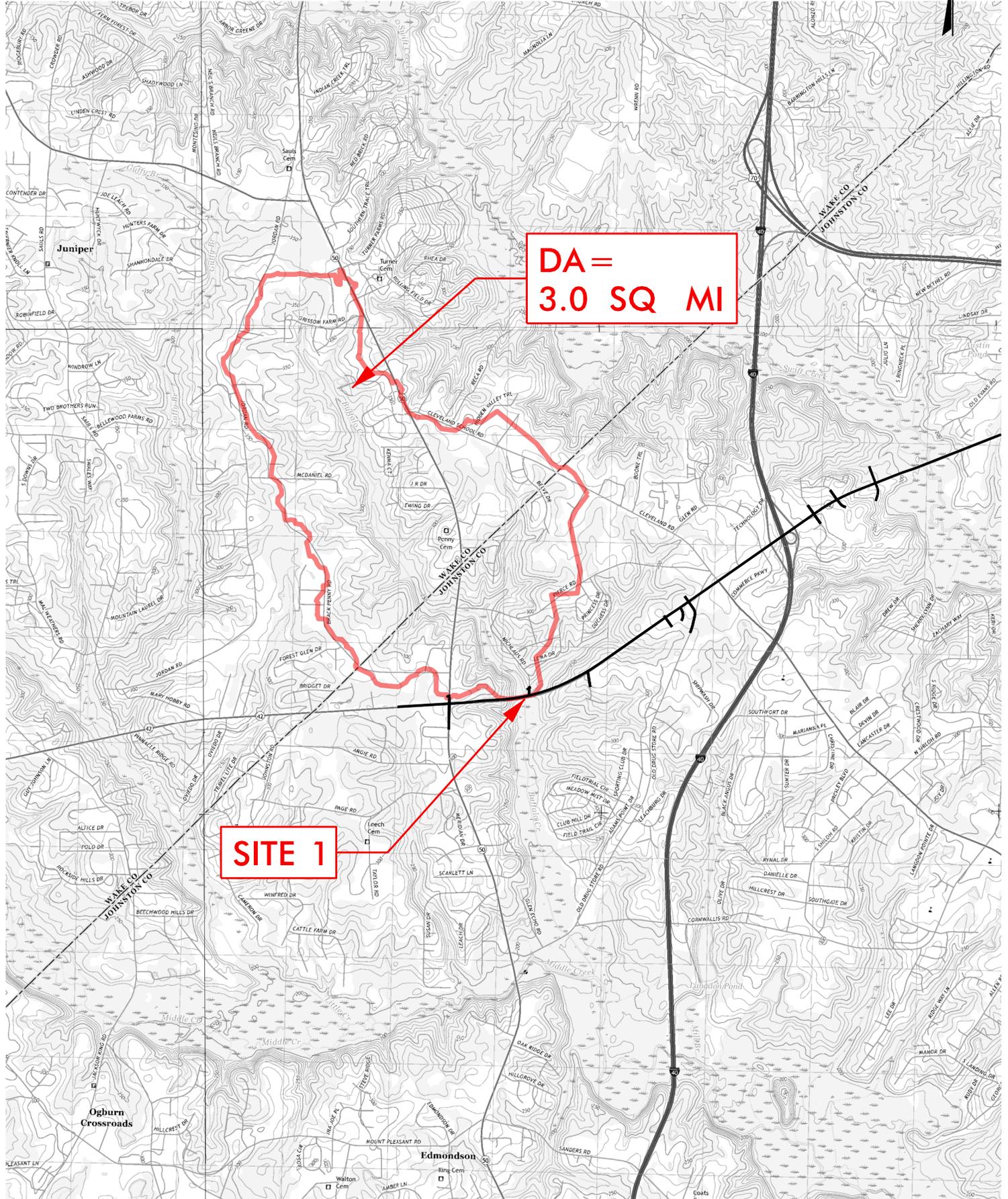
Preliminary Structure Estimate [Office Estimate]

Structure Type: Skew:

Dimensions/Spans:

Notes

R-3410
SITE 1 DRAINAGE AREA
JOHNSTON COUNTY
1" = 4000'





This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://FRIS.NC.GOV/FRIS](http://FRIS.NC.GOV/FRIS)

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE)
		With BFE or Depth Zone AE, AO, AH, VE, AR
OTHER AREAS OF FLOOD HAZARD		Regulatory Floodway
		0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile Zone X
OTHER AREAS		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
GENERAL STRUCTURES		Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
		Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall
OTHER FEATURES		Non-accredited Levee, Dike, or Floodwall
		North Carolina Geodetic Survey bench mark
		National Geodetic Survey bench mark
		Contractor Est. NCFMP Survey bench mark
		Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at <http://www.ncfloodmaps.com> or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/nifp/index.shtm>.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/nifp/index.shtm>.

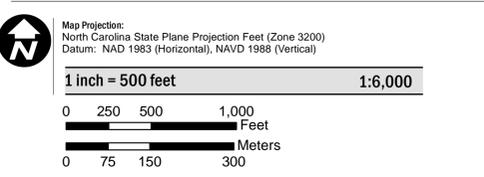
LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LMWA (or between the shoreline and the LMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE
This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/habitatconservation/coastal_barrier.html, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

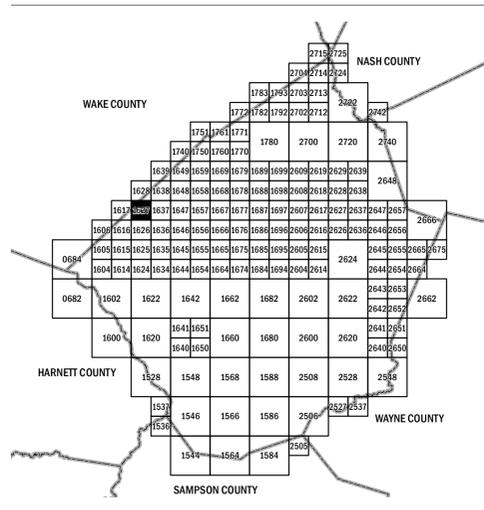
Limit of Moderate Wave Action (LMWA)

CBRS Area **Otherwise Protected Area**

SCALE



PANEL LOCATOR



National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1627

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
JOHNSTON COUNTY	370138	1627	J
WAKE COUNTY	370368	1627	J

MAP NUMBER
3720162700J
MAP REVISED
05/02/06

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262



EFFECTIVE: 12/2/2005

REVISED: 1/5/2007

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



Table 9 - Flooding Sources Studied by Detailed Methods: Redelineated

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with the Neuse River	Approximately 230 feet upstream of State Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with the Neuse River	Approximately 150 feet upstream of US Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little Creek	State Highway 42	Johnston County
Buffalo Creek (Basin 9, Stream 1)	The Wake/Johnston County boundary	Robertsons Pond Dam	Johnston County
Buffalo Creek West	The confluence with Middle Creek (South)	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 250 feet upstream of the confluence with Stony Fork	Johnston County
Little Creek	The confluence with the Swift Creek	Approximately 0.6 mile upstream of Shotwell Road	Johnston County Town Of Clayton
Little Creek (Basin 11, Stream 2)	The Wake/Johnston County boundary	Cemetery Road	Johnston County
Little Creek Tributary	The confluence with Little Creek	Approximately 800 feet upstream of US Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	US Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Middle Creek	The confluence with Swift Creek	Approximately 0.7 mile upstream of confluence of Middle Creek Tributary	Johnston County Town Of Smithfield
Mill Branch	At confluence with Mill Creek (South)	Approximately 2.4 miles upstream of Stevens Mill Road	Johnston County
Mill Creek (South)	At confluence with Neuse River	Approximately 0.7 mile upstream of the confluence with Stone Creek	Johnston County
Moccasin Creek	At confluence with Neuse River	Approximately 1,900 feet upstream of US Highway 70	Johnston County Town Of Princeton
Neuse River	Wayne/Lenoir County boundary	Falls of the Neuse Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Poplar Creek	The confluence with the Neuse River	Approximately 1.4 miles upstream of the confluence with Little Poplar Creek	Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.4 mile downstream of City Road	Approximately 100 feet upstream of City Road	Town Of Clayton
Stone Creek	The confluence with Mill Creek (South)	US Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of US Highway 301	Johnston County
Swift Creek	The confluence with the Neuse River	The confluence of Yates Branch (Basin 20, Stream 13)	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	NC 1525	Johnston County
White Oak Creek	The confluence with Swift Creek	Approximately 0.4 mile upstream of Pergo Parkway	Johnston County Town Of Clayton

Table 10, "Flooding Sources Studied by Detailed Methods: Limited Detailed", lists all flooding sources within the county that were studied by limited detailed methods for either this FIS or previous FISs.

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Arters Branch	The confluence with the Neuse River	Approximately 300 feet upstream of North Johnson Road	Town Of Smithfield
Basin 11, Stream 7	The Wake/Johnston County boundary	Approximately 0.4 mile upstream of Wake/Johnston County boundary	Johnston County
Bawdy Creek	The confluence with the Neuse River	The confluence with Bawdy Swamp and Quincosin Swamp	Johnston County
Bawdy Swamp	The confluence with Bawdy Creek	Approximately 0.8 mile upstream of HWY 70	Johnston County Town Of Pine Level
Beaverdam Branch	The confluence with Middle Creek	Approximately 100 feet downstream of Raleigh Road	Johnston County
Beaverdam Creek	At Rosewood Road	Approximately 575 feet downstream of Pierce Street	Johnston County Town Of Princeton
Beaverdam Swamp	The confluence with Hannah Creek	Approximately 1,300 feet upstream of Tetersville Road	Johnston County Town Of Four Oaks
Beddingfield Creek	Approximately 0.4 mile upstream of the confluence with the Neuse River	Approximately 0.2 mile upstream of Shotwell Road	Town Of Clayton

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 390 feet downstream of Covered Bridge Road	32.10	*	*	6510	*
Approximately 0.7 mile upstream of Covered Bridge Road	31.11	*	*	6390	*
Approximately 1.0 mile downstream of Wendell Road	28.82	*	*	6090	*
Approximately 0.9 mile downstream of Wendell Road	26.14	*	*	5730	*
Approximately 0.2 mile upstream of Wendell Road	23.30	*	*	5330	*
Approximately 0.4 mile upstream of Lake Wendell Road	23.11	*	*	5300	*
Approximately 1.1 mile upstream of Lake Wendell Road	22.12	*	*	5160	*
Approximately 1.2 mile upstream of Lake Wendell Road	21.21	*	*	5030	*
Approximately 0.3 mile upstream of Stotts Mill Road	20.22	*	*	4880	*
Buffalo Creek West					
At the mouth at Middle Creek	5.80	*	*	2230	*
Below unnamed tributary at Station 9200	4.10	*	*	1830	*
Above unnamed tributary at Station 9200	3.00	*	*	1530	*
At Johnston-Wake County boundary	1.80	*	*	1150	*
Bull Branch					
Just upstream of the confluence with Moccasin Creek 1	3.07	*	*	1500	*
Approximately 0.6 mile upstream of the confluence with Moccasin Creek 1	2.57	*	*	1340	*
Approximately 0.5 mile downstream of Flower Hill Road	2.28	*	*	1250	*
Approximately 0.5 mile upstream of Flower Hill Road	2.00	*	*	1150	*
Approximately 1.0 mile upstream of Flower Hill Road	1.58	*	*	990	*
Approximately 0.1 mile upstream of Woodard's Dairy Road	1.30	*	*	878	*
Burnt Stocking Branch					
At the confluence with Little Creek	3.63	*	*	1670	*
Approximately 1.0 mile downstream of Pine Level Micro Road	2.86	*	*	1440	*
Approximately 0.1 mile upstream of Pine Level Micro Road	1.90	*	*	1110	*
Camp Branch					
Approximately 0.5 mile upstream of Stephenson Road	4.20	*	*	1057	*
Approximately 0.2 mile upstream of Stephenson Road	4.03	*	*	1030	*
Approximately 0.4 mile upstream of the confluence with Black Creek	3.54	*	*	957	*
Cattail Creek					
At the confluence with the Little River	9.79	*	*	3101	*
Approximately 0.8 mile upstream of North Carolina Highway 96	8.95	*	*	2930	*
Approximately 0.5 mile upstream of Antioch Church Road	8.39	*	*	2820	*
Approximately 0.4 mile downstream of Eatmon Road	7.44	*	*	2610	*
Approximately 0.7 mile downstream of Covered Bridge Road	5.27	*	*	2110	*
Approximately 0.1 mile upstream of Covered Bridge Road	4.73	*	*	1970	*
Approximately 0.2 mile upstream of Covered Bridge Road	3.68	*	*	1680	*
Approximately 0.3 mile upstream of Covered Bridge Road	3.51	*	*	1630	*
Approximately 0.6 mile upstream of Covered Bridge Road	2.55	*	*	1340	*
Approximately 0.1 mile downstream of Lake Wendell Road	1.86	*	*	1100	*
Approximately 0.3 mile downstream of Harris Wilson Road	1.00	*	*	746	*
Cooper Branch					
At the confluence with Swift Creek	3.95	*	*	1020	*
Approximately 300 feet downstream of Little Church Creek Road	3.82	*	*	1220	*

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the flood elevations for the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and/or Water-surface elevation rasters. For stream segments for which BFEs were computed, selected cross-section locations are also shown on the FIRM. Flood Profiles and/or Water-surface elevation rasters were developed showing computed water-surface elevations for floods of the selected recurrence intervals.

Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles and/or Water-surface elevation rasters or in the Floodway Data tables in the FIS Report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in the FIS in conjunction with the data shown on the FIRM.

The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the Flood Profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For details on the county's hydraulic analyses, the hydraulic report is available by request.

For the streams studied by detailed methods, water surface elevations of floods of the selected recurrence intervals were computed through use of the Army Corps of Engineers' HEC RAS step backwater computer program. The hydraulic analyses were based on unobstructed flow. The flood elevations shown on the Profiles and/or Water-surface elevation rasters are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail. The computer models were calibrated using historic high water data collected during field investigations.

The cross section geometries were obtained from a combination of digital elevation data obtained by Light Detection and Ranging (LIDAR) and field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. Natural floodplain cross sections were surveyed approximately every 4000 feet along the detail study reaches to obtain the channel geometry between bridges and culverts. Overbank cross section data for the backwater analyses were obtained from recently flown LIDAR data.

Channel roughness factors (Manning's "n") used in the hydraulic computations were made in the field by an engineer where stream access was possible, with orthophotos used to supplement areas that could not be accessed. The channel and overbank "n" values for all of the streams studied by detailed methods are shown in Table 16, "Roughness Coefficients".

Table 16 - Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Arters Branch	0.045	0.110 to 0.130
Basin 10, Stream 2	0.050	0.032 to 0.090
Basin 11, Stream 7	0.042	0.130
Bawdy Creek	0.050	0.150
Bawdy Swamp	0.050	0.150
Beaverdam Branch	0.045	0.130
Beaverdam Creek	0.040 to 0.068	0.080 to 0.160
Beaverdam Swamp	0.050	0.150
Beddingfield Creek	0.050	0.130
Bernal Branch	0.050	0.150
Big Arm Creek	0.055	0.150
Big Branch	0.042	0.130
Black Creek	0.025 to 0.060	0.030 to 0.150
Black Creek Tributary	0.045	0.130
Buffalo Creek	0.040 to 0.055	0.030 to 0.150
Buffalo Creek (Basin 9, Stream 1)	0.030 to 0.070	0.032 to 0.140
Buffalo Creek West	0.045 to 0.052	0.030 to 0.140
Bull Branch	0.045 to 0.050	0.120 to 0.130
Burnt Stocking Branch	0.050	0.150
Camp Branch	0.045	0.130
Cattail Creek	0.042	0.130
Cooper Branch	0.045	0.130

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
420	42,000	700	4,705	1.5	186.8	*	186.8	187.5	0.7
454	45,370	700	3,905	1.9	191.1	*	191.1	191.7	0.6
480	47,990	580	4,213	1.6	193.8	*	193.8	194.6	0.8
540	53,980	400	3,157	2.2	200.1	*	200.1	200.6	0.5
552	55,170	470	2,940	2.4	201.5	*	201.5	202.0	0.5
559	55,900	570	3,593	1.9	202.4	*	202.4	202.9	0.5
576	57,610	340	3,024	2.3	204.0	*	204.0	204.7	0.7
578	57,810	210	2,006	3.3	204.1	*	204.1	204.8	0.7
Buffalo Creek West									
024	2,360	235	1,334	1.7	197.4 ¹	*	195.9	196.2	0.3
055	5,480	150	745	3.0	199.4	*	199.4	199.7	0.3
082	8,200	140	733	2.7	210.2	*	210.2	210.8	0.6
103	10,325	100	630	2.4	220.9	*	220.9	221.0	0.1
119	11,860	100	476	2.9	226.1	*	226.1	226.8	0.7
134	13,400	100	422	3.3	232.7	*	232.7	233.5	0.8
145	14,500	80	649	1.9	244.0	*	244.0	244.2	0.2
Hannah Creek									
049	4,900	420	3,282	1.8	97.7	*	97.7	98.7	1.0
080	7,960	515	4,540	1.3	100.3	*	100.3	101.0	0.7
121	12,080	480	4,354	1.3	101.8	*	101.8	102.7	0.9
144	14,440	600	5,351	1.1	102.5	*	102.5	103.5	1.0
160	16,000	550	4,000	1.4	103.2	*	103.2	104.2	1.0
186	18,600	600	4,151	1.4	105.0	*	105.0	105.8	0.8
208	20,800	540	5,193	1.1	107.9	*	107.9	108.7	0.8
218	21,810	810	6,324	0.9	108.3	*	108.3	109.0	0.7
270	27,000	520	5,053	1.1	109.8	*	109.8	110.6	0.8
305	30,500	1,130	11,149	0.5	110.2	*	110.2	111.1	0.9
336	33,600	700	6,543	0.8	110.4	*	110.4	111.3	0.9
353	35,270	470	5,453	1.0	112.2	*	112.2	113.1	0.9
375	37,450	690	7,029	0.7	112.4	*	112.4	113.3	0.9
407	40,710	1,250	8,076	0.6	112.7	*	112.7	113.7	1.0
437	43,700	750	5,770	0.8	113.3	*	113.3	114.3	1.0
481	48,080	500	3,351	1.4	115.4	*	115.4	116.0	0.6
508	50,800	445	3,786	1.2	118.3	*	118.3	119.0	0.7
530	53,000	470	3,645	1.2	119.6	*	119.6	120.3	0.7
577	57,700	580	5,429	0.8	121.5	*	121.5	122.2	0.7
615	61,480	400	3,446	1.2	122.4	*	122.4	123.3	0.9
635	63,500	670	5,033	0.8	123.9	*	123.9	124.9	1.0
642	64,220	900	8,101	0.5	124.0	*	124.0	125.0	1.0
668	66,840	630	5,179	0.8	124.3	*	124.3	125.3	1.0
683	68,290	660	4,159	1.0	124.7	*	124.7	125.7	1.0
701	70,060	590	3,759	1.1	125.8	*	125.8	126.5	0.7
714	71,390	605	4,562	0.9	126.4	*	126.4	127.1	0.7
733	73,300	400	3,251	1.2	127.7	*	127.7	128.4	0.7

PRELIMINARY FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262

PRELIMINARY



PRELIMINARY: 3/31/2015

REVISED: 3/31/2015

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



both mailed to each jurisdiction within Johnston County and posted to the State's website at www.ncfloodmaps.com.

Draft basin plans were developed based on the results of the initial scoping meetings. Final scoping meetings were held by the State and FEMA to provide counties and communities an overview of the draft basin plans, including the proposed scope and schedule for the project, and to provide an opportunity for additional county and community input. After the final scoping meeting was held, the Final Basin Plans were produced.

This FIS covers the geographic area of Johnston County, , and all jurisdictions therein. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. Limits of detailed study are indicated on the Flood Profiles and/or Water-surface elevation rasters and/or the FIRM.

Table 8P, "Scope of Revisions: Revised or New Detailed Study -Preliminary", lists flooding sources that were newly studied by detailed methods or were previously studied by detailed methods and had a change in backwater elevation due to flooding effects from a newly studied flooding source.

Table 8P - Scope of Revisions: Revised or New Detailed Study - Preliminary

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with Neuse River	Approximately 230 feet upstream of NC Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with Neuse River	Approximately 300 feet upstream of U.S. Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little River	Approximately 720 feet upstream of NC Highway 42	Johnston County
Buffalo Creek West	The confluence with Middle Creek	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 1,800 feet upstream of Interstate 95	Johnston County
Little Creek	The confluence with Swift Creek	The confluence with Swift Creek	Johnston County Town Of Clayton
Little Creek Tributary	The confluence with Little Creek	Approximately 770 feet upstream of U.S. Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	Approximately 260 feet upstream of U.S. Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Approximately 1.0 mile upstream of the Wayne/Johnston County Boundary	Johnston County
Middle Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Mill Branch	The confluence with Mill Creek (South)	Approximate 2.4 miles upstream of Harper House Road	Johnston County
Mill Creek (South)	The confluence with Neuse River	Approximate 0.8 mile upstream of confluence of Stone Creek	Johnston County
Moccasin Creek	Approximately 3,425 feet downstream of Buckleberry Road	Approximately 0.4 mile upstream of U.S. Highway 70	Johnston County Town Of Princeton
Moccasin Creek	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Neuse River	The Johnston/Wayne County boundary	Just downstream of Mial Plantation Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.7 mile upstream of Oneil Street	Approximately 270 feet upstream of City Road	Town Of Clayton
Spring Branch	The confluence with Neuse River	Collier Street	Town Of Smithfield
Stone Creek	The confluence with Mill Creek (South)	Approximately 1,640 feet upstream of U.S. Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of U.S. Highway 301	Johnston County
Swift Creek	The confluence with Neuse River	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	Approximately 190 feet upstream of Cornwallis Road	Johnston County
White Oak Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Clayton

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)				
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Future Annual Chance	0.2% Annual Chance
Approximately 0.4 mile upstream of Jordan Narron Road	37.02	*	*	7120	*	*
Approximately 0.5 mile upstream of Jordan Narron Road	36.54	*	*	7060	*	*
Approximately 1.0 mile upstream of Jordan Narron Road	34.04	*	*	6760	*	*
Approximately 2.0 mile upstream of Jordan Narron Road	33.07	*	*	6630	*	*
Approximately 2,320 feet downstream of Covered Bridge Road	32.50	3410	5334	6137	*	8154
Approximately 390 feet downstream of Covered Bridge Road	32.10	*	*	6510	*	*
Approximately 0.7 mile upstream of Covered Bridge Road	31.11	*	*	6390	*	*
Approximately 1.0 mile downstream of Wendell Road	28.82	*	*	6090	*	*
Approximately 4,500 feet downstream of Wendell Road	28.80	3166	4962	5713	*	7600
Approximately 0.9 mile downstream of Wendell Road	26.14	*	*	5730	*	*
Approximately 600 feet downstream of Lake Wendell Road	25.60	2941	4618	5322	*	7089
Approximately 0.2 mile upstream of Wendell Road	23.30	*	*	5330	*	*
Approximately 0.4 mile upstream of Lake Wendell Road	23.11	*	*	5300	*	*
Approximately 1.1 mile upstream of Lake Wendell Road	22.12	*	*	5160	*	*
NP	22.10	2690	4235	4884	*	6516
Approximately 1.2 mile upstream of Lake Wendell Road	21.21	*	*	5030	*	*
Approximately 0.3 mile upstream of Stotts Mill Road	20.22	*	*	4880	*	*
NP	20.21	2544	4012	4629	*	6182
Buffalo Creek Overflow						
Just above confluence with Buffalo Creek	1.69	332	440	468	*	570
Buffalo Creek West						
At mouth	5.72	510	880	1072	*	1520
Approximately 3,700 feet upstream of Old Drug Store Road	5.12	476	823	1003	*	1424
Below unnamed tributary at RS 9200	4.17	420	728	888	*	1264
Above unnamed Tributary at RS 9200	2.95	339	591	723	*	1033
Approximately 2,000 feet downstream of Johnston/Wake County Boundary	2.15	278	489	598	*	858
At Johnston-Wake County Boundary	1.81	251	442	542	*	778
Bull Branch						
Just upstream of the confluence with Moccasin Creek 1	3.07	*	*	1500	*	*
Approximately 0.6 mile upstream of the confluence with Moccasin Creek 1	2.57	*	*	1340	*	*
Approximately 0.5 mile downstream of Flower Hill Road	2.28	*	*	1250	*	*
Approximately 0.5 mile upstream of Flower Hill Road	2.00	*	*	1150	*	*
Approximately 1.0 mile upstream of Flower Hill Road	1.58	*	*	990	*	*
Approximately 0.1 mile upstream of Woodard's Dairy Road	1.30	*	*	878	*	*
Burnt Stocking Branch						
At confluence with Little Creek (near Micro)	3.63	784	1365	1668	*	2531
Approximately 3,700 feet upstream of Fulghum Little Creek Road	2.86	670	1174	1437	*	2191
Approximately 350 feet upstream of Pine Level-Micro Road	1.90	511	906	1114	*	1712
Camp Branch						
Approximately 0.5 mile upstream of Stephenson Road	4.20	*	*	1057	*	*
Approximately 0.2 mile upstream of Stephenson Road	4.03	*	*	1030	*	*
Approximately 0.4 mile upstream of the confluence with Black Creek	3.54	*	*	957	*	*
Cattail Creek						

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
528	52,766	616	3,243	2.1	192.9	*	192.9	193.1	0.3
533	53,289	486	2,532	2.7	193.6	*	193.6	194.1	0.6
538	53,808	609	3,943	1.8	194.5	*	194.5	195.3	0.8
547	54,660	632	4,140	1.7	195.4	*	195.4	196.2	0.9
554	55,414	870	5,443	1.3	195.9	*	195.9	196.8	0.9
562	56,244	839	5,147	1.3	196.4	*	196.4	197.3	0.9
570	57,031	520	3,164	2.2	197.2	*	197.2	198.1	0.9
575	57,539	614	3,905	1.8	198.0	*	198.0	198.9	0.9
582	58,213	555	3,659	1.9	199.0	*	199.0	199.8	0.8
592	59,198	873	5,817	1.2	199.7	*	199.7	200.6	0.9
599	59,867	726	4,691	1.5	200.2	*	200.2	201.0	0.9
603	60,307	803	4,427	1.6	200.6	*	200.6	201.4	0.8
608	60,758	796	4,931	1.4	201.0	*	201.0	201.9	0.8
613	61,343	689	4,319	1.6	201.5	*	201.5	202.4	0.8
619	61,913	585	3,994	1.7	202.0	*	202.0	202.8	0.8
629	62,876	320	2,673	2.6	204.8	*	204.8	205.6	0.8
633	63,257	559	5,124	1.4	205.0	*	205.0	205.9	0.9
Buffalo Creek West									
017	1,668	455	1,616	0.7	195.2 ¹	*	192.1	193.1	1.0
025	2,462	95	505	2.1	195.2 ¹	*	193.1	194.0	0.9
029	2,946	133	435	2.5	195.2 ¹	*	193.5	194.5	1.0
037	3,714	191	441	2.4	195.2 ¹	*	195.0	195.9	0.8
041	4,101	209	602	1.8	196.3	*	196.3	197.0	0.7
045	4,502	197	516	2.1	197.0	*	197.0	197.9	0.8
050	4,961	177	433	2.5	198.4	*	198.4	199.2	0.8
054	5,433	171	558	1.9	199.7	*	199.7	200.5	0.8
060	6,034	223	430	2.5	201.2	*	201.2	201.9	0.7
065	6,506	236	676	1.6	202.9	*	202.9	203.8	1.0
070	7,026	177	516	1.9	204.2	*	204.2	205.1	0.9
075	7,505	180	452	2.2	205.7	*	205.7	206.5	0.9
080	8,020	146	429	2.3	207.0	*	207.0	208.0	1.0
083	8,344	106	341	2.9	208.3	*	208.3	209.0	0.7
089	8,922	192	666	1.5	209.8	*	209.8	210.6	0.8
094	9,399	184	514	2.0	210.6	*	210.6	211.5	0.9
100	10,005	221	506	2.0	212.4	*	212.4	213.2	0.8
103	10,309	199	473	1.9	213.7	*	213.7	214.2	0.6
108	10,810	192	391	2.3	215.1	*	215.1	216.0	0.9
116	11,561	79	364	2.0	219.5	*	219.5	219.6	0.1
120	12,004	73	237	3.0	219.4	*	219.4	220.2	0.8
125	12,510	50	177	4.1	222.4	*	222.4	222.8	0.4
129	12,927	46	161	4.5	224.2	*	224.2	225.1	1.0
133	13,321	114	402	1.8	226.4	*	226.4	227.0	0.6
139	13,905	97	245	3.0	228.6	*	228.6	229.3	0.7
141	14,129	100	312	2.3	230.0	*	230.0	231.0	1.0

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
146	14,620	101	307	2.4	232.3	*	232.3	233.3	0.9
150	15,025	39	165	3.6	234.0	*	234.0	235.0	1.0
152	15,233	19	98	6.1	235.1	*	235.1	235.6	0.5
158	15,799	53	177	3.4	239.2	*	239.2	239.4	0.2
162	16,198	35	122	4.9	240.2	*	240.2	241.2	1.0
167	16,657	20	92	6.5	243.9	*	243.9	244.2	0.4
Hannah Creek									
005	500	1,501	8,765	1.0	95.3 ¹	*	94.7	95.7	1.0
010	1,000	1,266	8,215	1.1	95.3 ¹	*	94.8	95.8	1.0
015	1,500	933	5,838	1.6	95.3 ¹	*	95.2	96.2	1.0
022	2,156	910	6,125	1.5	95.9	*	95.9	96.8	1.0
030	3,016	632	4,236	2.2	97.0	*	97.0	97.9	0.9
046	4,642	1,192	10,584	0.9	98.3	*	98.3	99.2	1.0
051	5,123	834	5,294	1.7	98.4	*	98.4	99.4	1.0
065	6,497	353	2,734	3.4	99.3	*	99.3	100.0	0.7
070	6,997	493	3,995	2.3	100.2	*	100.2	101.1	0.8
075	7,497	535	4,327	2.1	100.7	*	100.7	101.5	0.9
080	7,997	559	5,358	1.7	101.4	*	101.4	102.4	0.9
085	8,525	709	7,033	1.3	101.9	*	101.9	102.9	1.0
090	9,038	646	7,104	1.3	102.1	*	102.1	103.0	1.0
095	9,536	630	6,655	1.4	102.3	*	102.3	103.3	1.0
104	10,366	649	6,887	1.3	102.8	*	102.8	103.7	1.0
111	11,106	978	9,088	1.0	103.1	*	103.1	104.1	1.0
121	12,100	1,494	12,974	0.7	103.5	*	103.5	104.4	1.0
131	13,105	1,206	10,266	0.9	103.7	*	103.7	104.7	1.0
136	13,607	1,239	9,582	1.0	103.9	*	103.9	104.9	1.0
145	14,515	890	7,669	1.2	104.5	*	104.5	105.4	1.0
156	15,559	1,063	8,162	1.1	105.1	*	105.1	106.1	1.0
166	16,563	1,003	8,890	1.0	105.7	*	105.7	106.7	1.0
176	17,555	882	7,505	1.2	106.2	*	106.2	107.2	1.0
191	19,054	729	7,336	1.2	107.9	*	107.9	108.6	0.7
196	19,554	805	8,035	1.1	108.1	*	108.1	108.8	0.7
206	20,599	975	9,726	0.9	108.4	*	108.4	109.2	0.8
213	21,292	887	8,310	1.1	108.7	*	108.7	109.5	0.8
220	21,968	770	7,471	1.2	108.9	*	108.9	109.7	0.8
227	22,705	618	6,541	1.4	109.1	*	109.1	110.0	0.9
236	23,562	688	7,669	1.2	109.6	*	109.6	110.5	0.9
241	24,062	817	8,461	1.1	109.8	*	109.8	110.7	0.9
251	25,062	894	8,615	1.0	110.1	*	110.1	111.0	0.9
261	26,062	1,068	10,104	0.9	110.3	*	110.3	111.2	0.9
266	26,562	1,219	11,315	0.8	110.4	*	110.4	111.3	0.9
276	27,562	1,664	15,998	0.6	110.5	*	110.5	111.4	0.9
286	28,562	1,687	14,908	0.6	110.6	*	110.6	111.5	0.9
297	29,671	1,383	11,725	0.8	110.7	*	110.7	111.6	0.9

This spreadsheet computes the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows for ungaged urban stream or small, rural stream in Georgia, South Carolina, and North Carolina, and that has drainage area within hydrologic region 1. The spreadsheet also includes the 95-percent prediction interval minus and plus standard error of prediction intervals, and the average standard error of prediction. To use this spreadsheet, enter requested information in the yellow cells below.

Enter a site-description name:

R-3410 Site 1 - Buffalo Creek

Enter the explanatory variables:

Drainage area, in square miles	3
Percentage of impervious area, in percent	20

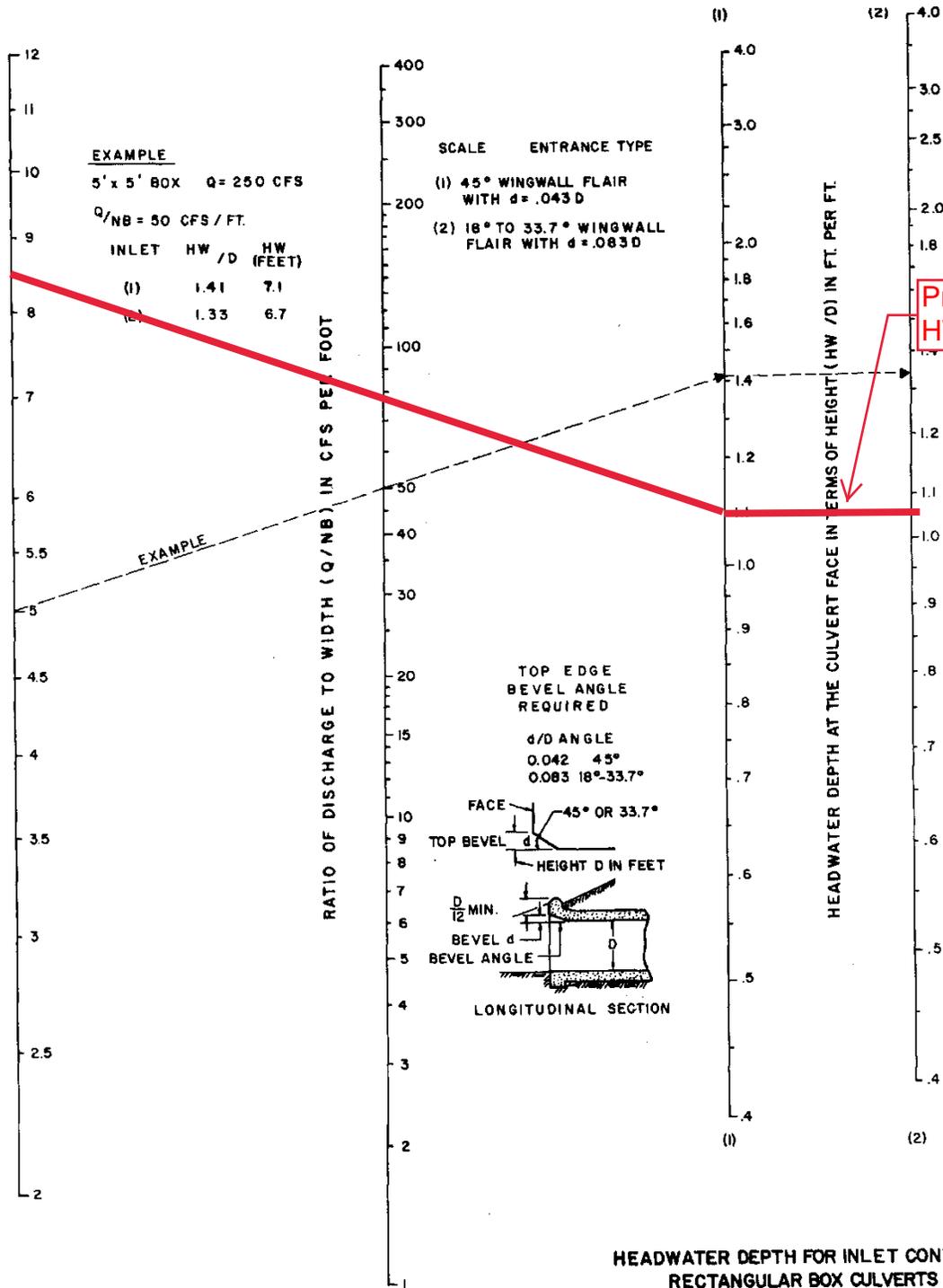
Applicable range of drainage area is 0.10 to 436 square miles

Applicable range of percentage of impervious area is 0.0 to 100 percent

Warnings and Cautions

Percent chance exceedance	Percent chance exceedance flow, in ft ³ /s	Lower 95 percent prediction interval flow, in ft ³ /s	Upper 95 percent prediction interval flow, in ft ³ /s	-S _{p,i} (percent)	+S _{p,i} (percent)	Average S _{p,i} (percent)
50	593	307	1,140	-28.4	39.6	34.3
20	934	508	1,720	-26.6	36.2	31.6
10	1,170	647	2,120	-26.0	35.1	30.8
4	1,480	802	2,730	-26.7	36.5	31.8
2	1,710	909	3,220	-27.4	37.8	32.9
1	1,930	990	3,760	-28.7	40.2	34.8
0.5	2,170	1,080	4,360	-29.8	42.5	36.6
0.2	2,480	1,180	5,220	-31.5	45.9	39.2

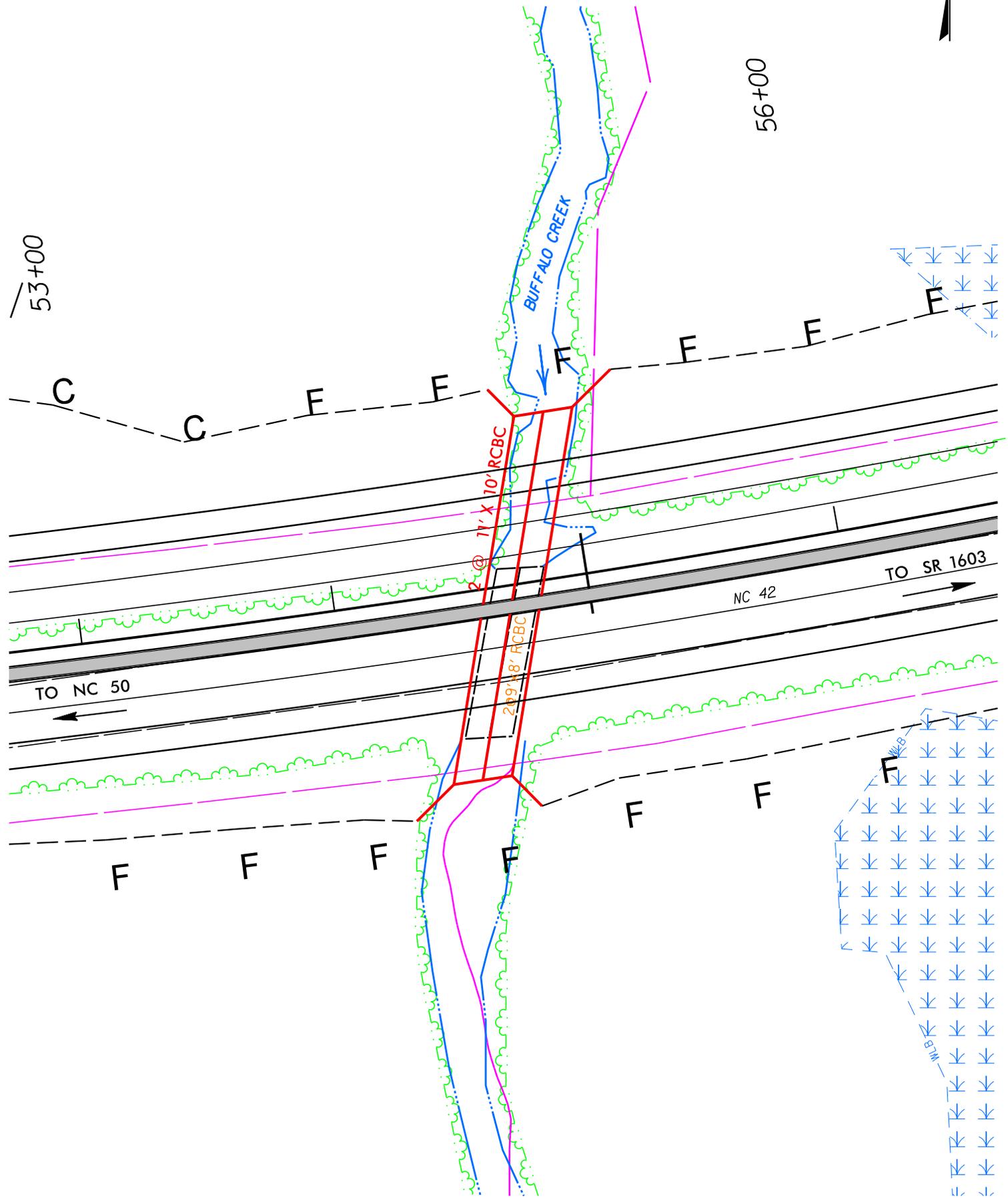
CHART 9B



Proposed 50-yr
 HW/D=1.05

**HEADWATER DEPTH FOR INLET CONTROL
 RECTANGULAR BOX CULVERTS
 FLARED WINGWALLS 18° TO 33.7° & 45°
 WITH BEVELED EDGE AT TOP OF INLET**

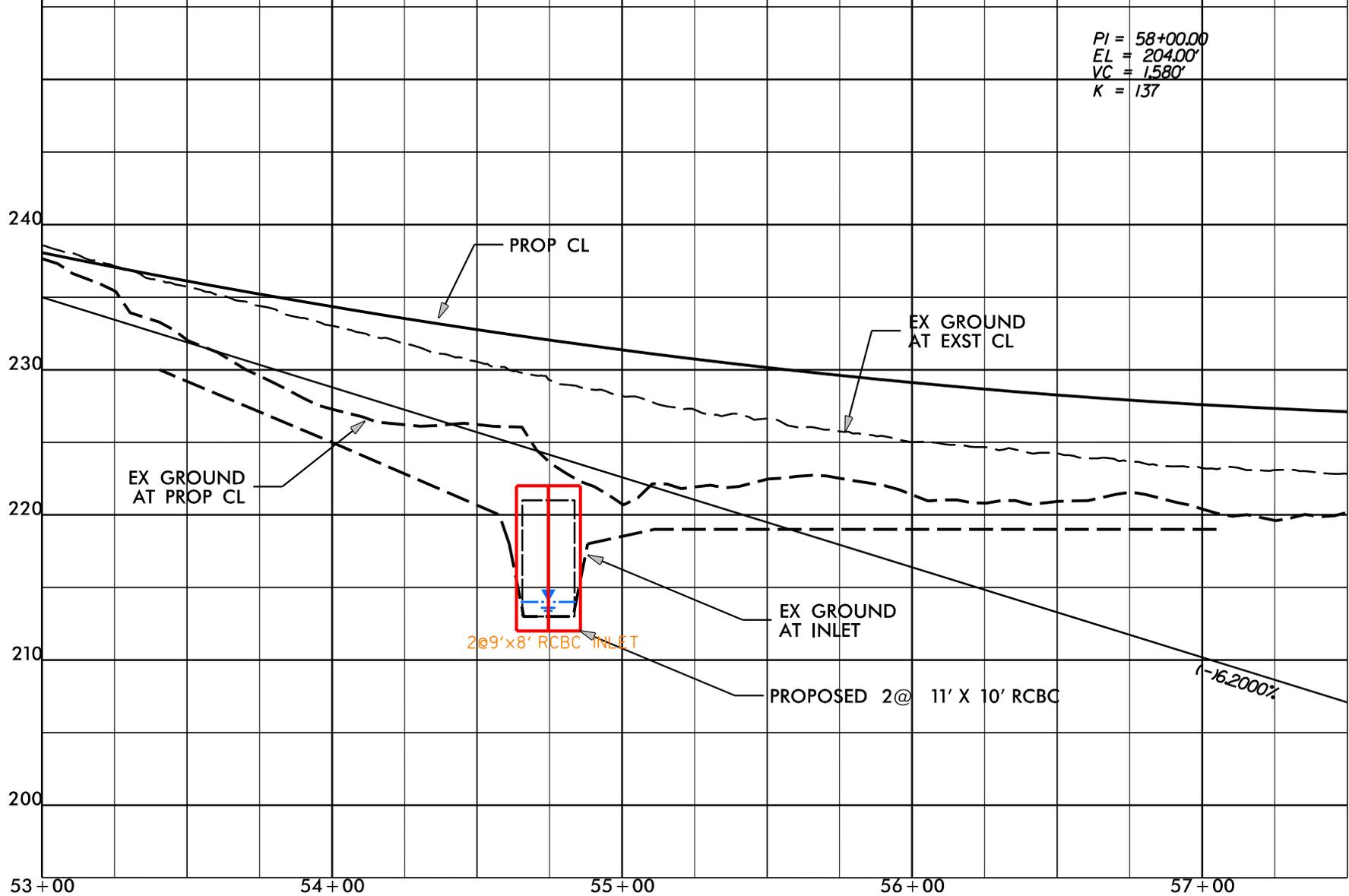
R-3410
SITE 1 BUFFALO CREEK
JOHNSTON COUNTY
1" = 50'



**BED PROFILE
@ UPSTREAM FACE**

BUFFALO CREEK

*PI = 58+00.00
EL = 204.00'
VC = 1,580'
K = 137*



WEST

R-3410 NC 42

EAST

SITE #1 JOHNSTON COUNTY

VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 50'



Upstream face of culvert



Looking upstream from roadway



Looking upstream at scour hole and downstream face of culvert



Looking downstream from roadway



Looking east



Looking west

Site 1A

UT to Buffalo Creek West

All Alternatives

Site 1A**Stream: UT to Buffalo Creek (West)****Alignment: All**

Site 1A is located at and Unnamed Tributary to Buffalo Creek (West) and is crossed by existing NC 42 and all alternatives. The existing crossing is a 1 @ 7' x 7' RCBC. The existing culvert was open and free of sediment accumulation and appeared to be in fair condition. There was a significant scour hole that extended approximately 100 feet downstream from the culvert. The existing culvert does not have a Bridge Inspection Report and the date of construction is unknown.

Buffalo Creek is located in the Neuse River Basin and is subject to the Neuse River Riparian Buffer Rules. According to NCDEQ, Buffalo Creek (Index #27-43-15-11) is classified as Class C and Nutrient Sensitive Waters and is not included on the 2014 303d list of impaired streams.

Johnston County is a participant in the Federal Flood Insurance Program. The proposed crossing is not located in a Study Area.

The drainage area at this location is approximately 1.08 square miles. The drainage basin currently consists of low to medium density residential and agricultural. It is anticipated that the drainage basin will become primarily low to medium density residential in the future. Below are the flow rates obtained from the USGS SIR 2014-5030 (region 1) using an impervious percentage of 20%:

USGS

Q10= 572 cfs

Q50= 796 cfs

Q100 = 895 cfs

Q500 = 1110 cfs

Based on the available information and the existing scour hole, the existing box culvert appears to be under sized (50-year HW/D=2.2). Based on the age, condition, and size, the culvert should be replaced. The proposed culvert should be a 1 @ 11' x 8' RCBC with a beveled headwall (50-year HW/D=1.2). The culvert invert should be buried 1' below the stream bed. The minimum shoulder point elevation should be approximately elevation 227.0 so that adequate freeboard above the design storm is provided.

The length and size of the proposed culvert and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

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

Date: 01/02/2018

County: Stream:

Road #: Road Name:

Division: Location:

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

Assigned to:

Prepared By:

Hydro Reviewer:

Project Type:

Existing Structure

Structure Type: Yr Built:

Span Arrangement: OAL (ft): Skew: Abutment Type:

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

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

ADT: Year ADT: Scour Code (item113): Prior Survey Completed: Survey Date:

Drainage Area: Sq. Mi. Drainage Area Source: Roadway Overtops at Q100:

Discharge Method: USGS Region: Stream Gage Number(if applicable):

Q10 (cfs): Q25 (cfs): Q50 (cfs): Q100 (cfs): QBFE (cfs):

Structure in Flood Hazard Zone: Panel #: Panel Date: Type of FIS: Date of FIS:

Environmental

Quad Map: River Basin: Buffer Rule:

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:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

Bed to Crown (ft): Year Built:

Downstream Feature:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

Bed to Crown (ft) Year Built:

Preliminary Structure Estimate [Office Estimate]

Structure Type: Skew:

Dimensions/Spans:

Notes

61

62

63

A

B

SITE 1A

500

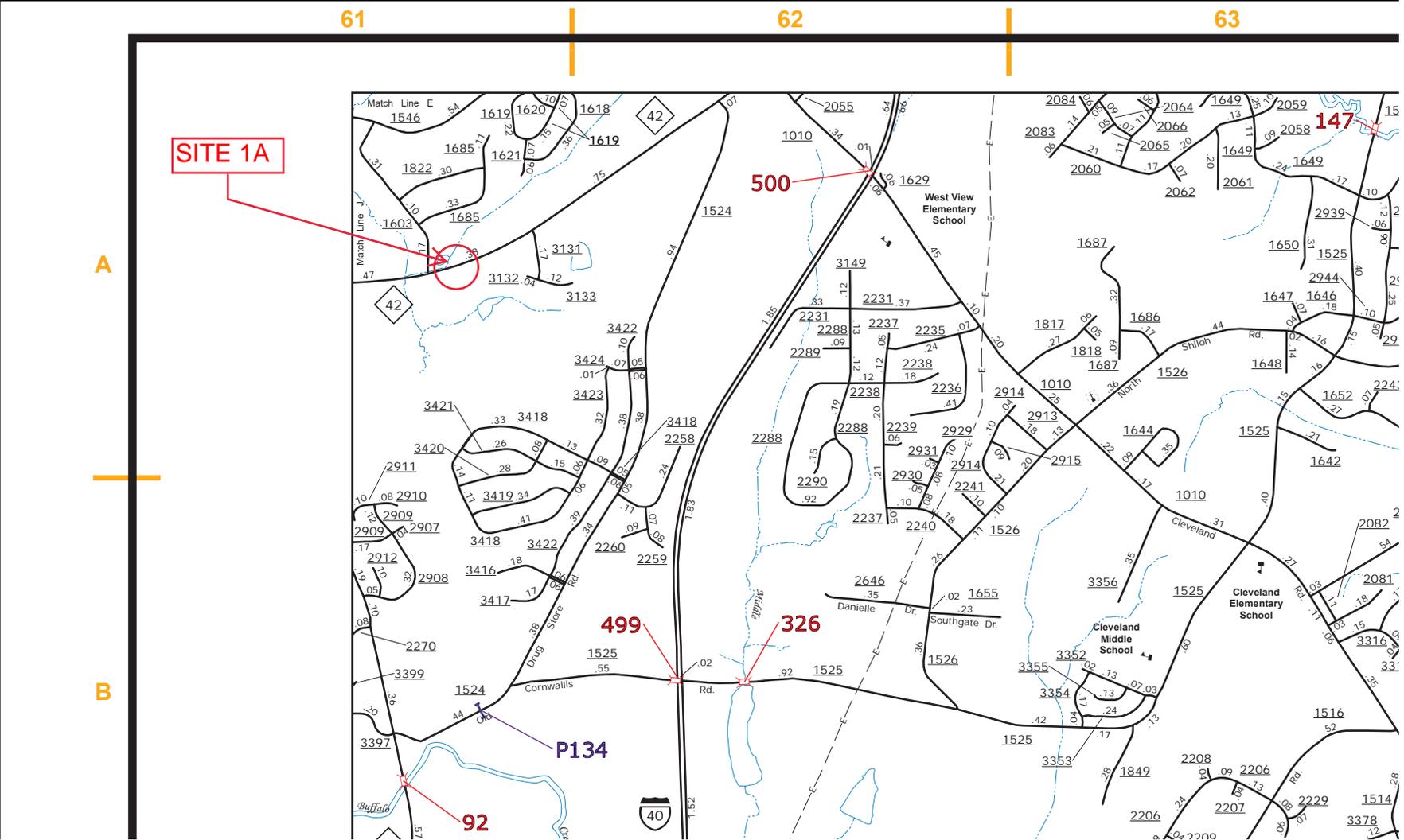
147

499

326

P134

92



This spreadsheet computes the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows for ungaged urban stream or small, rural stream in Georgia, South Carolina, and North Carolina, and that has drainage area within hydrologic region 1. The spreadsheet also includes the 95-percent prediction interval minus and plus standard error of prediction intervals, and the average standard error of prediction. To use this spreadsheet, enter requested information in the yellow cells below.

Enter a site-description name:

R-3410 Site 1A - UT to Buffalo Creek

Enter the explanatory variables:

Drainage area, in square miles	1.08
Percentage of impervious area, in percent	20

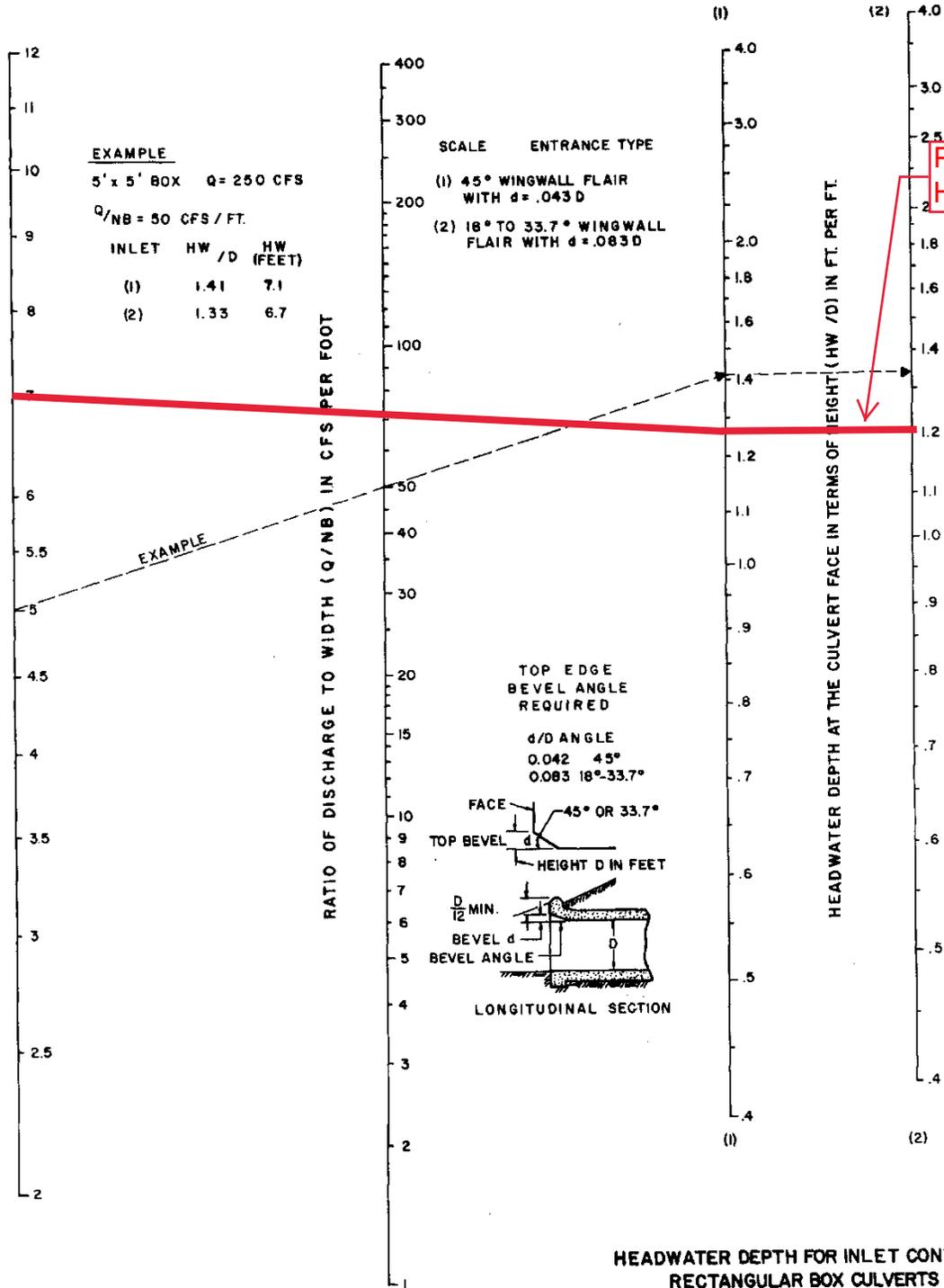
Applicable range of drainage area is 0.10 to 436 square miles

Applicable range of percentage of impervious area is 0.0 to 100 percent

Warnings and Cautions

Percent chance exceedance	Percent chance exceedance flow, in ft ³ /s	Lower 95 percent prediction interval flow, in ft ³ /s	Upper 95 percent prediction interval flow, in ft ³ /s	-S _{p,i} (percent)	+S _{p,i} (percent)	Average S _{p,i} (percent)
50	317	171	587	-26.5	36.1	31.6
20	467	283	770	-22.1	28.4	25.4
10	572	354	924	-21.3	27.1	24.3
4	702	415	1,190	-23.1	30.1	26.7
2	796	451	1,400	-24.7	32.8	29.0
1	895	479	1,670	-26.8	36.7	32.0
0.5	991	503	1,950	-28.7	40.3	34.8
0.2	1,110	540	2,270	-30.1	43.0	36.9

CHART 9B

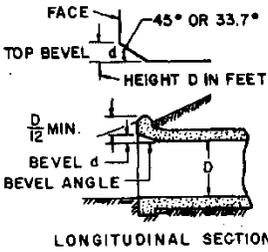


EXAMPLE
 5' x 5' BOX Q = 250 CFS
 Q/NB = 50 CFS / FT.

INLET	HW /D	HW (FEET)
(1)	1.41	7.1
(2)	1.33	6.7

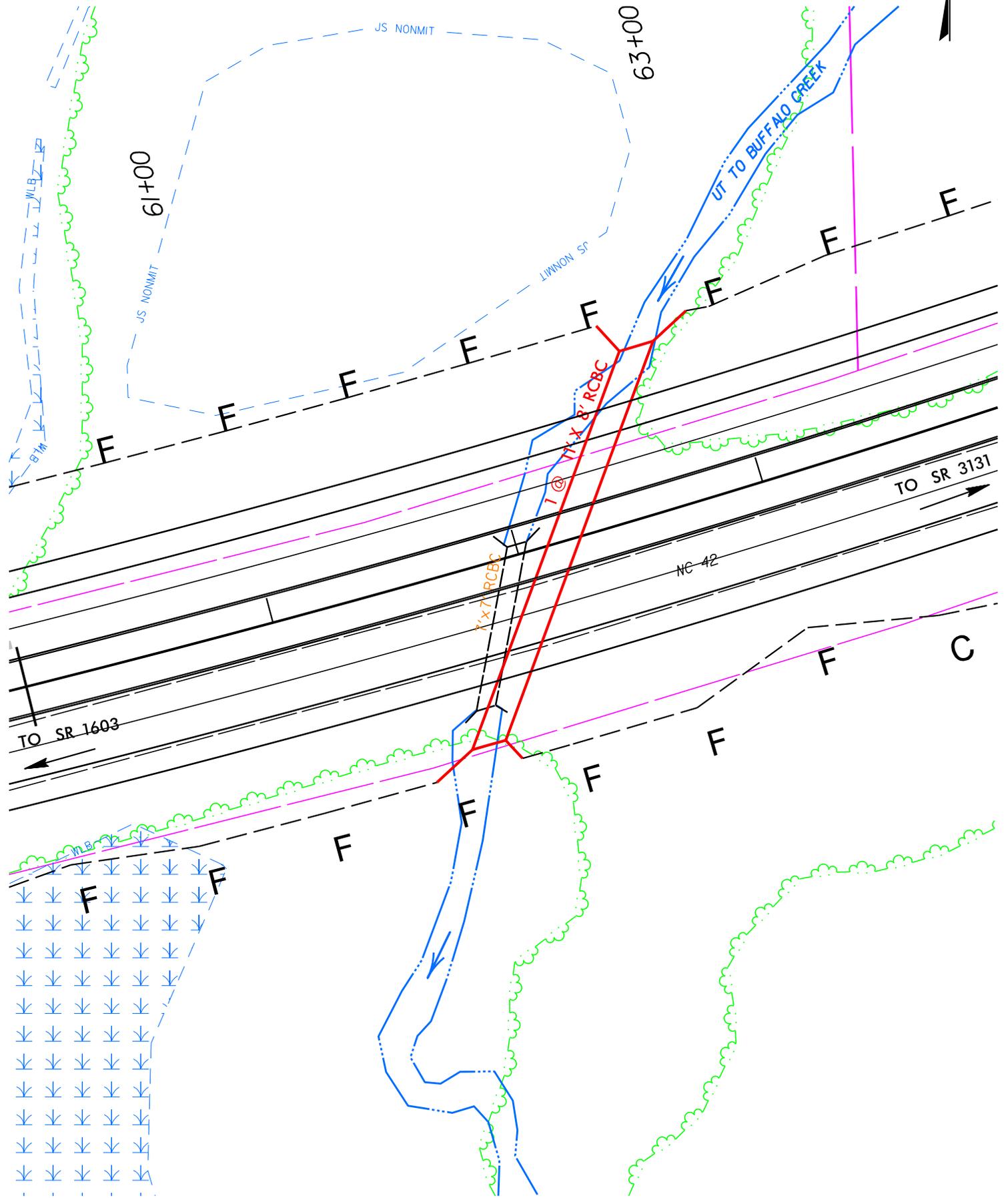
SCALE ENTRANCE TYPE
 (1) 45° WINGWALL FLAIR WITH $d = .043 D$
 (2) 18° TO 33.7° WINGWALL FLAIR WITH $d = .083 D$

TOP EDGE BEVEL ANGLE REQUIRED
 d/D ANGLE
 0.042 45°
 0.083 18°-33.7°



HEADWATER DEPTH FOR INLET CONTROL
 RECTANGULAR BOX CULVERTS
 FLARED WINGWALLS 18° TO 33.7° & 45°
 WITH BEVELED EDGE AT TOP OF INLET

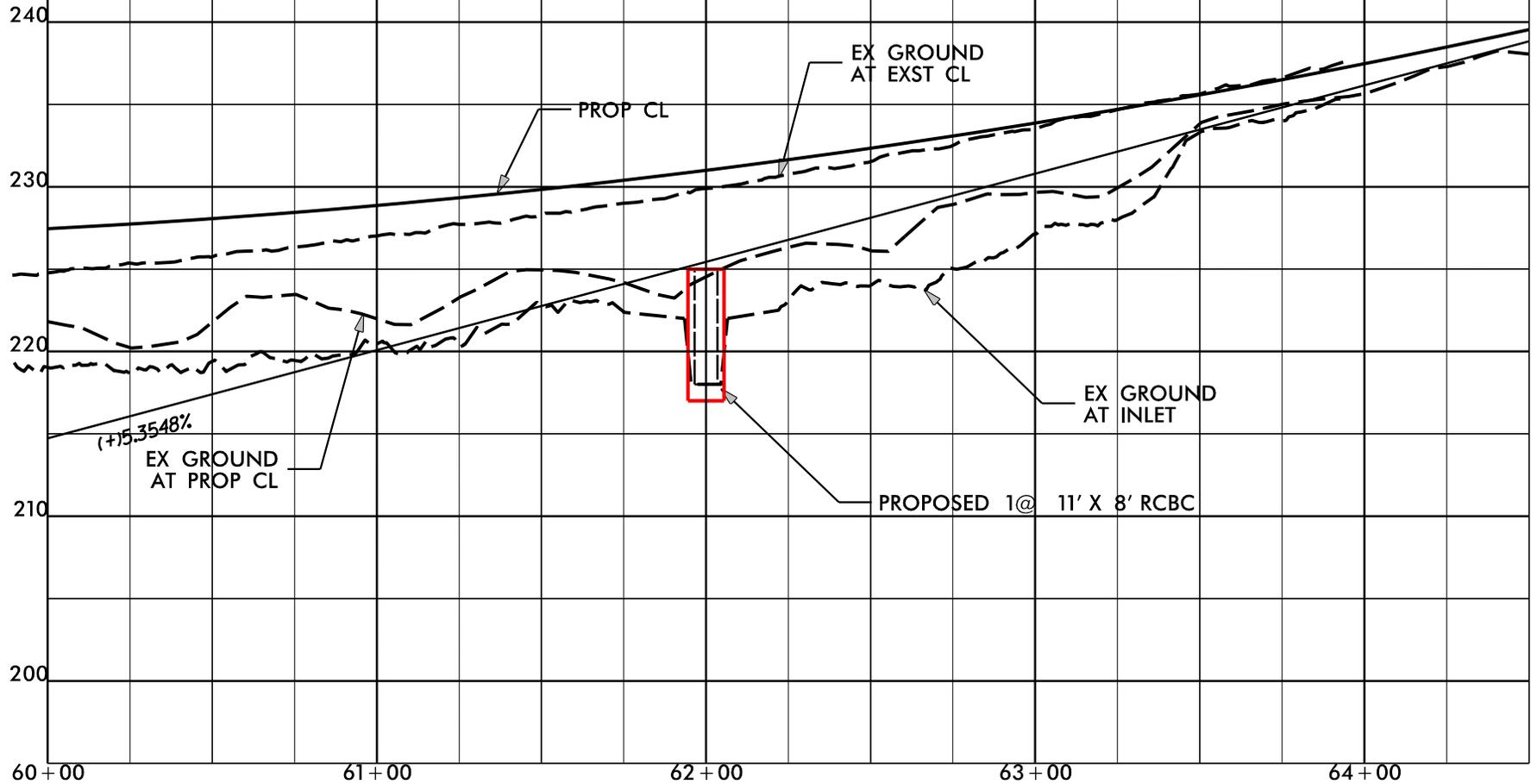
R-3410
SITE 1A
JOHNSTON COUNTY
1" = 50'



**BED PROFILE
@ UPSTREAM FACE**

**UNNAMED TRIBUTARY
TO BUFFALO CREEK**

PI = 58+00.00
EL = 204.00'
VC = 1,580'
K = 137



WEST

R-3410 NC 42

EAST

SITE #1A JOHNSTON COUNTY

VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 50'



Upstream face of culvert



Looking upstream from roadway



Downstream face of culvert



Looking downstream from roadway



Looking east



Looking west

Site 2

Swift Creek

All Alternatives

Site 2**Stream: Swift Creek****Alignment: All**

Site 2 is located at Swift Creek and is crossed by existing NC 42 and all alternatives. The existing structure number is 500021 and is a 6 @ 38' concrete deck on steel I-beam bridge. The existing bridge was constructed in 1947 and has a sufficiency rating of 59.66 and is classified as functionally obsolete.

Swift Creek is located in the Neuse River Basin and is subject to the Neuse River Riparian Buffer Rules. According to NCDEQ, Swift Creek (Index #27-43-(8)) is classified as Class C and Nutrient Sensitive Waters and is not included on the 2014 303d list of impaired streams.

Johnston County is a participant in the Federal Flood Insurance Program. The proposed crossing is located in a Detailed Study Area. An MOA will be required for this stream crossing. Based on available mapping, there does not appear to be any insurable structures located in the floodplain upstream of the bridge.

The drainage area at this location is approximately 86.5 square miles. The drainage basin currently consists of a large portion of the City of Raleigh, Town of Cary, and Town of Garner. A USGS stream gage (0208773375) is located downstream of the crossing at SR 1555 (Barber Mill Road) with a drainage area of 113.7 square miles, however sufficient data is not currently available to use this gage to prorate discharges. According to USGS Stream Stats, the drainage area is currently 8.2% impervious. It is anticipated that the drainage basin will continue to become urbanized in the future. Below are the flow rates obtained from the USGS SIR 2014-5030 (Region 1) using 20% impervious compared with the FEMA Effective and Preliminary discharges:

<u>USGS</u>	<u>FEMA Effective</u>	<u>FEMA Preliminary</u>
Q10= 7550 cfs		Q10=6002 cfs
Q50= 10600 cfs		Q50=9243 cfs
Q100 = 11800 cfs	Q100=9290 cfs	Q100=10577 cfs
Q500 = 14800 cfs		Q500=13911 cfs

According to the Preliminary HEC-RAS model, the existing bridge causes approximately 2.5 feet of backwater. The bridge opening velocity in the 100-year event is 7.3 feet per second which could result in high scour depths. Between the left stream bank (looking downstream) and the east bridge abutment, there was a considerable amount of recently installed rip rap that appeared to be remediation of a scour event. Just to the west of the existing bridge, there is an existing channel on the upstream and downstream side of the road that is blocked by the road fill. Based on the above information, the bridge appears to be undersized and should be lengthened. The proposed bridge should be approximately 400 feet long and the existing roadway fill excavated to reconnect the

existing channels located upstream and downstream. The existing bridge low chord should be matched (approximate elevation 192.6). The bridge length is based on spanning the reconnected channel on the east end and lengthening the bridge approximately 10 feet on the west end.

The length of the proposed bridge and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

County: Stream:

Road #: Road Name:

Division: Location:

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

Assigned to:

Prepared By:

Hydro Reviewer:

Project Type:

Existing Structure

Structure Type: Yr Built:

Span Arrangement: OAL (ft): Skew: Abutment Type:

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

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

ADT: Year ADT: Scour Code (item113): Prior Survey Completed: Survey Date:

Drainage Area: Sq. Mi. Drainage Area Source: Roadway Overtops at Q100:

Discharge Method: USGS Region: Stream Gage Number(if applicable):

Q10 (cfs): Q25 (cfs): Q50 (cfs): Q100 (cfs): QBFE (cfs):

Structure in Flood Hazard Zone: Panel #: Panel Date: Type of FIS: Date of FIS:

Environmental

Quad Map: River Basin: Buffer Rule:

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:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

Bed to Crown (ft): Year Built:

Downstream Feature:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

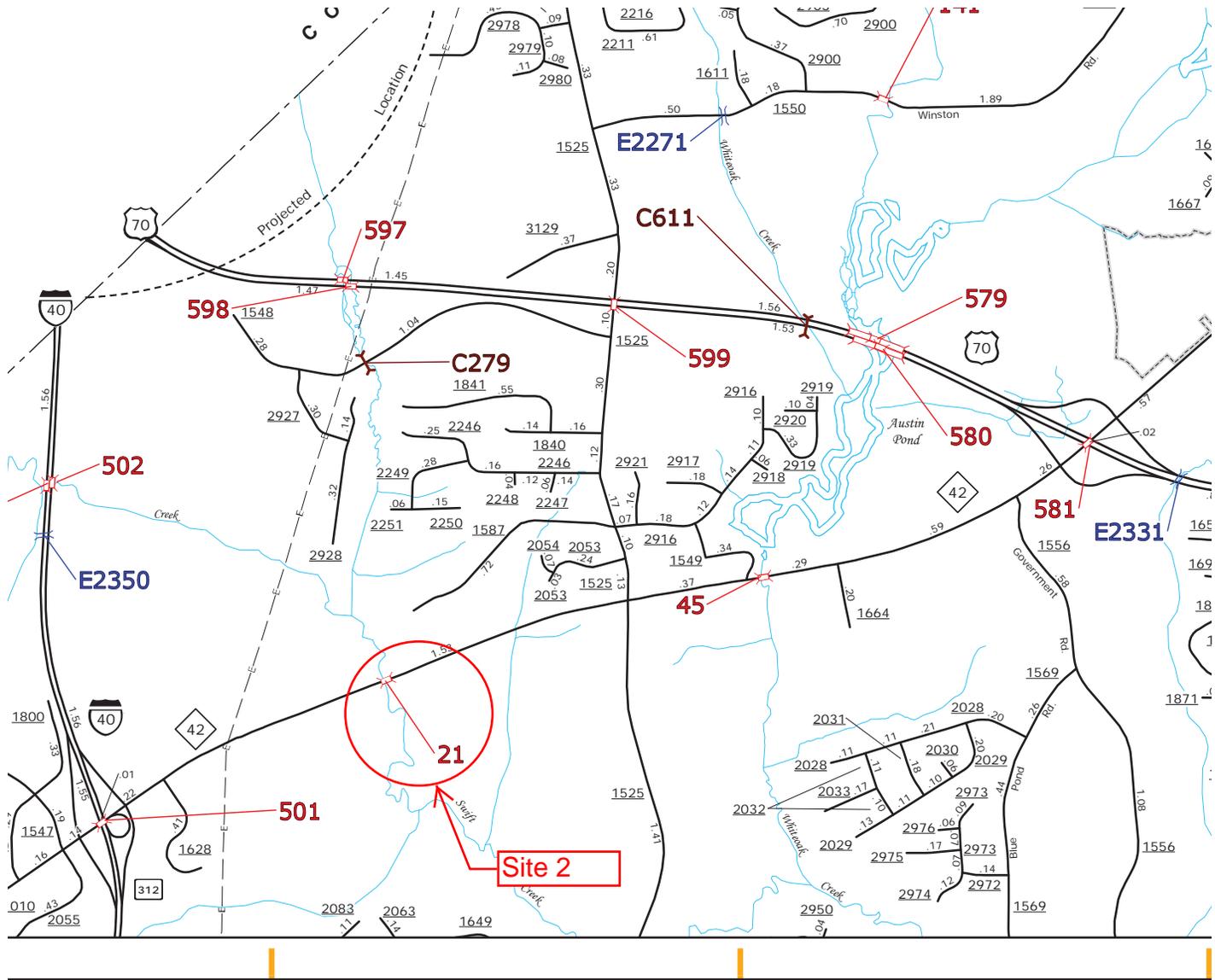
Bed to Crown (ft) Year Built:

Preliminary Structure Estimate [Office Estimate]

Structure Type: Skew:

Dimensions/Spans:

Notes





NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 STRUCTURE MANAGEMENT UNIT

ATTENTION: **Temporary repairs: beams**

Structure Safety Report

Routine Element Inspection

COUNTY: JOHNSTON STRUCTURE NUMBER: 500021 FREQUENCY: 24 MONTHS

FACILITY CARRIED: NC42 MILE POST: _____

LOCATION: 0.7 MI W JCT SR1525

FEATURE INTERSECTED: SWIFT CREEK

LATITUDE: 35° 36' 47.79" LONGITUDE: 78° 32' 55.49"

SUPERSTRUCTURE: REINFORCED CONCRETE FLOOR/CONT.I-BEAMS

SUBSTRUCTURE: E.BTS&INT.BTS:1,4,5:RC CAPS/H-PILES;INT.BTS2&3:RCP&B

1@37'8.5;4@37'6;1@37'8.5 CONT.

SPANS: 1@37"8.5;4@37"6;1@37"8.5 CONT.

FRACTURE CRITICAL TEMPORARY SHORING SCOUR CRITICAL SCOUR PLAN OF ACTION

PRESENT CONDITION: Fair INSPECTION DATE: 10/07/2015

POSTED SV: Not Posted POSTED TTST: Not Posted

OTHER SIGNS PRESENT: 2 Delineators



Looking East

Sign noticed issued for		Number Required
<u>NO</u>	WEIGHT LIMIT	<u>0</u>
<u>YES</u>	DELINEATORS	<u>2</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 Willis C May	SIGNATURE <i>Willis C May</i>	ASSISTED BY Wayne T Wilkinson
------------------------------	----------------------------------	----------------------------------

Span Element Report

Structure Number: 500021

Inspection Date: 10/07/2015

Span Number 1

Span Length 37.71 Feet

Number of Beams/Girders: 4

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,116	970	126	20	0	146	3326
107		Steel Open Girder/Beam	300	73	215	12	0	227	3314
515	107	Steel Protective Coating	2320	100	1770	0	450	2220	3342
225		Steel Pile	6	6	0	0	0	0	3354
234		Reinforced Concrete Pier Cap	42	34	0	8	0	3	3348
311		Movable Bearing	6	2	0	4	0	4	3334
515	311	Steel Protective Coating	5	1	0	0	4	4	3342
313		Fixed Bearing	10	1	6	3	0	9	3334
515	313	Steel Protective Coating	8	0	0	0	8	8	3342
331		Reinforced Concrete Bridge Railing	76	74	2	0	0	2	3318
510		Wearing Surface	987	987	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 2

Span Length 37.42 Feet

Number of Beams/Girders: 0

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,110	985	125	0	0	125	3326
225		Steel Pile	5	5	0	0	0	0	3354
234		Reinforced Concrete Pier Cap	27	27	0	0	0	0	3348
331		Reinforced Concrete Bridge Railing	76	75	0	1	0	1	3318
510		Wearing Surface	980	980	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 3

Span Length 37.42 Feet

Number of Beams/Girders: 4

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,110	985	125	0	0	125	3326
107		Steel Open Girder/Beam	300	0	292	8	0	300	3314
515	107	Steel Protective Coating	2320	20	2000	0	300	2300	3342
205		Reinforced Concrete Column	2	0	2	0	0	4	3348
220		Reinforced Concrete Pile Cap/Footing	6	6	0	0	0	0	3348
234		Reinforced Concrete Pier Cap	26	9	0	17	0	17	3348
301		Pourable Joint Seal	30	30	0	0	0	0	3310
311		Movable Bearing	4	0	0	4	0	4	3334
515	311	Steel Protective Coating	8	4	0	0	4	4	3342
313		Fixed Bearing	8	0	4	4	0	8	3334
515	313	Steel Protective Coating	8	0	0	0	8	8	3342
331		Reinforced Concrete Bridge Railing	76	76	0	0	0	0	3318
510		Wearing Surface	980	954	0	26	0	26	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 4

Span Length 37.5 Feet

Number of Beams/Girders: 0

Structure Number: 500021

Inspection Date: 10/07/2015

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,107	961	125	21	0	146	3326
205		Reinforced Concrete Column	2	0	2	0	0	4	3348
220		Reinforced Concrete Pile Cap/Footing	6	6	0	0	0	0	3348
234		Reinforced Concrete Pier Cap	26	26	0	0	0	0	3348
331		Reinforced Concrete Bridge Railing	76	76	0	0	0	0	3318
510		Wearing Surface	982	982	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 5

Span Length 37.5 Feet

Number of Beams/Girders: 4

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,107	982	125	0	0	125	3326
107		Steel Open Girder/Beam	300	0	296	4	0	300	3314
515	107	Steel Protective Coating	2320	300	1645	0	375	2020	3342
225		Steel Pile	5	5	0	0	0	0	3354
234		Reinforced Concrete Pier Cap	27	10	1	16	0	17	3348
301		Pourable Joint Seal	30	30	0	0	0	0	3310
311		Movable Bearing	5	1	0	4	0	4	3334
515	311	Steel Protective Coating	8	4	0	0	4	4	3342
313		Fixed Bearing	8	0	4	4	0	8	3334
515	313	Steel Protective Coating	8	0	0	0	8	8	3342
331		Reinforced Concrete Bridge Railing	76	76	0	0	0	0	3318
510		Wearing Surface	982	982	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 6

Span Length 37.71 Feet

Number of Beams/Girders: 0

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,116	990	126	0	0	126	3326
225		Steel Pile	11	11	0	0	0	0	3354
234		Reinforced Concrete Pier Cap	69	69	0	0	0	0	3348
331		Reinforced Concrete Bridge Railing	76	75	1	0	0	1	3318
510		Wearing Surface	987	987	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1116	970	126	20	0	146	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	38	36	2	0	0	2	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	987	987	0	0	0	0	2816	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	107	Steel Open Girder/Beam	75	0	71	4	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	480	0	100	580	3342	
<input checked="" type="checkbox"/> Beam	2	107	Steel Open Girder/Beam	75	0	73	2	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	430	0	150	580	3342	
<input checked="" type="checkbox"/> Beam	3	107	Steel Open Girder/Beam	75	73	0	2	0	2	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	100	405	0	75	480	3342	
<input checked="" type="checkbox"/> Beam	4	107	Steel Open Girder/Beam	75	0	71	4	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	455	0	125	580	3342	
<input checked="" type="checkbox"/> Bearing Device	1	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	1	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	1	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Structure Number: 500021

Inspection Date: 10/07/2015

Span Number 1

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input type="checkbox"/> Bearing Device	3	311	Movable Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	311	Movable Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Span Number 2

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1110	985	125	0	0	125	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	38	37	0	1	0	1	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	980	980	0	0	0	0	2816	<input type="checkbox"/> Requested

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1110	985	125	0	0	125	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	980	954	0	26	0	26	2816	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	107	Steel Open Girder/Beam	75	0	73	2	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	5	500	0	75	575	3342	
<input checked="" type="checkbox"/> Beam	2	107	Steel Open Girder/Beam	75	0	73	2	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	5	500	0	75	575	3342	
<input checked="" type="checkbox"/> Beam	3	107	Steel Open Girder/Beam	75	0	73	2	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	5	500	0	75	575	3342	
<input checked="" type="checkbox"/> Beam	4	107	Steel Open Girder/Beam	75	0	73	2	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	5	500	0	75	575	3342	
<input checked="" type="checkbox"/> Bearing Device	1	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	1	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	1	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested

Structure Number: 500021

Inspection Date: 10/07/2015

Span Number 3

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Expansion Joints	1	301	Pourable Joint Seal	30	30	0	0	0	0	3310	<input type="checkbox"/> Requested

Span Number 4

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1107	961	125	21	0	146	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	982	982	0	0	0	0	2816	<input type="checkbox"/> Requested

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1107	982	125	0	0	125	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	982	982	0	0	0	0	2816	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	107	Steel Open Girder/Beam	75	0	71	4	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	430	0	150	580	3342	
<input checked="" type="checkbox"/> Beam	2	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	100	405	0	75	480	3342	
<input checked="" type="checkbox"/> Beam	3	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	100	405	0	75	480	3342	
<input checked="" type="checkbox"/> Beam	4	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	100	405	0	75	480	3342	
<input checked="" type="checkbox"/> Bearing Device	1	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	1	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	1	311	Movable Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bearing Device	1	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	

Structure Number: 500021

Inspection Date: 10/07/2015

Span Number 5

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Bearing Device	4	311	Movable Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	2	1	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	313	Fixed Bearing	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Expansion Joints	1	301	Pourable Joint Seal	30	30	0	0	0	0	3310	<input type="checkbox"/> Requested

Span Number 6

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1116	990	126	0	0	126	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	38	37	1	0	0	1	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	38	38	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	987	987	0	0	0	0	2816	<input type="checkbox"/> Requested

Superstructure Element Defect Descriptions

Structure Number: 500021

Inspection Date: 10/07/2015

Span Number 1

Span	Deck	1	Component Name:	Reinforced Concrete Deck				
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Element: 12	Name Reinforced Concrete Deck	Qty: 1116	Lvl 2: 126	Lvl 3: 20	Lvl 4: 0	Maint. Qty: 0	146
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Defect Description:

126 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

diaphragms

20 Square Feet spalled and cracked overhang diaphragm, and bay 1,2,3 diaphragms at bent 2.

Span	Bridge Rail	1	Component Name:	Concrete Railing				
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Element: 331	Name Reinforced Concrete Bridge Ra	Qty: 38	Lvl 2: 2	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 0	2
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Defect Description:

2 Feet of Cracking (RC and Other): Width 0.012-0.05 in. or spacing of 1.0-3.0 ft.

Span	Wearing Surfaces		Component Name:	Asphalt Wearing Surface				
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Element: 510	Name Wearing Surface	Qty: 987	Lvl 2: 0	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 0	0
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Defect Description:

Asphalt wearing surface replaced since last inspection.

Span	Beam	1	Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 71	Lvl 3: 4	Lvl 4: 0	Maint. Qty: 0	75
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Defect Description:

end bent 1

2 Feet of Corrosion: Section loss in bottom flange at end bent 1 with 9/16 in remaining.

bent 2

2 Feet of Corrosion: Section loss in the bottom flange at bent 2 with 3/8 in remaining and section loss in the web in two spots 6 in diameter with 5/16 in remaining .

71 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

100 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

480 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	Beam	2	Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 73	Lvl 3: 2	Lvl 4: 0	Maint. Qty: 0	75
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Defect Description:

2 Feet of Corrosion: Section loss in the web at bent 2 with 7/16 in remaining 3 in high x 2 ft and in the bottom flange with 1/4 in remaining x 2 ft.

73 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

150 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

430 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	Beam	3	Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 0	Lvl 3: 2	Lvl 4: 0	Maint. Qty: 0	2
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Defect Description:

bent 2

2 Feet of Corrosion: Section loss in the web at bent 2 with 3/8 in remaining 5 in high x 2 ft and in the bottom flange with 3/16 in x 2 ft long remaining in the right side and down to knife edge in the left side with a spot 2 in long x 1 in wide with a 100 % section loss.

75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

405 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	Beam	Qty	Component Name:	Plate Girder
1	4			

Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 71 Lvl 3: 4 Lvl 4: 0 Maint. Qty: 75

Defect Description:

end bent 1

2 Feet of Corrosion: Section loss in web at end bent 1 with 7/16 in remaining 3 in high and 9/16 in remaining in bottom flange.
bent 2

2 Feet of Corrosion: Section loss in the web at bent 2 with 3/8 in remaining 3 in high x 2 ft at the bottom of web and at the top of web at diaphragm also section loss in the bottom flange with 3/8 in remaining x 2 ft.

71 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

125 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

455 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	Bearing Device	Qty	Component Name:	Fixed Bearing
1	1			

Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Movable Bearing
1	1			

Element: 311 Name Movable Bearing Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Fixed Bearing
1	1			

Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Fixed Bearing
1	2			

Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Movable Bearing
1	2			

Element: 311 Name Movable Bearing Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Fixed Bearing
1	2			

Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Fixed Bearing
1	3			

Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	Bearing Device	Qty	Component Name:	Movable Bearing
1	3			

Element: 311 Name Movable Bearing Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty: 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device	3	Component Name:	Fixed Bearing								
Element: 313	Name	Fixed Bearing	Qty:	1	Lvl 2:	1	Lvl 3:	0	Lvl 4:	0	Maint. Qty:	1
Defect Description:												

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device	4	Component Name:	Fixed Bearing								
Element: 313	Name	Fixed Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty:	1
Defect Description:												

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device	4	Component Name:	Movable Bearing								
Element: 311	Name	Movable Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty:	1
Defect Description:												

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device	4	Component Name:	Fixed Bearing								
Element: 313	Name	Fixed Bearing	Qty:	1	Lvl 2:	1	Lvl 3:	0	Lvl 4:	0	Maint. Qty:	1
Defect Description:												

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device	4	Component Name:	Fixed Bearing								
Element: 313	Name	Fixed Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty:	1
Defect Description:												

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span Number 2

Span 2	Deck	1	Component Name:	Reinforced Concrete Deck								
Element: 12	Name	Reinforced Concrete Deck	Qty:	1110	Lvl 2:	125	Lvl 3:	0	Lvl 4:	0	Maint. Qty:	125
Defect Description:												

125 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Span 2	Bridge Rail	1	Component Name:	Concrete Railing								
Element: 331	Name	Reinforced Concrete Bridge Ra	Qty:	38	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty:	1
Defect Description:												

1 Foot of Delamination/Spall/Patched Area: Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.

Span 2	Wearing Surfaces		Component Name:	Asphalt Wearing Surface								
Element: 510	Name	Wearing Surface	Qty:	980	Lvl 2:	0	Lvl 3:	0	Lvl 4:	0	Maint. Qty:	0
Defect Description:												

Asphalt wearing surface replaced since last inspection.

Span Number 3

Span 3	Deck	1	Component Name:	Reinforced Concrete Deck								
Element: 12	Name	Reinforced Concrete Deck	Qty:	1110	Lvl 2:	125	Lvl 3:	0	Lvl 4:	0	Maint. Qty:	125
Defect Description:												

125 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Span 3	Wearing Surfaces		Component Name:	Asphalt Wearing Surface				
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Element: 510	Name Wearing Surface	Qty: 980	Lvl 2: 0	Lvl 3: 26	Lvl 4: 0	Maint. Qty: 0	26
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Defect Description:

Asphalt wearing surface replaced since last inspection.

26 Square Feet of Cracking over Bent 2 (Wearing Surface): Width of more than 0.05 in. or spacing of less than 1.0 ft.

Span 3	Beam 1		Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 73	Lvl 3: 2	Lvl 4: 0	Maint. Qty: 0	75
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Defect Description:

bent 2

2 Feet of Corrosion: Section loss in the bottom flange at bent 2 with 3/8 in remaining and section loss in the web with 7/16 in remaining 3 in high and 6 in diameter at diaphragm with 3/8 in remaining.

73 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

500 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Beam web and bottom flange has been repaired at bent 4 - see drawings.

Span 3	Beam 2		Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 73	Lvl 3: 2	Lvl 4: 0	Maint. Qty: 0	75
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Defect Description:

bent 2

2 Feet of Corrosion: Section loss in the web at bent 2 with 7/16 in remaining 3 in high x 2 ft and in the bottom flange with 1/4 in remaining x 2 ft.

73 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

500 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Beam web and bottom flange has been repaired at bent 4 - see drawings.

Span 3	Beam 3		Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 73	Lvl 3: 2	Lvl 4: 0	Maint. Qty: 0	75
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Defect Description:

bent 2

2 Feet of Corrosion: Section loss in the web at bent 2 with 7/16 in remaining 4 in high x 2 ft and in the bottom flange with 1/4 in remaining x 2 ft.

73 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

500 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Beam web and bottom flange has been repaired at bent 4 - see drawings.

Span 3	Beam 4		Component Name:	Plate Girder				
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Element: 107	Name Steel Open Girder/Beam	Qty: 75	Lvl 2: 73	Lvl 3: 2	Lvl 4: 0	Maint. Qty: 0	75
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Defect Description:

2 Feet of Corrosion: Section loss in the web at bent 2 - 3 in high 2 ft long with 3/8 in remaining and 3/8 in remaining in the bottom flange 2 ft long.

73 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

500 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Beam web and bottom flange has been repaired at bent 4 - see drawings.

Span 3	Bearing Device 1		Component Name:	Fixed Bearing				
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 0	1
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Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 1	Component Name:	Movable Bearing
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Element: 311	Name Movable Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 1	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 1	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 2	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 2	Component Name:	Movable Bearing
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Element: 311	Name Movable Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 2	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 1	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 3	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 3	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 1	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 3	Component Name:	Movable Bearing
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Element: 311	Name Movable Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device 4	Component Name:	Movable Bearing
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Element: 311	Name Movable Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device	4	Component Name:	Fixed Bearing
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Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Bearing Device	4	Component Name:	Fixed Bearing
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Element: 313 Name Fixed Bearing Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

- 1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3	Expansion Joints	1	Component Name:	Standard Joint
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Element: 301 Name Pourable Joint Seal Qty: 30 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

Not visible.

Span Number 4

Span 4	Deck	1	Component Name:	Reinforced Concrete Deck
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Element: 12 Name Reinforced Concrete Deck Qty: 1107 Lvl 2: 125 Lvl 3: 21 Lvl 4: 0 Maint. Qty 146

Defect Description:

- 3 Square Feet of Cracking in the right curb (RC and Other): Width 0.012-0.05 in. or spacing of 1.0-3.0 ft.
- 122 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

diaphragms

21 Square Feet of Cracking and spalling in overhang and end diaphragms at bent 4.

Span 4	Wearing Surfaces		Component Name:	Asphalt Wearing Surface
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Element: 510 Name Wearing Surface Qty: 982 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

Asphalt wearing surface replaced since last inspection.

Span Number 5

Span 5	Deck	1	Component Name:	Reinforced Concrete Deck
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Element: 12 Name Reinforced Concrete Deck Qty: 1107 Lvl 2: 125 Lvl 3: 0 Lvl 4: 0 Maint. Qty 125

Defect Description:

- 125 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Span 5	Wearing Surfaces		Component Name:	Asphalt Wearing Surface
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Element: 510 Name Wearing Surface Qty: 982 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

Asphalt wearing surface replaced since last inspection.

Span 5	Beam	1	Component Name:	Plate Girder
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Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 71 Lvl 3: 4 Lvl 4: 0 Maint. Qty 75

Defect Description:

- Beam web and bottom flange has been repaired at bent 4 - see drawings.
- 75 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
- 4 Feet of Corrosion: Section loss in the bottom flange at bent 4 2 in wide with 23/32 in remaining.
- 150 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
- 430 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span 5	Beam	2	Component Name:	Plate Girder
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Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 75 Lvl 3: 0 Lvl 4: 0 Maint. Qty 75

Defect Description:

Beam web and bottom flange has been repaired at bent 4 - see drawings.
 75 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 405 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	5	Beam	3	Component Name:	Plate Girder								
Element:	107	Name	Steel Open Girder/Beam	Qty:	75	Lvl 2:	75	Lvl 3:	0	Lvl 4:	0	Maint. Qty	75
Defect Description:													

Beam web and bottom flange has been repaired at bent 4 - see drawings.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 405 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	5	Beam	4	Component Name:	Plate Girder								
Element:	107	Name	Steel Open Girder/Beam	Qty:	75	Lvl 2:	75	Lvl 3:	0	Lvl 4:	0	Maint. Qty	75
Defect Description:													

Beam web and bottom flange has been repaired at bent 4 - see drawings.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 405 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Span	5	Bearing Device	1	Component Name:	Fixed Bearing								
Element:	313	Name	Fixed Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	5	Bearing Device	1	Component Name:	Fixed Bearing								
Element:	313	Name	Fixed Bearing	Qty:	1	Lvl 2:	1	Lvl 3:	0	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	5	Bearing Device	1	Component Name:	Movable Bearing								
Element:	311	Name	Movable Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	5	Bearing Device	2	Component Name:	Movable Bearing								
Element:	311	Name	Movable Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	5	Bearing Device	2	Component Name:	Fixed Bearing								
Element:	313	Name	Fixed Bearing	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	5	Bearing Device	2	Component Name:	Fixed Bearing								
Element:	313	Name	Fixed Bearing	Qty:	1	Lvl 2:	1	Lvl 3:	0	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Bearing Device	3	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Bearing Device	3	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 1	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Bearing Device	3	Component Name:	Movable Bearing
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Element: 311	Name Movable Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Bearing Device	4	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Bearing Device	4	Component Name:	Fixed Bearing
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Element: 313	Name Fixed Bearing	Qty: 1	Lvl 2: 1	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Bearing Device	4	Component Name:	Movable Bearing
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Element: 311	Name Movable Bearing	Qty: 1	Lvl 2: 0	Lvl 3: 1	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
- 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 5	Expansion Joints	1	Component Name:	Standard Joint
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Element: 301	Name Pourable Joint Seal	Qty: 30	Lvl 2: 0	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 0
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Defect Description:

Not visible.

Span Number 6

Span 6	Deck	1	Component Name:	Reinforced Concrete Deck
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Element: 12	Name Reinforced Concrete Deck	Qty: 1116	Lvl 2: 126	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 126
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Defect Description:

- 126 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Span 6	Bridge Rail	1	Component Name:	Concrete Railing
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Element: 331	Name Reinforced Concrete Bridge Ra	Qty: 38	Lvl 2: 1	Lvl 3: 0	Lvl 4: 0	Maint. Qty: 1
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Defect Description:

- 1 Foot of Delamination/Spall/Patched Area: Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.

Structure Number: 500021

Inspection Date: 10/07/2015

Span 6	Wearing Surfaces	Component Name:	Asphalt Wearing Surface						
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Element: 510	Name	Wearing Surface	Qty:	987	Lvl 2:	0	Lvl 3	0	Lvl 4	0	Maint. Qty	0
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Defect Description:

Asphalt wearing surface replaced since last inspection.

Substructure Detailed Element Quantites

Structure Number: 500021
End Bent 1

Inspection Date: 10/07/2015

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	42	34	0	8	0	3	3348	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Bent 1

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	27	27	0	0	0	0	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Bent 2

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input type="checkbox"/> Footing	1	220	Reinforced Concrete Pile Cap/Footing	6	6	0	0	0	0	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	26	9	0	17	0	17	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	205	Reinforced Concrete Column	1	0	1	0	0	2	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	205	Reinforced Concrete Column	1	0	1	0	0	2	3348	<input type="checkbox"/> Requested

Bent 3

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input type="checkbox"/> Footing	1	220	Reinforced Concrete Pile Cap/Footing	6	6	0	0	0	0	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	26	26	0	0	0	0	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	205	Reinforced Concrete Column	1	0	1	0	0	2	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	205	Reinforced Concrete Column	1	0	1	0	0	2	3348	<input type="checkbox"/> Requested

Bent 4

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	27	10	1	16	0	17	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Bent 5

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	27	27	0	0	0	0	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Structure Number: 500021

Inspection Date: 10/07/2015

End Bent 2

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	42	42	0	0	0	0	3348	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Substructure Element Defect Descriptions

Structure Number: 500021

Inspection Date: 10/07/2015

End Bent 1

End Bent 1	Row 1	Caps	1							
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Element: 234 Name Reinforced Concrete Pier Cap Qty: 42 Lvl 2: 0 Lvl 3: 8 Lvl 4: 0 Maint. Qty 3

Defect Description:

3 Feet of 1/16 in Longitudinal Cracking in face of bay 1.
5 Feet of 1/16 in Longitudinal Cracking in face of bay 3.

Bent 2	Row 1	Caps	1							
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Element: 234 Name Reinforced Concrete Pier Cap Qty: 26 Lvl 2: 0 Lvl 3: 17 Lvl 4: 0 Maint. Qty 17

Defect Description:

1 Feet of Exposed Rebar: Present with 1/8 in section loss in face of cap span 2 side 6 in from left end in a 12 in diameter spall
16 Feet of 1/8 in Longitudinal Cracking in span 2 side 3 in down from top from left end to beam 3.

Bent 2	Row 1	Piles and Columns	1							
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Element: 205 Name Reinforced Concrete Column Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 2

Defect Description:

1 Each of Abrasion/Wear (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Bent 2	Row 1	Piles and Columns	2							
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Element: 205 Name Reinforced Concrete Column Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 2

Defect Description:

1 Each of Abrasion/Wear (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Bent 3	Row 1	Piles and Columns	1							
--------	-------	-------------------	---	--	--	--	--	--	--	--

Element: 205 Name Reinforced Concrete Column Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 2

Defect Description:

1 Each of Abrasion/Wear (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Bent 3	Row 1	Piles and Columns	2							
--------	-------	-------------------	---	--	--	--	--	--	--	--

Element: 205 Name Reinforced Concrete Column Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 2

Defect Description:

1 Each of Abrasion/Wear (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

Bent 4	Row 1	Caps	1							
--------	-------	------	---	--	--	--	--	--	--	--

Element: 234 Name Reinforced Concrete Pier Cap Qty: 27 Lvl 2: 1 Lvl 3: 16 Lvl 4: 0 Maint. Qty 17

Defect Description:

1 Feet of Delamination in span 4 side at beam 1.
8 Feet of 1/8 to 1/4 in wide Longitudinal cracking in span 4 side in bay 2 and 3 near top and bottom corner and Longitudinal cracking near bottom corner in span 5 side from beam 2 to right end.

Bent 4	Row 1	Piles and Columns	1							
--------	-------	-------------------	---	--	--	--	--	--	--	--

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

Concrete jacket has vertical cracks 1/16 in wide.

Bent 4	Row 1	Piles and Columns	2							
--------	-------	-------------------	---	--	--	--	--	--	--	--

Structure Number: 500021

Inspection Date: 10/07/2015

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 0

Defect Description:

Concrete jacket has vertical crack 1/4 in wide.

Bent 4	Row 1	Piles and Columns	5
--------	-------	-------------------	---

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 0

Defect Description:

spall in concrete jacket 4 in wide with exposed flange.

BRIDGE INSPECTION RECORD AND SUMMARY FOR SHORED STRUCTURES OR STRUCTURES WITH TEMPORARY REPAIRS MADE TO KEEP A BRIDGE OPEN

BRIDGE: **500021** County **Johnston** DATE: **12/31/2013**

THE FOLLOWING S. I. & A ITEMS ARE TO BE CODED TO REFLECT THE FACT THAT THE STRUCTURE IS SHORED OR HAS HAD TEMPORARY REPAIRS MADE TO KEEP THE BRIDGE OPEN :

	<u>CODE</u>	<u>BY</u>
S I & A ITEM 103 - TEMPORARY STRUCTURE DESIGNATION	T	TSE
S I & A ITEM 59 - SUPERSTRUCTURE	4	TSE 12/31/13
S I & A ITEM 60 - SUBSTRUCTURE		
S I & A ITEM 64 OPERATING RATING		
HS		BY:
S I & A ITEM 66 - INVENTORY RATING		
HS		BY:

COMMENTS

Plates welded to the web and bottom flange of some beams.

Temporary Repair *NOT TEMP TMS 03/14/16*

National Bridge and NC Inspection Items

Structure Number: 500021

Inspection Date: 10/07/2015

National Bridge Inventory Items

Item	Grade Scale	Grade
Item 58: Deck	0 - 9 , N	6
Item 59: Superstructure	0 - 9 , N	5
Item 60: Substructure	0 - 9 , N	6
Item 61: Channel and Channel Protection	0 - 9 , N	7
Item 62: Culvert	0 - 9 , N	
Item 71: Waterway Adequacy	0 - 9 , N	7
Item 72: Approach Roadway Alignment	0 - 9 , N	8

Note: If NBI Inspection Item is not present, code NBI item with "N"

NC SMU Inspection Items

Item	Grade Scale	Grade	Maint. Qty.	Maint. Code
Deck Debris	G, F, P, or C	F	450	3376
Drainage System	G, F, P, or C	P	450	3332
Utilities	G, F, P, or C			
Slope Protection	G, F, P, or C	F	75	3352
Scour	G, F, P, or C	G		
Wingwall	G, F, P, or C	G	0	3350
Field Scour Evaluation		G		
Drift	G, F, P, or C	G	0	3366
Fender System	G, F, P, or C			
Movable Span Machinery	G, F, P, or C			
Response to Live Load	G, F, P, or C	G		
Estimated Remaining Life	0 - 100 Years	10		

Note: If NC SMU Inspection Item is not present, leave NC SMU item blank

Inspection Information

Item	Grade Scale	Grade
Regulatory Sign Noticed Issued	YES/NO	Y
Priority Maintenance Request Submitted	YES/NO	N
Inspection Time	Hours	10
Traffic Control Time	Hours	
Snooper Time	Hours	
Ladder Used	YES/NO	Y
Bucket Truck Used	YES/NO	N
Boat Used	YES/NO	N
Other Equipment Used	YES/NO	N

National Bridge and NC SMU Inspection Item Details

Structure Number: 500021

Inspection Date: 10/07/2015

Item	Regulatory Sign Notice Issued	Grade	Y	Maint Code	Qty.	0
------	-------------------------------	-------	---	------------	------	---

Details Delineators

Item	Deck Debris	Grade	F	Maint Code	3376	Qty.	450
------	-------------	-------	---	------------	------	------	-----

Details Dirt and Vegetation out 1 ft. along curblines.

Item	Drainage System	Grade	P	Maint Code	3332	Qty.	450
------	-----------------	-------	---	------------	------	------	-----

Details Dirt and Vegetation clogging drains.

Item	Slope Protection	Grade	F	Maint Code	3352	Qty.	75
------	------------------	-------	---	------------	------	------	----

Details Erosion under span 5 between bent 4 piles to stream 3 ft wide x 6 ft long.
End bent 2 berm cracked and settled 2 in, has been repaired with grout, repair is cracked.



Abrasion along deck curbs



Transverse crack in the Left side guardrail in Span 1



Transverse crack in Wearing surface over Bent 2



Dirt and Vegetation along curblines



Abrasion with Coarse aggregate exposed along guardrails



Spall in the left Guardrail post at Approach 2 Guardrail connection in Span 6



Peeling paint with Surface rust to exposed steel along the Top flange of Beam 1 in Span 1 - other beams similar



Horizontal crack in Face of cap at End Bent 1 bay 1



Spalling with Exposed rebar in the right exterior diaphragms at Bent 2



Section loss in the ends of Beam 1 over Bent 2 - other beams similar



Section loss in Beam 1 Bearing assemblies at Bent 2 - other bearings similar



Spalling with Section loss to Exposed rebar in the left exterior diaphragms at Bent 2



Spalling with Section loss to Exposed rebar in Span 2 end Diaphragm at Bent 2 bay 2 - bay 1 similar



Spall with Section loss to Exposed rebar in Face of cap at Bent 2 Span 2 side at left end



Spalling and Delamination in Backwall at End Bent 1 to the Left side of Beam 1



Grout Repair cracked and separated across End Bent 2



Section loss in the web of Beam 1 in Span 5 over Bent 4 from the end of beam to the vert stiffener



Section loss in the Bottom flange of Beam 1 in Span 5 over Bent 4 extending out 4 ft.



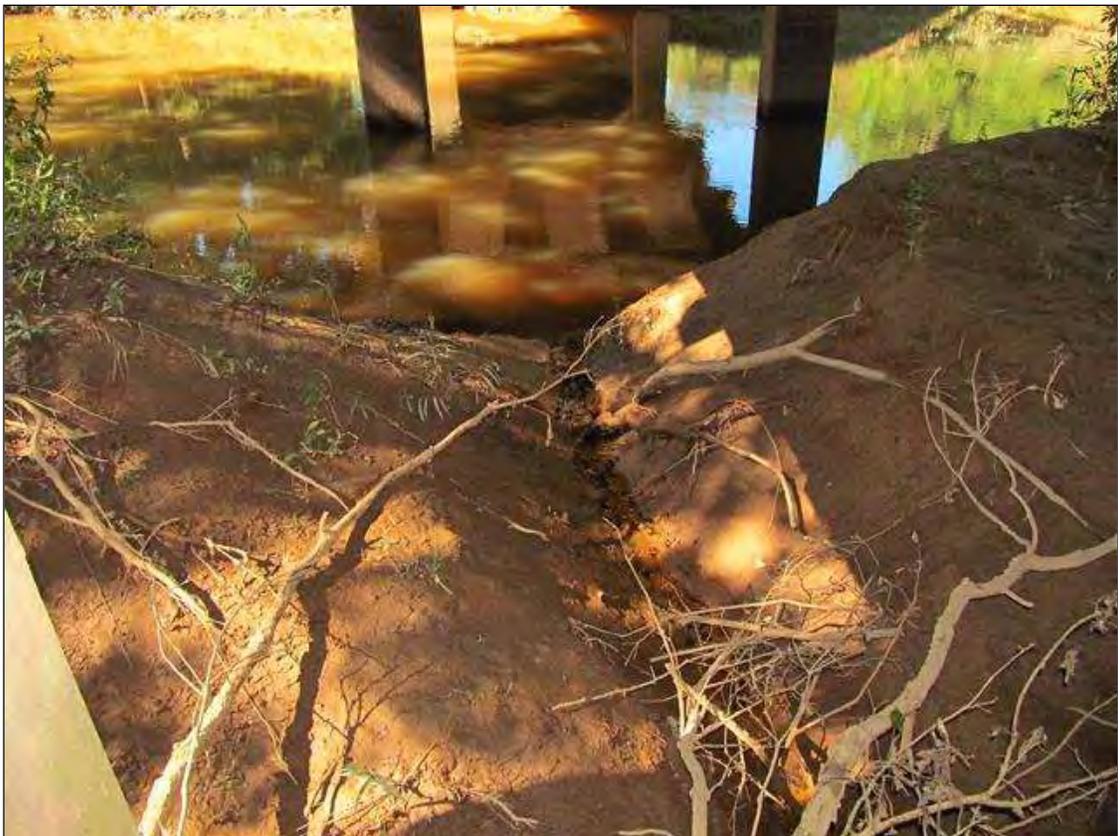
Spall with Section loss to Exposed rebar in the left exterior Diaphragm at Bent 4 Span 5 side



Section loss in existing repair (Bottom flange and web) of Beam 1 in Span 5 over Bent 4 - other repairs similar



Rust scale along edges of cover plate for Beam 1 in Span 5 near Bent 4



Bank erosion under Span 4



Spall with Section loss to Exposed rebar in the Right side of Pile 5 at Bent 4



section loss in bottom flange of beam 3 span 2 at bent 2



Looking East



Approach Guardrail connection



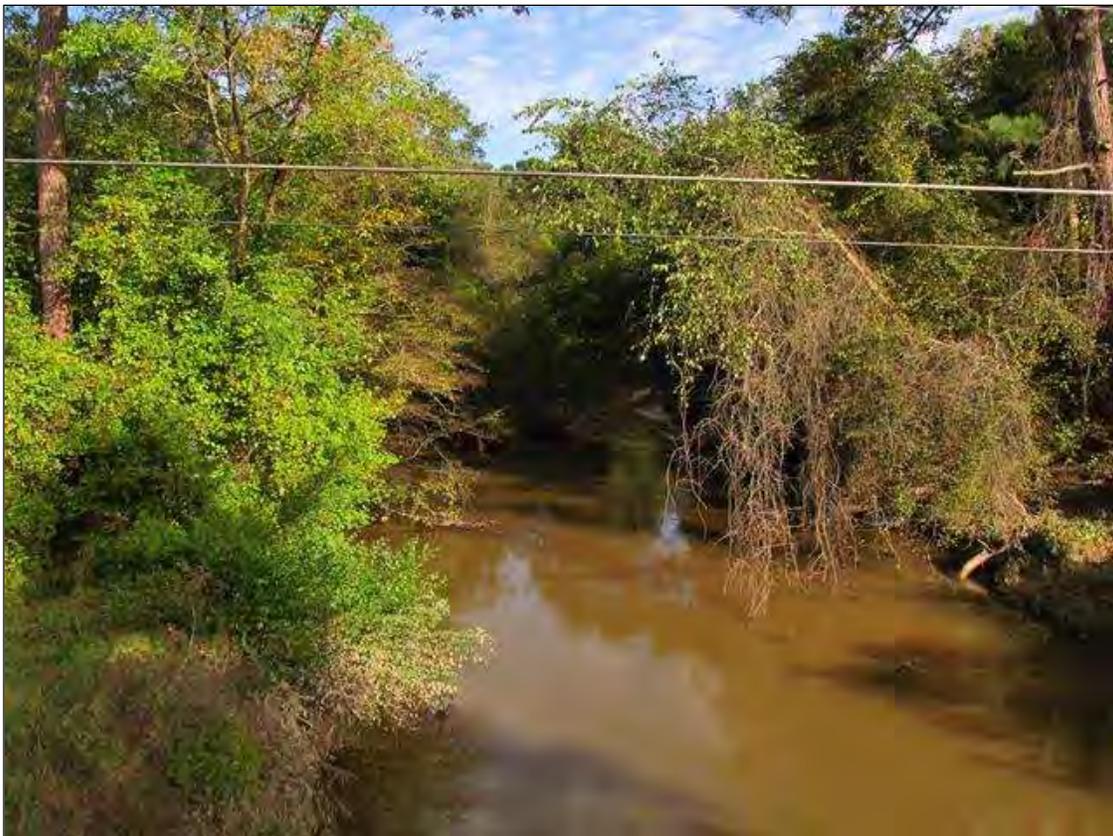
Wearing surface over End Bent 1



Span 1 Asphalt wearing surface overview - Other spans similar



Asphalt wearing surface over Bent 1



Looking north upstream



Asphalt wearing surface over Bent 3



Asphalt wearing surface over Bent 4



Asphalt wearing surface over Bent 5



Looking west



Looking south downstream



End Bent 1 overview



Superstructure over End of cap at Bent 1 - bents 3 & 5 similar



Bent 1 Span 2 side



Bent 2 Span 2 side



Bent 3 Span 3 side



Superstructure over End of cap at Bent 2 - Bent 4 similar



End Bent 2 overview



Exiting shoring on Top of cap at Bent 4 Bay 2



Superstructure overview



Ends of beams over Bent 4 all have existing repairs

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Update Date: 03/14/2016

COUNTY : JOHNSTON DIVISION : 4 DISTRICT : 3 STRUCTURE NUMBER : 500021 LENGTH : 225 FEET

ROUTE CARRIED : NC42 FEATURE INTERSECTED : SWIFT CREEK

LOCATED : 0.7 MI W JCT SR1525 BRIDGE NAME : CITY : *CLAYTON 12860

FUNC. CLASS : 16 SYST.ON : FA SYST.UNDER : NFA ADT & YR : 18000 2013 RAIL TYPE : LT 111 RT 111

BUILT : 1947 BY : SHPWC PROJ : 2397 FED.AID PROJ : DESIGN LOAD : HS 15

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

NAVIGATION : VC 0 FT HT. CRN. TO BED : 20 FT WATER DEPTH : 4 FT

SUPERSTRUCTURE : REINFORCED CONCRETE FLOOR/CONT.I-BEAMS

SUBSTRUCTURE : E.BTS&INT.BTS:1,4,5:RC CAPS/H-PILES;INT.BTS2&3:RCP&B

SPANS : 1@37'8 1/2", 4@37'6", 1@37'8 1/2" CONT.

BEAMS OR GIRDERS : 4 LINES W27X94 CONT.I-BEAMS@7'6 CENTERS

FLOOR : 6.75 RC/5" AWS ENCROACHMENT : DECK (OUT TO OUT) : 29.5833 FT

CLEAR ROADWAY : 26.1667 FT BETWEEN RAILS : 29.25 FT SIDEWALK OR CURB : LT 1.5417 FT RT 1.5417 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-16 OPE.RTG. : HS-27 CONTR.MEMBER : Cont gir POSTED : SV TTST DATE : 03/09/2009

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

UNDER ROUTES AND CLEARANCES

REMARKS : cont.

IDENTIFICATION

(1) STATE NAME -NORTH CAROLINA BRIDGE 500021
 (8) STRUCTURE NUMBER(FEDERAL) 000000001010021
 (5) INVENTORY ROUTE (ON/UNDER) - ON 31000420
 (2) STATE HIGHWAY DEPARTMENT DISTRICT 3
 (3) COUNTY CODE 101 (4) PLACE CODE 12860
 (6) FEATURE INTERSECTED - SWIFT CREEK
 (7) FACILITY CARRIED NC42
 (9) LOCATION 0.7 MI W JCT SR1525
 (11)MILEPOINT 0
 (16)LAT 35° 36' 47.79" (17)LONG 78° 32' 55.49"
 (98)BORDER BRIDGE STATE CODE PCT SHARE
 (99)BORDER BRIDGE STRUCTURE NO

SUFFICIENCY RATING = 59.66
 STATUS = Functionally Obsolete

CLASSIFICATION CODE

(112)NBIS BRIDGE SYSTEM - YES
 (104)HIGHWAY SYSTEM Is not on NHS 0
 (26) FUNCTIONAL CLASS - Minor Arterial 16
 (100)STRAHNET HIGHWAY - Not a STRAHNET Route 0
 (101)PARALLEL STRUCTURE - No Parallel Structure N
 (102)DIRECTION OF TRAFFIC - 2-way Traffic 2
 (103)TEMPORARY STRUCTURE -
 (110)DESIGNATED NATIONAL NETWORK - Not on the National Network 0
 (20) TOLL On Free Road 3
 (31) MAINTAIN - State Highway Agency 01
 (22) OWNER - State Highway Agency 01
 (37) HISTORICAL SIGNIFICANCE - Not Eligible 5

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE MAIN: Steel Continuous
 TYPE - Stringer Mutibeam or Girder CODE 402
 (44) STRUCTURE TYPE APPR :
 TYPE - CODE 000
 (45) NUMBER OF SPANS IN MAIN UNIT 6
 (46) NUMBER OF APPROACH SPANS
 (107)DECK STRUCTURE TYPE - 1 CODE
 (108)WEARING SURFACE / PROTECTIVE SYSTEM :
 (A) TYPE OF WEARING SURFACE - CODE
 (B) TYPE OF MEMBRANE - CODE
 (C) TYPE OF DECK PROTECTION - CODE

CONDITION CODE

(58) DECK 6
 (59) SUPERSTRUCTURE 6
 (60) SUBSTRUCTURE 6
 (61) CHANNEL & CHANNEL PROTECTION 7
 (62) CULVERTS N

LOAD RATING AND POSTING CODE

(31) DESIGN LOAD HS 15 3
 (63) OPERATING RATING METHOD - Load Factor 1
 (64) OPERATING RATING - HS-27 49
 (65) INVENTORY RATING METHOD - Load Factor 1
 (66) INVENTORY RATING - HS-16 29
 (70) BRIDGE POSTING - No Posting Required 5
 (41) STRUCTURE OPEN, POSTED ,OR CLOSED A
 DESCRIPTION - Open, No Restriction

AGE AND SERVICE

(27) YEAR BUILT 1947
 (106)YEAR RECONSTRUCTED
 (42) TYPE OF SERVICE : ON - Highway
 UNDER - Waterway CODE 15
 (28) LANES: ON STRUCTURE 2 UNDER STRUCTURE 0
 (29) AVERAGE DAILY TRAFFIC 18000
 (30) YEAR OF ADT 2013 (109) TRUCK ADT PCT 6%
 (19) BYPASS OR DETOUR LENGTH 7 MI

APPRAISAL CODE

(67) STRUCTURAL EVALUATION 6
 (68) DECK GEOMETRY 3
 (69) UNDERCLEARANCES,VERTI & HORIZ N
 (71) WATERWAY ADEQUACY 7
 (72) APPROACH ROADWAY ALIGNMENT 8
 (36) TRAFFIC SAFETY FEATURES 0000
 (113)SCOUR CRITICAL BRIDGES 7

GEOMETRIC DATA

(48) LENGTH OF MAXIMUM SPAN 38 FT
 (49) STRUCTURE LENGTH 225 FT
 (50)CURB OR SIDEWALK: LEFT 1.5417 FT RIGHT 1.5417 FT
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 26.1667 FT
 (52) DECK WIDTH OUT TO OUT 29.5833 FT
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 28 FT
 (33) BRIDGE MEDIAN - No Median CODE 0
 (34) SKEW 0° (35) STRUCTURE FLARED 0
 (10) INVENTORY ROUTE MIN VERT CLEAR 999.9 FT
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 26.1667 FT
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 999.9 FT
 (54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad 0 FT
 (55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad 000 FT
 (56) MIN LAT UNDERCLEAR LT REF - 000 FT

PROPOSED IMPROVEMENTS

(75) TYPE OF WORK - CODE
 (76) LENGTH OF STRUCTURE IMPROVEMENT
 (94) BRIDGE IMPROVEMENT COST
 (95) ROADWAY IMPROVEMENT COST
 (96) TOTAL PROJECT COST
 (97) YEAR OF IMPROVEMENT COST ESTIMATE
 (114)FUTURE ADT 36000 (115) YEAR FUTURE ADT 2025

INSPECTIONS

(90) INSPECTION DATE 10/07/2015
 (92) CRITICAL FEATURE INSPECTION : (93) CFI DATE
 A) FRACTURE CRIT DETAIL - NO A)
 B) UNDERWATER INSP - NO B)
 C) OTHER SPECIAL INSP NO C)
 SCOUR

NAVIGATION DATA

(38) NAVIGATION CONTROL - No Navigational Control CODE 0
 (111)PIER PROTECTION - CODE
 (39) NAVIGATION VERTICAL CLEARANCE 0
 (116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR FT
 (40) NAVIGATION HORIZONTAL CLEARANCE 0 FT

IDENTIFICATION					
(1) STATE NAME -NORTH CAROLINA	BRIDGE	500021	SUFFICIENCY RATING =		7
(8) STRUCTURE NUMBER(FEDERAL)	000000001010021		STATUS =	Structurally Deficient	
(5) INVENTORY ROUTE (ON/UNDER) - ON		31000420			
(2) STATE HIGHWAY DEPARTMENT DISTRICT		3	CLASSIFICATION		CODE
(3) COUNTY CODE 101 (4) PLACE CODE		12860	(112)NBIS BRIDGE SYSTEM -		YES
(6) FEATURE INTERSECTED - SWIFT CREEK			(104)HIGHWAY SYSTEM Is not on NHS		0
(7) FACILITY CARRIED NC42			(26) FUNCTIONAL CLASS - Minor Arterial		16
(9) LOCATION 0.7 MI W JCT SR1525			(100)STRAHNET HIGHWAY - Not a STRAHNET Route		0
(11)MILEPOINT		0	(101)PARALLEL STRUCTURE - No Parallel Structure		N
(16)LAT 35° 36' 47.79" (17)LONG 78° 32' 55.49"			(102)DIRECTION OF TRAFFIC - 2-way Traffic		2
(98)BORDER BRIDGE STATE CODE	PCT SHARE		(103)TEMPORARY STRUCTURE - Temporary Structure/Conditions		T
(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 Continuous			(22) OWNER - State Highway Agency		01
TYPE - Stringer Multibeam or Girder	CODE	402	(37) HISTORICAL SIGNIFICANCE - Not Eligible		5
(44) STRUCTURE TYPE APPR :			CONDITION		CODE
TYPE -	CODE	000	(58) DECK		6
(45) NUMBER OF SPANS IN MAIN UNIT		6	(59) SUPERSTRUCTURE		4
(46) NUMBER OF APPROACH SPANS			(60) SUBSTRUCTURE		6
(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-1		1
			(65) INVENTORY RATING METHOD - Load Factor		1
			(66) INVENTORY RATING - HS-1		1
			(70) BRIDGE POSTING - No Posting Required		5
			(41) STRUCTURE OPEN, POSTED ,OR CLOSED		D
			DESCRIPTION - Open Temporary Shoring		
AGE AND SERVICE			APPRAISAL		CODE
(27) YEAR BUILT		1947	(67) STRUCTURAL EVALUATION		3
(106)YEAR RECONSTRUCTED			(68) DECK GEOMETRY		3
(42) TYPE OF SERVICE : ON - Highway			(69) UNDERCLEARANCES,VERTI & HORIZ		N
UNDER - Waterway	CODE	15	(71) WATERWAY ADEQUACY		7
(28) LANES: ON STRUCTURE 2 UNDER STRUCTURE		0	(72) APPROACH ROADWAY ALIGNMENT		8
(29) AVERAGE DAILY TRAFFIC		18000	(36) TRAFFIC SAFETY FEATURES		0000
(30) YEAR OF ADT 2013 (109) TRUCK ADT PCT		6%	(113)SCOUR CRITICAL BRIDGES		7
(19) BYPASS OR DETOUR LENGTH		7 MI	PROPOSED IMPROVEMENTS		CODE
GEOMETRIC DATA			(75) TYPE OF WORK -		
(48) LENGTH OF MAXIMUM SPAN		38 FT	(76) LENGTH OF STRUCTURE IMPROVEMENT		
(49) STRUCTURE LENGTH		225 FT	(94) BRIDGE IMPROVEMENT COST		
(50)CURB OR SIDEWALK: LEFT 1.5417 FT RIGHT 1.5417 FT			(95) ROADWAY IMPROVEMENT COST		
(51) BRIDGE ROADWAY WIDTH CURB TO CURB		26.1667 FT	(96) TOTAL PROJECT COST		
(52) DECK WIDTH OUT TO OUT		29.5833 FT	(97) YEAR OF IMPROVEMENT COST ESTIMATE		
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)		28 FT	(114)FUTURE ADT 36000 (115) YEAR FUTURE ADT 2025		
(33) BRIDGE MEDIAN - No Median	CODE	0	INSPECTIONS		
(34) SKEW 0° (35) STRUCTURE FLARED		0	(90) INSPECTION DATE		10/07/2015
(10) INVENTORY ROUTE MIN VERT CLEAR		999.9 FT	(92) CRITICAL FEATURE INSPECTION :		(93) CFI DATE
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR		26.1667 FT	A) FRACTURE CRIT DETAIL - NO		A)
(53) MIN VERT CLEAR OVER BRIDGE RDWY		999.9 FT	B) UNDERWATER INSP - NO		B)
(54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad		0 FT	C) OTHER SPECIAL INSP NO		C)
(55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad		000 FT	SCOUR		
(56) MIN LAT UNDERCLEAR LT REF -		000 FT	NAVIGATION DATA		
(38) NAVIGATION CONTROL - No Navigational Control	CODE	0	(92) CRITICAL FEATURE INSPECTION :		(93) CFI DATE
(111)PIER PROTECTION -	CODE		A) FRACTURE CRIT DETAIL - NO		A)
(39) NAVIGATION VERTICAL CLEARANCE		0	B) UNDERWATER INSP - NO		B)
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR	FT		C) OTHER SPECIAL INSP NO		C)
(40) NAVIGATION HORIZONTAL CLEARANCE		0 FT	SCOUR		

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 03/04/2016

COUNTY : JOHNSTON DIVISION : 4 DISTRICT : 3 STRUCTURE NUMBER : 500021 LENGTH : 225 FEET

ROUTE CARRIED : NC42 FEATURE INTERSECTED : SWIFT CREEK

LOCATED : 0.7 MI W JCT SR1525 BRIDGE NAME : CITY : *CLAYTON

FUNC. CLASS : 16 SYST.ON : FA SYST.UNDER : NFA ADT & YR : 18000 2013 RAIL TYPE : LT 111 RT 111

BUILT : 1947 BY : SHPWC PROJ : 2397 FED.AID PROJ : DESIGN LOAD : HS 15

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

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 20 FT WATER DEPTH : 4 FT

SUPERSTRUCTURE : REINFORCED CONCRETE FLOOR/CONT.I-BEAMS

SUBSTRUCTURE : E.BTS&INT.BTS:1,4,5:RC CAPS/H-PILES;INT.BTS2&3:RCP&B

SPANS : 1@37'8 1/2", 4@37'6, 1@37'8 1/2" CONT.

BEAMS OR GIRDERS : 4 LINES W27X94 CONT.I-BEAMS@7'6 CENTERS

FLOOR : 6.75 RC/5" AWS ENCROACHMENT : DECK (OUT TO OUT) : 29.5833 FT

CLEAR ROADWAY : 26.1667 FT BETWEEN RAILS : 29.25 FT SIDEWALK OR CURB : LT 1.5417 FT RT 1.5417 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-1 OPE.RTG. : HS-1 CONTR.MEMBER : Cont gir POSTED : SV TTST DATE 03/09/2009

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

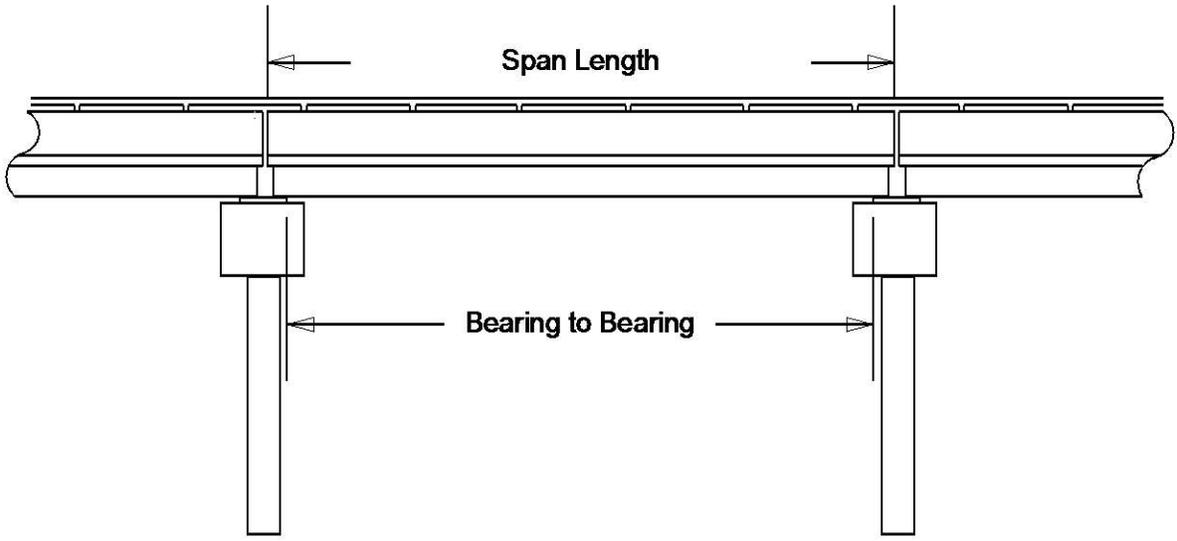
UNDER ROUTES AND CLEARANCES

REMARKS :

Structure Data Worksheet

Spans

County: JOHNSTON Structure No: 500021 Date: _____ Inspected By: WCM



Span No	Span Length	Bearing to Bearing	Comments
1	37.7083	37	
2	37.5	37.5	
3	37.5	37	
4	37.5	37	
5	37.5	37.5	
6	37.7083	37	NBIS: 221.417 FT

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 500021 County: JOHNSTON Date: _____ By: WCM

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

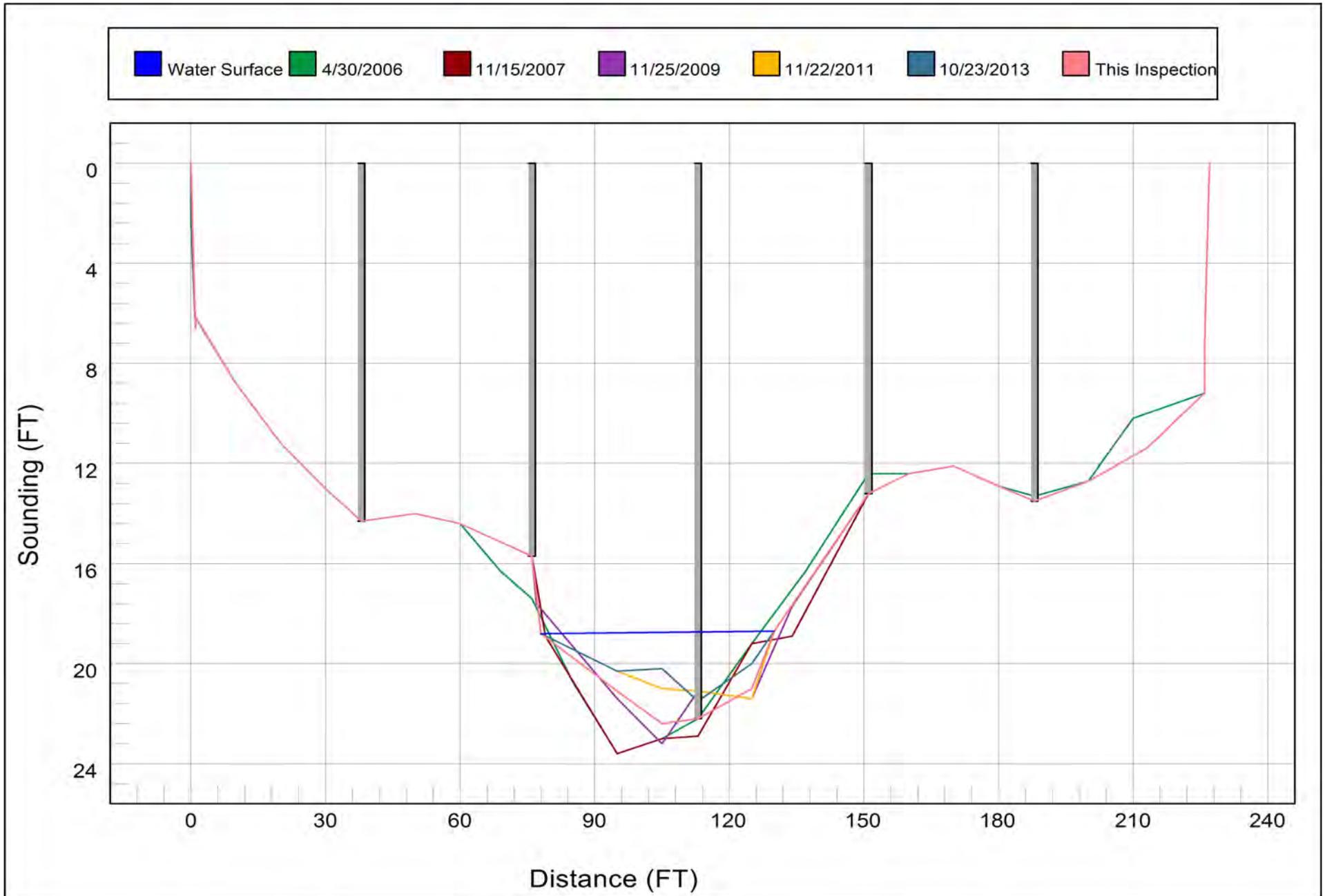
Distance from Highwater Mark to top of rail: _____ Location of Highwater Mark: _____

DOWNSTREAM			UPSTREAM		
Distance (Station) (ft)	Sounding (ft)	Description	Distance (Station) (ft)	Sounding (ft)	Description
0	0	TOP OF RAIL			
1	6.6	TOP OF CAP			
1.2	6.2	GROUND AT CAP - CONCRETE			
10	8.8	TOP OF SLOPE			
20	11.2	GROUND			
30	13	GROUND			
38	14.3	BENT 1	38	13.8	BENT 1
50	14	GROUND			
60	14.4	GROUND			
76	15.7	BENT 2	76	14.8	BENT 2
78	18.8	Water Surface/Water Edge (WSWE)			
95	21.1				
105	22.4				
113	22.2	BENT 3	113	22.1	BENT 3
125	21				
130	18.7	Water Surface/Water Edge (WSWE)			
151	13.2	BENT 4	151	12.4	BENT 4
160	12.4	GROUND			
170	12.1	GROUND			
180	12.9	GROUND			
188	13.5	BENT 5	188	15.9	BENT 5
200	12.7	GROUND			
213	11.4	TOP OF SLOPE			
225.9	9.2	GROUND AT CAP - CONCRETE	225.9	8.7	GROUND AT CAP - CONCRETE
226	6.6	TOP OF CAP			

DOWNSTREAM			UPSTREAM		
Distance (Station) (ft)	Sounding (ft)	Description	Distance (Station) (ft)	Sounding (ft)	Description
227	0	TOP OF RAIL			

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



Bridge Inspection Field Sketch



Roadway	24ft Wide	2 Paved Lanes	Looking East
Left Shoulder	7ft Wide	2ft Paved	5ft Unpaved
Right Shoulder	7ft Wide	2ft Paved	5ft Unpaved
Left Guardrail			
Right Guardrail			

CHECKED BY: WCM 10/7/2015

Title

APPROACH ROADWAY

Description

LOOKING EAST

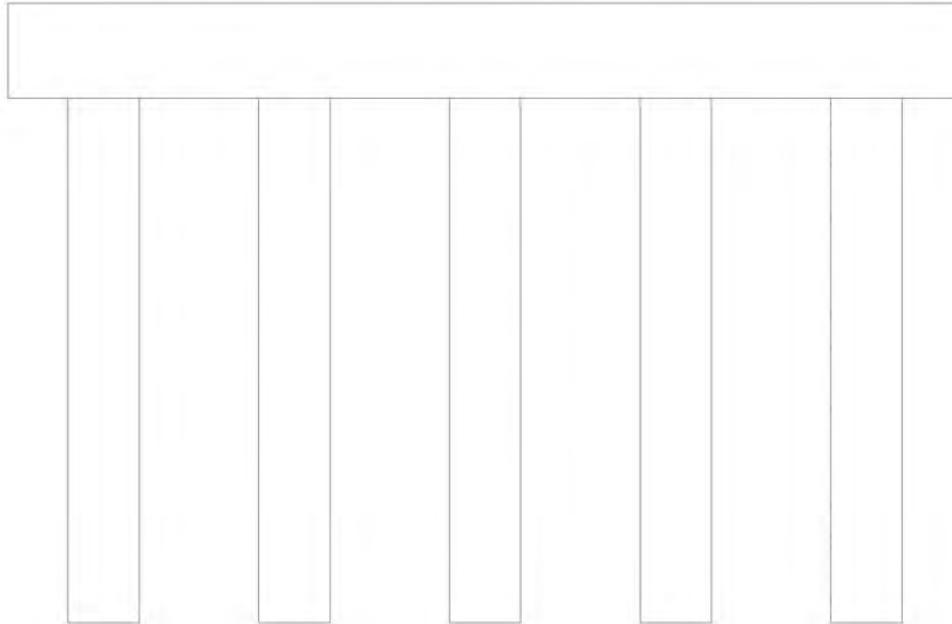
Bridge No: 500021

Drawn By: KMM

Date: 05/01/2006

File Name: S0242000477

Bridge Inspection Field Sketch



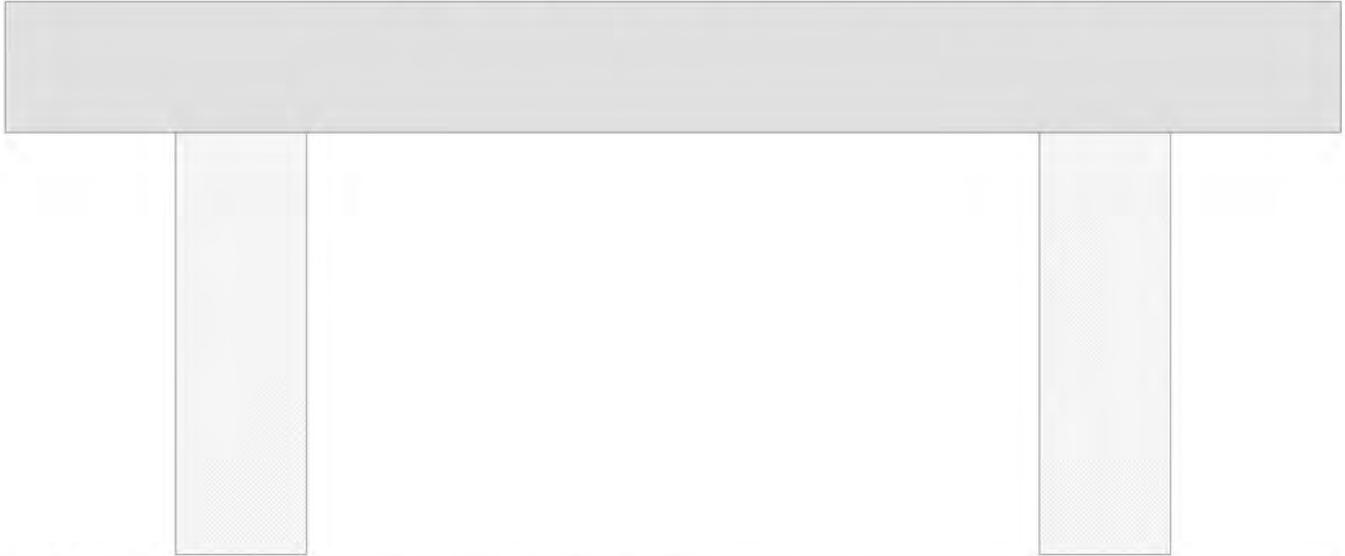
Bent #	1	Bents 4,5 similar	
Cap - Cast In Place			
Cap Size	26.6667ft Long	2.0ft Wide	2.4167ft High
Left Overhang	1.1667ft	Lt Cap/Beam Overhang	2.0833ft
Right Overhang	1.1667ft	Rt Cap/Beam Overhang	2.0833ft

Pile #	Material	Pile Type	Spacing	Length	Width/Diam.	Height	Orientation
1	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
2	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
3	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
4	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
5	Prestressed Concrete	Pile Bent			1.5	1.5	Vertical

CHECKED BY: WCM 10/7/2015

Title PILE DIAGRAM	Description BENTS 1, 4, AND 5
Bridge No: 500021	Drawn By: KMM
Date: 05/01/2006	File Name: S0242000478

Bridge Inspection Field Sketch

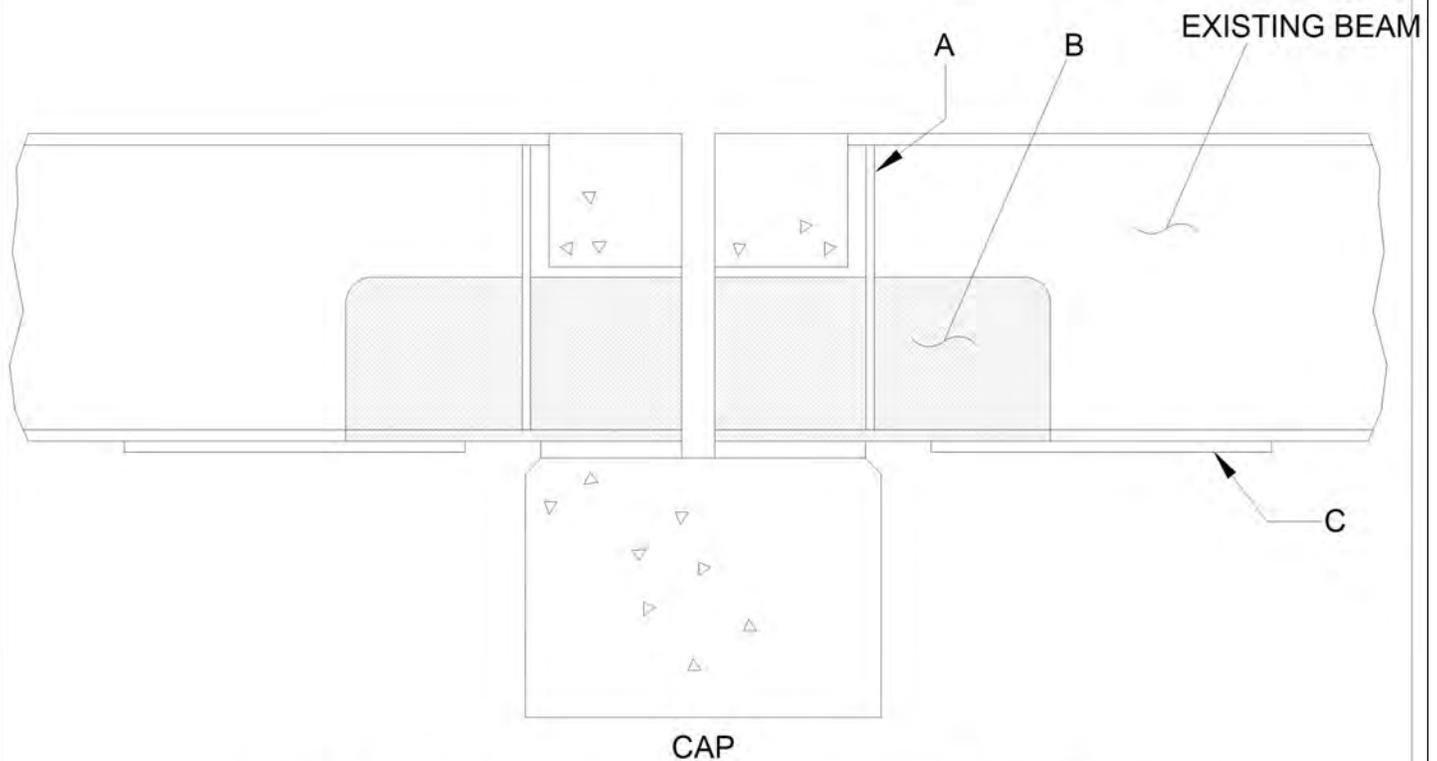


Cap Information			Material Cast-in-Place Concrete							
Length	Width	Height	Left Overhang	Right Overhang	Left Beam to End of Cap.	Right Beam to End of Cap.				
25.500 ft.	2.500 ft.	2.500 ft.	4.500 ft.	4.500 ft.	1.500 ft.	1.500 ft.				
Subcap Information			Material							
Length	Width	Height	Left Overhang	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	16.5 ft.	2.5 ft.			Vertical	No	No	No	No
2	Concrete		2.5 ft.			Vertical	No	No	No	No
Bent/Abutment #: 2			Similar Bents: 2,3							

Title BENT 2		CHECKED BY: WCM 10/7/2015			Description BENT 2		
Bridge No: 500021	Drawn By: WCM			Date: 11/25/2009	File Name: S0014003803		

Bridge Inspection Field Sketch

TYPICAL BEAM REPAIRS FOR BEAMS 1-3
BENT 4 SPANS 4 & 5



A	1/2" x 5" VERT. STIFFNER 12" FROM END OF BEAM
B	14" x 3' SECTION OF WEB AND BTM FLANGE REPLACED
C	3/4" x 12" x 3' COVER PLATE ADDED TO BTM FLANGE

CHECKED BY: WCM 10/7/2015

Title

BEAM REPAIRS I

Description

BEAMS 1 - 3 OVER BENT 4, SPANS
4 & 5

Bridge No: 500021

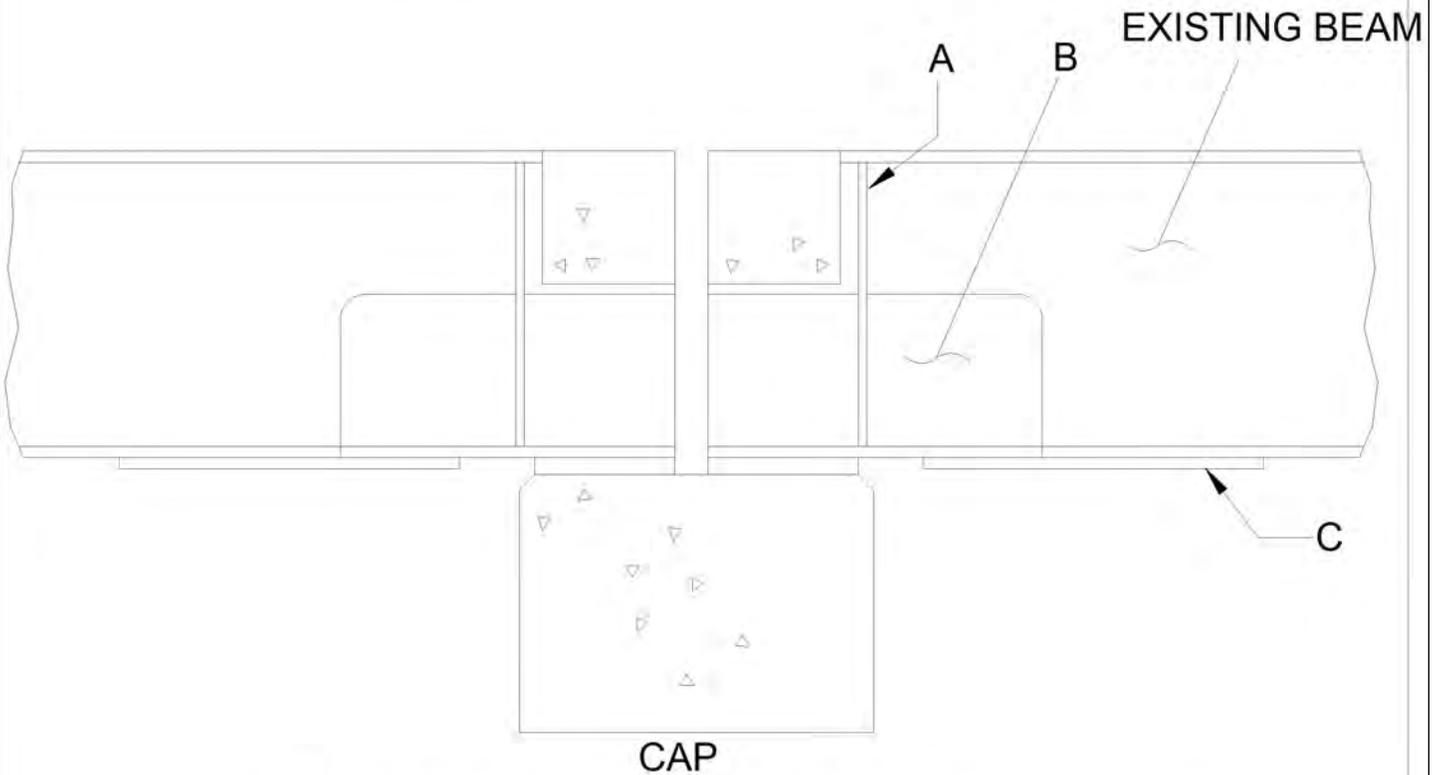
Drawn By: WTW

Date: 11/25/2009

File Name: S0018014363

Bridge Inspection Field Sketch

BEAM 4 REPAIR AT BT4 SPANS 4 & 5



A	1/2" x 5" VERT. STIFFNER 12" FROM END OF BEAM
B	14" x 4' SECTION OF WEB AND BTM FLANGE REPLACED
C	3/4" x 12" x 3' COVER PLATE ADDED TO BTM FLANGE

CHECKED BY: WCM 10/7/2015

Title
BEAM REPAIRS II

Description
BEAM 4 AT BT4 SPANS 4 & 5

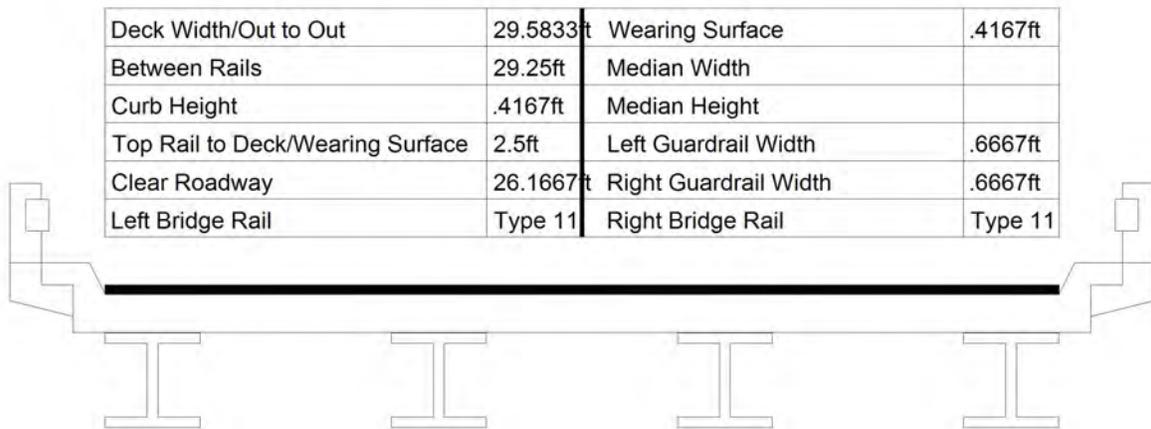
Bridge No: 500021

Drawn By: WTW

Date: 11/25/2009

File Name: S0018014364

Bridge Inspection Field Sketch



Measurements for Span #	1		
Deck Thickness	.5625	Left Overhang	3.5417
Top of Rail to Bottom of Beam	4.9167	Right Overhang	3.5417

Beam No	Beam Type	Spacing	Comments
1	Steel I Beam	7.5ft	W 27 X 94 I BEAM
2	Steel I Beam	7.5ft	W 27 X 94 I BEAM
3	Steel I Beam	7.5ft	W 27 X 94 I BEAM
4	Steel I Beam		W 27 X 94 I BEAM

CONTINUOUS SPAN OVER SPANS 1 AND 2, 3 AND 4, 5 AND 6.

CHECKED BY: WCM 10/7/2015

Title

TYPICAL SECTION

Description

4 LINES OF I-BEAMS

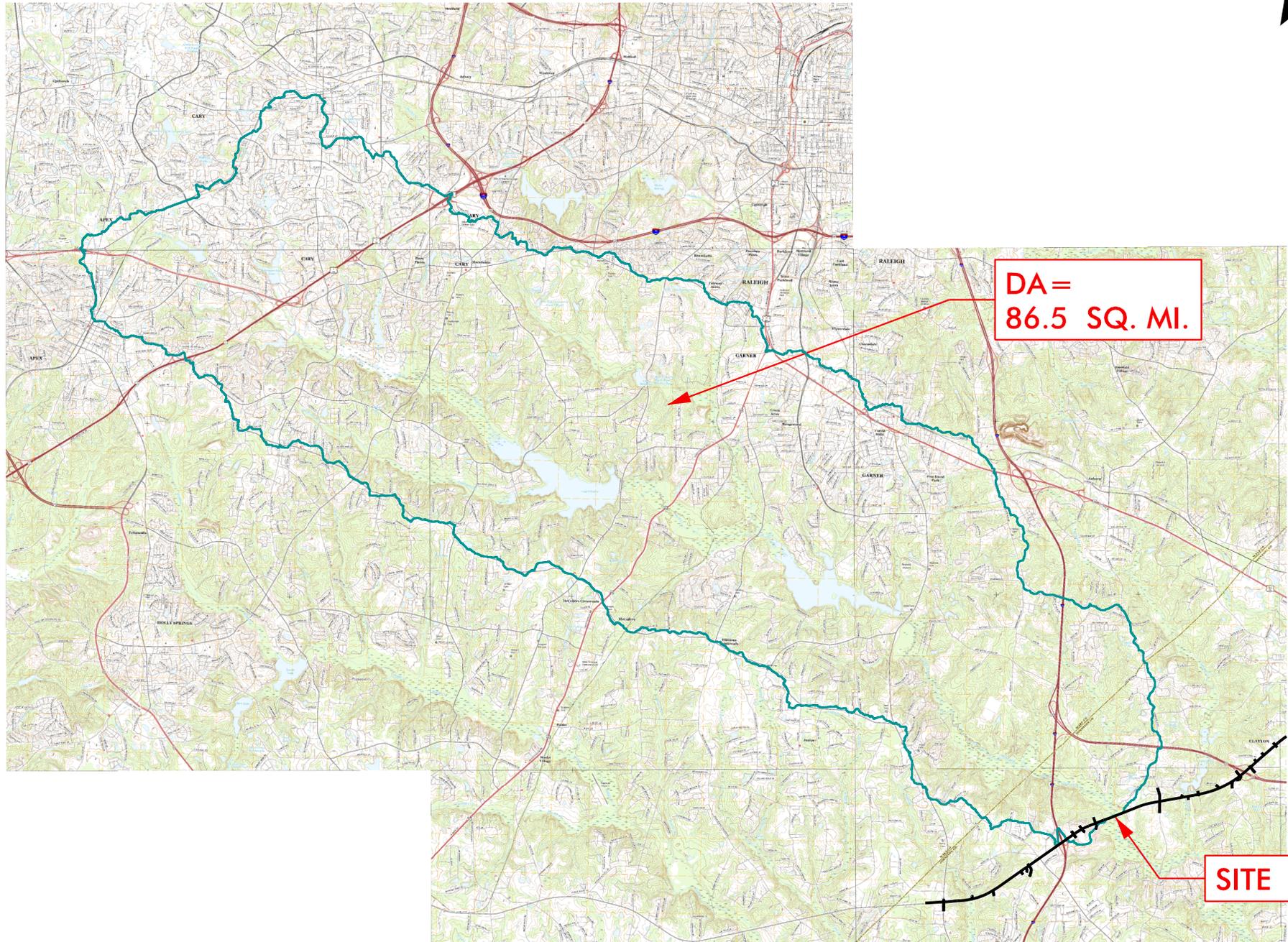
Bridge No: 500021

Drawn By: KMM

Date: 05/01/2006

File Name: S0242000476

R-3410
SITE 2 DRAINAGE AREA
JOHNSTON COUNTY
1" = 12,000'



DA =
86.5 SQ. MI.

SITE 2



This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPicted ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://FRIS.NC.GOV/FRIS](http://FRIS.NC.GOV/FRIS)

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE)
		With BFE or Depth Zone AE, AO, AH, VE, AR
OTHER AREAS OF FLOOD HAZARD		Regulatory Floodway
		0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile Zone X
OTHER AREAS		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
GENERAL STRUCTURES		Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
		Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall
OTHER FEATURES		Non-accredited Levee, Dike, or Floodwall
		North Carolina Geodetic Survey bench mark
		National Geodetic Survey bench mark
		Contractor Est. NCFMP Survey bench mark
		Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at <http://www.ncfloodmaps.com>, or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above. For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/ifip/index.shtm>.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/ifip/index.shtm>.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LIMWA). The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/habitatconservation/coastal_barrier.html, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

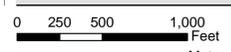
CBRS Area Otherwise Protected Area

SCALE

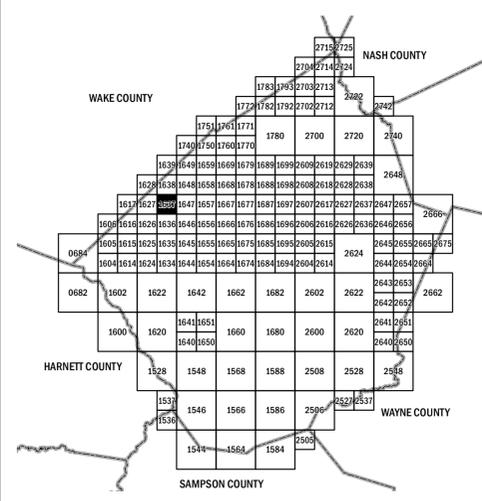


Map Projection:
 North Carolina State Plane Projection Feet (Zone 3200)
 Datum: NAD 1983 (Horizontal), NAVD 1986 (Vertical)

1 inch = 500 feet 1:6,000



PANEL LOCATOR



National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
 NATIONAL FLOOD INSURANCE PROGRAM
 FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1637

Panel Contains:

CID PANEL SUFFIX

COMMUNITY

JOHNSTON COUNTY

370138 1637 J

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262



EFFECTIVE: 12/2/2005

REVISED: 1/5/2007

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



The landfall location of Diana was 38 miles south of Wilmington with 90 mph winds at its closest approach to Wilmington. Diana had 115 mph sustained winds before landfall. Storm surge was approximately 5-6 feet.

Table 5, "Historic Flood Elevations", lists selected flooding sources in Johnston County with records of past stages. The table shows the historic peak, a location description, approximate stream station, the date of the historic peak, and approximate recurrence interval of the flood elevation. The approximate recurrence interval for a flood is often estimated based on an analysis of rainfall amounts from a storm and/or stream gage data.

Table 5 - Historic Flood Elevations

Flooding Source/Tropical Storm	Location Description	Approx. Stream Station	Historic Peak (Feet NAVD 88)	Date	Approximate Recurrence Interval (in years)
Bawdy Swamp / Hurricane Floyd	3913 Stevens Chapel Road, Smithville	4847	113.8	9/1/1999	100
Bull Branch / Unknown Storm	Flower Road	5878	169.6	1/1/1994	100
Little River / Hurricane Floyd	Just upstream of Zebulon Road	416200	307.0	9/1/1996	100
Little River / Hurricane Floyd	4811 NC 231, Zebulon	334089	202.8	9/1/1999	100
Little River / Hurricane Floyd	Approximately 0.3 mile downstream of Wheeler Creek	366000	229.5	9/1/1999	100
Little River / Hurricane Floyd	Upstream of Highway 98	457531	342.4	9/1/1999	100
Little River / Hurricane Fran	Just upstream of State Highway 97	372000	236.1	9/1/1996	100
Marks Creek / Unknown Storm	500 Windless Trail, Clayton	11685	167.6	9/1/1996	100
Mill Creek (South) / Hurricane Floyd	1534 Olvens Grove Road, Four Oak	12558	151.5	9/1/1999	100
Moccasin Creek / Hurricane Floyd	Downstream of Pearses Road	111461	262.2	9/1/1999	100
Neuse River / Hurricane Floyd	Upstream face of Weyerhaeuser Road	57075	10.6	9/1/1999	100
Neuse River / Hurricane Floyd	Downstream face of West Craven Middle School Road	65300	11.7	9/1/1999	100
Neuse River / Hurricane Floyd	400 feet southwest of intersection of River Road and Cowpens Landing Road	76975	14.6	9/1/1999	100
Neuse River / Hurricane Floyd	Approximately 1.0 mile upstream of intersection of River Road and State Camp Road	94750	17.7	9/1/1999	100
Neuse River / Hurricane Floyd	Backwater up Core Creek (approximately 2.9 miles downstream of NC 55)	127000	18.7	9/1/1999	100
Neuse River / Hurricane Floyd	Backwater up Village Creek (downstream face of Biddle Road)	135000	22.2	9/1/1999	100
Neuse River / Hurricane Floyd	Approximately 0.25 mile downstream of confluence of Contentnea Creek	149375	23.8	9/1/1999	100
Neuse River / Hurricane Floyd	Approximately 0.70 mile southeast of intersection of Saw Mill and Tick Bite Road	180773	27.1	9/1/1999	500
Neuse River / Hurricane Floyd	Downstream of Highway 55	213720	30.4	9/1/1999	100
Neuse River / Hurricane Floyd	Approximately 400 feet southwest of intersection of East New Bern Road and Trenton Highway	253195	35.8	9/1/1999	100
Neuse River / Hurricane Floyd	Downstream face of State Highway 11	265071	37.4	9/1/1999	100
Neuse River / Hurricane Floyd	Upstream face of U.S. Highway 70/Queen St.	258355	37.6	9/1/1999	100
Neuse River / Hurricane Floyd	Upstream face of New Bern Road	278765	39.3	9/1/1999	100
Neuse River / Hurricane Floyd	State Highway 11	286920	39.4	9/1/1999	100
Neuse River / Hurricane Floyd	Upstream face of Hardy Bridge Road	360288	50.2	9/1/1999	100
Neuse River / Hurricane Floyd	Downstream face of Main Street	591830	54.9	9/1/1999	50
Neuse River / Hurricane Floyd	Rockford Church Road	389065	56.1	9/1/1999	100
Neuse River / Hurricane Floyd	Downstream face of NC 111	636585	61.7	9/1/1999	50
Neuse River / Hurricane Floyd	Upstream face of SR 1915	694195	71.1	9/1/1999	50
Neuse River / Hurricane Floyd	160 feet Southeast of Bryan Boulevard	710650	72.8	9/1/1999	50
Swift Creek / Hurricane Floyd	Near Swift Creek Lane	193500	245.3	9/1/1996	100
Swift Creek / Hurricane Fran	Near Swift Creek Lane	193300	247.4	9/1/1996	100
Swift Creek / Hurricane Fran	Golf Course Green approximately 700 feet upstream of confluence from Lens Branch (Basin 20, Stream 22)	241000	309.8	9/1/1996	100
Swift Creek / Hurricane Fran	Golf course maintenance shed	238300	311.2	9/1/1996	100

* Data Not Available

4.4 Flood Protection Measures

Flood protection measures may be structural (such as levees, dams, and reservoirs) or non-structural (such as land-use management ordinances, policies, or practices).

Table 9 - Flooding Sources Studied by Detailed Methods: Redelineated

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with the Neuse River	Approximately 230 feet upstream of State Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with the Neuse River	Approximately 150 feet upstream of US Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little Creek	State Highway 42	Johnston County
Buffalo Creek (Basin 9, Stream 1)	The Wake/Johnston County boundary	Robertsons Pond Dam	Johnston County
Buffalo Creek West	The confluence with Middle Creek (South)	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 250 feet upstream of the confluence with Stony Fork	Johnston County
Little Creek	The confluence with the Swift Creek	Approximately 0.6 mile upstream of Shotwell Road	Johnston County Town Of Clayton
Little Creek (Basin 11, Stream 2)	The Wake/Johnston County boundary	Cemetery Road	Johnston County
Little Creek Tributary	The confluence with Little Creek	Approximately 800 feet upstream of US Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	US Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Middle Creek	The confluence with Swift Creek	Approximately 0.7 mile upstream of confluence of Middle Creek Tributary	Johnston County Town Of Smithfield
Mill Branch	At confluence with Mill Creek (South)	Approximately 2.4 miles upstream of Stevens Mill Road	Johnston County
Mill Creek (South)	At confluence with Neuse River	Approximately 0.7 mile upstream of the confluence with Stone Creek	Johnston County
Moccasin Creek	At confluence with Neuse River	Approximately 1,900 feet upstream of US Highway 70	Johnston County Town Of Princeton
Neuse River	Wayne/Lenoir County boundary	Falls of the Neuse Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Poplar Creek	The confluence with the Neuse River	Approximately 1.4 miles upstream of the confluence with Little Poplar Creek	Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.4 mile downstream of City Road	Approximately 100 feet upstream of City Road	Town Of Clayton
Stone Creek	The confluence with Mill Creek (South)	US Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of US Highway 301	Johnston County
Swift Creek	The confluence with the Neuse River	The confluence of Yates Branch (Basin 20, Stream 13)	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	NC 1525	Johnston County
White Oak Creek	The confluence with Swift Creek	Approximately 0.4 mile upstream of Pergo Parkway	Johnston County Town Of Clayton

Table 10, "Flooding Sources Studied by Detailed Methods: Limited Detailed", lists all flooding sources within the county that were studied by limited detailed methods for either this FIS or previous FISs.

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Arters Branch	The confluence with the Neuse River	Approximately 300 feet upstream of North Johnson Road	Town Of Smithfield
Basin 11, Stream 7	The Wake/Johnston County boundary	Approximately 0.4 mile upstream of Wake/Johnston County boundary	Johnston County
Bawdy Creek	The confluence with the Neuse River	The confluence with Bawdy Swamp and Quincosin Swamp	Johnston County
Bawdy Swamp	The confluence with Bawdy Creek	Approximately 0.8 mile upstream of HWY 70	Johnston County Town Of Pine Level
Beaverdam Branch	The confluence with Middle Creek	Approximately 100 feet downstream of Raleigh Road	Johnston County
Beaverdam Creek	At Rosewood Road	Approximately 575 feet downstream of Pierce Street	Johnston County Town Of Princeton
Beaverdam Swamp	The confluence with Hannah Creek	Approximately 1,300 feet upstream of Tetersville Road	Johnston County Town Of Four Oaks
Beddingfield Creek	Approximately 0.4 mile upstream of the confluence with the Neuse River	Approximately 0.2 mile upstream of Shotwell Road	Town Of Clayton

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 0.2 mile downstream of Federal Road	3.12	*	*	1520	*
Approximately 0.1 mile upstream of Interstate 40	2.64	*	*	1370	*
Swift Creek					
At the mouth	287.00	*	*	20500	*
Above Middle Creek (at North Carolina 210)	157.00	*	*	14560	*
Approximately 1.3 miles downstream from confluence of Little Creek	139.10	*	*	15200	*
Approximately 2.0 miles downstream of Lee Road	120.80	*	*	12500	*
Approximately 1.1 miles downstream of Lee Road	117.90	*	*	12400	*
Approximately 1.2 mile downstream of Barber Mill Road	113.90	*	*	12200	*
Approximately 0.9 mile upstream of Barber Mill Road	110.10	*	*	12100	*
Approximately 2.0 miles upstream of Barber Mill Road	105.30	*	*	11700	*
Approximately 0.9 mile downstream of Cornwallis Road	89.40	*	*	9540	*
Approximately 0.3 mile upstream of N.C. Route 42	81.20	*	*	9290	*
Unnamed Tributary (#1) to Swift Creek					
At the confluence with Swift Creek	4.70	*	*	4670	*
Approximately 100 feet downstream of New Bethel Church Road	4.10	*	*	4430	*
Unnamed Tributary (#2) to Swift Creek					
At the confluence with Swift Creek	2.20	*	*	2050	*
Approximately 1.1 mile downstream of Cornwallis Road	1.50	*	*	2010	*
White Oak Creek					
At the confluence with Swift Creek	14.60	*	*	4630	*
Approximately 480 feet upstream of N.C. Route 42	13.60	*	*	4720	*
Approximately 0.8 mile upstream of Winston Road	12.00	*	*	5510	*
Approximately 120 feet downstream of Winston Road	10.30	*	*	5270	*
Approximately 1.6 miles upstream of Winston Road	8.00	*	*	5330	*

¹Modified by storage at State Route 1003

²Discharges reduced by storage at U.S. Highway 70

³Part of flow for Mill Creek goes into the Neuse River

⁴Discharge reduced by storage

⁵Modified by Falls Lake

Table 14, "Summary of Stillwater Elevations" is not applicable in Johnston County.

Table 15, "Gage Information", lists the stream gages located in Johnston County, including the drainage area of the flooding source at the gage and the period of record available at the time of the publication of this FIS Report.

Table 15 - Gage Information

Gage Number	Flooding Source	Site Name	Drainage Area (square miles)	Period of Record	
				From	To
02088210	Hannah Creek Tributary 2	HANNAH CREEK NEAR BENSON, N.C.	2.59	1953	1971
02088140	Stone Creek	STONE CREEK NEAR NEWTON GROVE, N.C.	27.90	1953	1971

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
1031	103,116	1,483	15,728	0.7	178.3	*	178.3	179.3	1.0
1059	105,871	2,250	20,001	0.6	178.8	*	178.8	179.8	1.0
1097	109,730	1,081	7,499	1.6	179.6	*	179.6	180.6	1.0
1131	113,089	567	3,666	3.2	182.7	*	182.7	183.4	0.7
1160	116,011	327	3,053	3.8	185.5	*	185.5	186.3	0.8
1189	118,897	559	6,004	1.6	187.9	*	187.9	188.7	0.8
1236	123,628	332	3,935	2.4	189.2	*	189.2	189.9	0.7
1272	127,159	951	11,011	0.9	189.8	*	189.8	190.7	0.9
1326	132,630	900	7,829	1.2	192.1	*	192.1	192.9	0.8
1359	135,894	901	6,222	1.5	193.6	*	193.6	194.4	0.8
1384	138,418	618	5,547	1.7	195.0	*	195.0	195.8	0.8
1407	140,722	821	5,813	2.0	197.1	*	197.1	197.7	0.6
1421	142,050	416	4,451	2.7	201.0	*	201.0	201.5	0.5
1445	144,485	1,090	9,478	1.3	202.1	*	202.1	202.7	0.6
Unnamed Tributary (#1) to Swift Creek									
016	1,561	170	1,381	3.4	192.3 ¹	*	190.6	191.6	1.0
020	2,018	160	1,106	4.2	192.3 ¹	*	191.6	192.6	1.0
028	2,847	255	1,933	2.4	194.3	*	194.3	195.2	0.9
036	3,601	97	599	7.8	195.1	*	195.1	196.1	1.0
045	4,516	225	1,658	2.8	200.5	*	200.5	201.5	1.0
058	5,783	310	1,931	2.3	203.5	*	203.5	204.5	1.0
067	6,716	335	2,217	2.0	204.5	*	204.5	205.5	1.0
076	7,602	240	1,349	3.3	205.7	*	205.7	206.7	1.0
083	8,256	100	739	6.0	207.9	*	207.9	208.9	1.0
092	9,175	235	1,735	2.6	211.7	*	211.7	212.7	1.0
101	10,051	258	1,407	2.4	213.4	*	213.4	214.4	1.0
112	11,235	400	958	3.6	216.6	*	216.6	217.6	1.0
Unnamed Tributary (#2) to Swift Creek									
010	1,001	100	522	3.9	177.1 ¹	*	174.2	175.0	0.8
016	1,598	160	698	2.9	177.1 ¹	*	175.8	176.8	1.0
022	2,200	100	457	4.5	178.2	*	178.2	178.5	0.3
036	3,558	51	296	6.9	185.0	*	185.0	185.9	0.9
042	4,164	37	253	8.1	187.9	*	187.9	188.9	1.0
050	5,025	37	180	11.4	194.8	*	194.8	195.1	0.3
059	5,945	46	279	7.3	202.0	*	202.0	203.0	1.0
068	6,801	85	336	6.1	208.4	*	208.4	209.0	0.6
076	7,579	120	651	3.1	214.1	*	214.1	215.1	1.0
085	8,506	85	430	4.7	218.5	*	218.5	218.8	0.3
092	9,237	65	346	5.8	223.0	*	223.0	223.9	0.9
102	10,191	40	232	5.7	229.6	*	229.6	230.6	1.0
112	11,179	55	181	7.3	236.8	*	236.8	236.9	0.1
121	12,065	80	365	3.6	245.9	*	245.9	246.9	1.0
130	12,960	80	489	2.7	251.6	*	251.6	252.2	0.6
White Oak Creek									

PRELIMINARY FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262

PRELIMINARY



PRELIMINARY: 3/31/2015

REVISED: 3/31/2015

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



both mailed to each jurisdiction within Johnston County and posted to the State's website at www.ncfloodmaps.com.

Draft basin plans were developed based on the results of the initial scoping meetings. Final scoping meetings were held by the State and FEMA to provide counties and communities an overview of the draft basin plans, including the proposed scope and schedule for the project, and to provide an opportunity for additional county and community input. After the final scoping meeting was held, the Final Basin Plans were produced.

This FIS covers the geographic area of Johnston County, , and all jurisdictions therein. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. Limits of detailed study are indicated on the Flood Profiles and/or Water-surface elevation rasters and/or the FIRM.

Table 8P, "Scope of Revisions: Revised or New Detailed Study -Preliminary", lists flooding sources that were newly studied by detailed methods or were previously studied by detailed methods and had a change in backwater elevation due to flooding effects from a newly studied flooding source.

Table 8P - Scope of Revisions: Revised or New Detailed Study - Preliminary

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with Neuse River	Approximately 230 feet upstream of NC Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with Neuse River	Approximately 300 feet upstream of U.S. Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little River	Approximately 720 feet upstream of NC Highway 42	Johnston County
Buffalo Creek West	The confluence with Middle Creek	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 1,800 feet upstream of Interstate 95	Johnston County
Little Creek	The confluence with Swift Creek	The confluence with Swift Creek	Johnston County Town Of Clayton
Little Creek Tributary	The confluence with Little Creek	Approximately 770 feet upstream of U.S. Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	Approximately 260 feet upstream of U.S. Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Approximately 1.0 mile upstream of the Wayne/Johnston County Boundary	Johnston County
Middle Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Mill Branch	The confluence with Mill Creek (South)	Approximate 2.4 miles upstream of Harper House Road	Johnston County
Mill Creek (South)	The confluence with Neuse River	Approximate 0.8 mile upstream of confluence of Stone Creek	Johnston County
Moccasin Creek	Approximately 3,425 feet downstream of Buckleberry Road	Approximately 0.4 mile upstream of U.S. Highway 70	Johnston County Town Of Princeton
Moccasin Creek	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Neuse River	The Johnston/Wayne County boundary	Just downstream of Mial Plantation Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.7 mile upstream of Oneil Street	Approximately 270 feet upstream of City Road	Town Of Clayton
Spring Branch	The confluence with Neuse River	Collier Street	Town Of Smithfield
Stone Creek	The confluence with Mill Creek (South)	Approximately 1,640 feet upstream of U.S. Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of U.S. Highway 301	Johnston County
Swift Creek	The confluence with Neuse River	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	Approximately 190 feet upstream of Cornwallis Road	Johnston County
White Oak Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Clayton

Table 13 - Summary of Discharges

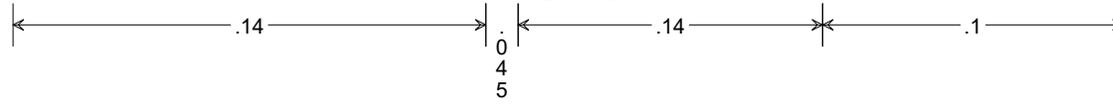
Flooding Source		Discharges (cfs)				
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Future Annual Chance	0.2% Annual Chance
Approximately 8,365 feet upstream of U.S. 701	19.24	1171	1966	2365	*	3294
Approximately 5,950 feet downstream of Stone Creek Road	11.12	835	1415	1708	*	2393
Approximately 1,685 feet downstream of Stone Creek Road	10.24	793	1346	1626	*	2280
Approximately 3,300 feet upstream of Stone Creek Road	8.58	711	1211	1463	*	2056
At N.C. 96	7.40	649	1108	1340	*	1886
Approximately 3,145 feet upstream of N.C. 96	6.13	578	990	1199	*	1692
Approximately 4,650 feet downstream of Adams Road	5.03	511	879	1066	*	1506
Approximately 2,350 feet downstream of Adams Road	1.79	271	473	578	*	826
Approximately 800 feet downstream of Adams Road	1.24	216	380	464	*	667
Approximately 1,750 feet downstream of Interstate 40	1.09	198	351	430	*	618
At Interstate 40	0.62	140	250	308	*	445
Stone Creek Tributary						
Approximately 0.2 mile upstream of the confluence with Stone Creek	2.59	*	*	1350	*	*
Approximately 0.1 mile downstream of Adams Road	1.43	*	*	933	*	*
Approximately 0.2 mile upstream of Adams Road	1.33	*	*	889	*	*
Approximately 0.5 mile upstream of Adams Road	1.06	*	*	773	*	*
Stony Fork						
At the mouth at Hannah Creek	9.43	1589	2539	2943	*	3963
At the mouth at Hannah Creek	8.70	*	*	1920	*	*
At Railroad	7.95	1431	2293	2664	*	3589
Approximately 0.5 mile downstream of Raleigh Road	7.68	*	*	2660	*	*
Approximately 0.1 mile upstream of Shade Tree Road	2.78	*	*	1410	*	*
Approximately 0.6 mile upstream of Shade Tree Road	1.87	*	*	1100	*	*
Stony Fork Tributary						
Approximately 0.4 mile upstream of the confluence with Stony Fork	3.78	*	*	1710	*	*
Approximately 0.6 mile downstream of Federal Road	3.39	*	*	1600	*	*
Approximately 0.2 mile downstream of Federal Road	3.12	*	*	1520	*	*
Approximately 0.1 mile upstream of Interstate 40	2.64	*	*	1370	*	*
Swift Creek						
At the mouth	286.80	9523	14739	17036	*	22489
Above Middle Creek (at NC 210)	155.22	7904	12164	13961	*	18358
Just upstream of confluence with Swift Creek Tributary 3	153.01	7894	12145	13934	*	18318
Approximately 2.0 miles downstream of Lee Road	120.85	7424	11387	13022	*	17083
Approximately 0.9 mile upstream of Barver Mill Road	109.88	7070	10853	12412	*	16290
Approximately 0.9 mile downstream of Cornwallis Road	89.45	6195	9547	10936	*	14389
Approximately 0.3 mile upstream of NC 42	81.22	6002	9243	10577	*	13911
Swift Creek Tributary 3						
Just upstream of confluence with Swift Creek	1.62	477	904	1069	*	1572
Approximately 3,225 feet upstream of confluence with Swift Creek	0.57	122	220	271	*	395
Approximately 1,150 feet downstream of Market Street	0.40	99	178	220	*	322
Approximately 1,265 feet upstream of Market Street	0.21	65	119	148	*	218
Unnamed Tributary (#1) to Swift Creek						
At the confluence with Swift Creek	4.77	1044	1687	1963	*	2664

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
1301	130,128	943	6,372	1.7	190.6	*	190.6	191.5	0.9
1308	130,771	935	6,542	1.7	191.0	*	191.0	191.8	0.8
1318	131,761	669	6,785	1.6	193.7	*	193.7	194.2	0.5
1320	132,050	697	6,328	1.7	193.7	*	193.7	194.2	0.5
1326	132,592	726	6,592	1.7	194.0	*	194.0	194.6	0.6
1331	133,098	735	8,096	1.3	194.1	*	194.1	194.7	0.6
1336	133,575	770	5,956	1.8	194.3	*	194.3	194.9	0.6
1338	133,841	758	5,279	2.0	194.4	*	194.4	195.1	0.7
1343	134,343	895	7,097	1.5	194.7	*	194.7	195.5	0.9
1349	134,911	862	6,623	1.6	194.8	*	194.8	195.7	0.9
1355	135,466	1,013	7,690	1.4	195.2	*	195.2	196.1	0.9
1361	136,087	953	7,950	1.3	195.4	*	195.4	196.4	0.9
1366	136,579	876	5,848	1.8	195.7	*	195.7	196.6	0.9
1371	137,065	829	6,454	1.6	196.2	*	196.2	197.1	0.8
1376	137,569	711	5,171	2.0	196.8	*	196.8	197.7	0.9
1380	138,045	674	4,490	2.4	197.3	*	197.3	198.3	1.0
1386	138,591	560	5,229	2.0	198.3	*	198.3	199.3	1.0
1393	139,252	574	5,439	1.9	199.0	*	199.0	199.8	0.8
1396	139,643	649	6,188	1.7	199.3	*	199.3	200.2	0.8
1411	141,092	384	4,882	2.2	202.2	*	202.2	202.8	0.6
1415	141,524	758	8,922	1.2	202.3	*	202.3	203.1	0.8
1427	142,676	953	10,580	1.0	202.4	*	202.4	203.2	0.8
1431	143,118	1,002	10,614	1.0	202.5	*	202.5	203.3	0.9
Unnamed Tributary (#1) to Swift Creek									
004	378	131	663	3.0	194.1 ¹	*	188.0	188.9	0.9
008	840	188	883	2.2	194.1 ¹	*	189.2	190.2	1.0
011	1,130	194	916	2.1	194.1 ¹	*	190.0	191.0	1.0
015	1,472	155	644	3.0	194.1 ¹	*	191.1	192.0	0.9
019	1,940	93	530	3.7	194.1 ¹	*	193.2	194.1	0.9
022	2,178	120	649	3.0	194.3	*	194.3	195.2	0.9
023	2,322	197	1,141	1.7	194.7	*	194.7	195.7	1.0
027	2,660	273	1,423	1.4	195.0	*	195.0	196.0	1.0
030	2,971	238	1,170	1.7	195.2	*	195.2	196.2	1.0
033	3,288	157	607	3.2	195.8	*	195.8	196.7	0.9
035	3,453	145	650	3.0	196.5	*	196.5	197.5	1.0
037	3,703	184	843	2.3	197.2	*	197.2	198.2	1.0
041	4,106	163	739	2.7	198.2	*	198.2	199.2	1.0
043	4,340	105	525	3.7	198.8	*	198.8	199.8	1.0
051	5,128	206	1,248	1.6	201.4	*	201.4	202.4	1.0
054	5,442	248	1,136	1.6	201.7	*	201.7	202.7	1.0
057	5,699	201	892	2.0	202.0	*	202.0	203.0	1.0
061	6,100	227	869	2.0	202.6	*	202.6	203.6	1.0
064	6,378	353	1,176	1.5	203.2	*	203.2	204.2	0.9
068	6,841	210	771	2.3	204.4	*	204.4	205.2	0.7

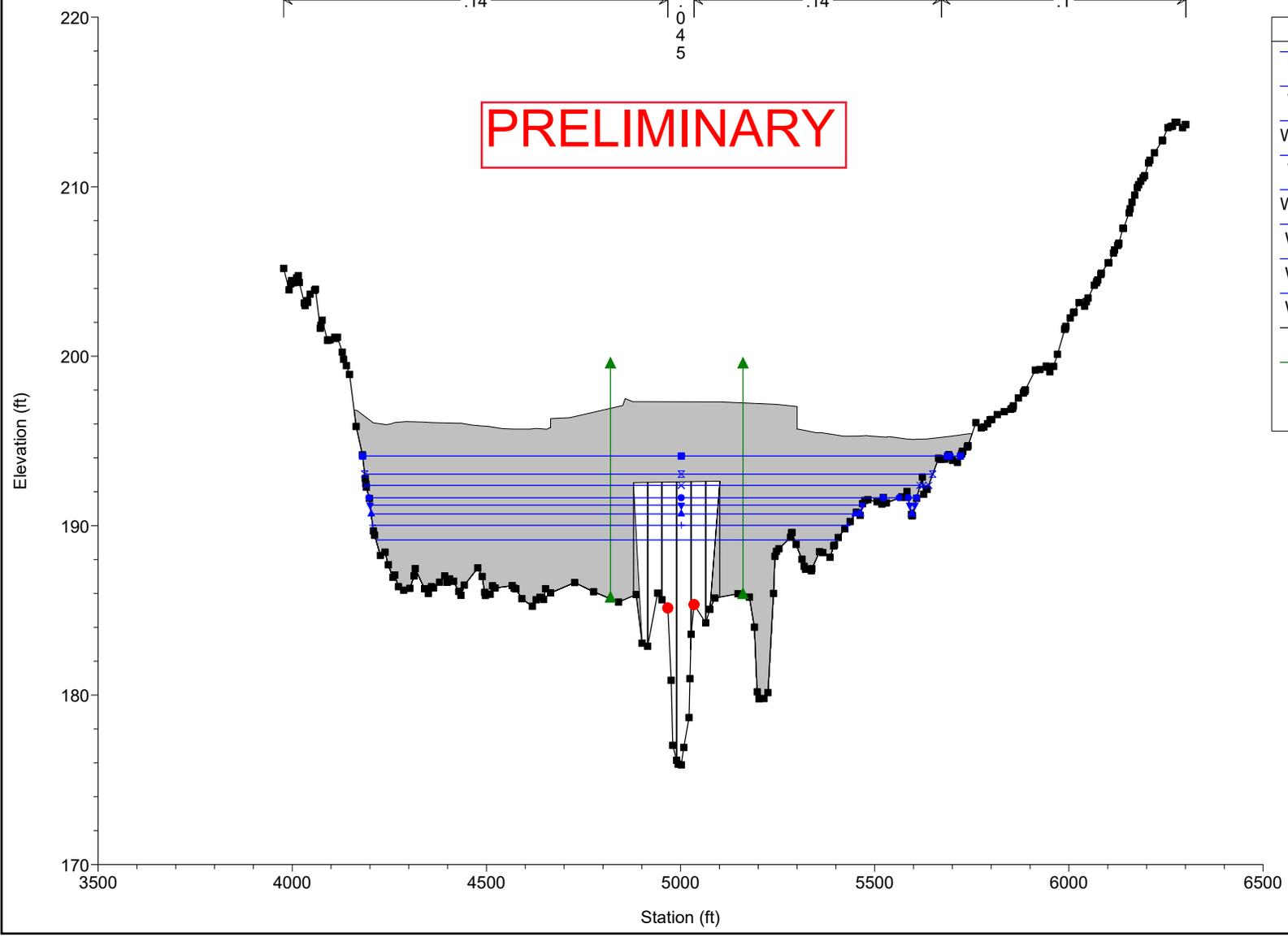
Swift Creek Detailed Study Plan: Multiple Run 10/20/2010

NC HWY 42 (SC) torStructure ID: J_SWIC_06Detailed Survey Struc



PRELIMINARY

Legend	
WS ult fut	■
WS 20%fut	×
WS 500-year	●
WS 10%fut	▲
WS 100-year	▼
WS 50-year	▲
WS 25-year	+
WS 10-year	+
Ground	■
Ineff	▲
Bank Sta	●



This spreadsheet computes the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows for ungaged urban stream or small, rural stream in Georgia, South Carolina, and North Carolina, and that has drainage area within hydrologic region 1. The spreadsheet also includes the 95-percent prediction interval minus and plus standard error of prediction intervals, and the average standard error of prediction. To use this spreadsheet, enter requested information in the yellow cells below.

Enter a site-description name:

R-3410 Site 2 - Swift Creek

Enter the explanatory variables:

Drainage area, in square miles	86.5
Percentage of impervious area, in percent	20

Applicable range of drainage area is 0.10 to 436 square miles

Applicable range of percentage of impervious area is 0.0 to 100 percent

Warnings and Cautions

Percent chance exceedance	Percent chance exceedance flow, in ft ³ /s	Lower 95 percent prediction interval flow, in ft ³ /s	Upper 95 percent prediction interval flow, in ft ³ /s	-S _{p,i} (percent)	+S _{p,i} (percent)	Average S _{p,i} (percent)
50	4,080	2,130	7,810	-28.1	39.0	33.8
20	6,150	3,380	11,200	-26.2	35.5	31.1
10	7,550	4,220	13,500	-25.6	34.4	30.2
4	9,310	5,100	17,000	-26.3	35.7	31.2
2	10,600	5,710	19,700	-26.9	36.9	32.2
1	11,800	6,100	22,700	-28.2	39.2	34.0
0.5	13,100	6,600	26,000	-29.3	41.5	35.8
0.2	14,800	7,140	30,700	-30.9	44.8	38.3



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Peak Streamflow for the Nation

USGS 0208773375 SWIFT CREEK AT SR1555 NEAR CLAYTON, NC

Available data for this site

Johnston County, North Carolina
 Hydrologic Unit Code 03020201
 Latitude 35°34'30", Longitude 78°29'55" NAD83
 Drainage area 113.7 square miles
 Gage datum 155.69 feet above NAVD88

Output formats

Table
Graph
Tab-separated file
peakfq (watstore) format
Reselect output format

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
2009	Jun. 17, 2009	13.10	1,850
2010	Aug. 24, 2010	13.99	2,050
2011	Oct. 01, 2010	10.98	1,410
2012	Apr. 22, 2012	5.03	414
2013	Jun. 07, 2013	12.50	1,770
2014	Sep. 09, 2014	14.34	2,900

2015	Dec. 25, 2014	13.19	2,220
2016	Dec. 25, 2015	11.28	1,330

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Title: Surface Water for USA: Peak Streamflow

URL: <https://nwis.waterdata.usgs.gov/nwis/peak?>

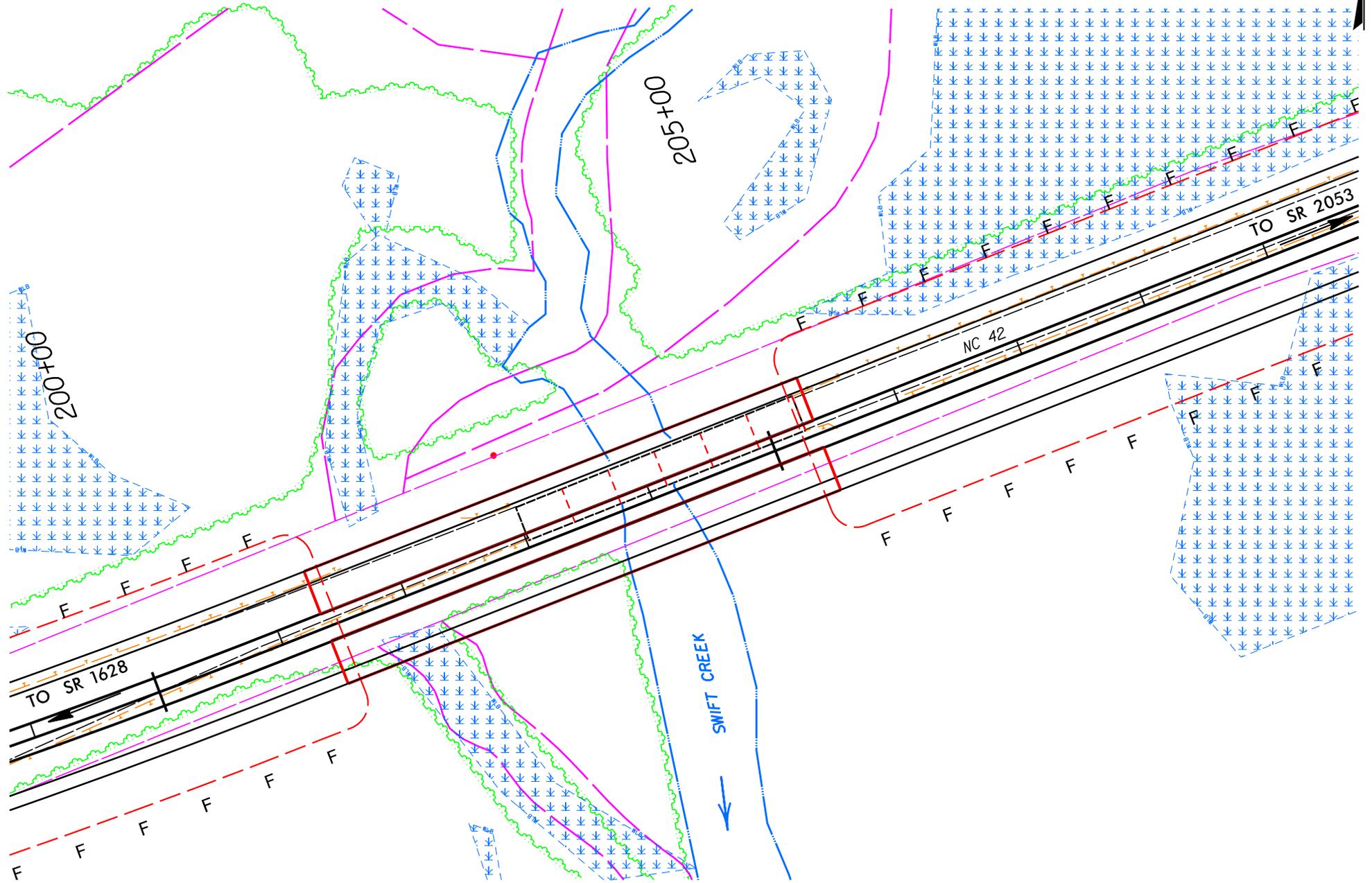


Page Contact Information: [USGS Water Data Support Team](#)

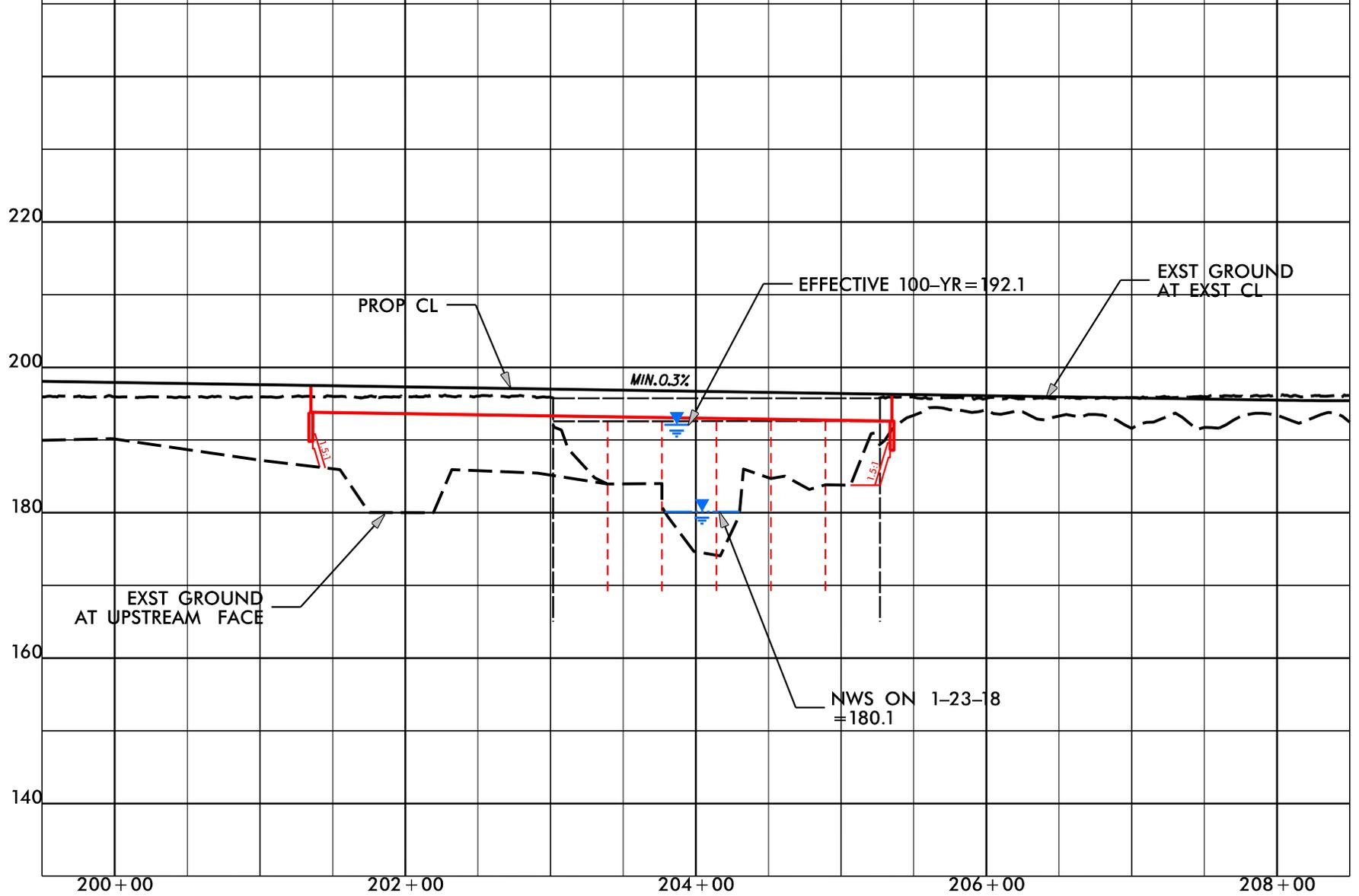
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0.34 0.32 nadww01

R-3410
SITE 2 SWIFT CREEK
JOHNSTON COUNTY
1" = 100'



BED PROFILE @ UPSTREAM FACE SWIFT CREEK



WEST

R-3410 NC 42

EAST

SITE #2 JOHNSTON COUNTY

VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 100'



Upstream face of bridge



Looking upstream from roadway



Downstream face of bridge



Looking downstream from roadway



Looking upstream from roadway at disconnected channel



Looking downstream from roadway at disconnected channel

Site 3

White Oak Creek

All Alternatives

Site 3**Stream: White Oak Creek****Alignment: All**

Site 3 is located at White Oak Creek and is crossed by existing NC 42 and all alternatives. The existing structure number is 500045 and is a 3 @ 38' concrete deck on steel I-beam bridge. The existing bridge was constructed in 1947 and has a sufficiency rating of 7 and is classified as structurally deficient.

White Oak Creek is located in the Neuse River Basin and is subject to the Neuse River Riparian Buffer Rules. According to NCDEQ, Swift Creek (Index #27-43-11) is classified as Class C and Nutrient Sensitive Waters and is not included on the 2014 303d list of impaired streams.

Johnston County is a participant in the Federal Flood Insurance Program. The proposed crossing is located in a Detailed Study Area. An MOA will be required for this stream crossing. Based on available mapping, there does not appear to be any insurable structures located in the floodplain upstream of the bridge.

The drainage area at this location is approximately 13.5 square miles. The drainage basin currently consists of a large portion of low density residential and agricultural areas. However, I-540 will eventually cross the drainage area and urbanization of the basin is anticipated. It is anticipated that the drainage basin will become primarily low to medium density residential in the future. Below are the flow rates obtained from the USGS SIR 2014-5030 (Region 1) with an impervious percentage of 20% compared with the FEMA Effective and Preliminary discharges:

<u>USGS</u>	<u>FEMA Effective</u>	<u>FEMA Preliminary</u>
Q10= 2700 cfs		Q10=1985 cfs
Q50= 3870 cfs		Q50=3152 cfs
Q100 = 4350 cfs	Q100=4720 cfs	Q100=3646 cfs
Q500 = 5520 cfs		Q500=4891 cfs

The existing stream channel widens considerably at the upstream face of bridge. This could be a result of scouring around the piers. The proposed bridge should be approximately 160 feet long. The bridge length is based on moving the west abutment away from the stream in order to provide a minimum 10' setback from the top of bank. The east abutment was set using a 1.5:1 sloping abutment from the base of the existing abutment. The minimum bridge low chord should be elevation 191.0 to provide freeboard above the Effective Base Flood Elevation.

The length of the proposed bridge and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

County: Stream:

Road #: Road Name:

Division: Location:

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

Assigned to:

Prepared By:

Hydro Reviewer:

Project Type:

Existing Structure

Structure Type: Yr Built:

Span Arrangement: OAL (ft): Skew: Abutment Type:

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

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

ADT: Year ADT: Scour Code (item113): Prior Survey Completed: Survey Date:

Drainage Area: Sq. Mi. Drainage Area Source: Roadway Overtops at Q100:

Discharge Method: USGS Region: Stream Gage Number(if applicable):

Q10 (cfs): Q25 (cfs): Q50 (cfs): Q100 (cfs): QBFE (cfs):

Structure in Flood Hazard Zone: Panel #: Panel Date: Type of FIS: Date of FIS:

Environmental

Quad Map: River Basin: Buffer Rule:

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:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

Bed to Crown (ft): Year Built:

Downstream Feature:

Location:

Structure #: Route:

Latitude: Longitude:

Prior Survey Completed: Survey Date:

Structure Type:

Span Arrangement: OAL (ft):

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

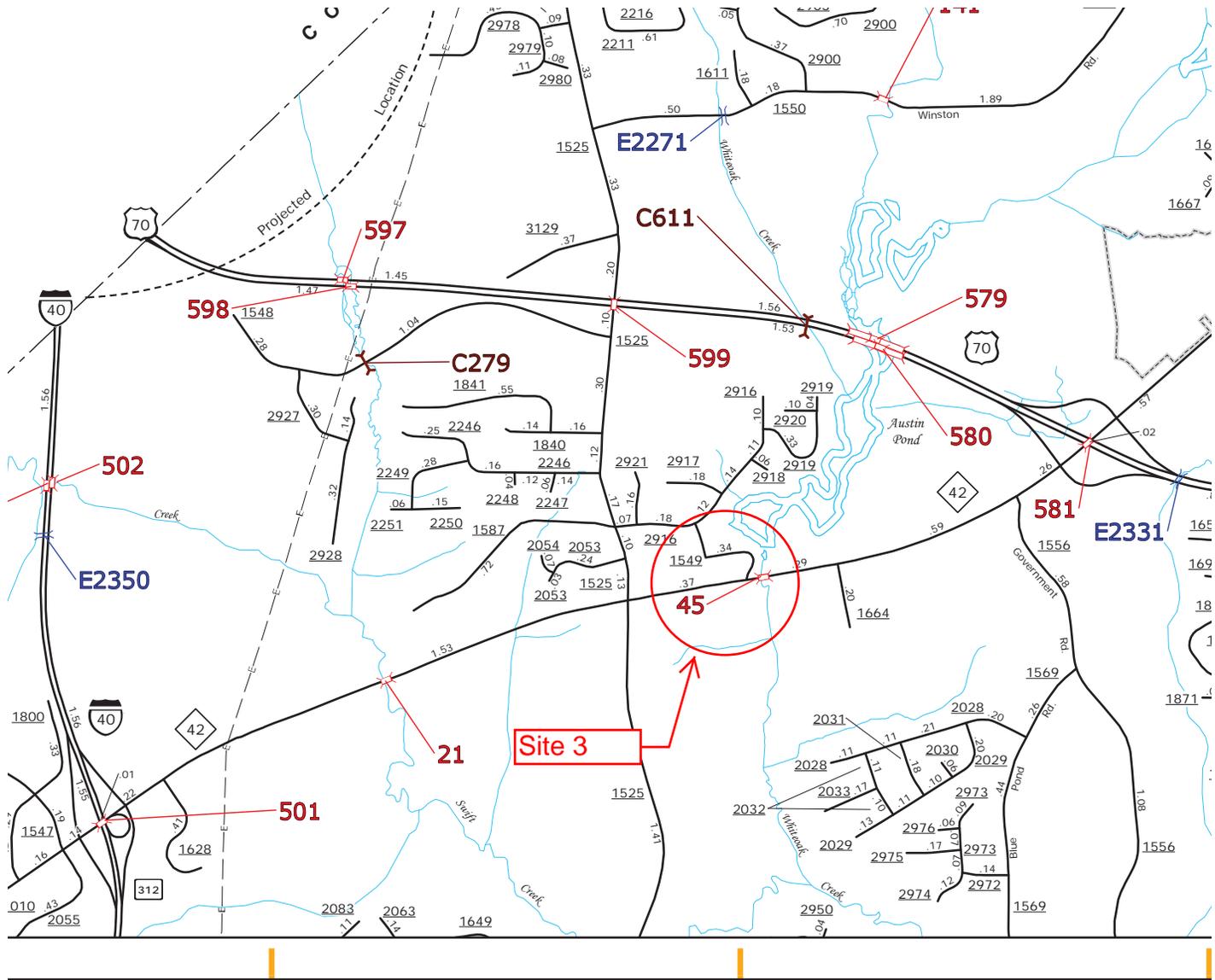
Bed to Crown (ft): Year Built:

Preliminary Structure Estimate [Office Estimate]

Structure Type: Skew:

Dimensions/Spans:

Notes





NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 STRUCTURE MANAGEMENT UNIT

ATTENTION: temporary beam repairs

Structure Safety Report

Routine Element Inspection

COUNTY: JOHNSTON STRUCTURE NUMBER: 500045 FREQUENCY: 24 MONTHS

FACILITY CARRIED: NC42 MILE POST: _____

LOCATION: 0.15MI.E.JCT.SR1549

FEATURE INTERSECTED: WHITE OAK CREEK

LATITUDE: 35° 37' 4.04" LONGITUDE: 78° 31' 41.35"

SUPERSTRUCTURE: RC DECK ON CONT.I-BEAMS&BEAMS

SUBSTRUCTURE: E.BTS&INT.BTS:RC CAP/H PILES;BTS:ENCASED IN CONCRETE.

2@37'6 CONT;1@37'6

SPANS: 2@37"6 CONT;1@37"6

FRACTURE CRITICAL TEMPORARY SHORING SCOUR CRITICAL SCOUR PLAN OF ACTION

PRESENT CONDITION: Fair INSPECTION DATE: 10/07/2015

POSTED SV: Not Posted POSTED TTST: Not Posted

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 Willis C May	SIGNATURE <i>Willis C May</i>	ASSISTED BY Wayne T Wilkinson
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Span Element Report

Structure Number: 500045
Span Number 1

Span Length 37.5 Feet

Inspection Date: 10/07/2015
Number of Beams/Girders: 4

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,113	983	130	0	0	130	3326
107		Steel Open Girder/Beam	300	0	300	0	0	300	3314
515	107	Steel Protective Coating	2320	0	1595	425	300	2320	3342
225		Steel Pile	6	6	0	0	0	0	3354
234		Reinforced Concrete Pier Cap	32	32	0	0	0	0	3348
316		Other Bearings	12	4	4	4	0	8	3334
515	316	Steel Protective Coating	12	4	0	0	8	8	3342
331		Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318
510		Wearing Surface	0	0	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 2

Span Length 37.5 Feet

Number of Beams/Girders: 0

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,113	974	125	14	0	139	3326
107		Steel Open Girder/Beam	189	189	0	0	0	0	3314
515	107	Steel Protective Coating	1164	1164	0	0	0	0	3342
225		Steel Pile	5	5	0	0	0	0	3354
234		Reinforced Concrete Pier Cap	27	27	0	0	0	0	3348
316		Other Bearings	8	8	0	0	0	0	3334
331		Reinforced Concrete Bridge Railing	0	-1	1	0	0	1	3318
510		Wearing Surface	0	0	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 3

Span Length 37.5 Feet

Number of Beams/Girders: 4

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
12		Reinforced Concrete Deck	1,113	978	135	0	0	135	3326
107		Steel Open Girder/Beam	144	-4	148	0	0	148	3314
515	107	Steel Protective Coating	1104	0	831	125	148	1104	3342
225		Steel Pile	10	10	0	0	0	37	3354
229		Other Pile	1	1	0	0	0	0	3348
234		Reinforced Concrete Pier Cap	59	43	1	15	0	15	3348
301		Pourable Joint Seal	0	0	0	0	0	0	3310
316		Other Bearings	8	4	0	4	0	4	3334
515	316	Steel Protective Coating	8	4	0	0	4	4	3342
331		Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318
510		Wearing Surface	0	0	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1113	983	130	0	0	130	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces	0	510	Wearing Surface	0	0	0	0	0	0	2816	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	430	75	75	580	3342	
<input checked="" type="checkbox"/> Beam	2	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	430	75	75	580	3342	
<input checked="" type="checkbox"/> Beam	3	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	380	125	75	580	3342	
<input checked="" type="checkbox"/> Beam	4	107	Steel Open Girder/Beam	75	0	75	0	0	75	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	580	0	355	150	75	580	3342	
<input type="checkbox"/> Bearing Device	1	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	1	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	1	316	Other Bearings	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	2	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	2	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	2	316	Other Bearings	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	3	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	3	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	3	316	Other Bearings	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	4	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Structure Number: 500045

Inspection Date: 10/07/2015

Span Number 1

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	4	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input checked="" type="checkbox"/> Bearing Device	4	316	Other Bearings	1	0	1	0	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	

Structure Number: 500045
Span Number 2

Inspection Date: 10/07/2015

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1113	974	125	14	0	139	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	0	-1	1	0	0	1	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces	0	510	Wearing Surface	0	0	0	0	0	0	2816	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	1	107	Steel Open Girder/Beam	75	75	0	0	0	0	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	291	291	0	0	0	0	3342	
<input type="checkbox"/> Beam	2	107	Steel Open Girder/Beam	38	38	0	0	0	0	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	291	291	0	0	0	0	3342	
<input type="checkbox"/> Beam	3	107	Steel Open Girder/Beam	38	38	0	0	0	0	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	291	291	0	0	0	0	3342	
<input type="checkbox"/> Beam	4	107	Steel Open Girder/Beam	38	38	0	0	0	0	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	291	291	0	0	0	0	3342	
<input type="checkbox"/> Bearing Device	1	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	1	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	2	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	2	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	3	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	3	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Deck	1	12	Reinforced Concrete Deck	1113	978	135	0	0	135	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	1	331	Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Bridge Rail	2	331	Reinforced Concrete Bridge Railing	0	0	0	0	0	0	3318	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Wearing Surfaces	0	510	Wearing Surface	0	0	0	0	0	0	2816	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	107	Steel Open Girder/Beam	36	-1	37	0	0	37	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	276	0	164	75	37	276	3342	
<input checked="" type="checkbox"/> Beam	2	107	Steel Open Girder/Beam	36	-1	37	0	0	37	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	276	0	239	0	37	276	3342	
<input checked="" type="checkbox"/> Beam	3	107	Steel Open Girder/Beam	36	-1	37	0	0	37	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	276	0	209	30	37	276	3342	
<input checked="" type="checkbox"/> Beam	4	107	Steel Open Girder/Beam	36	-1	37	0	0	37	3314	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	276	0	219	20	37	276	3342	
<input checked="" type="checkbox"/> Bearing Device	1	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	1	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	2	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	2	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	3	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	3	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input checked="" type="checkbox"/> Bearing Device	4	316	Other Bearings	1	0	0	1	0	1	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	0	0	0	1	1	3342	
<input type="checkbox"/> Bearing Device	4	316	Other Bearings	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	1	1	0	0	0	0	3342	
<input type="checkbox"/> Expansion Joints	1	301	Pourable Joint Seal	0	0	0	0	0	0	3310	<input type="checkbox"/> Requested

Superstructure Element Defect Descriptions

Structure Number: 500045

Inspection Date: 10/07/2015

Span Number 1

Span 1	Deck	1	Component Name:	Reinforced Concrete Deck				
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Element: 12 Name Reinforced Concrete Deck Qty: 1113 Lvl 2: 130 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 130

Defect Description:

11 Square Feet of Exposed Rebar in vertical face of left and right curb: Present without measurable section loss.
 118 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

1 Square Feet of Spall 1 in. or less deep or 6 in. or less in diameter in bay 2 end diaphragm.

Span 1	Wearing Surfaces	0	Component Name:	Asphalt Wearing Surface				
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Element: 510 Name Wearing Surface Qty: 0 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 0

Defect Description:

Asphalt wearing surface replaced since last inspection.

Span 1	Beam	1	Component Name:	Plate Girder				
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Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 75 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 75

Defect Description:

75 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 75 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 430 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section loss in end of beam over bent 2 has been repaired with 5/16 in plates bolted to each side of web and 1/2 in x 4 in plates welded to top of bottom flange and 1/2 in x 12 in cover plate added to bottom of bottom flange. See drawing

Span 1	Beam	2	Component Name:	Plate Girder				
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Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 75 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 75

Defect Description:

75 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 75 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 430 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section loss in end of beam over bent 2 has been repaired with 5/16 in plates bolted to each side of web and 1/2 in x 4 in plates welded to top of bottom flange and 1/2 in x 12 in cover plate added to bottom of bottom flange. See drawing

Span 1	Beam	3	Component Name:	Plate Girder				
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Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 75 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 75

Defect Description:

75 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 125 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 380 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section in end of beam at bent 2 has been repaired bay removing section of web and bottom flange and new section welded in place with plates on top of bottom flange and cover plate added over splice. See drawing

Span 1	Beam	4	Component Name:	Plate Girder				
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Element: 107 Name Steel Open Girder/Beam Qty: 75 Lvl 2: 75 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 75

Defect Description:

75 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 75 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 150 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 355 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section loss in end of beam over bent 2 has been repaired with 5/16 in plates bolted to each side of web and 1/2 in x 4 in plates welded to top of bottom flange and 1/2 in x 12 in cover plate added to bottom of bottom flange. See drawing

Span 1	Bearing Device 1	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:
not visible

Span 1	Bearing Device 1	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device 1	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device 2	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no pile

Span 1	Bearing Device 2	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

not visible

Span 1	Bearing Device 2	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device 3	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

not visible

Span 1	Bearing Device 3	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 1	Bearing Device 3	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no pile

Span 1	Bearing Device 4	Component Name:	Other Bearing						
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Element: 316 Name Other Bearings Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Freckled rust. Corrosion of the steel has initiated.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no pile

Span	1	Bearing Device	4	Component Name:	Other Bearing								
Element:	316	Name	Other Bearings	Qty:	1	Lvl 2:	0	Lvl 3:	0	Lvl 4:	0	Maint. Qty	0
Defect Description:													
not visible													

Span	1	Bearing Device	4	Component Name:	Other Bearing								
Element:	316	Name	Other Bearings	Qty:	1	Lvl 2:	0	Lvl 3:	1	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span Number 2

Span	2	Deck	1	Component Name:	Reinforced Concrete Deck								
Element:	12	Name	Reinforced Concrete Deck	Qty:	1113	Lvl 2:	125	Lvl 3:	14	Lvl 4:	0	Maint. Qty	139
Defect Description:													

6 Square Feet of Exposed Rebar in vertical face of the left and right curbs: Present without measurable section loss.
 2 Square Feet of Spalled/Patched Area in the left curb: Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.
 117 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.

diaphragms

12 Square Feet of Longitudinal cracking in bay 2 & 3 end diaphragms and right overhang diaphragms.
 2 Square Feet of spall 2 ft long x 4 in deep in bay 3 end diaphragm.

Span	2	Bridge Rail	1	Component Name:	Concrete Railing								
Element:	331	Name	Reinforced Concrete Bridge Ra	Qty:	0	Lvl 2:	1	Lvl 3:	0	Lvl 4:	0	Maint. Qty	1
Defect Description:													

1 Foot of Delamination/Spall/Patched Area: Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.

Span	2	Wearing Surfaces	0	Component Name:	Asphalt Wearing Surface								
Element:	510	Name	Wearing Surface	Qty:	0	Lvl 2:	0	Lvl 3:	0	Lvl 4:	0	Maint. Qty	0
Defect Description:													

Asphalt wearing surface replaced since last inspection.

Span Number 3

Span	3	Deck	1	Component Name:	Reinforced Concrete Deck								
Element:	12	Name	Reinforced Concrete Deck	Qty:	1113	Lvl 2:	135	Lvl 3:	0	Lvl 4:	0	Maint. Qty	135
Defect Description:													

3 Square Feet of Exposed Rebar in vertical face of the right curb: Present without measurable section loss.
 2 Square Feet of Cracking in the left curb (RC and Other): Width 0.012-0.05 in. or spacing of 1.0-3.0 ft.
 120 Square Feet of Abrasion/Wear along deck curbs (PSC/RC): Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.
 bottom of deck
 4 Square Feet of Delamination 2 ft in left overhang and 2 ft in right overhang.
 2 Square Feet of Exposed Rebar: Present without measurable section loss in surface spalls 6 in diameter in right overhang.
 4 Square Feet of Efflorescence: Surface white without build-up along hairline transverse cracks in bottom of deck bay 1.

Span	3	Wearing Surfaces	0	Component Name:	Asphalt Wearing Surface								
Element:	510	Name	Wearing Surface	Qty:	0	Lvl 2:	0	Lvl 3:	0	Lvl 4:	0	Maint. Qty	0
Defect Description:													

Asphalt wearing surface replaced since last inspection.

Span	3	Beam	1	Component Name:	Plate Girder								
Element:	107	Name	Steel Open Girder/Beam	Qty:	36	Lvl 2:	37	Lvl 3:	0	Lvl 4:	0	Maint. Qty	37
Defect Description:													

37 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 37 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 75 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 164 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section loss in end of beam over bent 2 has been repaired with 5/16 in plates bolted to each side of web and 1/2 in x 4 in plates welded to top of bottom flange and 1/2 in x 12 in cover plate added to bottom of bottom flange. See drawing

Span	3	Beam	2	Component Name:	Plate Girder
------	---	------	---	-----------------	--------------

Element:	107	Name	Steel Open Girder/Beam	Qty:	36	Lvl 2:	37	Lvl 3	0	Lvl 4	0	Maint. Qty	37
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Defect Description:

37 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 37 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 37 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish coats only.
 202 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section loss in end of beam over bent 2 has been repaired with 5/16 in plates bolted to each side of web and 1/2 in x 4 in plates welded to top of bottom flange and 1/2 in x 12 in cover plate added to bottom of bottom flange. See drawing

Span	3	Beam	3	Component Name:	Plate Girder
------	---	------	---	-----------------	--------------

Element:	107	Name	Steel Open Girder/Beam	Qty:	36	Lvl 2:	37	Lvl 3	0	Lvl 4	0	Maint. Qty	37
----------	-----	------	------------------------	------	----	--------	----	-------	---	-------	---	------------	----

Defect Description:

37 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 37 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 30 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 209 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section in end of beam at bent 2 has been repaired bay removing section of web and bottom flange and new section welded in place with plates on top of bottom flange and cover plate added over splice. See drawing

Span	3	Beam	4	Component Name:	Plate Girder
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Element:	107	Name	Steel Open Girder/Beam	Qty:	36	Lvl 2:	37	Lvl 3	0	Lvl 4	0	Maint. Qty	37
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Defect Description:

37 Feet of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
 37 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.
 20 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish and primer coats.
 219 Square Feet of Chalking (Steel Protective Coatings): Surface dulling.

Section loss in end of beam over bent 2 has been repaired with 5/16 in plates bolted to each side of web and 1/2 in x 4 in plates welded to top of bottom flange and 1/2 in x 12 in cover plate added to bottom of bottom flange. See drawing

Span	3	Bearing Device	1	Component Name:	Other Bearing
------	---	----------------	---	-----------------	---------------

Element:	316	Name	Other Bearings	Qty:	1	Lvl 2:	0	Lvl 3	1	Lvl 4	0	Maint. Qty	1
----------	-----	------	----------------	------	---	--------	---	-------	---	-------	---	------------	---

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span	3	Bearing Device	1	Component Name:	Other Bearing
------	---	----------------	---	-----------------	---------------

Element:	316	Name	Other Bearings	Qty:	1	Lvl 2:	0	Lvl 3	0	Lvl 4	0	Maint. Qty	0
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Defect Description:

not visible

Span	3	Bearing Device	2	Component Name:	Other Bearing
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Element:	316	Name	Other Bearings	Qty:	1	Lvl 2:	0	Lvl 3	1	Lvl 4	0	Maint. Qty	1
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Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.
 1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Structure Number: 500045

Inspection Date: 10/07/2015

Span 3 Bearing Device 2 Component Name: Other Bearing

Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

not visible

Span 3 Bearing Device 3 Component Name: Other Bearing

Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3 Bearing Device 3 Component Name: Other Bearing

Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

not visible

Span 3 Bearing Device 4 Component Name: Other Bearing

Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss is evident or pack rust is present but does not warrant structural review.

1 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Span 3 Bearing Device 4 Component Name: Other Bearing

Element: 316 Name Other Bearings Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 0

Defect Description:

not visible

Substructure Detailed Element Quantites

Structure Number: 500045
End Bent 1

Inspection Date: 10/07/2015

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	32	32	0	0	0	0	3348	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Bent 1

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	27	27	0	0	0	0	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Bent 2

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	27	11	1	15	0	15	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	5	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	10	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	12	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	10	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	229	Other Pile	1	1	0	0	0	0	3348	<input type="checkbox"/> Requested

Structure Number: 500045

Inspection Date: 10/07/2015

End Bent 2

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Caps	1	234	Reinforced Concrete Pier Cap	32	32	0	0	0	0	3348	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested

Substructure Element Defect Descriptions

Structure Number: 500045

Inspection Date: 10/07/2015

Bent 2

Bent 2	Row 1	Caps	1
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Element: 234 Name Reinforced Concrete Pier Cap Qty: 27 Lvl 2: 1 Lvl 3: 15 Lvl 4: 0 Maint. Qty: 15

Defect Description:

1 Feet of Patched area that is sound in left end of cap.

6 Feet of Cracking: 1/8 in wide Longitudinal crack in bottom near span 2 side corner 3 ft long in bay 1 and 3/16 in wide Longitudinal crack 4 ft long at bottom corner of span 3 side bay 1.

8 Feet of 1/16 in Longitudinal Cracking 4 ft long in span 3 side bottom corner with 4 ft between pile 2 - 3 and 4 ft between pile 3 - 4.

1 Feet of Patched area that is unsound: Patched left end of cap is map cracked to 1/16 in wide.

Bent 2	Row 1	Piles and Columns	1
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 5

Defect Description:

Concrete encasement has a 1/8 in wide x 5 ft long vertical crack in the right side.

Bent 2	Row 1	Piles and Columns	2
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 10

Defect Description:

3 - 1/16 in wide vertical cracks in left side and 2 - 1/16 in wide vertical cracks 10 ft long in the right side of the concrete encasement.

Bent 2	Row 1	Piles and Columns	3
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 12

Defect Description:

Concrete encasement has a 1/16 in vertical crack 12 ft long in the span 3 side.

Bent 2	Row 1	Piles and Columns	4
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 10

Defect Description:

The concrete encasement has a 1/8 in vertical crack 10 ft long in the left side.

BRIDGE INSPECTION RECORD AND SUMMARY FOR SHORED STRUCTURES OR STRUCTURES WITH TEMPORARY REPAIRS MADE TO KEEP A BRIDGE OPEN

BRIDGE: **500045**County **Johnston**DATE: **12/31/2013**

THE FOLLOWING S. I. & A ITEMS ARE TO BE CODED TO REFLECT THE FACT THAT THE STRUCTURE IS SHORED OR HAS HAD TEMPORARY REPAIRS MADE TO KEEP THE BRIDGE OPEN :

	<u>CODE</u>	<u>BY</u>
S I & A ITEM 103 - TEMPORARY STRUCTURE DESIGNATION	T	TSE
S I & A ITEM 59 - SUPERSTRUCTURE	4	TSE <i>12/31/13</i>
S I & A ITEM 60 - SUBSTRUCTURE		
S I & A ITEM 64 OPERATING RATING		
HS		BY:
S I & A ITEM 66 - INVENTORY RATING		
HS		BY:

COMMENTS

Plates bolted to the web of some beams and plates welded to the bottom flange of some beams.

Temporary Repair **RETAIN TEMP - TMS 03/14/16**

National Bridge and NC Inspection Items

Structure Number: 500045

Inspection Date: 10/07/2015

National Bridge Inventory Items

Item	Grade Scale	Grade
Item 58: Deck	0 - 9 , N	6
Item 59: Superstructure	0 - 9 , N	5
Item 60: Substructure	0 - 9 , N	6
Item 61: Channel and Channel Protection	0 - 9 , N	7
Item 62: Culvert	0 - 9 , N	
Item 71: Waterway Adequacy	0 - 9 , N	7
Item 72: Approach Roadway Alignment	0 - 9 , N	8

Note: If NBI Inspection Item is not present, code NBI item with "N"

NC SMU Inspection Items

Item	Grade Scale	Grade	Maint. Qty.	Maint. Code
Deck Debris	G, F, P, or C	F	226	3376
Drainage System	G, F, P, or C	P	226	3332
Utilities	G, F, P, or C			
Slope Protection	G, F, P, or C	F	100	3352
Scour	G, F, P, or C	G		
Wingwall	G, F, P, or C	G	0	3350
Field Scour Evaluation		R		
Drift	G, F, P, or C	G	0	3366
Fender System	G, F, P, or C		0	3364
Movable Span Machinery	G, F, P, or C			
Response to Live Load	G, F, P, or C	G		
Estimated Remaining Life	0 - 100 Years	14		

Note: If NC SMU Inspection Item is not present, leave NC SMU item blank

Inspection Information

Item	Grade Scale	Grade
Regulatory Sign Noticed Issued	YES/NO	N
Priority Maintenance Request Submitted	YES/NO	N
Inspection Time	Hours	8
Traffic Control Time	Hours	
Snooper Time	Hours	
Ladder Used	YES/NO	Y
Bucket Truck Used	YES/NO	N
Boat Used	YES/NO	N
Other Equipment Used	YES/NO	N

National Bridge and NC SMU Inspection Item Details

Structure Number: 500045

Inspection Date: 10/07/2015

Item	Channel and Channel Protection - Item 61	Grade	7	Maint Code	Qty.	0
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Details utility pipe in stream flow 40 ft downstream.

Item	Deck Debris	Grade	F	Maint Code	3376	Qty.	226
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Details Dirt and Vegetation out 1 ft. along deck curblines.

Item	Drainage System	Grade	P	Maint Code	3332	Qty.	226
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Details All deck drains clogged with dirt and Vegetation.

Item	Slope Protection	Grade	F	Maint Code	3352	Qty.	100
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Details Erosion and settlement 2 ft deep between berm and lower slope protection at end bent 1.



Abrasion along deck curbs



Random pop-outs along the left deck curb



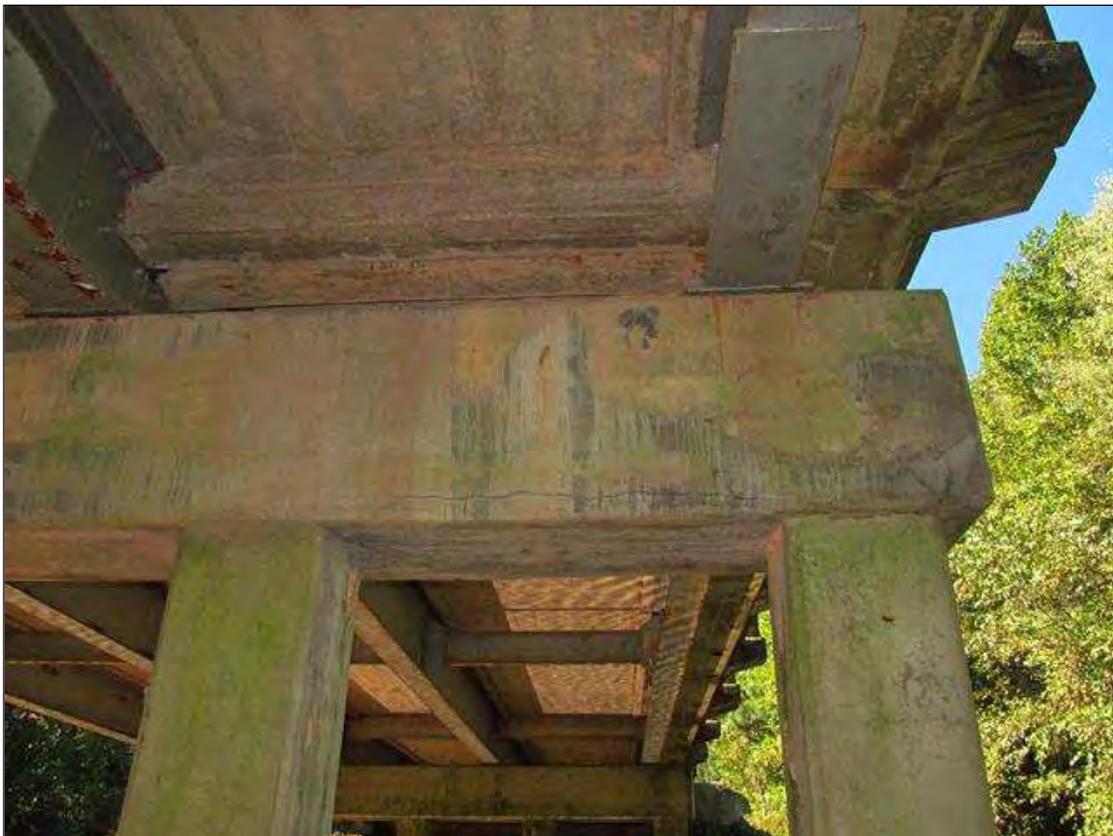
Spall in the left guardrail in Span 2



Dirt and Vegetation along deck curblines



Random spots of Exposed rebar in vertical face of deck curblines



Horizontal crack in Face of cap at Bent 2 Span 3 side between piles 1 & 2



Cracked patch in Span 3 side of Pile 3 at Bent 2



Cracked patch in the Left side of Pile 4 at Bent 2



Vertical cracks and Delamination in the Left side of Pile 5 at Bent 2



Repair patch in left End of cap at Bent 2



Cracking and Delamination in End Bent 1 Backwall Adjacent to the Left side of Beam 4 - other areas similar



Peeling paint with Surface rust to exposed steel in beam webs and flanges throughout structure



Looking East



Asphalt wearing surface over End Bent 1



Span 1 Asphalt wearing surface overview - Other spans similar



Approach Guardrail connection



Looking north upstream



Asphalt wearing surface over Bent 1



Asphalt wearing surface over Bent 2



Looking west



End Bent 2 overview



Superstructure overview



Superstructure over End of cap at Bent 2



Bent 1 Span 2 side - Bent 2 similar



Looking south downstream



Superstructure over End of cap at Bent 1



End Bent 1 overview



South profile



North profile

IDENTIFICATION					
(1) STATE NAME -NORTH CAROLINA	BRIDGE	500045	SUFFICIENCY RATING =		7
(8) STRUCTURE NUMBER(FEDERAL)		000000001010045	STATUS =	Structurally Deficient	
(5) INVENTORY ROUTE (ON/UNDER) - ON		31000420			
(2) STATE HIGHWAY DEPARTMENT DISTRICT		3	CLASSIFICATION		CODE
(3) COUNTY CODE 101 (4) PLACE CODE		12860	(112)NBIS BRIDGE SYSTEM -		YES
(6) FEATURE INTERSECTED - WHITE OAK CREEK			(104)HIGHWAY SYSTEM Is not on NHS		0
(7) FACILITY CARRIED NC42			(26) FUNCTIONAL CLASS - Minor Arterial		16
(9) LOCATION 0.15MI.E.JCT.SR1549			(100)STRAHNET HIGHWAY - Not a STRAHNET Route		0
(11)MILEPOINT		0	(101)PARALLEL STRUCTURE - No Parallel Structure		N
(16)LAT 35° 37' 4.04" (17)LONG 78° 31' 41.35"			(102)DIRECTION OF TRAFFIC - 2-way Traffic		2
(98)BORDER BRIDGE STATE CODE	PCT SHARE		(103)TEMPORARY STRUCTURE - Temporary Structure/Conditions		T
(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 Continuous			(22) OWNER - State Highway Agency		01
TYPE - Stringer Multibeam or Girder	CODE	402	(37) HISTORICAL SIGNIFICANCE - Not Eligible		5
(44) STRUCTURE TYPE APPR : Steel			CONDITION		CODE
TYPE - Stringer Multibeam or Girder	CODE	302	(58) DECK		6
(45) NUMBER OF SPANS IN MAIN UNIT		2	(59) SUPERSTRUCTURE		4
(46) NUMBER OF APPROACH SPANS		1	(60) SUBSTRUCTURE		6
(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-1		1
			(65) INVENTORY RATING METHOD - Load Factor		1
			(66) INVENTORY RATING - HS-1		1
			(70) BRIDGE POSTING - No Posting Required		5
			(41) STRUCTURE OPEN, POSTED ,OR CLOSED		D
			DESCRIPTION - Open Temporary Shoring		
AGE AND SERVICE			APPRAISAL		CODE
(27) YEAR BUILT		1947	(67) STRUCTURAL EVALUATION		3
(106)YEAR RECONSTRUCTED			(68) DECK GEOMETRY		2
(42) TYPE OF SERVICE : ON - Highway			(69) UNDERCLEARANCES,VERTI & HORIZ		N
UNDER - Waterway	CODE	15	(71) WATERWAY ADEQUACY		7
(28) LANES: ON STRUCTURE 2 UNDER STRUCTURE		0	(72) APPROACH ROADWAY ALIGNMENT		8
(29) AVERAGE DAILY TRAFFIC		17000	(36) TRAFFIC SAFETY FEATURES		0000
(30) YEAR OF ADT 2013 (109) TRUCK ADT PCT		6%	(113)SCOUR CRITICAL BRIDGES		7
(19) BYPASS OR DETOUR LENGTH		7 MI	PROPOSED IMPROVEMENTS		CODE
GEOMETRIC DATA			(75) TYPE OF WORK -		
(48) LENGTH OF MAXIMUM SPAN		37 FT	(76) LENGTH OF STRUCTURE IMPROVEMENT		
(49) STRUCTURE LENGTH		113 FT	(94) BRIDGE IMPROVEMENT COST		
(50)CURB OR SIDEWALK: LEFT 1.625 FT RIGHT 1.625 FT			(95) ROADWAY IMPROVEMENT COST		
(51) BRIDGE ROADWAY WIDTH CURB TO CURB		26.25 FT	(96) TOTAL PROJECT COST		
(52) DECK WIDTH OUT TO OUT		29.6667 FT	(97) YEAR OF IMPROVEMENT COST ESTIMATE		
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)		28 FT	(114)FUTURE ADT 34000 (115) YEAR FUTURE ADT 2025		
(33) BRIDGE MEDIAN - No Median	CODE	0	INSPECTIONS		
(34) SKEW 0° (35) STRUCTURE FLARED		0	(90) INSPECTION DATE		10/07/2015
(10) INVENTORY ROUTE MIN VERT CLEAR		999.9 FT	(92) CRITICAL FEATURE INSPECTION :		(93) CFI DATE
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR		26.25 FT	A) FRACTURE CRIT DETAIL - NO		A)
(53) MIN VERT CLEAR OVER BRIDGE RDWY		999.9 FT	B) UNDERWATER INSP - NO		B)
(54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad		0 FT	C) OTHER SPECIAL INSP NO		C)
(55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad		000 FT	SCOUR		
(56) MIN LAT UNDERCLEAR LT REF -		000 FT			
NAVIGATION DATA					
(38) NAVIGATION CONTROL - No Navigational Control	CODE	0			
(111)PIER PROTECTION -	CODE				
(39) NAVIGATION VERTICAL CLEARANCE		0			
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR	FT				
(40) NAVIGATION HORIZONTAL CLEARANCE		0 FT			

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 03/04/2016

COUNTY : JOHNSTON DIVISION : 4 DISTRICT : 3 STRUCTURE NUMBER : 500045 LENGTH : 113 FEET

ROUTE CARRIED : NC42 FEATURE INTERSECTED : WHITE OAK CREEK

LOCATED : 0.15MI.E.JCT.SR1549 BRIDGE NAME : CITY : *CLAYTON

FUNC. CLASS : 16 SYST.ON : FA SYST.UNDER : NFA ADT & YR : 17000 2013 RAIL TYPE : LT 241 RT 241

BUILT : 1947 BY : SHPWC PROJ : 2397 FED.AID PROJ : DESIGN LOAD : HS 15

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

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 24 FT WATER DEPTH : 5 FT

SUPERSTRUCTURE : RC DECK ON CONTINUOUS I-BEAMS

SUBSTRUCTURE : E.BTS&INT.BTS:RC CAP/H PILES;BTS:ENCASED IN CONCRETE.

SPANS : (1@36'8 1/2", 1@37'6" CONT.), 1@36'8 1/2"

BEAMS OR GIRDERS : 4 LINES W27X94 I-BEAMS (CONT.) @ 7'6 CENTERS

FLOOR : 6.75 RC/3.5" AWS ENCROACHMENT : DECK (OUT TO OUT) : 29.6667 FT

CLEAR ROADWAY : 26.25 FT BETWEEN RAILS : 29.5 FT SIDEWALK OR CURB : LT 1.625 FT RT 1.625 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-1 OPE.RTG. : HS-1 CONTR.MEMBER : int.bmC POSTED : SV TTST DATE 03/23/2009

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

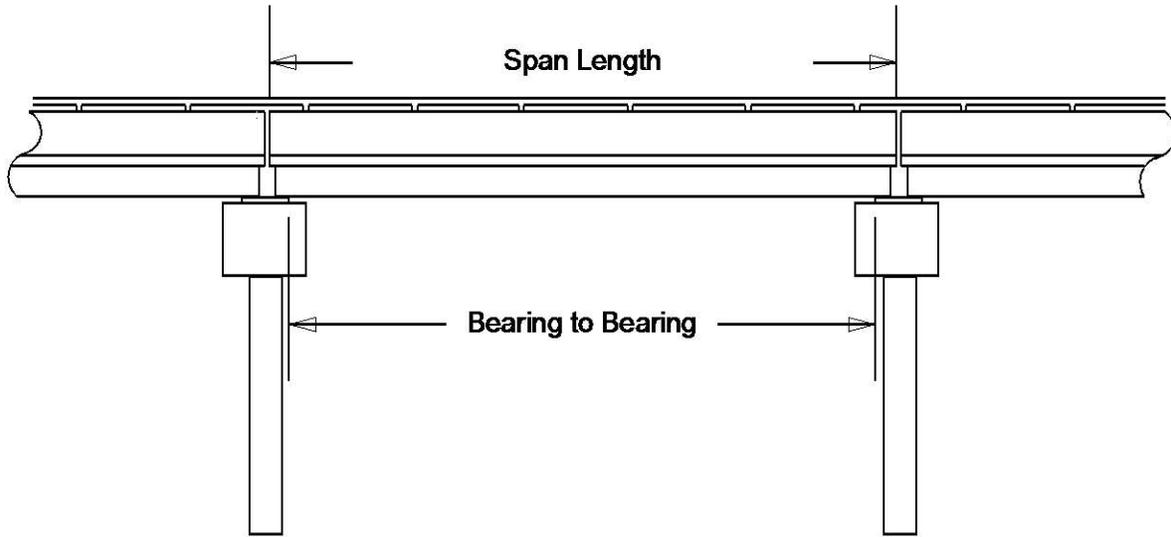
UNDER ROUTES AND CLEARANCES

REMARKS :

Structure Data Worksheet

Spans

County: JOHNSTON Structure No: 500045 Date: _____ Inspected By: WCM



Span No	Span Length	Bearing to Bearing	Comments
1	37.5	37	
2	37.5	37	
3	37.5	37	NBIS : 108.5 FT

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 500045 County: JOHNSTON Date: _____ By: WCM

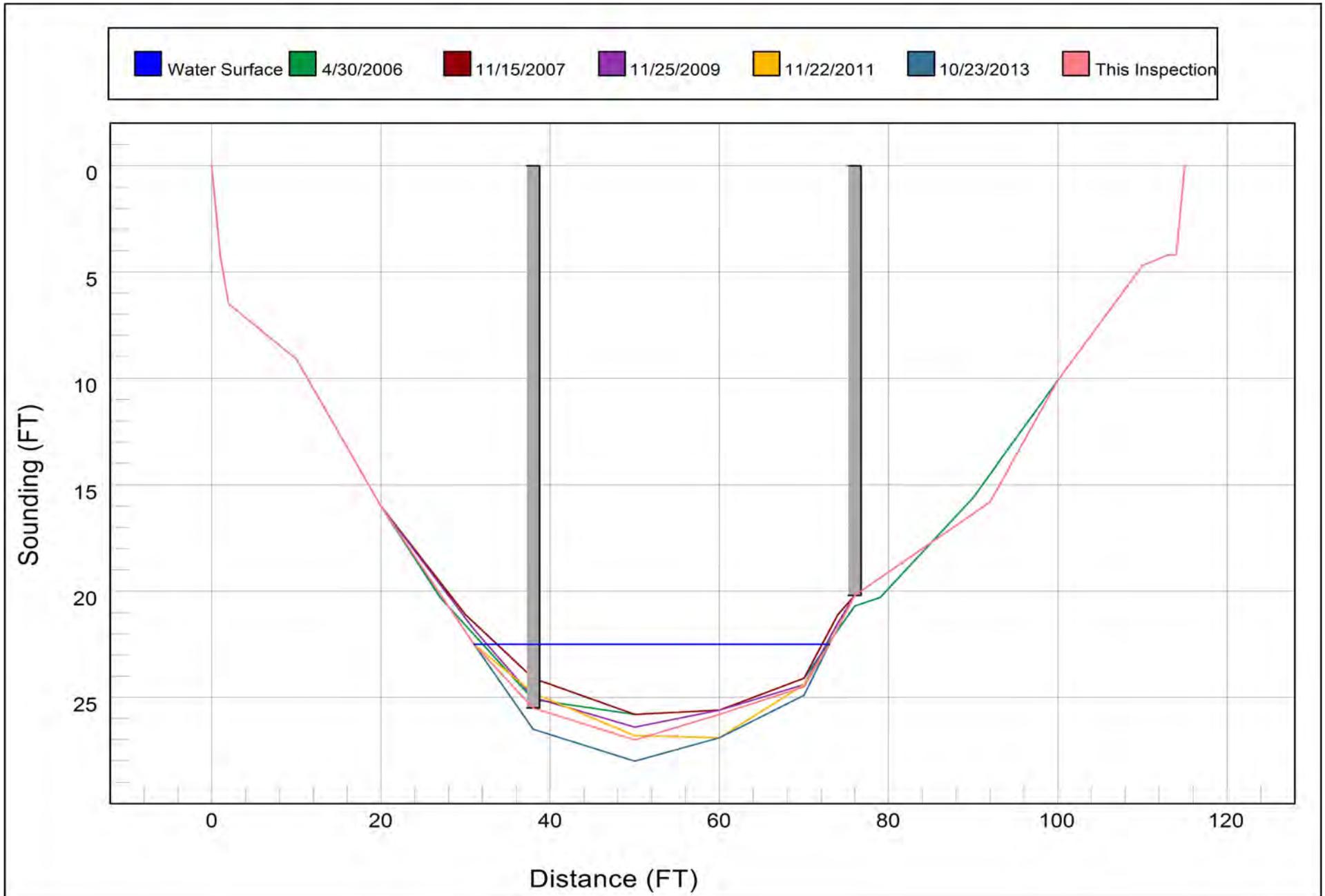
Record sounding from top of rail. Other location if needed: _____

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	0	TOP OF RAIL			
1	4.2	TOP OF CAP			
2	6.5	GROUND AT CAP- CONCRETE	2	5.9	GROUND AT CAP - CONCRETE
10	9.1	GROUND - CONCRETE			
20	16	GROUND - CONCRETE			
31	22.5	Water Surface/Water Edge (WSWE)			
38	25.5	BENT 1	38	26	BENT 1
50	27				
60	25.8				
70	24.5				
73	22.5	Water Surface/Water Edge (WSWE)			
76	20.2	BENT 2	76	20.1	BENT 2
92	15.8	TOP OF SLOPE			
100	10.1	GROUND - RIP RAP			
110	4.7	GROUND - RIP RAP			
113	4.2	GROUND AT CAP - RIP RAP	113	4.5	GROUND AT CAP - RIP RAP
114	4.2	TOP OF CAP			
115	0	TOP OF RAIL			

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



Bridge Inspection Field Sketch



Roadway	24ft Wide	2 Paved Lanes	Looking East
Left Shoulder	7ft Wide	2ft Paved	5ft Unpaved
Right Shoulder	7ft Wide	2ft Paved	5ft Unpaved
Left Guardrail			
Right Guardrail			

CHECKED BY: WCM 10/7/2015

Title

APPROACH ROADWAY

Description

LOOKING EAST

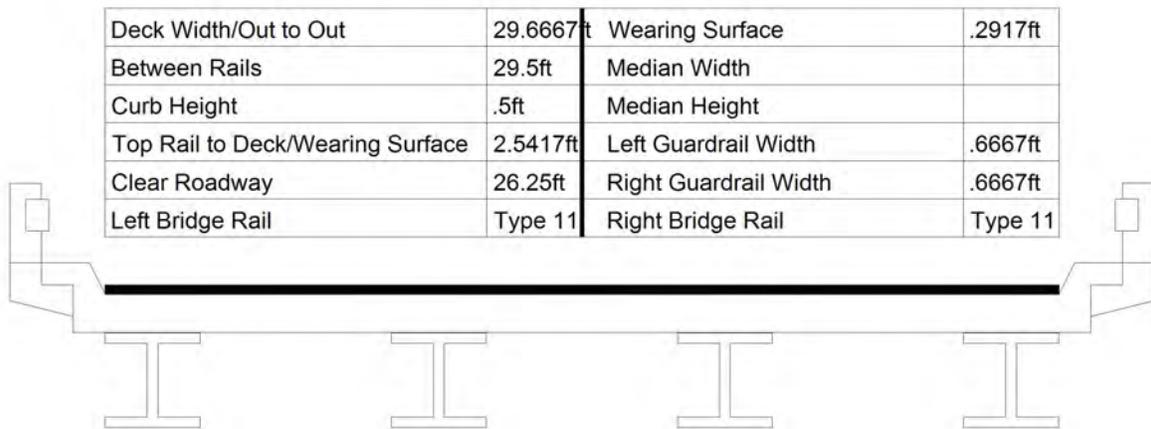
Bridge No: 500045

Drawn By: KMM

Date: 05/01/2006

File Name: S0242000480

Bridge Inspection Field Sketch



Measurements for Span #	1	Spans 2 & 3 similar	
Deck Thickness	.5625	Left Overhang	3.5833
Top of Rail to Bottom of Beam	4.9167	Right Overhang	3.5833

Beam No	Beam Type	Spacing	Comments
1	Steel I Beam	7.5ft	W 27 X 94 I BEAM
2	Steel I Beam	7.5ft	W 27 X 94 I BEAM
3	Steel I Beam	7.5ft	W 27 X 94 I BEAM
4	Steel I Beam		W 27 X 94 I BEAM

CHECKED BY: WCM 10/7/2015

Title
TYPICAL SECTION

Description
4 LINES OF I-BEAMS

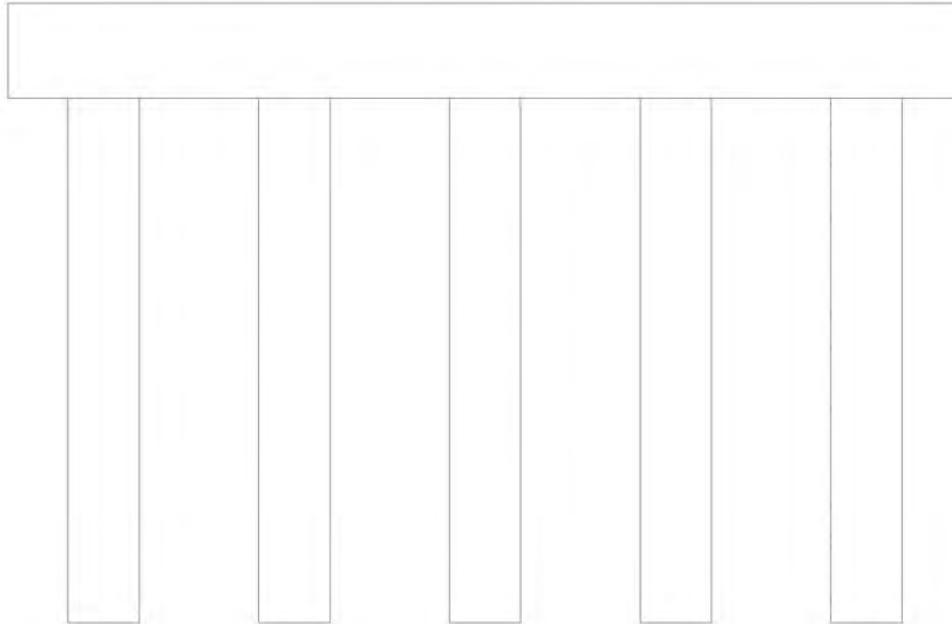
Bridge No: 500045

Drawn By: KMM

Date: 05/01/2006

File Name: S0242000479

Bridge Inspection Field Sketch



Bent #	1	Bents 2 similar	
Cap - Cast In Place			
Cap Size	26.667ft Long	2.0ft Wide	2.4167ft High
Left Overhang	1.1667ft	Lt Cap/Beam Overhang	2.083ft
Right Overhang	1.1667ft	Rt Cap/Beam Overhang	2.083ft

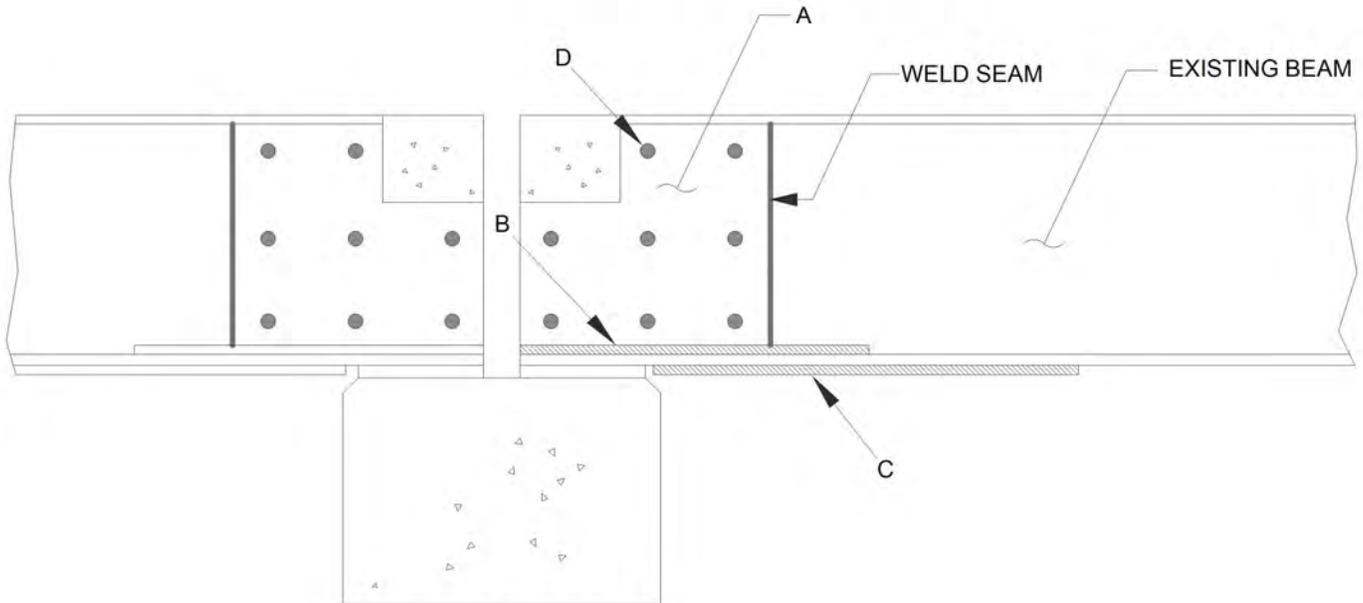
Pile #	Material	Pile Type	Spacing	Length	Width/Diam.	Height	Orientation
1	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
2	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
3	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
4	Prestressed Concrete	Pile Bent	6.0833		1.5	1.5	Vertical
5	Prestressed Concrete	Pile Bent			1.5	1.5	Vertical

CHECKED BY: WCM 10/7/2015

Title PILE DIAGRAM	Description BENTS
Bridge No: 500045	Drawn By: KMM
Date: 05/01/2006	File Name: S0242000481

Bridge Inspection Field Sketch

REPAIR DETAIL FOR BEAMS 1, 2 & 4 SPANS 2 & 3 OVER BENT 2



BENT 2 CAP

A	5/16" × 20" × 24" PLATE ADDED EACH SIDE OF EXISTING WEB
B	1/2" × 4" × 2' PLATE ADDED EACH SIDE OF BTM FLANGE
C	1/2" × 12" × 4' COVER PLATE ADDED TO BTM FLANGE
D	3/4" BOLTS × 8 QTY.

CHECKED BY: WCM 10/7/2015

Title
BEAM REPAIRS

Description
BEAMS 1, 2 & 4 AT BT2

Bridge No: 500045

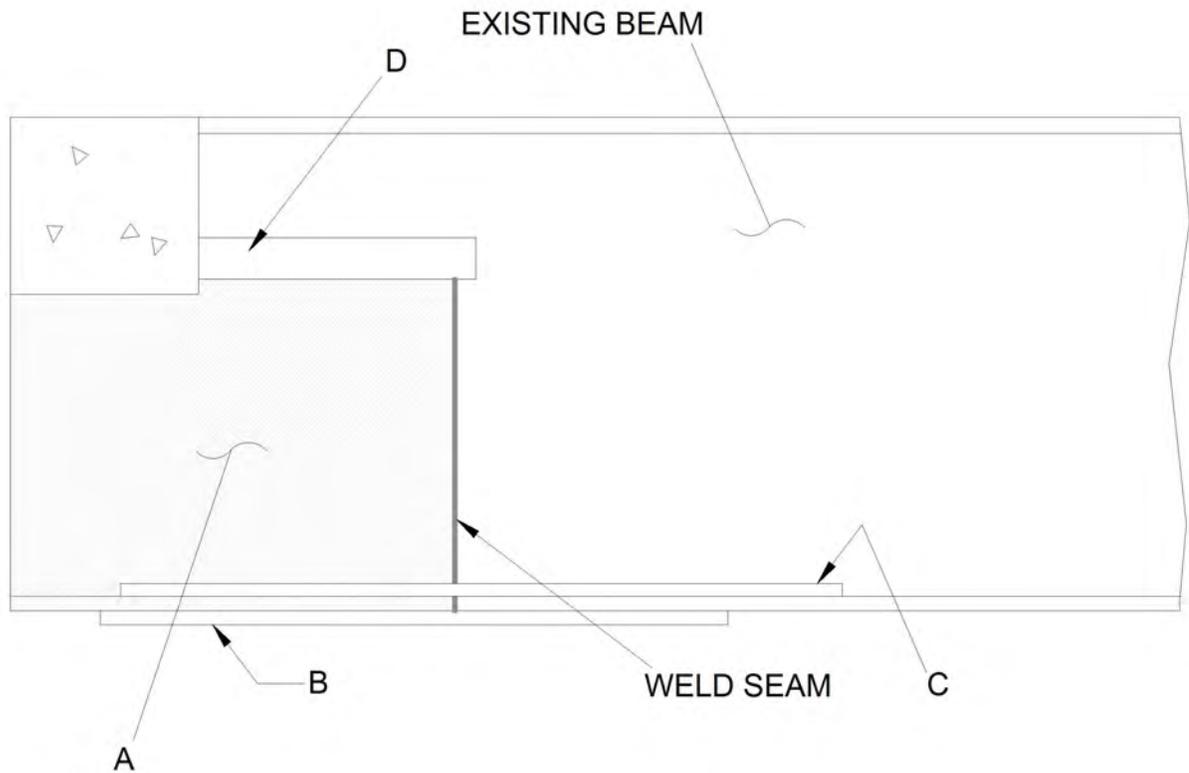
Drawn By: WTW

Date: 11/25/2009

File Name: S0018014358

Bridge Inspection Field Sketch

BEAM 3 REPAIR AT BENT 2 SPANS 2 & 3



A	NEW BEAM END 18" HIGH × 2 FT. LONG
B	1/2" × 12" × 3 FT. COVER PLATE ADDED
C	1/2" × 4" × 3 FT. PLATE ADDED EACH SIDE OF BTM FLANGE
D	COVER PLATE ADDED OVER SEAM

CHECKED BY: WCM 10/7/2015

Title
BEAM REPAIRS II

Description
BEAM 3, SPAN 2 & 3

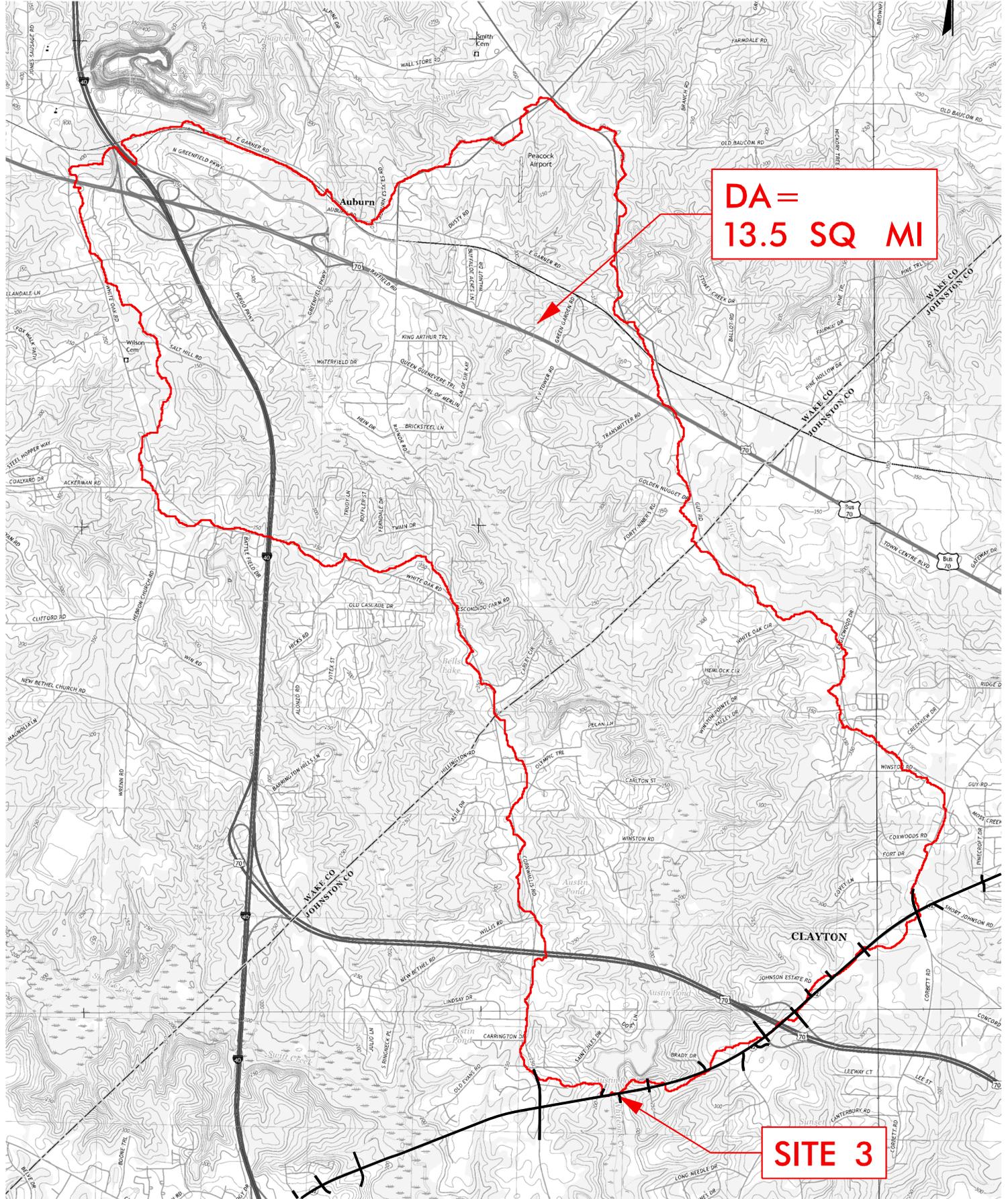
Bridge No: 500045

Drawn By: WTW

Date: 11/25/2009

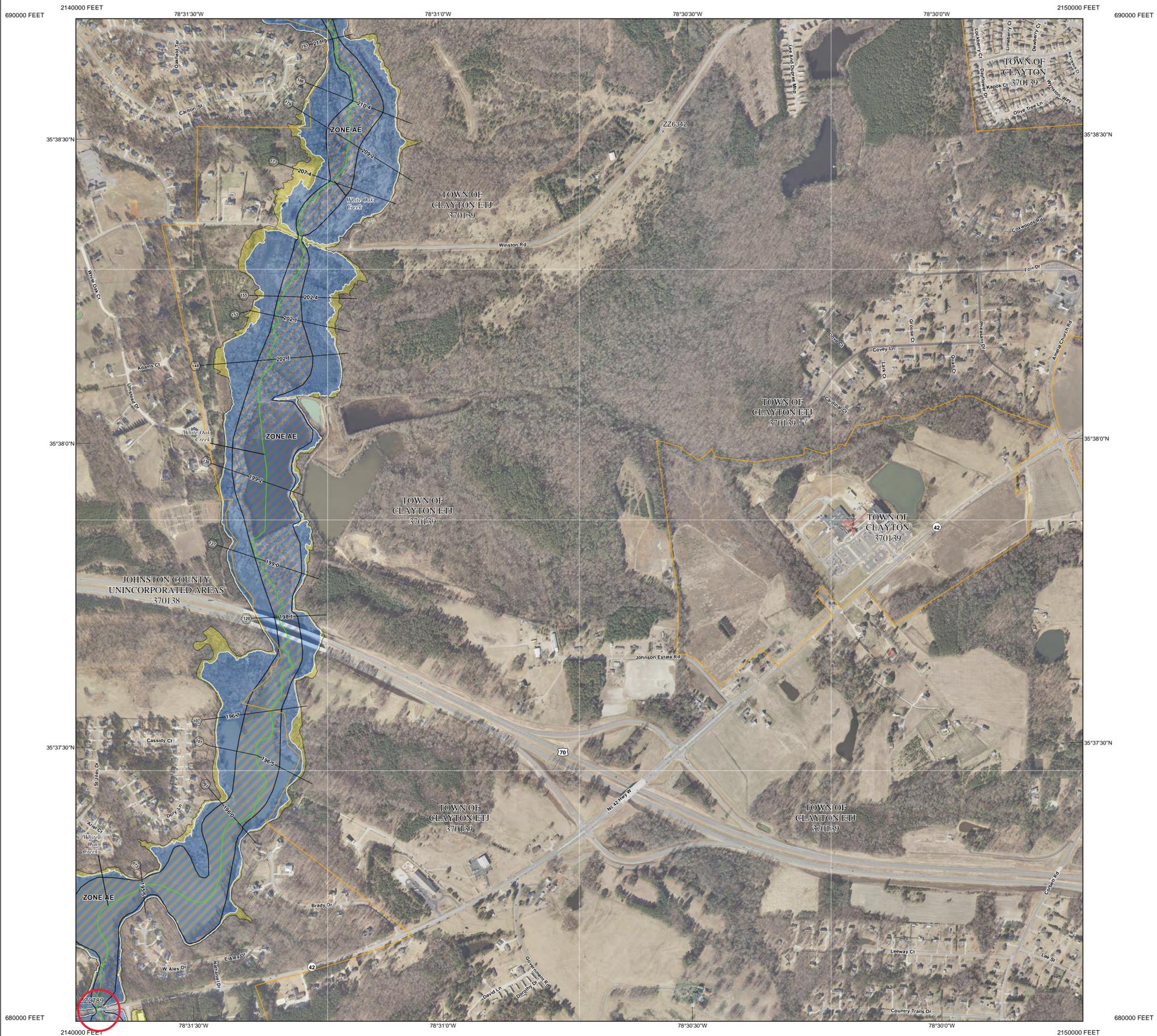
File Name: S0018014361

R-3410
SITE 3 DRAINAGE AREA
JOHNSTON COUNTY
1" = 4000'



**DA =
13.5 SQ MI**

SITE 3



This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://FRIS.NC.GOV/FRIS](http://FRIS.NC.GOV/FRIS)

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE)
	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes Zone X
OTHER AREAS OF FLOOD HAZARD	Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
OTHER AREAS	Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall
GENERAL STRUCTURES	Non-accredited Levee, Dike, or Floodwall
	North Carolina Geodetic Survey bench mark
	National Geodetic Survey bench mark
	Contractor Est. NCFMP Survey bench mark
	Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	Coastal Transect
OTHER FEATURES	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at <http://www.ncfloodmaps.com>, or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/nfip/index.shtm>.

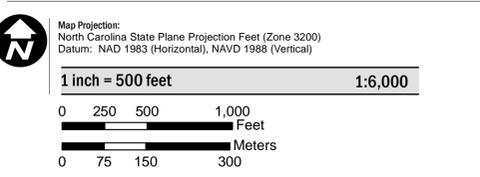
PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/nfip/index.shtm>.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LMWA (or between the shoreline and the LMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

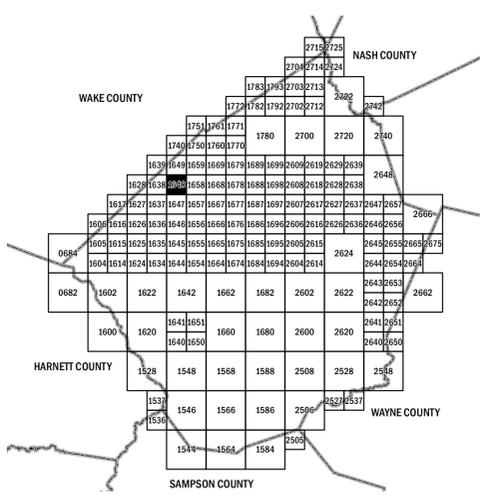
COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE
This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/habitatconservation/coastal_barrier.html, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

CBRS Area Otherwise Protected Area

SCALE



PANEL LOCATOR



FEMA

National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1648

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
CLAYTON, TOWN OF	370139	1648	J
JOHNSTON COUNTY	370138	1648	J

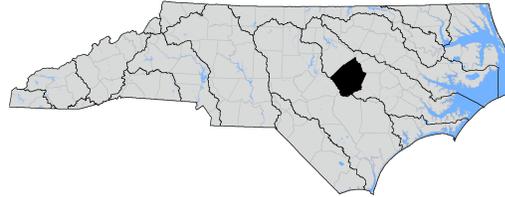
MAP NUMBER
3720164800J

MAP REVISED
12/02/05

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262



EFFECTIVE: 12/2/2005

REVISED: 1/5/2007

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



Table 9 - Flooding Sources Studied by Detailed Methods: Redelineated

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with the Neuse River	Approximately 230 feet upstream of State Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with the Neuse River	Approximately 150 feet upstream of US Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little Creek	State Highway 42	Johnston County
Buffalo Creek (Basin 9, Stream 1)	The Wake/Johnston County boundary	Robertsons Pond Dam	Johnston County
Buffalo Creek West	The confluence with Middle Creek (South)	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 250 feet upstream of the confluence with Stony Fork	Johnston County
Little Creek	The confluence with the Swift Creek	Approximately 0.6 mile upstream of Shotwell Road	Johnston County Town Of Clayton
Little Creek (Basin 11, Stream 2)	The Wake/Johnston County boundary	Cemetery Road	Johnston County
Little Creek Tributary	The confluence with Little Creek	Approximately 800 feet upstream of US Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	US Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Middle Creek	The confluence with Swift Creek	Approximately 0.7 mile upstream of confluence of Middle Creek Tributary	Johnston County Town Of Smithfield
Mill Branch	At confluence with Mill Creek (South)	Approximately 2.4 miles upstream of Stevens Mill Road	Johnston County
Mill Creek (South)	At confluence with Neuse River	Approximately 0.7 mile upstream of the confluence with Stone Creek	Johnston County
Moccasin Creek	At confluence with Neuse River	Approximately 1,900 feet upstream of US Highway 70	Johnston County Town Of Princeton
Neuse River	Wayne/Lenoir County boundary	Falls of the Neuse Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Poplar Creek	The confluence with the Neuse River	Approximately 1.4 miles upstream of the confluence with Little Poplar Creek	Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.4 mile downstream of City Road	Approximately 100 feet upstream of City Road	Town Of Clayton
Stone Creek	The confluence with Mill Creek (South)	US Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of US Highway 301	Johnston County
Swift Creek	The confluence with the Neuse River	The confluence of Yates Branch (Basin 20, Stream 13)	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	NC 1525	Johnston County
White Oak Creek	The confluence with Swift Creek	Approximately 0.4 mile upstream of Pergo Parkway	Johnston County Town Of Clayton

Table 10, "Flooding Sources Studied by Detailed Methods: Limited Detailed", lists all flooding sources within the county that were studied by limited detailed methods for either this FIS or previous FISs.

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Arters Branch	The confluence with the Neuse River	Approximately 300 feet upstream of North Johnson Road	Town Of Smithfield
Basin 11, Stream 7	The Wake/Johnston County boundary	Approximately 0.4 mile upstream of Wake/Johnston County boundary	Johnston County
Bawdy Creek	The confluence with the Neuse River	The confluence with Bawdy Swamp and Quincosin Swamp	Johnston County
Bawdy Swamp	The confluence with Bawdy Creek	Approximately 0.8 mile upstream of HWY 70	Johnston County Town Of Pine Level
Beaverdam Branch	The confluence with Middle Creek	Approximately 100 feet downstream of Raleigh Road	Johnston County
Beaverdam Creek	At Rosewood Road	Approximately 575 feet downstream of Pierce Street	Johnston County Town Of Princeton
Beaverdam Swamp	The confluence with Hannah Creek	Approximately 1,300 feet upstream of Tetersville Road	Johnston County Town Of Four Oaks
Beddingfield Creek	Approximately 0.4 mile upstream of the confluence with the Neuse River	Approximately 0.2 mile upstream of Shotwell Road	Town Of Clayton

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 0.2 mile downstream of Federal Road	3.12	*	*	1520	*
Approximately 0.1 mile upstream of Interstate 40	2.64	*	*	1370	*
Swift Creek					
At the mouth	287.00	*	*	20500	*
Above Middle Creek (at North Carolina 210)	157.00	*	*	14560	*
Approximately 1.3 miles downstream from confluence of Little Creek	139.10	*	*	15200	*
Approximately 2.0 miles downstream of Lee Road	120.80	*	*	12500	*
Approximately 1.1 miles downstream of Lee Road	117.90	*	*	12400	*
Approximately 1.2 mile downstream of Barber Mill Road	113.90	*	*	12200	*
Approximately 0.9 mile upstream of Barber Mill Road	110.10	*	*	12100	*
Approximately 2.0 miles upstream of Barber Mill Road	105.30	*	*	11700	*
Approximately 0.9 mile downstream of Cornwallis Road	89.40	*	*	9540	*
Approximately 0.3 mile upstream of N.C. Route 42	81.20	*	*	9290	*
Unnamed Tributary (#1) to Swift Creek					
At the confluence with Swift Creek	4.70	*	*	4670	*
Approximately 100 feet downstream of New Bethel Church Road	4.10	*	*	4430	*
Unnamed Tributary (#2) to Swift Creek					
At the confluence with Swift Creek	2.20	*	*	2050	*
Approximately 1.1 mile downstream of Cornwallis Road	1.50	*	*	2010	*
White Oak Creek					
At the confluence with Swift Creek	14.60	*	*	4630	*
Approximately 480 feet upstream of N.C. Route 42	13.60	*	*	4720	*
Approximately 0.8 mile upstream of Winston Road	12.00	*	*	5510	*
Approximately 120 feet downstream of Winston Road	10.30	*	*	5270	*
Approximately 1.6 miles upstream of Winston Road	8.00	*	*	5330	*

¹Modified by storage at State Route 1003

²Discharges reduced by storage at U.S. Highway 70

³Part of flow for Mill Creek goes into the Neuse River

⁴Discharge reduced by storage

⁵Modified by Falls Lake

Table 14, "Summary of Stillwater Elevations" is not applicable in Johnston County.

Table 15, "Gage Information", lists the stream gages located in Johnston County, including the drainage area of the flooding source at the gage and the period of record available at the time of the publication of this FIS Report.

Table 15 - Gage Information

Gage Number	Flooding Source	Site Name	Drainage Area (square miles)	Period of Record	
				From	To
02088210	Hannah Creek Tributary 2	HANNAH CREEK NEAR BENSON, N.C.	2.59	1953	1971
02088140	Stone Creek	STONE CREEK NEAR NEWTON GROVE, N.C.	27.90	1953	1971

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
015	1,493	260	3,901	1.2	189.4	*	189.4	190.0	0.6
023	2,272	240	3,368	1.4	189.4	*	189.4	190.2	0.8
028	2,803	465	5,287	0.9	189.5	*	189.5	190.4	0.9
036	3,619	550	6,154	0.8	189.5	*	189.5	190.4	0.9
045	4,462	545	5,414	0.9	189.6	*	189.6	190.6	1.0
050	5,033	480	3,784	1.2	189.8	*	189.8	190.8	1.0
073	7,343	184	1,822	2.6	195.5	*	195.5	196.2	0.7
091	9,108	310	2,738	1.7	196.0	*	196.0	196.7	0.7
101	10,145	450	3,478	1.4	196.5	*	196.5	197.4	0.9
107	10,651	360	2,550	1.9	196.7	*	196.7	197.7	1.0
120	11,959	210	1,665	3.3	198.1	*	198.1	199.1	1.0
127	12,673	500	3,652	1.5	199.0	*	199.0	200.0	1.0
136	13,625	608	1,143	4.8	199.2	*	199.2	200.2	1.0
148	14,845	560	4,121	1.3	202.1	*	202.1	203.0	0.9
153	15,339	265	1,821	3.0	202.1	*	202.1	203.1	1.0
155	15,525	220	1,344	4.1	202.4	*	202.4	203.4	1.0
173	17,266	210	1,236	4.3	207.4	*	207.4	208.4	1.0
179	17,944	340	1,829	2.9	209.2	*	209.2	210.2	1.0
186	18,569	327	1,665	3.2	210.4	*	210.4	211.4	1.0
193	19,250	53	488	10.8	211.9	*	211.9	212.9	1.0
204	20,387	180	1,436	3.7	216.9	*	216.9	217.6	0.7
208	20,767	305	2,004	2.6	217.8	*	217.8	218.8	1.0
216	21,631	320	2,561	1.3	218.9	*	218.9	219.9	1.0
224	22,445	110	971	3.5	219.1	*	219.1	220.1	1.0
231	23,078	170	1,219	2.7	220.1	*	220.1	221.0	0.9
239	23,880	150	1,093	3.1	220.8	*	220.8	221.7	0.9
248	24,839	240	1,753	1.9	221.7	*	221.7	222.6	0.9
255	25,475	271	1,789	1.9	222.0	*	222.0	223.0	1.0
261	26,123	176	891	3.8	222.5	*	222.5	223.5	1.0

¹Elevation includes backwater effects

²ELEVATION INCLUDES FLOODING CONTROLLED BY NEUSE RIVER

³ELEVATION INCLUDES FLOODING CONTROLLED BY POPLAR CREEK

⁴Combined Neuse River and Poplar Creek floodway

⁵Data not available

* Future conditions not computed for this stream

6.4 Coastal Flood Hazard Mapping

Flood insurance zones and BFEs including the wave effects were identified on each transect based on the results from the onshore wave hazard analyses. Between transects, elevations were interpolated using topographic maps, land-use and land-cover data, and

PRELIMINARY FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
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TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262

PRELIMINARY



PRELIMINARY: 3/31/2015

REVISED: 3/31/2015

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



both mailed to each jurisdiction within Johnston County and posted to the State's website at www.ncfloodmaps.com.

Draft basin plans were developed based on the results of the initial scoping meetings. Final scoping meetings were held by the State and FEMA to provide counties and communities an overview of the draft basin plans, including the proposed scope and schedule for the project, and to provide an opportunity for additional county and community input. After the final scoping meeting was held, the Final Basin Plans were produced.

This FIS covers the geographic area of Johnston County, , and all jurisdictions therein. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. Limits of detailed study are indicated on the Flood Profiles and/or Water-surface elevation rasters and/or the FIRM.

Table 8P, "Scope of Revisions: Revised or New Detailed Study -Preliminary", lists flooding sources that were newly studied by detailed methods or were previously studied by detailed methods and had a change in backwater elevation due to flooding effects from a newly studied flooding source.

Table 8P - Scope of Revisions: Revised or New Detailed Study - Preliminary

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with Neuse River	Approximately 230 feet upstream of NC Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with Neuse River	Approximately 300 feet upstream of U.S. Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little River	Approximately 720 feet upstream of NC Highway 42	Johnston County
Buffalo Creek West	The confluence with Middle Creek	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 1,800 feet upstream of Interstate 95	Johnston County
Little Creek	The confluence with Swift Creek	The confluence with Swift Creek	Johnston County Town Of Clayton
Little Creek Tributary	The confluence with Little Creek	Approximately 770 feet upstream of U.S. Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	Approximately 260 feet upstream of U.S. Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Approximately 1.0 mile upstream of the Wayne/Johnston County Boundary	Johnston County
Middle Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Mill Branch	The confluence with Mill Creek (South)	Approximate 2.4 miles upstream of Harper House Road	Johnston County
Mill Creek (South)	The confluence with Neuse River	Approximate 0.8 mile upstream of confluence of Stone Creek	Johnston County
Moccasin Creek	Approximately 3,425 feet downstream of Buckleberry Road	Approximately 0.4 mile upstream of U.S. Highway 70	Johnston County Town Of Princeton
Moccasin Creek	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Neuse River	The Johnston/Wayne County boundary	Just downstream of Mial Plantation Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.7 mile upstream of Oneil Street	Approximately 270 feet upstream of City Road	Town Of Clayton
Spring Branch	The confluence with Neuse River	Collier Street	Town Of Smithfield
Stone Creek	The confluence with Mill Creek (South)	Approximately 1,640 feet upstream of U.S. Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of U.S. Highway 301	Johnston County
Swift Creek	The confluence with Neuse River	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	Approximately 190 feet upstream of Cornwallis Road	Johnston County
White Oak Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Clayton

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)				
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Future Annual Chance	0.2% Annual Chance
Approximately 100 feet downstream of New Bethel Church Road	3.98	934	1513	1763	*	2397
Approximately 3,050 feet upstream of New Bethel Road	3.12	804	1309	1527	*	2082
Unnamed Tributary (#2) to Swift Creek						
At the confluence with Swift Creek	2.27	499	836	993	*	1380
Just upstream of Josephine Road	1.88	444	746	887	*	1235
Approximately 1.1 mile downstream of Cornwallis Road	1.67	400	676	806	*	1125
Approximately 4,325 feet upstream of Josephine Road	1.14	311	530	633	*	889
Approximately 4,175 feet downstream of Cornwallis Road	0.82	244	418	502	*	709
Approximately 1,300 feet downstream of Cornwallis Road	0.54	156	275	334	*	479
White Oak Creek						
At the confluence with Swift Creek	14.46	2069	3282	3794	*	5086
Approximately 480 feet upstream of NC 42	13.52	1985	3152	3646	*	4891
Approximately 120 feet downstream of Winston Road	10.48	1696	2705	3133	*	4215
Approximately 3,200 feet upstream of Winston Road	9.66	1613	2576	2986	*	4020
Approximately 1.6 miles upstream of Winston Road	8.06	1443	2311	2682	*	3618

Table 14, "Summary of Stillwater Elevations" is not applicable in Johnston County.

Table 15, "Gage Information", lists the stream gages located in Johnston County, including the drainage area of the flooding source at the gage and the period of record available at the time of the publication of this FIS Report.

Table 15 - Gage Information

Gage Number	Flooding Source	Site Name	Drainage Area (square miles)	Period of Record	
				From	To
02088210	Hannah Creek Tributary 2	HANNAH CREEK NEAR BENSON, N.C.	2.59	1953	1971
02088000	Middle Creek	MIDDLE CREEK NEAR CLAYTON, NC	83.50	1939	2013
02087500	Neuse River	NEUSE RIVER NEAR CLAYTON, NC	1150.00	1919	2013
02088140	Stone Creek	STONE CREEK NEAR NEWTON GROVE, N.C.	27.90	1953	1971

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the flood elevations for the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and/or Water-surface elevation rasters. For stream segments for which BFEs were computed, selected cross-section locations are also shown on the FIRM. Flood Profiles and/or Water-surface elevation rasters were developed showing computed water-surface elevations for floods of the selected recurrence intervals.

Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles and/or Water-surface elevation rasters or in the Floodway Data tables in the FIS Report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in the FIS in conjunction with the data shown on the FIRM.

The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the Flood Profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For details on the county's hydraulic analyses, the hydraulic report is available by request.

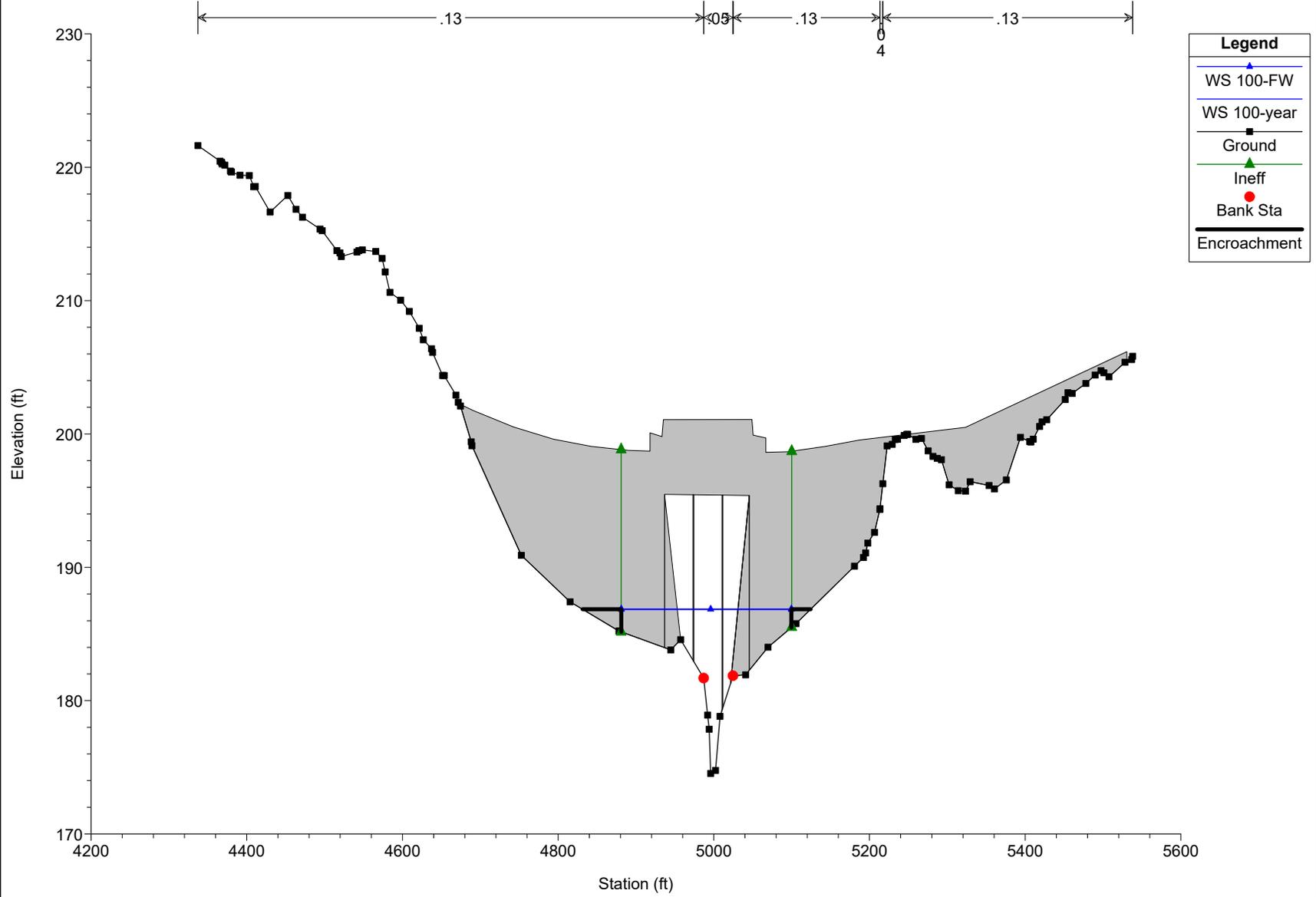
Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
White Oak Creek									
002	217	108	742	5.1	184.8 ¹	*	176.4	176.4	0.0
006	616	67	463	8.2	184.8 ¹	*	177.3	177.3	0.0
010	1,046	215	1,218	3.1	184.8 ¹	*	179.5	179.7	0.2
015	1,500	382	1,996	1.9	184.8 ¹	*	180.0	180.4	0.4
021	2,060	290	1,482	2.6	184.8 ¹	*	180.5	181.0	0.5
025	2,456	362	1,785	2.1	184.8 ¹	*	181.0	181.6	0.6
031	3,054	449	2,159	1.8	184.8 ¹	*	181.7	182.3	0.6
036	3,629	338	1,414	2.7	184.8 ¹	*	182.3	182.9	0.6
038	3,845	487	1,545	2.5	184.8 ¹	*	182.6	183.3	0.7
041	4,062	451	1,949	2.0	184.8 ¹	*	183.7	184.0	0.2
047	4,694	524	2,133	1.8	185.0	*	185.0	185.1	0.1
051	5,084	417	1,611	2.4	185.7	*	185.7	185.7	0.0
058	5,829	202	1,050	3.5	189.2	*	189.2	189.2	0.0
063	6,292	451	3,921	0.9	196.6	*	196.6	196.6	0.0
072	7,229	177	1,533	2.4	196.6	*	196.6	196.6	0.0
080	8,045	655	3,373	1.1	196.8	*	196.8	196.8	0.0
087	8,727	291	2,911	1.2	196.8	*	196.8	196.8	0.0
097	9,735	433	3,552	1.0	196.9	*	196.9	196.9	0.0
103	10,314	224	1,694	2.2	196.9	*	196.9	196.9	0.0
108	10,804	645	4,044	0.9	197.0	*	197.0	197.0	0.0
112	11,206	437	1,937	1.9	197.1	*	197.1	197.1	0.0
115	11,514	466	1,777	2.0	197.4	*	197.4	197.4	0.0
119	11,882	460	1,673	2.2	197.7	*	197.7	197.9	0.2
125	12,514	446	2,088	1.8	198.0	*	198.0	198.3	0.3
134	13,435	269	976	3.2	198.4	*	198.4	198.7	0.3
143	14,336	369	1,248	2.5	201.3	*	201.3	202.0	0.6
147	14,694	463	1,588	2.0	202.3	*	202.3	203.0	0.7
159	15,857	355	1,785	1.8	206.2	*	206.2	206.3	0.0
164	16,387	444	1,816	1.7	206.6	*	206.6	206.8	0.3
173	17,298	392	1,430	2.2	207.3	*	207.3	207.8	0.5
178	17,809	267	880	3.6	208.6	*	208.6	209.2	0.6
183	18,267	93	656	4.8	209.9	*	209.9	210.6	0.7
184	18,410	51	377	8.3	210.0	*	210.0	210.5	0.5
189	18,930	276	1,705	1.8	211.8	*	211.8	212.5	0.7
196	19,604	112	578	5.2	212.5	*	212.5	213.1	0.6
200	20,042	235	1,230	2.4	214.0	*	214.0	214.8	0.8
208	20,758	410	2,244	1.3	214.9	*	214.9	215.7	0.8
211	21,097	308	1,516	2.0	215.2	*	215.2	216.0	0.8
218	21,756	123	883	3.4	216.3	*	216.3	217.0	0.7
220	21,963	120	748	4.0	216.7	*	216.7	217.4	0.7
225	22,473	86	658	4.5	218.4	*	218.4	219.1	0.7
234	23,401	356	2,377	1.3	220.1	*	220.1	221.0	0.8
238	23,844	178	1,323	2.3	220.5	*	220.5	221.3	0.8

PRELIMINARY

White Oak Creek Detailed Study Plan: Floodway Run 11/29/2010

NC HWY 42 (WOC) for Structure ID: J_WHI_01 Detailed Survey Struc



This spreadsheet computes the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows for ungaged urban stream or small, rural stream in Georgia, South Carolina, and North Carolina, and that has drainage area within hydrologic region 1. The spreadsheet also includes the 95-percent prediction interval minus and plus standard error of prediction intervals, and the average standard error of prediction. To use this spreadsheet, enter requested information in the yellow cells below.

Enter a site-description name:

R-3410 Site 3 - White Oak Creek

Enter the explanatory variables:

Drainage area, in square miles	13.5
Percentage of impervious area, in percent	20

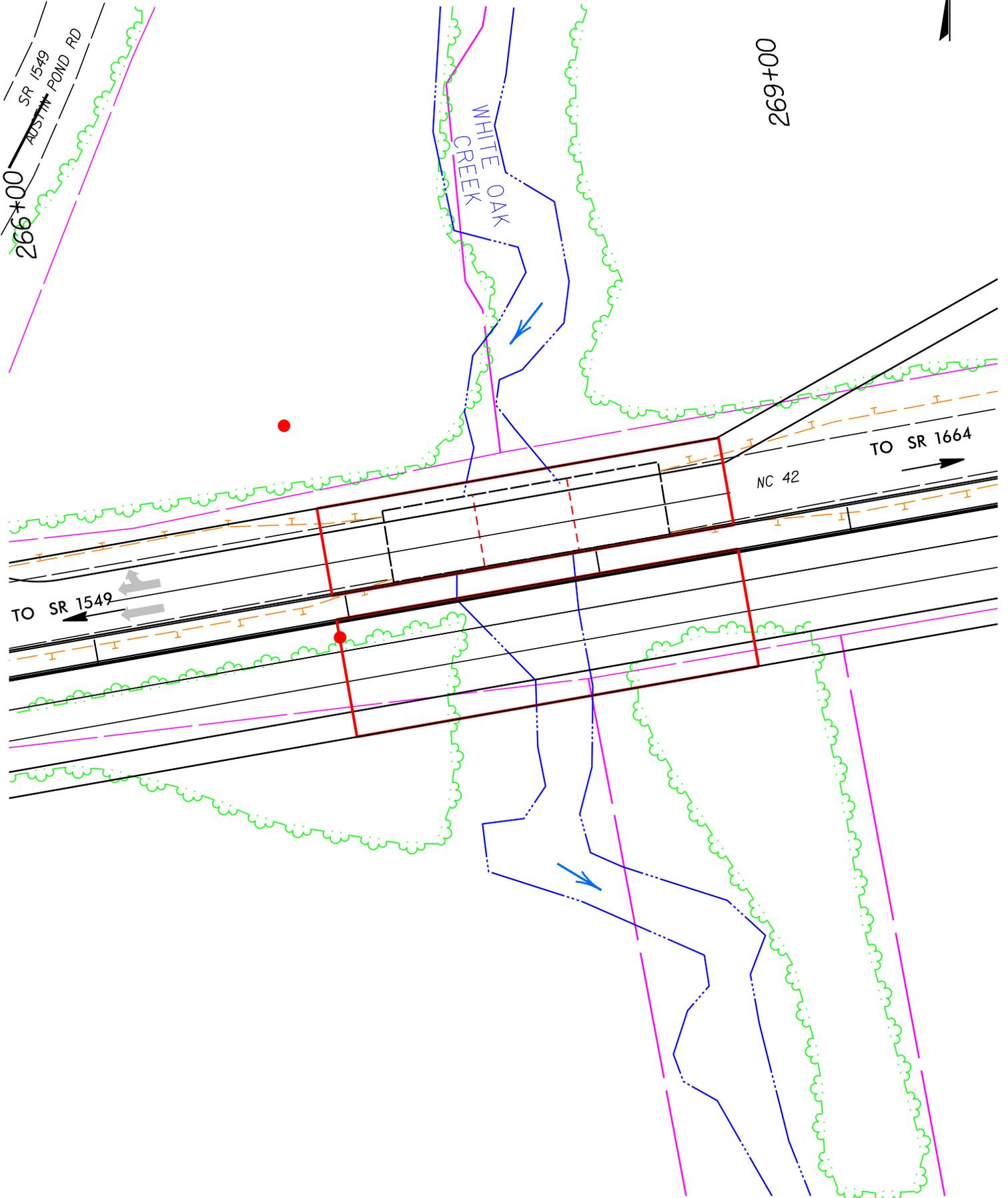
Applicable range of drainage area is 0.10 to 436 square miles

Applicable range of percentage of impervious area is 0.0 to 100 percent

Warnings and Cautions

Percent chance exceedance	Percent chance exceedance flow, in ft ³ /s	Lower 95 percent prediction interval flow, in ft ³ /s	Upper 95 percent prediction interval flow, in ft ³ /s	-S _{p,i} (percent)	+S _{p,i} (percent)	Average S _{p,i} (percent)
50	1,400	730	2,680	-28.1	39.1	33.9
20	2,170	1,190	3,960	-26.3	35.7	31.3
10	2,700	1,500	4,850	-25.7	34.6	30.4
4	3,370	1,840	6,160	-26.4	35.9	31.4
2	3,870	2,080	7,210	-27.1	37.1	32.4
1	4,350	2,260	8,380	-28.3	39.5	34.2
0.5	4,860	2,440	9,670	-29.5	41.8	36.0
0.2	5,520	2,650	11,500	-31.1	45.1	38.5

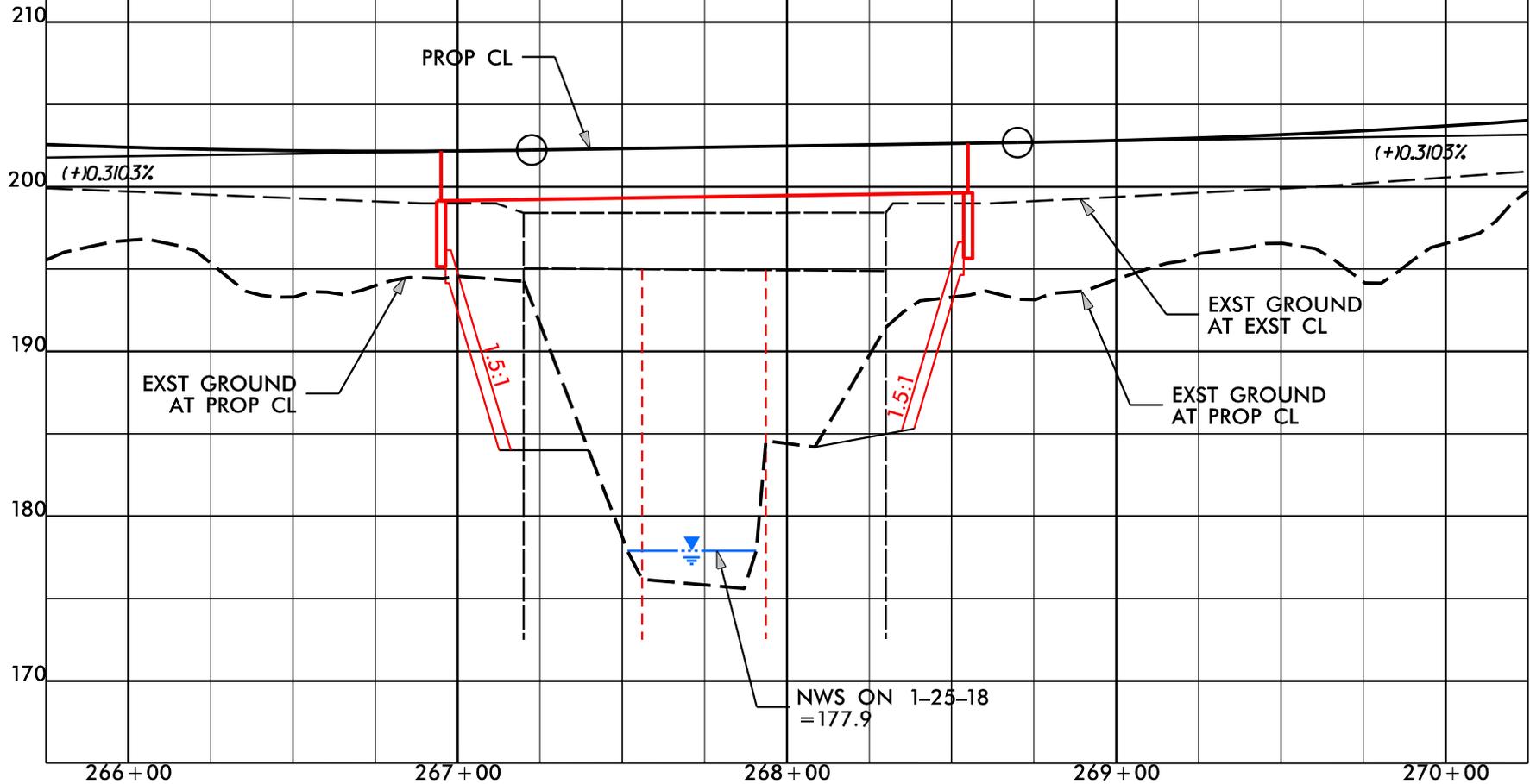
R-3410
SITE 3 WHITE OAK CREEK
JOHNSTON COUNTY
1" = 50'



BED PROFILE @ UPSTREAM FACE **WHITE OAK CREEK**

PI = 264+50.00
 EL = 201.38'
 VC = 545'
 K = 137

PI = 271+50.00
 EL = 203.56'
 VC = 560'
 K = 141



WEST

R-3410 NC 42

EAST

SITE #3 JOHNSTON COUNTY

VERTICAL SCALE: 1" = 10'
 HORIZONTAL SCALE: 1" = 50'



Upstream face of bridge



Looking upstream from roadway



Downstream face of bridge



Looking downstream from roadway



Looking west



Looking east

Site 4

Little Creek

All Alternatives

Site 4**Stream: Little Creek****Alignment: All**

Site 4 is located at Little Creek and is crossed by existing NC 42 and all alternatives. The existing structure number is 500058 and is a 2 @ 35' prestressed concrete cored slab bridge. The existing bridge was constructed in 1967 and has a sufficiency rating of 51.75 and is classified as functionally obsolete. There is an existing multiuse path bridge just upstream of NC 42 and high tension power lines cross NC 42 just west of the existing bridge.

Little Creek is located in the Neuse River Basin and is subject to the Neuse River Riparian Buffer Rules. According to NCDEQ, Swift Creek (Index #27-43-12) is classified as Class C and Nutrient Sensitive Waters and is not included on the 2014 303d list of impaired streams.

Johnston County is a participant in the Federal Flood Insurance Program. The proposed crossing is located in a Detailed Study Area. An MOA will be required for this stream crossing. Based on available mapping, there are insurable structures located in the floodplain upstream of the bridge.

The drainage area at this location is approximately 5.5 square miles. The drainage basin currently consists of a large portion of downtown Clayton and the Business 70 corridor. It is anticipated that the drainage basin will continue to be developed with large shopping centers and medium density residential in the future. Below are the flow rates obtained from the USGS SIR 2014-5030 (Region 1) with an impervious percentage of 35% compared with the FEMA Effective and Preliminary discharges:

<u>USGS</u>	<u>FEMA Effective</u>	<u>FEMA Preliminary</u>
Q10= 2020 cfs		Q10=1222 cfs
Q50= 2700 cfs		Q50=2059 cfs
Q100 = 2950 cfs	Q100=4250 cfs	Q100=2347 cfs
Q500 = 3560 cfs		Q500=3171 cfs

According to the Effective and Preliminary FEMA models and history from locals, the existing bridge and roadway are overtopped frequently. The proposed roadway grade should be raised to provide 2 feet of freeboard above the 50-year design storm event. According to the Preliminary FEMA model, the 50-year elevation is 242.4 so the minimum low chord should be set at 244.4. The proposed bridge should be approximately 150 feet long. The bridge length is based on the Preliminary floodway width.

The length of the proposed bridge and the recommended roadway elevation may be adjusted (increased or decreased) to accommodate design floods as determined in the final hydrologic study and hydraulic design.

County: Johnston Stream: Little Creek

Road #: NC 42 Road Name: S Lombard Street

Division: 4 Location: 0.1 mile west of JCT with US 70 BUS

Latitude: 35.64424 Longitude: -78.46489 Decimal degrees, a min of 5 decimal points

Assigned to:

Prepared By: Sungate Design Group, P.A.

Hydro Reviewer:

Project Type:

Existing Structure

Structure Type: Cored Slab Yr Built: 1967

Span Arrangement: 2 @ 35' OAL (ft): 70.0 Skew: 90 Abutment Type: Spill Through

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

Bed to Crown (ft): 9.6 Clear Roadway (ft): 26.0 Water Depth (ft): 1.0 Superstructure Depth: 1.6 ft

ADT: 18,000 Year ADT: 2013 Scour Code (item113): N/A Prior Survey Completed: No Survey Date:

Drainage Area: 5.5 Sq. Mi. Drainage Area Source: Quad Roadway Overtops at Q100: Yes

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

Q10 (cfs): 2,020.0 Q25 (cfs): 2,420.0 Q50 (cfs): 2,700.0 Q100 (cfs): 2,950.0 QBFE (cfs): 4,250.0

Structure in Flood Hazard Zone: Yes Panel #: 1658 Panel Date: 12/02/2005 Type of FIS: REDELINEATED Date of FIS: 01/05/2007

Environmental

Quad Map: CLAYTON, NC River Basin: Neuse Buffer Rule: Neuse

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: 0.15 Mi West of US 70 BUS

Structure #: 500398 Route: SR 1552

Latitude: 35.64959 Longitude: -78.47213

Prior Survey Completed: No Survey Date:

Structure Type: RCBC

Span Arrangement: OAL (ft):

Number of Barrels: 2 @ Span (ft): 12.0 x Rise (ft): 7.0

Bed to Crown (ft): 10.0 Year Built:

Downstream Feature: Bridge

Location: 0.2 Mi East of US 70 Bypass

Structure #: 500207 Route: SR 1560

Latitude: 35.61433 Longitude: -78.45983

Prior Survey Completed: No Survey Date:

Structure Type: Bridge

Span Arrangement: 3 @ 61' PSCG OAL (ft): 183.00

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

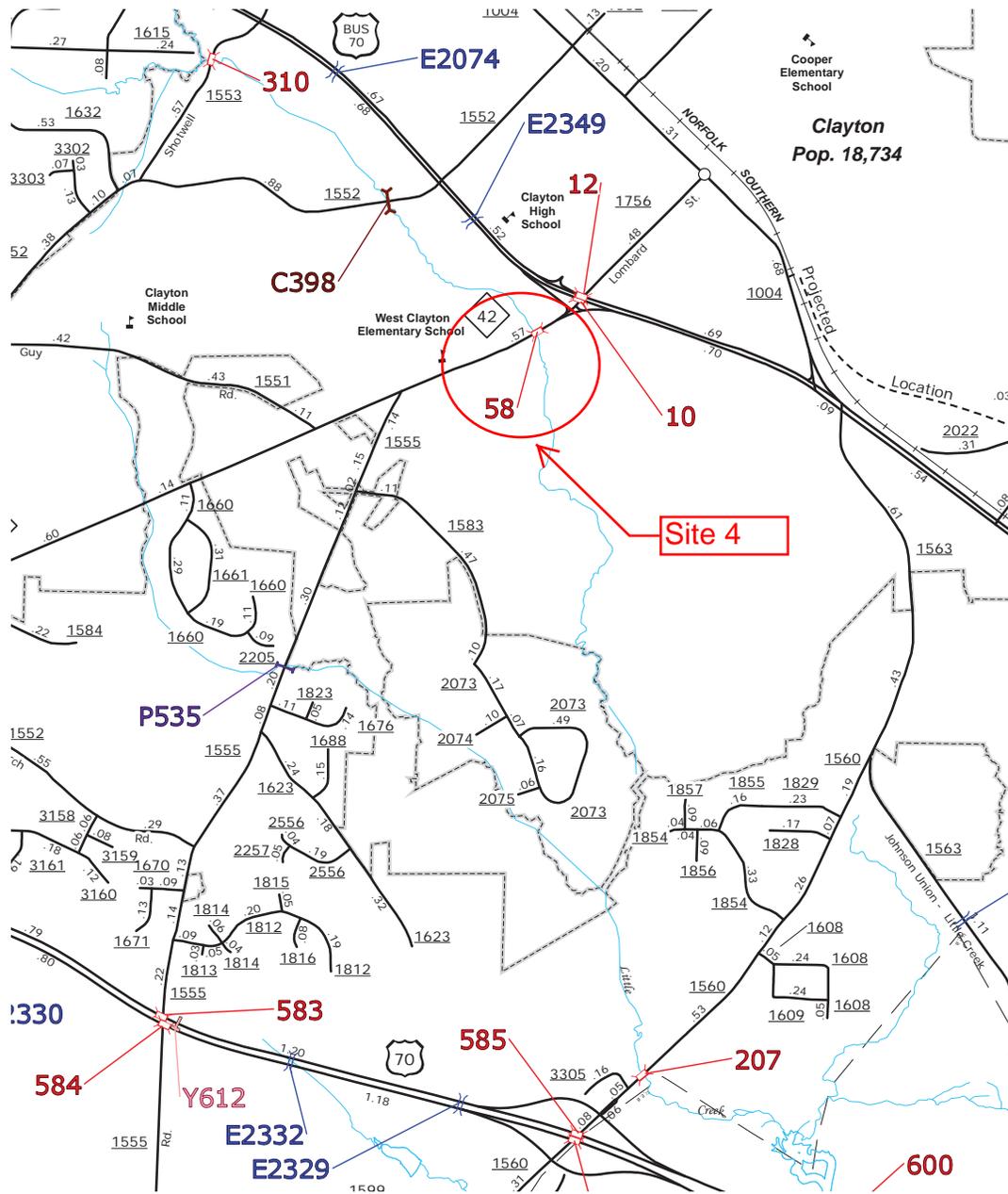
Bed to Crown (ft) 19.5 Year Built:

Preliminary Structure Estimate [Office Estimate]

Structure Type: Bridge Skew: 90

Dimensions/Spans: 150' long bridge

Notes





NC DEPARTMENT OF TRANSPORTATION ATTENTION:
 DIVISION OF HIGHWAYS
 STRUCTURE MANAGEMENT UNIT

Structure Safety Report

Routine Element Inspection

COUNTY: JOHNSTON STRUCTURE NUMBER: 500058 FREQUENCY: 24 MONTHS

FACILITY CARRIED: NC42 MILE POST: _____

LOCATION: 0.1 MI W JCT US70

FEATURE INTERSECTED: LITTLE CREEK

LATITUDE: 35° 38' 39.21" LONGITUDE: 78° 27' 53.74"

SUPERSTRUCTURE: PRESTRESSED CONCRETE CORED SLAB (BMD-19)

SUBSTRUCTURE: EBTS&IBTS:PPC CAP/H-PILES;ENCASED IN CONC.

SPANS: ^{2@35'}
2@35'

FRACTURE CRITICAL TEMPORARY SHORING SCOUR CRITICAL SCOUR PLAN OF ACTION

PRESENT CONDITION: Fair INSPECTION DATE: 11/04/2015

POSTED SV: Not Posted POSTED TTST: Not Posted

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 Willis C May	SIGNATURE <i>Willis C May</i>	ASSISTED BY Wayne T Wilkinson
------------------------------	----------------------------------	----------------------------------

Span Element Report

Structure Number: 500058

Inspection Date: 11/04/2015

Span Number 1

Span Length 35 Feet

Number of Slabs/Channels: 11

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
15		Prestressed Concrete Top Flange	1,034	1,034	0	0	0	0	3326
104		Prestressed Concrete Closed Web/Box	374	354	20	0	0	20	3306
216		Timber Abutment	33	31	2	0	0	2	3346
225		Steel Pile	6	1	5	0	0	6	3354
515	225	Steel Protective Coating	42	6	0	0	36	36	3342
233		Prestressed Concrete Pier Cap	33	25	0	8	0	8	3348
310		Elastomeric Bearing	22	22	0	0	0	0	3334
330		Metal Bridge Railing	70	0	67	2	1	70	3322
515	330	Steel Protective Coating	530	384	42	0	104	146	3342
510		Wearing Surface	1,024	1,024	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Span Number 2

Span Length 35 Feet

Number of Slabs/Channels: 11

Element Number	Parent Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code
15		Prestressed Concrete Top Flange	1,034	1,034	0	0	0	0	3326
104		Prestressed Concrete Closed Web/Box	374	369	5	0	0	5	3306
216		Timber Abutment	33	31	1	1	0	2	3346
225		Steel Pile	12	2	5	5	0	22	3354
515	225	Steel Protective Coating	186	120	0	0	66	66	3342
233		Prestressed Concrete Pier Cap	66	52	0	14	0	14	3348
301		Pourable Joint Seal	0	-16	16	0	0	16	3310
310		Elastomeric Bearing	22	22	0	0	0	0	3334
330		Metal Bridge Railing	70	0	66	4	0	70	3322
515	330	Steel Protective Coating	518	393	27	0	98	125	3342
510		Wearing Surface	1,024	1,024	0	0	0	0	2816

"Near" Approach and Substructure quantities have been include for reporting purposes. The last span will also include End Bent 2 and Far Approach quantities where applicable

Superstructure Detailed Element Quantities

Structure Number: 500058

Inspection Date: 11/04/2015

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Bridge Rail	1	330	Metal Bridge Railing	35	0	33	1	1	35	3322	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	259	181	25	0	53	78	3342	
<input checked="" type="checkbox"/> Bridge Rail	2	330	Metal Bridge Railing	35	0	34	1	0	35	3322	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	271	203	17	0	51	68	3342	
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	1024	1024	0	0	0	0	2816	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	1	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	2	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	2	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	3	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	3	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	4	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	4	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	5	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	5	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	6	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	6	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	7	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	7	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	8	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	8	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	9	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	9	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	10	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	10	104	Prestressed Concrete Closed Web/Box C	34	26	8	0	0	8	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	11	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	11	104	Prestressed Concrete Closed Web/Box C	34	22	12	0	0	12	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	1	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	1	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	2	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	2	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input type="checkbox"/> Bearing Device	3	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	3	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	5	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	5	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	6	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	6	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	7	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	7	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	8	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	8	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	9	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	9	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	10	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	10	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	11	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	11	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Bridge Rail	1	330	Metal Bridge Railing	35	0	31	4	0	35	3322	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	259	194	10	0	55	65	3342	
<input checked="" type="checkbox"/> Bridge Rail	2	330	Metal Bridge Railing	35	0	35	0	0	35	3322	<input type="checkbox"/> Requested
Protective System		515	Steel Protective Coating	259	199	17	0	43	60	3342	
<input checked="" type="checkbox"/> Wearing Surfaces		510	Wearing Surface	1024	1024	0	0	0	0	2816	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	1	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	1	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	2	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	2	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	3	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	3	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	4	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	4	104	Prestressed Concrete Closed Web/Box C	34	29	5	0	0	5	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	5	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	5	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	6	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	6	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	7	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	7	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	8	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	8	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	9	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	9	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	10	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	10	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Beam	11	15	Prestressed Concrete Top Flange	94	94	0	0	0	0	3326	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Beam	11	104	Prestressed Concrete Closed Web/Box C	34	34	0	0	0	0	3306	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	1	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	1	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	2	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	2	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input type="checkbox"/> Bearing Device	3	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	3	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	4	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	5	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	5	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	6	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	6	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	7	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	7	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	8	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	8	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	9	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	9	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	10	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	10	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	11	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Bearing Device	11	310	Elastomeric Bearing	1	1	0	0	0	0	3334	<input type="checkbox"/> Requested
<input type="checkbox"/> Expansion Joints	1	301	Pourable Joint Seal	0	-16	16	0	0	16	3310	<input type="checkbox"/> Requested

Superstructure Element Defect Descriptions

Structure Number: 500058

Inspection Date: 11/04/2015

Span Number 1

Span	Bridge Rail	1	Component Name:	Steel Rail
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Element: 330 Name Metal Bridge Railing Qty: 35 Lvl 2: 33 Lvl 3 1 Lvl 4 1 Maint. Qty 35

Defect Description:

1 foot of Corrosion at post #3. Section loss consisting of 2 holes, 1" Diameter & 2" x 1" in flange against the exterior slab.
 33 Feet of Corrosion along guardrail, wheel-guard and posts: Freckled rust. Corrosion of the steel has initiated.
 1 Feet of Connection: Missing nut at the guardrail connection of post # 1.
 18 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal at various guardrail posts.
 35 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal along wheel-guard.
 25 Square Feet of Peeling/Bubbling/Cracking (steel Protective Coatings): Finish coats only.

Span	Bridge Rail	2	Component Name:	Steel Rail
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Element: 330 Name Metal Bridge Railing Qty: 35 Lvl 2: 34 Lvl 3 1 Lvl 4 0 Maint. Qty 35

Defect Description:

1 foot of Corrosion in flange of guardrail post #4: 0.063" to 0.188" Section loss is evident or pack rust is present. 0.125" to 0.25" remaining.
 34 Feet of Corrosion in guardrail, wheel-guard and posts: Freckled rust. Corrosion of the steel has initiated.
 35 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal along guardrail and wheel-guard.
 16 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal on various guardrail posts.
 17 Square Feet of Peeling/Bubbling/Cracking along wheel-guard (steel Protective Coatings): Finish coats only.

Span	Wearing Surfaces		Component Name:	Asphalt Wearing Surface
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Element: 510 Name Wearing Surface Qty: 1024 Lvl 2: 0 Lvl 3 0 Lvl 4 0 Maint. Qty 0

Defect Description:

Replaced since last inspection.

Span	Beam	1	Component Name:	Prestressed Concrete Cored Slab
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Element: 104 Name Prestressed Concrete Closed V Qty: 34 Lvl 2: 0 Lvl 3 0 Lvl 4 0 Maint. Qty 0

Defect Description:

The exterior face is scaled with exposed coarse aggregate.

Span	Beam	10	Component Name:	Prestressed Concrete Cored Slab
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Element: 104 Name Prestressed Concrete Closed V Qty: 34 Lvl 2: 8 Lvl 3 0 Lvl 4 0 Maint. Qty 8

Defect Description:

8 Feet of Patched area that is sound in the bottom of slab.

Span	Beam	11	Component Name:	Prestressed Concrete Cored Slab
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Element: 104 Name Prestressed Concrete Closed V Qty: 34 Lvl 2: 12 Lvl 3 0 Lvl 4 0 Maint. Qty 12

Defect Description:

12 Feet of Patched area that is sound in the exterior face at end bent 1.

Span Number 2

Span	Bridge Rail	1	Component Name:	Steel Rail
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Element: 330 Name Metal Bridge Railing Qty: 35 Lvl 2: 31 Lvl 3 4 Lvl 4 0 Maint. Qty 35

Defect Description:

4 Feet of Corrosion: 0.063" to 0.188" Section loss is evident or pack rust is present in post flanges at the exterior slab. 0.125" to 0.25" remaining.
 31 Feet of Corrosion: Freckled rust. Corrosion of the steel has initiated along guardrail, wheel-guard and posts.
 35 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal along wheel-guard.
 10 Square Feet of Peeling/Bubbling/Cracking along wheel-guard (steel Protective Coatings): Finish coats only.
 20 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal at various posts.

Structure Number: 500058

Inspection Date: 11/04/2015

Span 2 Bridge Rail 2 Component Name: Steel Rail

Element: 330 Name Metal Bridge Railing Qty: 35 Lvl 2: 35 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 35

Defect Description:

35 Feet of Corrosion: Freckled rust. Corrosion of the steel has initiated along guardrail, wheel-guard and posts.
35 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal along wheel-guard.
17 Square Feet of Peeling/Bubbling/Cracking along wheel-guard (steel Protective Coatings): Finish coats only.
8 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal at various posts.

Span 2 Wearing Surfaces Component Name: Asphalt Wearing Surface

Element: 510 Name Wearing Surface Qty: 1024 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 0

Defect Description:

Replaced since last inspection.

Span 2 Beam 4 Component Name: Prestressed Concrete Cored Slab

Element: 104 Name Prestressed Concrete Closed V Qty: 34 Lvl 2: 5 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 5

Defect Description:

5 Feet of Patched area that is sound in the bottom of slab.

Span 2 Expansion Joints 1 Component Name: Standard Joint

Element: 301 Name Pourable Joint Seal Qty: 0 Lvl 2: 16 Lvl 3: 0 Lvl 4: 0 Maint. Qty: 16

Defect Description:

16 Feet of Leakage: Minimal. Minor dripping through the joint.

Substructure Detailed Element Quantities

Structure Number: 500058
End Bent 1

Inspection Date: 11/04/2015

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Abutments	1	216	Timber Abutment	33	31	2	0	0	2	3346	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Caps	1	233	Prestressed Concrete Pier Cap	33	25	0	8	0	8	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	0	1	0	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	515	Steel Protective Coating	7	1	0	0	6	6	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	1	0	0	0	1	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	515	Steel Protective Coating	7	1	0	0	6	6	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	0	1	0	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	515	Steel Protective Coating	7	1	0	0	6	6	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	0	1	0	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	515	Steel Protective Coating	7	1	0	0	6	6	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	0	1	0	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	515	Steel Protective Coating	7	1	0	0	6	6	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	0	1	0	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	515	Steel Protective Coating	7	1	0	0	6	6	3342	<input type="checkbox"/> Requested

Bent 1

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	0	1	0	0	4	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Caps	1	233	Prestressed Concrete Pier Cap	33	24	0	9	0	9	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	0	1	0	0	4	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	1	0	0	0	0	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	0	1	0	0	4	3354	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	0	1	0	0	4	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	515	Steel Protective Coating	24	18	0	0	6	6	3342	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	2	515	Steel Protective Coating	24	18	0	0	6	6	3342	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	515	Steel Protective Coating	24	24	0	0	0	0	3342	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	515	Steel Protective Coating	24	24	0	0	0	0	3342	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	515	Steel Protective Coating	24	18	0	0	6	6	3342	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	515	Steel Protective Coating	24	18	0	0	6	6	3342	<input type="checkbox"/> Requested

Structure Number: 500058

Inspection Date: 11/04/2015

End Bent 2

Element Location	Location Number	Element Number	Element Name	Total Quantity	Level 1 Quantity	Level 2 Quantity	Level 3 Quantity	Level 4 Quantity	Maint. Quantity	Maint. Code	Priority Maintenance
<input checked="" type="checkbox"/> Abutments	1	216	Timber Abutment	33	31	1	1	0	2	3346	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Caps	1	233	Prestressed Concrete Pier Cap	33	28	0	5	0	5	3348	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	1	225	Steel Pile	1	0	1	0	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	1	515	Steel Protective Coating	7	0	0	0	7	7	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	2	225	Steel Pile	1	0	0	1	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	2	515	Steel Protective Coating	7	0	0	0	7	7	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	3	225	Steel Pile	1	0	0	1	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	3	515	Steel Protective Coating	7	0	0	0	7	7	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	4	225	Steel Pile	1	0	0	1	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	4	515	Steel Protective Coating	7	0	0	0	7	7	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	5	225	Steel Pile	1	0	0	1	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	5	515	Steel Protective Coating	7	0	0	0	7	7	3342	<input type="checkbox"/> Requested
<input checked="" type="checkbox"/> Piles and Columns	6	225	Steel Pile	1	0	0	1	0	1	3354	<input type="checkbox"/> Requested
<input type="checkbox"/> Piles and Columns	6	515	Steel Protective Coating	7	0	0	0	7	7	3342	<input type="checkbox"/> Requested

Substructure Element Defect Descriptions

Structure Number: 500058

Inspection Date: 11/04/2015

End Bent 1

End Bent 1	Row 1	Abutments	1							
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Element: 216 Name Timber Abutment Qty: 33 Lvl 2: 2 Lvl 3: 0 Lvl 4: 0 Maint. Qty 2

Defect Description:

2 Feet of Check/Shake in the left and right side bulkhead piles : Penetrates 5%-50% of the thickness of the member and not in a tension zone.

Architectural cloth covering bulkhead from pile 1 to pile 4, boards not visible.

End Bent 1	Row 1	Caps	1							
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Element: 233 Name Prestressed Concrete Pier Cap Qty: 33 Lvl 2: 0 Lvl 3: 8 Lvl 4: 0 Maint. Qty 8

Defect Description:

8 Feet of spalled area: spalls 2 in x 2 in x 1.5 in deep in the bottom corner of cap at the pile bearing plates of piles 1,2,3,4, & 6.

End Bent 1	Row 1	Piles and Columns	1							
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

A section of the pile has been replaced. A concrete collar has been placed over the splice.

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 1	Row 1	Piles and Columns	2							
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

A section of the pile has been replaced. A concrete collar has been placed over the splice.

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 1	Row 1	Piles and Columns	3							
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

A section of the pile has been replaced. A concrete collar has been placed over the splice.

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 1	Row 1	Piles and Columns	4							
------------	-------	-------------------	---	--	--	--	--	--	--	--

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

A section of the pile has been replaced. A concrete collar has been placed over the splice.

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 1	Row 1	Piles and Columns	5							
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

A section of the pile has been replaced. A concrete collar has been placed over the splice.

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.

6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 1	Row 1	Piles and Columns	6							
------------	-------	-------------------	---	--	--	--	--	--	--	--

Structure Number: 500058

Inspection Date: 11/04/2015

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

A section of the pile has been replaced. A concrete collar has been placed over the splice.
1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Bent 1 Row 1 Piles and Columns 1

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 4

Defect Description:

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Bent 1 Row 1 Caps 1

Element: 233 Name Prestressed Concrete Pier Cap Qty: 33 Lvl 2: 0 Lvl 3: 9 Lvl 4: 0 Maint. Qty 9

Defect Description:

9 Feet of spalled area: spalls 2 in x 2 in x 1.5 in deep in the bottom corner of cap at the pile bearing plates of the piles on span 1 side and span 2 side of cap.

Bent 1 Row 1 Piles and Columns 2

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 4

Defect Description:

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Bent 1 Row 1 Piles and Columns 5

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 4

Defect Description:

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

Bent 1 Row 1 Piles and Columns 6

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 4

Defect Description:

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
6 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 2 Row 1 Abutments 1

Element: 216 Name Timber Abutment Qty: 33 Lvl 2: 1 Lvl 3: 1 Lvl 4: 0 Maint. Qty 2

Defect Description:

1 Feet of Decay/Section Loss: the top of the left bulkhead pile is decayed down 3 in deep.
1 Feet of Check/Shake in the right bulkhead pile : Penetrates 5%-50% of the thickness of teh member and not in a tension zone.
The right side bulkhead boards from the cap to the right end have been replaced.
the right side bulkhead pile has been spliced and has a concrete collar.

End Bent 2 Row 1 Caps 1

Element: 233 Name Prestressed Concrete Pier Cap Qty: 33 Lvl 2: 0 Lvl 3: 5 Lvl 4: 0 Maint. Qty 5

Defect Description:

5 Feet of spalled area: spalls 2 in x 2 in x 1.5 in deep in the bottom corner of cap at the pile bearing plates of piles 1,2,3,4, & 6.

End Bent 2 Row 1 Piles and Columns 1

Structure Number: 500058

Inspection Date: 11/04/2015

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 1 Lvl 3: 0 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Freckled Rust. Corrosion of the steel has initiated.
7 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 2	Row 1	Piles and Columns	2
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss in the flanges and web with 1/4 in remaining 6 in high from concrete collar to top of pile.
7 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 2	Row 1	Piles and Columns	3
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Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss in the flanges and web with 1/4 in remaining 6 in high from concrete collar to top of pile.
7 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 2	Row 1	Piles and Columns	4
------------	-------	-------------------	---

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss in the flanges and web with 1/4 in remaining 6 in high from concrete collar to top of pile.
7 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 2	Row 1	Piles and Columns	5
------------	-------	-------------------	---

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss in the flanges and web with 1/4 in remaining 6 in high from concrete collar to top of pile.
7 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

End Bent 2	Row 1	Piles and Columns	6
------------	-------	-------------------	---

Element: 225 Name Steel Pile Qty: 1 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0 Maint. Qty 1

Defect Description:

1 Each of Corrosion: Section loss in the flanges and web with 1/4 in remaining 6 in high from concrete collar to top of pile.
7 Square Feet of Effectiveness (Steel Protective Coatings): Failed; no protection of the underlying metal.

National Bridge and NC Inspection Items

Structure Number: 500058

Inspection Date: 11/04/2015

National Bridge Inventory Items

Item	Grade Scale	Grade
Item 58: Deck	0 - 9 , N	6
Item 59: Superstructure	0 - 9 , N	6
Item 60: Substructure	0 - 9 , N	5
Item 61: Channel and Channel Protection	0 - 9 , N	7
Item 62: Culvert	0 - 9 , N	
Item 71: Waterway Adequacy	0 - 9 , N	7
Item 72: Approach Roadway Alignment	0 - 9 , N	8

Note: If NBI Inspection Item is not present, code NBI item with "N"

NC SMU Inspection Items

Item	Grade Scale	Grade	Maint. Qty.	Maint. Code
Deck Debris	G, F, P, or C	F	70	3376
Drainage System	G, F, P, or C	F	0	3332
Utilities	G, F, P, or C			
Slope Protection	G, F, P, or C	G	0	3352
Scour	G, F, P, or C	G		
Wingwall	G, F, P, or C		0	3350
Field Scour Evaluation		G		
Drift	G, F, P, or C	G	0	3366
Fender System	G, F, P, or C		0	3364
Movable Span Machinery	G, F, P, or C			
Response to Live Load	G, F, P, or C	G		
Estimated Remaining Life	0 - 100 Years	20		

Note: If NC SMU Inspection Item is not present, leave NC SMU item blank

Inspection Information

Item	Grade Scale	Grade
Regulatory Sign Noticed Issued	YES/NO	N
Priority Maintenance Request Submitted	YES/NO	N
Inspection Time	Hours	6
Traffic Control Time	Hours	
Snooper Time	Hours	
Ladder Used	YES/NO	N
Bucket Truck Used	YES/NO	N
Boat Used	YES/NO	N
Other Equipment Used	YES/NO	Y

National Bridge and NC SMU Inspection Item Details

Structure Number: 500058

Inspection Date: 11/04/2015

Item	Other Equipment Used	Grade	Y	Maint Code	Qty.	0
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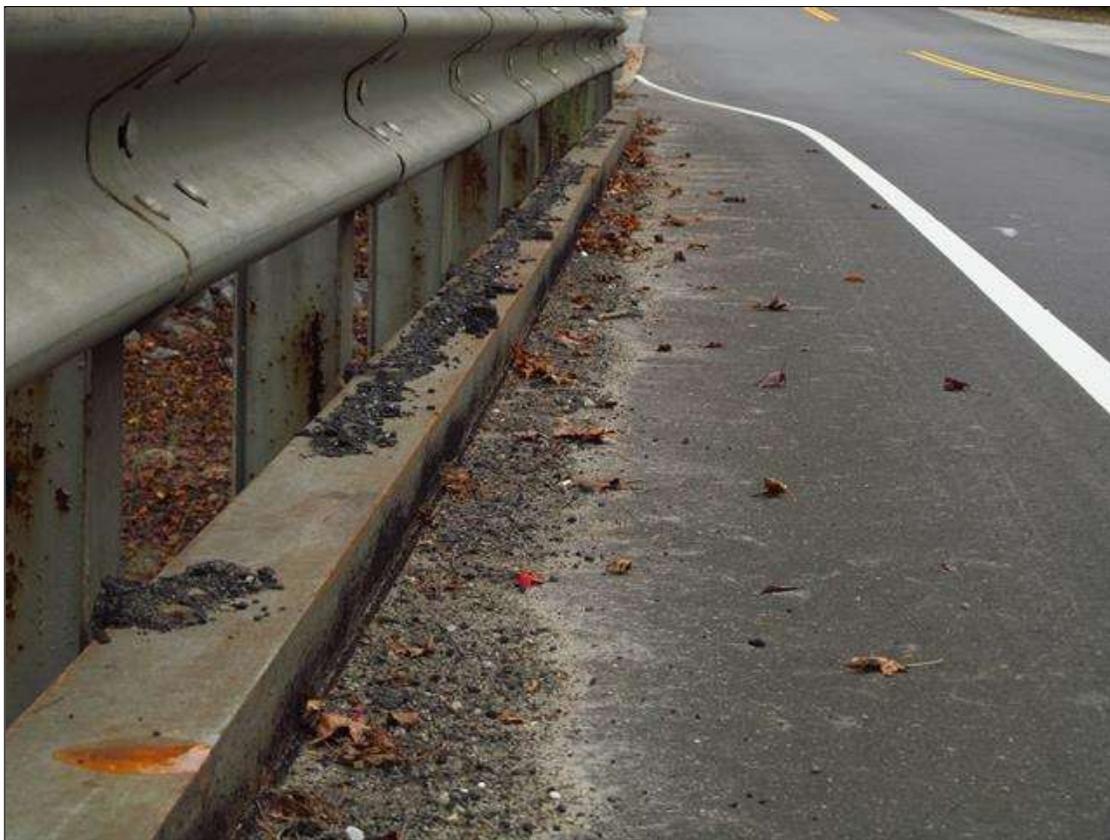
Details Boots.

Item	Deck Debris	Grade	F	Maint Code	3376	Qty.	70
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Details Debris out 1 ft along left guardrail.

Item	Drainage System	Grade	F	Maint Code	3332	Qty.	0
------	-----------------	-------	---	------------	------	------	---

Details Drainage under the left side wheelguard is blocked with asphalt.



Dirt and debris along gutterlines



Widespread areas of peeling/missing protective coating with Surface rust to exposed steel in guardrail posts



Dirt and debris buildup at the left end of End Bent 1 cap



Section of wheelguard has been replaced along the Right side of Span 1



Structure has temporary pile repairs at bulkheads



Areas of corrosion along guardrails



Areas of corrosion in guardrail posts



Random spots of Section loss in guardrail post flanges where posts are touching the exterior slabs



Up to 100% section loss in flange of Post #3 at the Left side of Span 1



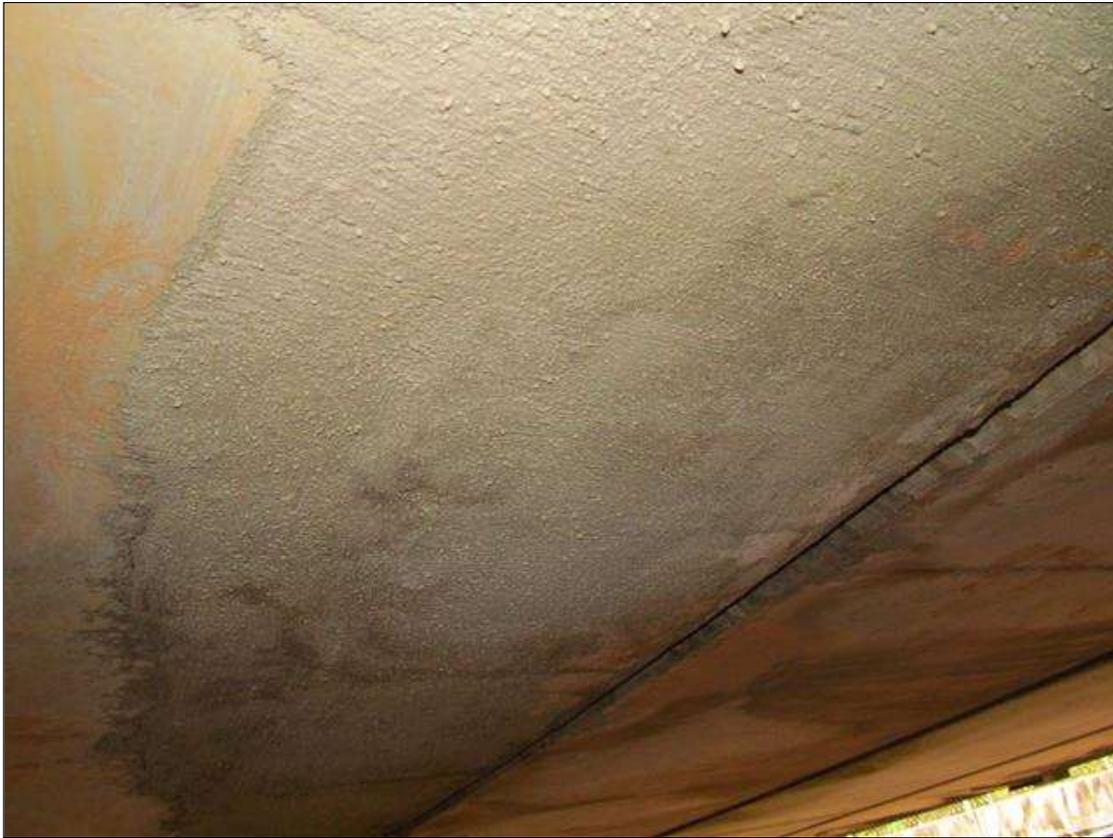
Spalling in bottom edge of End Bent 1 cap at piles bearing plates



Spalling along bottom edge of Bent 1 cap at pile bearing plates



Random leakage between slab units



Repair patch in the bottom of slab #4 in Span 2



Drainage along the Left side wheelguard blocked by Sediment and asphalt



Looking East



North profile



Asphalt wearing surface overview (new since last inspection)



3 guardrail post along the Right side of Span 1 have been replaced since last inspection



Looking west



South profile



End Bent 1 overview



Superstructure over End of cap



End Bent 2 overview



Superstructure overview



Bent 1 Span 2 side

IDENTIFICATION				CLASSIFICATION			
(1) STATE NAME -NORTH CAROLINA	BRIDGE	500058		SUFFICIENCY RATING =			51.75
(8) STRUCTURE NUMBER(FEDERAL)		000000001010058		STATUS =	Functionally Obsolete		
(5) INVENTORY ROUTE (ON/UNDER) - ON		31000420					
(2) STATE HIGHWAY DEPARTMENT DISTRICT		3					
(3) COUNTY CODE	101	(4) PLACE CODE	12860	(112)NBIS BRIDGE SYSTEM -			YES
(6) FEATURE INTERSECTED -	LITTLE CREEK			(104)HIGHWAY SYSTEM	Is not on NHS		0
(7) FACILITY CARRIED	NC42			(26) FUNCTIONAL CLASS -	Minor Arterial		16
(9) LOCATION	0.1 MI W JCT US70			(100)STRAHNET HIGHWAY -	Not a STRAHNET Route		0
(11)MILEPOINT		0		(101)PARALLEL STRUCTURE -	No Parallel Structure		N
(16)LAT	35° 38' 39.21"	(17)LONG	78° 27' 53.74"	(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
				(31) MAINTAIN -	State Highway Agency		01
				(22) OWNER -	State Highway Agency		01
				(37) HISTORICAL SIGNIFICANCE -	Not Eligible		5
STRUCTURE TYPE AND MATERIAL				CONDITION			
(43) STRUCTURE TYPE MAIN:	Prestressed Concrete			(58) DECK			6
TYPE -	Slab	CODE	501	(59) SUPERSTRUCTURE			6
(44) STRUCTURE TYPE APPR :				(60) SUBSTRUCTURE			5
TYPE -		CODE	000	(61) CHANNEL & CHANNEL PROTECTION			7
(45) NUMBER OF SPANS IN MAIN UNIT			2	(62) CULVERTS			N
(46) NUMBER OF APPROACH SPANS							
(107)DECK STRUCTURE TYPE -	2	CODE		LOAD RATING AND POSTING			
(108)WEARING SURFACE / PROTECTIVE SYSTEM :				(31) DESIGN LOAD	HS 15		3
(A) TYPE OF WEARING SURFACE -		CODE		(63) OPERATING RATING METHOD -	Load Factor		1
(B) TYPE OF MEMBRANE	-	CODE		(64) OPERATING RATING -	HS-24		43
(C) TYPE OF DECK PROTECTION -		CODE		(65) INVENTORY RATING METHOD -	Load Factor		1
				(66) INVENTORY RATING -	HS-14		25
				(70) BRIDGE POSTING -	Posting Required		3
				(41) STRUCTURE OPEN, POSTED ,OR CLOSED			A
				DESCRIPTION -	Open, No Restriction		
AGE AND SERVICE				APPRAISAL			
(27) YEAR BUILT			1967	(67) STRUCTURAL EVALUATION			5
(106)YEAR RECONSTRUCTED				(68) DECK GEOMETRY			2
(42) TYPE OF SERVICE : ON -	Highway			(69) UNDERCLEARANCES,VERTI & HORIZ			N
UNDER -	Waterway	CODE	15	(71) WATERWAY ADEQUACY			7
(28) LANES: ON STRUCTURE	2	UNDER STRUCTURE	0	(72) APPROACH ROADWAY ALIGNMENT			8
(29) AVERAGE DAILY TRAFFIC			18000	(36) TRAFFIC SAFETY FEATURES			0000
(30) YEAR OF ADT	2013	(109) TRUCK ADT PCT	6%	(113)SCOUR CRITICAL BRIDGES			8
(19) BYPASS OR DETOUR LENGTH			2 MI	PROPOSED IMPROVEMENTS			
GEOMETRIC DATA				(75) TYPE OF WORK -			CODE
(48) LENGTH OF MAXIMUM SPAN			34 FT	(76) LENGTH OF STRUCTURE IMPROVEMENT			
(49) STRUCTURE LENGTH			70 FT	(94) BRIDGE IMPROVEMENT COST			
(50)CURB OR SIDEWALK: LEFT	.25 FT	RIGHT	.25 FT	(95) ROADWAY IMPROVEMENT COST			
(51) BRIDGE ROADWAY WIDTH CURB TO CURB			29.25 FT	(96) TOTAL PROJECT COST			
(52) DECK WIDTH OUT TO OUT			30.25 FT	(97) YEAR OF IMPROVEMENT COST ESTIMATE			
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)			28 FT	(114)FUTURE ADT	36000	(115) YEAR FUTURE ADT	2025
(33) BRIDGE MEDIAN -	No Median	CODE	0	INSPECTIONS			
(34) SKEW	0°	(35) STRUCTURE FLARED	0	(90) INSPECTION DATE			11/04/2015
(10) INVENTORY ROUTE MIN VERT CLEAR			999.9 FT	(92) CRITICAL FEATURE INSPECTION :			(93) CFI DATE
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR			29.25 FT	A) FRACTURE CRIT DETAIL -	NO		A)
(53) MIN VERT CLEAR OVER BRIDGE RDWY			999.9 FT	B) UNDERWATER INSP -	NO		B)
(54) MIN VERT UNDERCLEAR REF	Not a Highway or Railroad		0 FT	C) OTHER SPECIAL INSP	NO		C)
(55) MIN LAT UNDERCLEAR RT REF	Not a Highway or Railroad		000 FT	SCOUR			
(56) MIN LAT UNDERCLEAR LT REF -			000 FT	NAVIGATION DATA			
(38) NAVIGATION CONTROL -	No Navigational Control	CODE	0	(92) CRITICAL FEATURE INSPECTION :			(93) CFI DATE
(111)PIER PROTECTION -		CODE		A) FRACTURE CRIT DETAIL -	NO		A)
(39) NAVIGATION VERTICAL CLEARANCE			0	B) UNDERWATER INSP -	NO		B)
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR			FT	C) OTHER SPECIAL INSP	NO		C)
(40) NAVIGATION HORIZONTAL CLEARANCE			0 FT	SCOUR			

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 07/20/2016

COUNTY : JOHNSTON DIVISION : 4 DISTRICT : 3 STRUCTURE NUMBER : 500058 LENGTH : 70 FEET

ROUTE CARRIED : NC42 FEATURE INTERSECTED : LITTLE CREEK

LOCATED : 0.1 MI W JCT US70 BRIDGE NAME : CITY : CLAYTON

FUNC. CLASS : 16 SYST.ON : FA SYST.UNDER : NFA ADT & YR : 18000 2013 RAIL TYPE : LT 233 RT 233

BUILT : 1967 BY : BMU PROJ : FED.AID PROJ : DESIGN LOAD : HS 15

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

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 9 FT WATER DEPTH : 1 FT

SUPERSTRUCTURE : PRESTRESSED CONCRETE CORED SLAB (BMD-19)

SUBSTRUCTURE : EBTS&IBTS:PPC CAP/H-PILES;ENCASED IN CONC.

SPANS : 2@35'

BEAMS OR GIRDERS : 11 PRESTRESSED CONCRETE CORED SLAB SECTIONS

FLOOR : PPCCS/3.5" AWS ENCROACHMENT : DECK (OUT TO OUT) : 30.25 FT

CLEAR ROADWAY : 29.25 FT BETWEEN RAILS : 29.75 FT SIDEWALK OR CURB : LT .25 FT RT .25 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-14 OPE.RTG. : HS-24 CONTR.MEMBER : Cored Slab (exposed) POSTED : SV TTST DATE

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

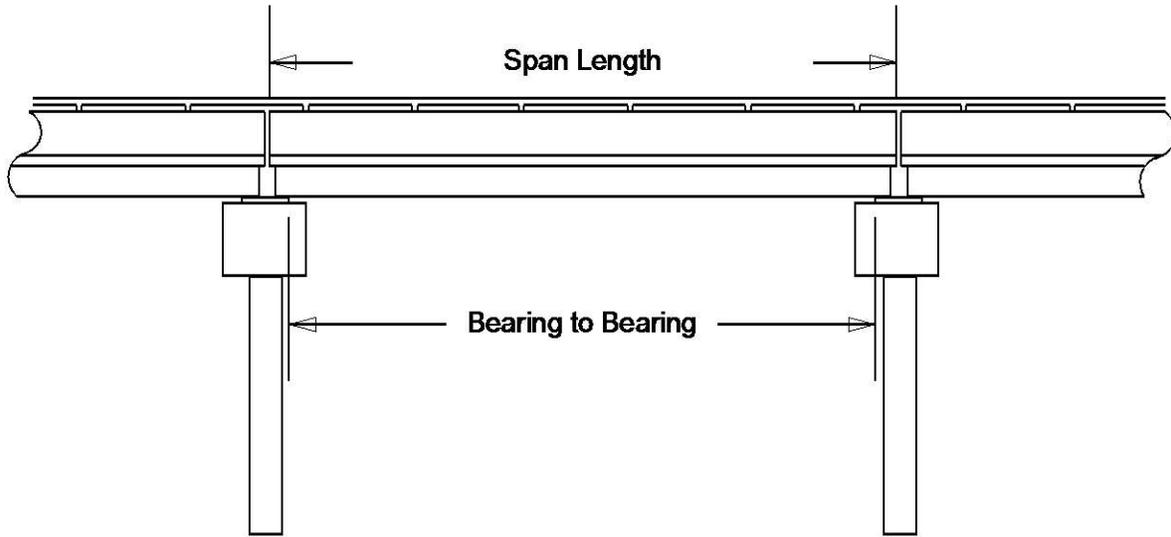
UNDER ROUTES AND CLEARANCES

REMARKS :

Structure Data Worksheet

Spans

County: JOHNSTON Structure No: 500058 Date: _____ Inspected By: WCM



Span No	Span Length	Bearing to Bearing	Comments
1	35.0	34.0'	
2	35.0	34.0'	NBIS: 66.5 FT

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 500058 County: JOHNSTON Date: _____ By: WCM

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	0	TOP OF RAIL			
1	4	TOP OF CAP			
2	6.1	GROUND AT CAP	2	4.7	GROUND AT CAP
10	6.8	GROUND			
18	10.4	Water Surface/Water Edge (WSWE)			
18	11.6				
25	11.4				
30	11.2				
35	11.4	BENT 1	35	11.8	BENT 1
41	10.3	Water Surface/Water Edge (WSWE)			
45	7.9				
50	7.6				
55	7.2	GROUND			
65	5.8	GROUND			
69	5.2	GROUND AT CAP	69	4.6	GROUND AT CAP
70	4	TOP OF CAP			
70.01	0	TOP OF RAIL			

Bridge Inspection Field Sketch



Roadway	28ft Wide	2 Paved Lanes	Looking East
Left Shoulder	6ft Wide		6ft Unpaved
Right Shoulder	6ft Wide		6ft Unpaved
Left Guardrail			
Right Guardrail			

CHECKED BY: WCM 11/4/2015

Title

APPROACH ROADWAY

Description

LOOKING EAST

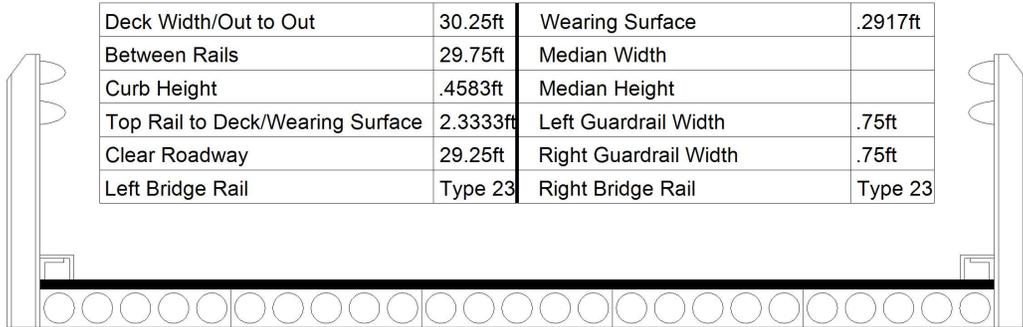
Bridge No: 500058

Drawn By: KMM

Date: 05/02/2006

File Name: S0242000483

Bridge Inspection Field Sketch



Measurements for Span #	1		
Deck Thickness	1.4167	Left Overhang	
Top of Rail to Bottom of Beam	3.75	Right Overhang	

No of Slabs	Slab Height	Slab Width	Comments
11	1.4167ft	2.75ft	

CHECKED BY: WCM 11/4/2015

Title

TYPICAL SECTION

Description

11 CORED SLAB UNITS

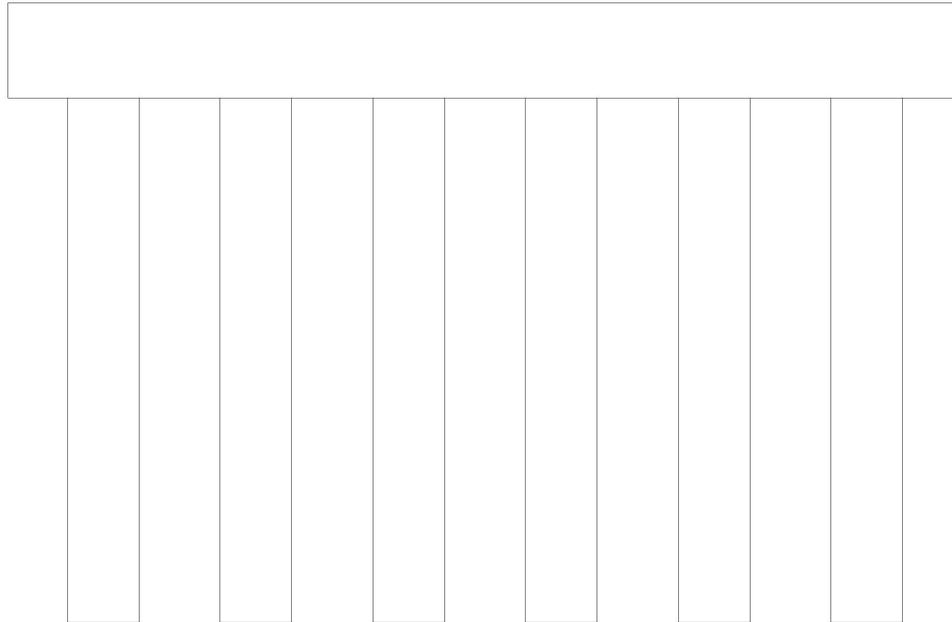
Bridge No: 500058

Drawn By: KMM

Date: 05/02/2006

File Name: S0242000482

Bridge Inspection Field Sketch



Abutment #	1	Abutment 2 and Bent similar	
Cap - Pre-Cast			
Cap Size	32.1667ft Long	1.5ft Wide	1.1667ft High
Left Overhang	2.3333ft	Lt Cap/Beam Overhang	.9583ft
Right Overhang	2.3333ft	Rt Cap/Beam Overhang	.9583ft

Pile #	Material	Pile Type	Spacing	Length	Width/Diam.	Height	Orientation
1	Steel	Pile Bent	5.5		1.1333	1.2167	Vertical
2	Steel	Pile Bent	5.5		1.1333	1.2167	Vertical
3	Steel	Pile Bent	5.5		1.1333	1.2167	Vertical
4	Steel	Pile Bent	5.5		1.1333	1.2167	Vertical
5	Steel	Pile Bent	5.5		1.1333	1.2167	Vertical
6	Steel	Pile Bent			1.1333	1.2167	Vertical

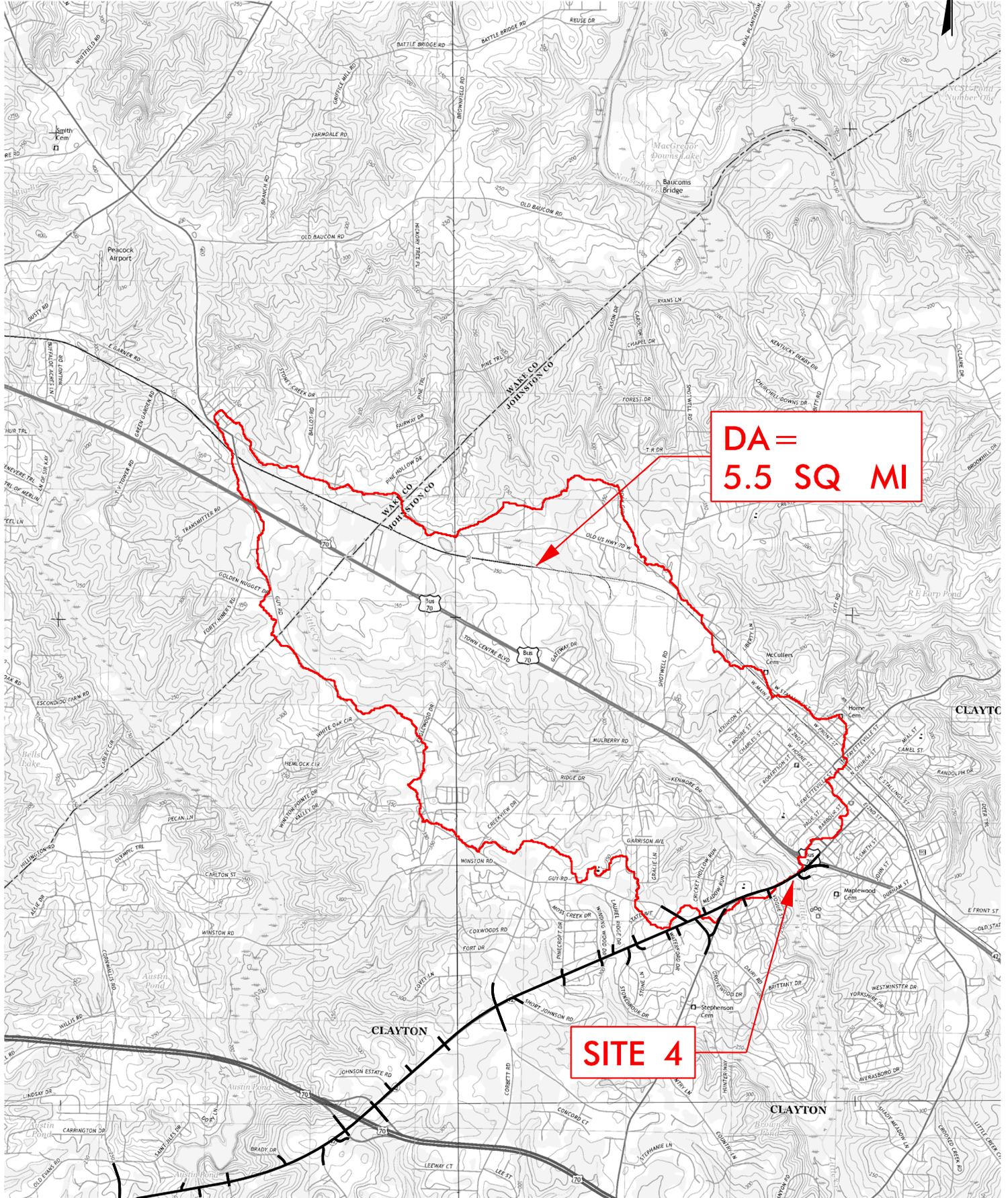
ALL PILES ARE ENCASED IN CONCRETE.
EXTERIOR PILES AT BENT 1 ARE BATTERED.

CHECKED BY: WCM 11/4/2015

Title PILE DIAGRAM	Description END BENTS AND BENT
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Bridge No: 500058	Drawn By: KMM	Date: 05/02/2006	File Name: S0242000484
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R-3410
SITE 4 DRAINAGE AREA
JOHNSTON COUNTY
1" = 4000'





This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://FRIS.NC.GOV/FRIS](http://FRIS.NC.GOV/FRIS)

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE)
		With BFE or Depth Zone AE, AO, AH, VE, AR
OTHER AREAS OF FLOOD HAZARD		Regulatory Floodway
		0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile Zone X
OTHER AREAS		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes Zone X
GENERAL STRUCTURES		Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
		Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall
OTHER FEATURES		Non-accredited Levee, Dike, or Floodwall
		North Carolina Geodetic Survey bench mark BM5510
		National Geodetic Survey bench mark Contractor Est. NCFMP Survey bench mark
		Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at <http://www.ncfloodmaps.com> or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/info/index.shtm>.

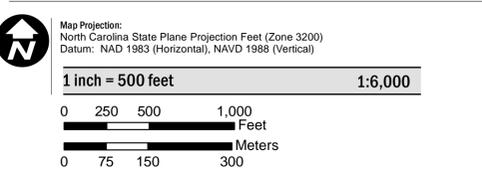
PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 regulations, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/business/info/index.shtm>.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LMWA). The LMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LMWA (or between the shoreline and the LMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

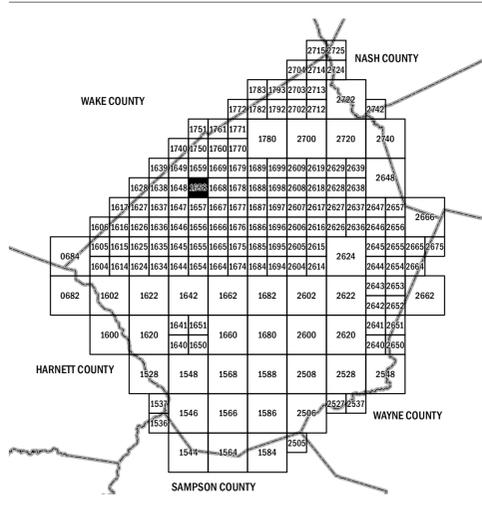
COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE
 This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/habitatconservation/coastal_barrier.html, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

CBRS Area Otherwise Protected Area

SCALE



PANEL LOCATOR



FEMA

National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 1658

Panel Contains:

COMMUNITY: CLAYTON, TOWN OF

CID: 370139

PANEL SUFFIX: 1658 J

MAP NUMBER: 3720165800J

MAP REVISED: 12/02/05

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262



EFFECTIVE: 12/2/2005

REVISED: 1/5/2007

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



Table 9 - Flooding Sources Studied by Detailed Methods: Redelineated

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with the Neuse River	Approximately 230 feet upstream of State Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with the Neuse River	Approximately 150 feet upstream of US Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little Creek	State Highway 42	Johnston County
Buffalo Creek (Basin 9, Stream 1)	The Wake/Johnston County boundary	Robertsons Pond Dam	Johnston County
Buffalo Creek West	The confluence with Middle Creek (South)	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 250 feet upstream of the confluence with Stony Fork	Johnston County
Little Creek	The confluence with the Swift Creek	Approximately 0.6 mile upstream of Shotwell Road	Johnston County Town Of Clayton
Little Creek (Basin 11, Stream 2)	The Wake/Johnston County boundary	Cemetery Road	Johnston County
Little Creek Tributary	The confluence with Little Creek	Approximately 800 feet upstream of US Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	US Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Middle Creek	The confluence with Swift Creek	Approximately 0.7 mile upstream of confluence of Middle Creek Tributary	Johnston County Town Of Smithfield
Mill Branch	At confluence with Mill Creek (South)	Approximately 2.4 miles upstream of Stevens Mill Road	Johnston County
Mill Creek (South)	At confluence with Neuse River	Approximately 0.7 mile upstream of the confluence with Stone Creek	Johnston County
Moccasin Creek	At confluence with Neuse River	Approximately 1,900 feet upstream of US Highway 70	Johnston County Town Of Princeton
Neuse River	Wayne/Lenoir County boundary	Falls of the Neuse Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Poplar Creek	The confluence with the Neuse River	Approximately 1.4 miles upstream of the confluence with Little Poplar Creek	Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.4 mile downstream of City Road	Approximately 100 feet upstream of City Road	Town Of Clayton
Stone Creek	The confluence with Mill Creek (South)	US Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of US Highway 301	Johnston County
Swift Creek	The confluence with the Neuse River	The confluence of Yates Branch (Basin 20, Stream 13)	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	NC 1525	Johnston County
White Oak Creek	The confluence with Swift Creek	Approximately 0.4 mile upstream of Pergo Parkway	Johnston County Town Of Clayton

Table 10, "Flooding Sources Studied by Detailed Methods: Limited Detailed", lists all flooding sources within the county that were studied by limited detailed methods for either this FIS or previous FISs.

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Arters Branch	The confluence with the Neuse River	Approximately 300 feet upstream of North Johnson Road	Town Of Smithfield
Basin 11, Stream 7	The Wake/Johnston County boundary	Approximately 0.4 mile upstream of Wake/Johnston County boundary	Johnston County
Bawdy Creek	The confluence with the Neuse River	The confluence with Bawdy Swamp and Quincosin Swamp	Johnston County
Bawdy Swamp	The confluence with Bawdy Creek	Approximately 0.8 mile upstream of HWY 70	Johnston County Town Of Pine Level
Beaverdam Branch	The confluence with Middle Creek	Approximately 100 feet downstream of Raleigh Road	Johnston County
Beaverdam Creek	At Rosewood Road	Approximately 575 feet downstream of Pierce Street	Johnston County Town Of Princeton
Beaverdam Swamp	The confluence with Hannah Creek	Approximately 1,300 feet upstream of Tetersville Road	Johnston County Town Of Four Oaks
Beddingfield Creek	Approximately 0.4 mile upstream of the confluence with the Neuse River	Approximately 0.2 mile upstream of Shotwell Road	Town Of Clayton

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Approximately 0.1 mi upstream of Glendale Road	10.28	*	*	3200	*
Just upstream of the confluence with Little Buffalo Creek Tributary	9.97	*	*	3140	*
Approximately 0.8 mile upstream of Beulah town Road	8.50	*	*	2840	*
Approximately 0.7 mile upstream of Beulah town Road	8.12	*	*	2760	*
Approximately 1.1 mile Little Buffalo Creek downstream of Bay Valley Road	7.22	*	*	2560	*
Approximately 0.2 mile downstream of Bay Valley Road	6.63	*	*	2430	*
Approximately 0.2 mile downstream of Bay Valley Road	4.49	*	*	1900	*
Approximately 0.5 mile downstream of Glendale Road	3.81	*	*	1719	*
Little Buffalo Creek Tributary					
Just upstream of the confluence with Little Buffalo Creek	10.91	*	*	3320	*
Approximately 0.1 mile upstream of Bay Valley Road	10.51	*	*	3240	*
Approximately 0.4 mile upstream of North Carolina Highway 222	7.93	*	*	2720	*
Little Creek					
At the confluence with Swift Creek	17.90	*	*	7700	*
Approximately 0.6 mile upstream of Steel Bridge Road	15.80	*	*	7370	*
Approximately 1.8 miles downstream of Ranch Road	12.80	*	*	6440	*
Approximately 0.7 mile downstream of Ranch Road	9.90	*	*	5290	*
Approximately 0.5 mile upstream of Ranch Road	7.20	*	*	4320	*
Approximately 140 feet downstream of Route 42	5.40	*	*	4250	*
Just upstream of the confluence of Little Creek Tributary	2.67	*	*	816	*
Approximately 0.6 mile upstream of the confluence of Little Creek Tributary	2.25	*	*	741	*
Approximately 0.8 mile upstream of the confluence of Little Creek Tributary	1.77	*	*	647	*
Approximately 1.2 miles upstream of the confluence of Little Creek Tributary	1.64	*	*	619	*
Approximately 1.5 miles upstream of the confluence of Little Creek Tributary	1.13	*	*	502	*
Approximately 1.7 miles upstream of the confluence of Little Creek Tributary	0.97	*	*	461	*
Approximately 1.9 miles upstream of the confluence of Little Creek Tributary	0.85	*	*	427	*
Little Creek (Basin 11, Stream 2)					
Approximately 0.6 mile upstream of the confluence with Moccasin Creek	6.38	*	*	2370	*
Approximately 0.3 mile upstream of the confluence with Moccasin Creek	5.86	*	*	2250	*
Approximately 0.1 mile upstream of the confluence with Moccasin Creek	5.39	*	*	2140	*
Little Creek (Into Middle Creek)					
Approximately 1.1 miles upstream of the confluence with Middle Creek	12.28	*	*	1940	*
Approximately 0.1 mile downstream of the Johnston/Wake County boundary	11.52	*	*	1870	*
At the Johnston/Wake County boundary	9.88	*	*	1711	*
Little Creek (Near Micro)					
Approximately 0.5 mile downstream of Bizzell Grove Church Road	16.53	*	*	4301	*
Approximately 0.1 mile upstream of Bizzell Grove Church Road	15.53	*	*	4140	*
Approximately 0.5 mile downstream of Rains Crossroads Road	14.82	*	*	4020	*
Just below Rains Crossroads Road	13.83	*	*	3850	*
At the confluence with Burnt Stocking Branch	9.68	*	*	3080	*
Approximately 0.1 mile upstream of the confluence with Burnt Stocking Branch	8.79	*	*	2900	*
Approximately 0.6 mile downstream of Lizzie Mill Rd	8.32	*	*	2800	*
Approximately 0.2 mile upstream of Lizzie Mill Road	7.37	*	*	2600	*
Just downstream of Pittman Road	6.43	*	*	2380	*

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
369	36,852	270	1,336	3.2	214.9	*	214.9	215.9	1.0
376	37,600	265	1,681	2.6	216.9	*	216.9	217.7	0.8
384	38,423	270	1,165	3.7	218.6	*	218.6	219.6	1.0
392	39,203	270	1,341	3.2	222.4	*	222.4	222.9	0.5
399	39,919	189	1,236	3.5	224.1	*	224.1	225.0	0.9
408	40,836	85	593	7.3	227.1	*	227.1	227.6	0.5
417	41,748	140	851	5.1	233.3	*	233.3	233.4	0.1
428	42,752	350	2,141	2.0	236.4	*	236.4	237.2	0.8
435	43,509	330	1,675	2.6	237.8	*	237.8	238.5	0.7
444	44,439	180	1,085	4.0	240.5	*	240.5	241.0	0.5
451	45,070	180	1,670	1.3	244.8	*	244.8	245.0	0.2
463	46,290	200	1,133	1.8	245.2	*	245.2	245.7	0.5
482	48,230	210	1,067	1.9	251.8	*	251.8	252.3	0.5
496	49,570	150	818	2.3	254.4	*	254.4	254.9	0.5
516	51,610	100	386	4.9	262.0	*	262.0	262.6	0.6
520	52,040	100	421	3.4	264.8	*	264.8	265.2	0.4
522	52,240	100	305	4.7	266.4	*	266.4	266.6	0.2
529	52,900	100	484	3.0	270.8	*	270.8	271.4	0.6
547	54,710	95	430	3.0	278.5	*	278.5	279.4	0.9
Little Creek Tributary									
004	350	60	248	3.2	264.4 ¹	*	262.5	263.2	0.7
005	512	60	222	3.6	264.4 ¹	*	264.0	264.7	0.7
014	1,440	50	553	1.6	279.5	*	279.5	279.5	0.0
021	2,080	50	480	1.8	279.6	*	279.6	280.0	0.4
Little Poplar Creek									
014	1,444	160	1,188	2.7	143.0 ³	*	143.0	143.9	0.9
022	2,209	108	746	4.3	144.9	*	144.9	145.9	1.0
034	3,400	325	1,524	2.1	150.9	*	150.9	151.9	1.0
040	3,980	205	1,020	3.1	153.7	*	153.7	154.7	1.0
046	4,552	250	1,550	2.1	155.9	*	155.9	156.9	1.0
052	5,154	176	980	3.3	157.8	*	157.8	158.8	1.0
065	6,453	175	1,172	2.7	164.7	*	164.7	165.7	1.0
073	7,259	155	1,168	2.7	166.9	*	166.9	167.9	1.0
081	8,086	140	856	3.8	169.8	*	169.8	170.8	1.0
090	9,032	215	1,117	2.9	174.7	*	174.7	175.7	1.0
098	9,800	140	963	3.3	177.6	*	177.6	178.6	1.0
108	10,784	95	619	5.0	181.8	*	181.8	182.8	1.0
117	11,681	110	542	5.8	190.1	*	190.1	190.7	0.6
126	12,616	155	1,025	3.0	196.0	*	196.0	197.0	1.0
134	13,397	115	732	4.3	199.1	*	199.1	199.9	0.8
143	14,336	180	1,181	2.6	202.9	*	202.9	203.9	1.0
151	15,094	135	724	4.3	205.8	*	205.8	206.6	0.8
160	15,993	205	1,426	1.9	208.8	*	208.8	209.8	1.0
167	16,686	205	1,169	1.7	209.7	*	209.7	210.7	1.0

PRELIMINARY FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in
**JOHNSTON COUNTY, NORTH
CAROLINA AND
INCORPORATED AREAS**



Community Name	Community Number
JOHNSTON COUNTY	370138
TOWN OF BENSON	370504
TOWN OF CLAYTON	370139
TOWN OF FOUR OAKS	370502
TOWN OF KENLY	370501
TOWN OF MICRO	370500
TOWN OF PINE LEVEL	370505
TOWN OF PRINCETON	370485
TOWN OF SELMA	370499
TOWN OF SMITHFIELD	370140
TOWN OF WILSON'S MILLS	370262

PRELIMINARY



PRELIMINARY: 3/31/2015

REVISED: 3/31/2015

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37101CV000

www.fema.gov and www.ncfloodmaps.com



both mailed to each jurisdiction within Johnston County and posted to the State's website at www.ncfloodmaps.com.

Draft basin plans were developed based on the results of the initial scoping meetings. Final scoping meetings were held by the State and FEMA to provide counties and communities an overview of the draft basin plans, including the proposed scope and schedule for the project, and to provide an opportunity for additional county and community input. After the final scoping meeting was held, the Final Basin Plans were produced.

This FIS covers the geographic area of Johnston County, , and all jurisdictions therein. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. Limits of detailed study are indicated on the Flood Profiles and/or Water-surface elevation rasters and/or the FIRM.

Table 8P, "Scope of Revisions: Revised or New Detailed Study -Preliminary", lists flooding sources that were newly studied by detailed methods or were previously studied by detailed methods and had a change in backwater elevation due to flooding effects from a newly studied flooding source.

Table 8P - Scope of Revisions: Revised or New Detailed Study - Preliminary

Source	Riverine Sources		Affected Communities
	From	To	
Black Creek	The confluence with Neuse River	Approximately 230 feet upstream of NC Highway 210	Johnston County Town Of Four Oaks Town Of Smithfield
Buffalo Creek	The confluence with Neuse River	Approximately 300 feet upstream of U.S. Highway 301	Town Of Smithfield
Buffalo Creek (Basin 9, Stream 1)	The confluence with Little River	Approximately 720 feet upstream of NC Highway 42	Johnston County
Buffalo Creek West	The confluence with Middle Creek	The Johnston/Wake County boundary	Johnston County
Hannah Creek	The confluence with Mill Creek (South)	Approximately 1,800 feet upstream of Interstate 95	Johnston County
Little Creek	The confluence with Swift Creek	The confluence with Swift Creek	Johnston County Town Of Clayton
Little Creek Tributary	The confluence with Little Creek	Approximately 770 feet upstream of U.S. Highway 70	Town Of Clayton
Little Poplar Creek	The confluence with Poplar Creek	Approximately 260 feet upstream of U.S. Highway 70	Johnston County Town Of Smithfield Town Of Wilson's Mills
Little River	At confluence with Neuse River	Approximately 1.0 mile upstream of the Wayne/Johnston County Boundary	Johnston County
Middle Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Mill Branch	The confluence with Mill Creek (South)	Approximate 2.4 miles upstream of Harper House Road	Johnston County
Mill Creek (South)	The confluence with Neuse River	Approximate 0.8 mile upstream of confluence of Stone Creek	Johnston County
Moccasin Creek	Approximately 3,425 feet downstream of Buckleberry Road	Approximately 0.4 mile upstream of U.S. Highway 70	Johnston County Town Of Princeton
Moccasin Creek	At confluence with Neuse River	Wayne/Johnston County boundary	Johnston County
Neuse River	The Johnston/Wayne County boundary	Just downstream of Mial Plantation Road	Johnston County Town Of Clayton Town Of Four Oaks Town Of Selma Town Of Smithfield Town Of Wilson's Mills
Sams Creek	Approximately 0.7 mile upstream of Oneil Street	Approximately 270 feet upstream of City Road	Town Of Clayton
Spring Branch	The confluence with Neuse River	Collier Street	Town Of Smithfield
Stone Creek	The confluence with Mill Creek (South)	Approximately 1,640 feet upstream of U.S. Highway 701	Johnston County
Stony Fork	The confluence with Hannah Creek	Approximately 1,550 feet upstream of U.S. Highway 301	Johnston County
Swift Creek	The confluence with Neuse River	The Johnston/Wake County boundary	Johnston County Town Of Smithfield
Unnamed Tributary (#1) to Swift Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County
Unnamed Tributary (#2) to Swift Creek	The confluence with Swift Creek	Approximately 190 feet upstream of Cornwallis Road	Johnston County
White Oak Creek	The confluence with Swift Creek	The Johnston/Wake County boundary	Johnston County Town Of Clayton

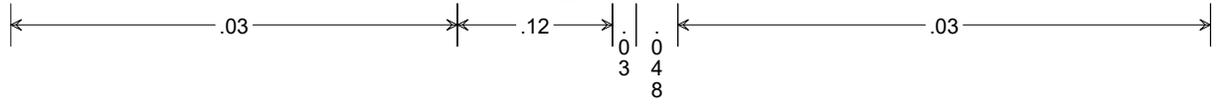
Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)				
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Future Annual Chance	0.2% Annual Chance
Approximately 0.5 mile upstream of State Highway 96	1.32	*	*	886	*	*
Approximately 0.8 mile upstream of State Highway 96	1.10	*	*	792	*	*
Juniper Swamp Tributary 2						
Approximately 0.7 mile upstream of the confluence with Juniper Swamp Tributary 1	0.88	*	*	687	*	*
Approximately 0.4 mile upstream of the confluence with Juniper Swamp Tributary 1	0.75	*	*	623	*	*
Little Bernal Branch						
Approximately 0.4 mile upstream of the confluence with Bernal Branch	1.05	*	*	770	*	*
Approximately 0.2 mile upstream of the confluence with Bernal Branch	0.96	*	*	724	*	*
Little Black Creek						
Approximately 0.4 mile downstream of Jackson King Road	11.83	*	*	1890	*	*
Approximately 0.8 mile upstream of Jackson King Road	11.06	*	*	1820	*	*
Approximately 1.0 mile downstream of Old Stage Road	9.23	*	*	1650	*	*
Approximately 0.7 mile downstream of Old Stage Road	7.42	*	*	1460	*	*
Approximately 0.3 mile downstream of Old Stage Road	7.10	*	*	1420	*	*
At the Johnston/Wake County boundary	6.36	*	*	1330	*	*
Little Buffalo Creek						
Approximately 0.4 mile downstream of Old Route 22	24.33	*	*	5480	*	*
Just upstream of Old Route 22	23.41	*	*	5350	*	*
Just downstream of Glendale Road	22.43	*	*	5200	*	*
Just upstream of Glendale Road	21.46	*	*	5060	*	*
Approximately 0.1 mi upstream of Glendale Road	10.28	*	*	3200	*	*
Just upstream of the confluence with Little Buffalo Creek Tributary	9.97	*	*	3140	*	*
Approximately 0.8 mile upstream of Beulah town Road	8.50	*	*	2840	*	*
Approximately 0.7 mile upstream of Beulah town Road	8.12	*	*	2760	*	*
Approximately 1.1 mile Little Buffalo Creek downstream of Bay Valley Road	7.22	*	*	2560	*	*
Approximately 0.2 mile downstream of Bay Valley Road	6.63	*	*	2430	*	*
Approximately 0.2 mile downstream of Bay Valley Road	4.49	*	*	1900	*	*
Approximately 0.5 mile downstream of Glendale Road	3.81	*	*	1719	*	*
Little Buffalo Creek Tributary						
Just upstream of the confluence with Little Buffalo Creek	10.91	*	*	3320	*	*
Approximately 0.1 mile upstream of Bay Valley Road	10.51	*	*	3240	*	*
Approximately 0.4 mile upstream of North Carolina Highway 222	7.93	*	*	2720	*	*
Little Creek						
Approximately 0.6 mile upstream of Steel Bridge Road	15.93	1965	3140	3651	*	4920
Approximately 1.8 miles downstream of Ranch Road	13.05	1707	2887	3325	*	4599
Approximately 0.7 mile downstream of Ranch Road	9.92	1615	2702	3089	*	4201
Approximately 0.5 mile upstream of Ranch Road	7.12	1396	2338	2667	*	3609
Approximately 0.85 mile downstream of Amelia Church Road	6.37	1361	2269	2582	*	3472
Approximately 140 feet downstream of NC 42	5.50	1222	2059	2347	*	3171
Approximately 250 feet downstream of Amelia Church Road	4.82	1069	1833	2100	*	2868
Just upstream of the confluence of Little Creek Tributary	2.67	*	*	816	*	*
Just upstream of confluence with Little Creek Tributary	2.67	729	1191	1391	*	1899

Table 22 - Floodway Data

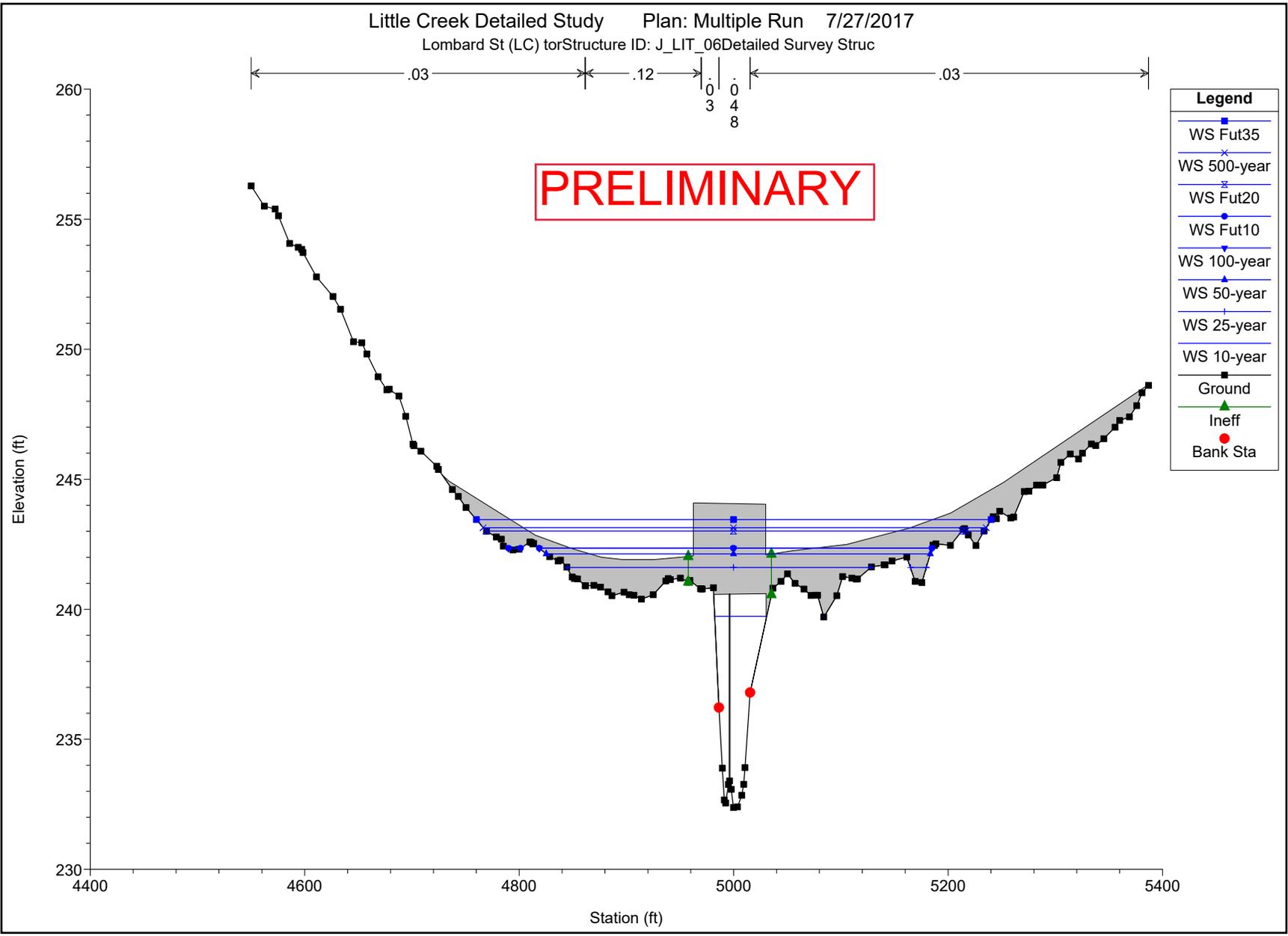
Floodway Source		Floodway			Water Surface Elevation				
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	1% Annual Chance Future Water-Surface Elevation	Without Floodway	With Floodway	Increase
266	26,557	234	1,961	1.7	192.5	*	192.5	192.5	0.0
271	27,115	598	3,387	1.0	192.6	*	192.6	192.6	0.0
275	27,464	425	2,265	1.4	192.6	*	192.6	192.6	0.0
279	27,926	356	1,324	2.3	192.8	*	192.8	192.9	0.0
282	28,194	250	1,014	3.0	193.4	*	193.4	193.8	0.4
287	28,695	329	1,343	2.3	195.1	*	195.1	195.9	0.8
292	29,179	381	1,877	1.6	196.0	*	196.0	196.8	0.8
296	29,635	435	1,657	1.9	196.6	*	196.6	197.4	0.9
300	29,962	327	1,239	2.5	197.2	*	197.2	198.2	1.0
308	30,808	317	2,092	1.5	201.9	*	201.9	202.1	0.1
315	31,453	320	2,007	1.5	202.3	*	202.3	202.6	0.3
321	32,057	236	1,722	1.8	202.6	*	202.6	203.2	0.5
324	32,414	254	1,570	2.0	203.0	*	203.0	203.6	0.6
327	32,719	350	1,963	1.6	203.1	*	203.1	203.8	0.7
330	33,029	329	1,389	2.2	203.3	*	203.3	204.1	0.7
337	33,710	346	1,400	2.2	204.3	*	204.3	205.0	0.8
340	34,048	389	1,231	2.5	205.4	*	205.4	206.2	0.8
346	34,601	270	1,385	1.9	207.0	*	207.0	208.0	1.0
351	35,139	233	1,098	2.4	207.9	*	207.9	208.8	0.9
356	35,583	251	802	3.3	209.2	*	209.2	210.1	0.8
360	35,951	250	1,045	2.6	210.9	*	210.9	211.6	0.8
365	36,451	263	991	2.7	212.6	*	212.6	213.3	0.8
370	36,970	75	406	6.6	214.5	*	214.5	215.0	0.5
375	37,451	65	485	5.5	217.3	*	217.3	218.3	1.0
379	37,868	116	632	4.2	219.1	*	219.1	219.8	0.8
385	38,474	232	943	2.8	220.5	*	220.5	221.5	1.0
389	38,868	245	941	2.8	221.3	*	221.3	222.2	0.9
395	39,513	239	975	2.7	224.1	*	224.1	225.0	0.9
400	40,010	117	700	3.7	226.4	*	226.4	227.2	0.9
404	40,437	109	765	3.4	228.1	*	228.1	229.0	1.0
409	40,862	70	466	5.5	229.3	*	229.3	230.2	0.9
414	41,385	84	619	4.2	232.2	*	232.2	233.0	0.8
415	41,540	101	822	3.1	232.9	*	232.9	233.8	1.0
420	41,992	284	1,899	1.4	233.9	*	233.9	234.9	1.0
426	42,618	314	1,952	1.3	234.4	*	234.4	235.3	0.9
431	43,054	159	777	3.3	234.9	*	234.9	235.6	0.7
435	43,504	108	634	4.1	236.4	*	236.4	237.2	0.9
440	43,967	133	709	3.6	237.6	*	237.6	238.5	0.9
444	44,403	152	691	3.4	239.3	*	239.3	240.3	1.0
448	44,764	266	827	2.8	242.4	*	242.4	242.7	0.3
450	45,029	183	1,056	2.2	242.9	*	242.9	243.2	0.3
455	45,515	149	890	2.6	243.3	*	243.3	243.7	0.4
459	45,853	130	560	4.2	243.6	*	243.6	244.0	0.4
460	46,019	90	719	3.3	244.1	*	244.1	244.7	0.6

Little Creek Detailed Study Plan: Multiple Run 7/27/2017
 Lombard St (LC) for Structure ID: J_LIT_06Detailed Survey Struc



PRELIMINARY

Legend	
WS Fut35	■
WS 500-year	×
WS Fut20	×
WS Fut10	●
WS 100-year	▼
WS 50-year	▲
WS 25-year	+
WS 10-year	+
Ground	■
Ineff	▲
Bank Sta	●



This spreadsheet computes the 50-, 20-, 10-, 4-, 2-, 1-, 0.5-, and 0.2-percent chance exceedance flows for ungaged urban stream or small, rural stream in Georgia, South Carolina, and North Carolina, and that has drainage area within hydrologic region 1. The spreadsheet also includes the 95-percent prediction interval minus and plus standard error of prediction intervals, and the average standard error of prediction. To use this spreadsheet, enter requested information in the yellow cells below.

Enter a site-description name:

R-3410 Site 4 - Little Creek

Enter the explanatory variables:

Drainage area, in square miles	5.5
Percentage of impervious area, in percent	35

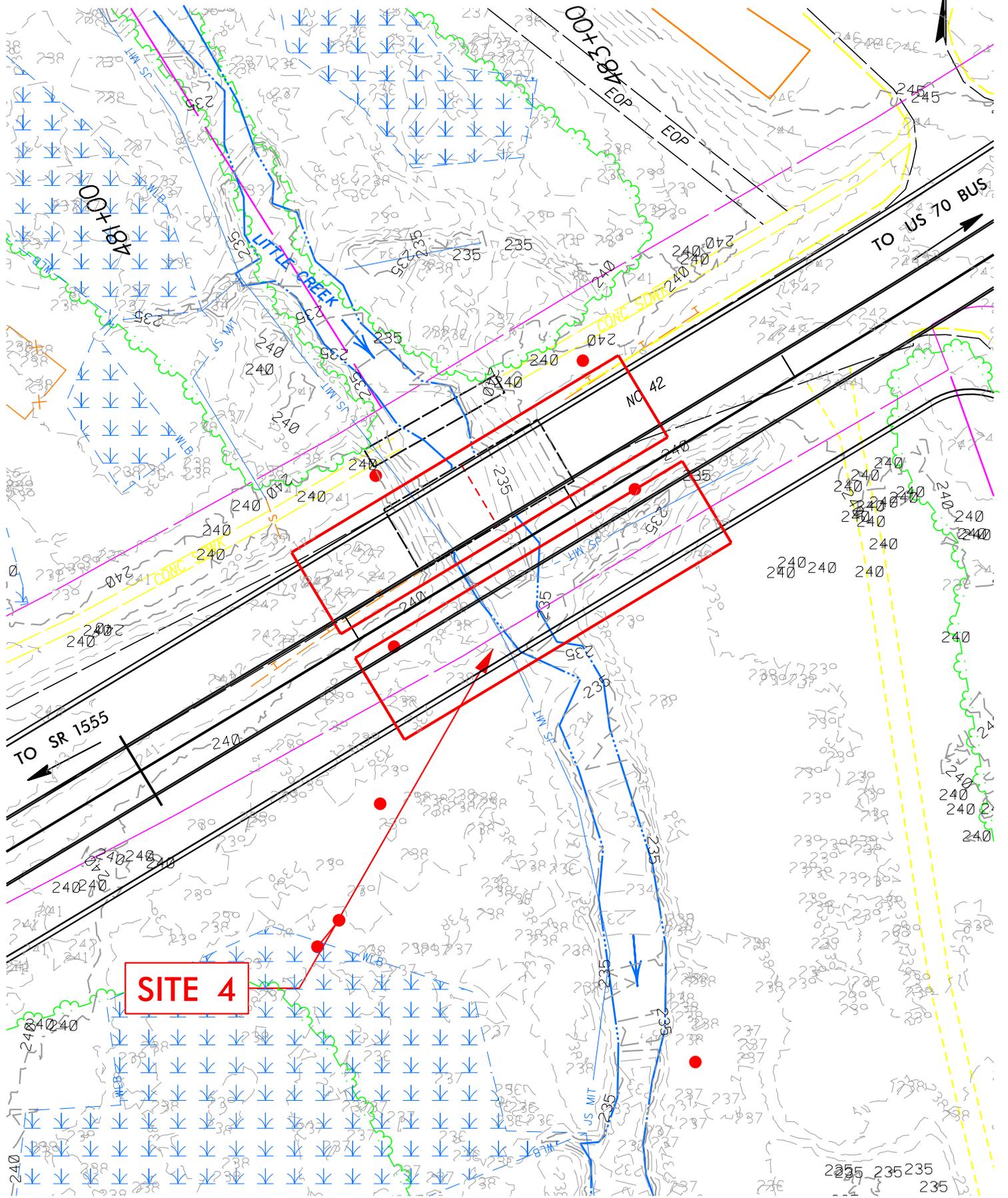
Applicable range of drainage area is 0.10 to 436 square miles

Applicable range of percentage of impervious area is 0.0 to 100 percent

Warnings and Cautions

Percent chance exceedance	Percent chance exceedance flow, in ft ³ /s	Lower 95 percent prediction interval flow, in ft ³ /s	Upper 95 percent prediction interval flow, in ft ³ /s	-S _{p,i} (percent)	+S _{p,i} (percent)	Average S _{p,i} (percent)
50	1,190	619	2,290	-28.2	39.4	34.1
20	1,690	923	3,100	-26.4	35.9	31.5
10	2,020	1,120	3,640	-25.8	34.8	30.6
4	2,420	1,320	4,450	-26.6	36.2	31.6
2	2,700	1,440	5,050	-27.2	37.4	32.6
1	2,950	1,520	5,710	-28.5	39.8	34.5
0.5	3,230	1,610	6,460	-29.7	42.2	36.3
0.2	3,560	1,700	7,460	-31.3	45.5	38.9

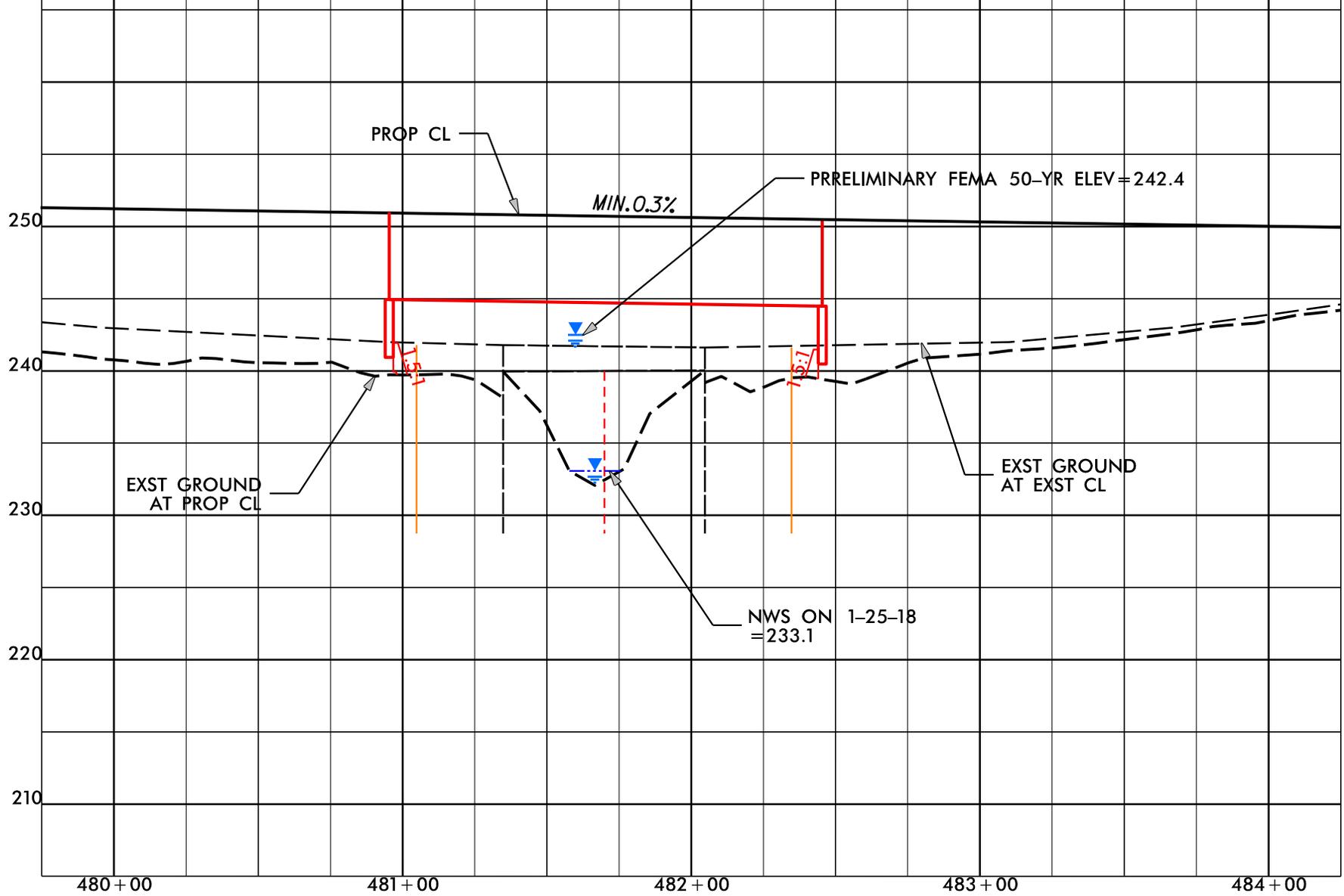
R-3410
SITE 4 LITTLE CREEK
JOHNSTON COUNTY
1" = 50'



SITE 4

235 235 235
235

BED PROFILE @ UPSTREAM FACE **LITTLE CREEK**



WEST

R-3410 NC 42
SITE #4 JOHNSTON COUNTY

EAST

VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 50'



Upstream face of bridge



Looking upstream from roadway



Downstream face of bridge



Looking downstream from roadway



Looking west



Looking east



Pedestrian bridge upstream of NC 42



Under existing bridge looking upstream