

PREDESIGN/PRESURVEY REPORT

County: Rowan

Project No.:

TIP No.:

Let Date:

WBS No.: 17BP.9.R.35

Bridge No.: 790315

Road No.: SR1225 (Patterson St)

Stream: Prong of Grants Creek

Type of Request:

Date: 7/1/2013

Name:

Assigned to: EMT

Checked by:

Prior Survey Date (attach copy of prior survey):

Study by Scour Section: 03/15/10

Flood Zone: AE
with FI

Detail Study: DS

Date: 06/16/09

Panel No.: 5626

BM Info:

Quad Map: China Grove
Enochville

Drainage Area: 4.1 sq.mi

From: Quad/Stream Stats

Q25: 2000cfs Q50: 2300cfs Q100: 2600cfs Method: USGS Urban Regression: Region 1

EXISTING BRIDGE INFORMATION

Location: 0.3 Miles East of JCT SR1477 (Dogwood Rd)

Average Daily Traffic: 2004 – 2900

Length: 31'

Bed-to-Crown: 10'

Water Depth: 1'

Type of Structure: Tim Deck on I-Beams; End Bnt: Tim Cap on Tim Piles, Tim Bulkheads

Type of Span(s): 1@30'6

Upstream Structure: 790248 – Tim Deck on I-Beams; End Bnts: Tim Cap & Piles, Timber Bulkheads

Location: 0.3 Miles South of JCT SR1212 (Sutton Rd)

Bed-to-Crown: 11'

Prior Survey:

Downstream Structure: 7900002 – Triple 9'X11' RC Box Culvert, 80'6 Along Centerline of Culvert

Location: 0.1 Mile West of JCT SR1227 (Ketchie St)

Bed-to-Crown: 22'

Prior Survey:

SCS Watershed:

ENVIRONMENTAL

Trout Stream: No

Anadromous Fish: No

Primary Nursery Area: No

High Quality Waters: No

Nutrient Sensitive Waters: No

Near Water Supply Intake:

CAMA County: No

Stream Classification: C: Aquatic Life, Secondary Recreation, Fresh Water

Notes: None

DENR River Basin Info: Yadkin/Pee-Dee

MAINTENANCE COORDINATION

Bridge Maintenance – Contact Superintendent and Supervisor.

High Water:

Relocation:New Alignment Staked:BM Information:

Road Maintenance – Contact District Engineer and County Maintenance Engineer.

High Water:

Road to be Paved:Relocation of Vicinity of Bridge:

New Alignment Staked:BM Information:

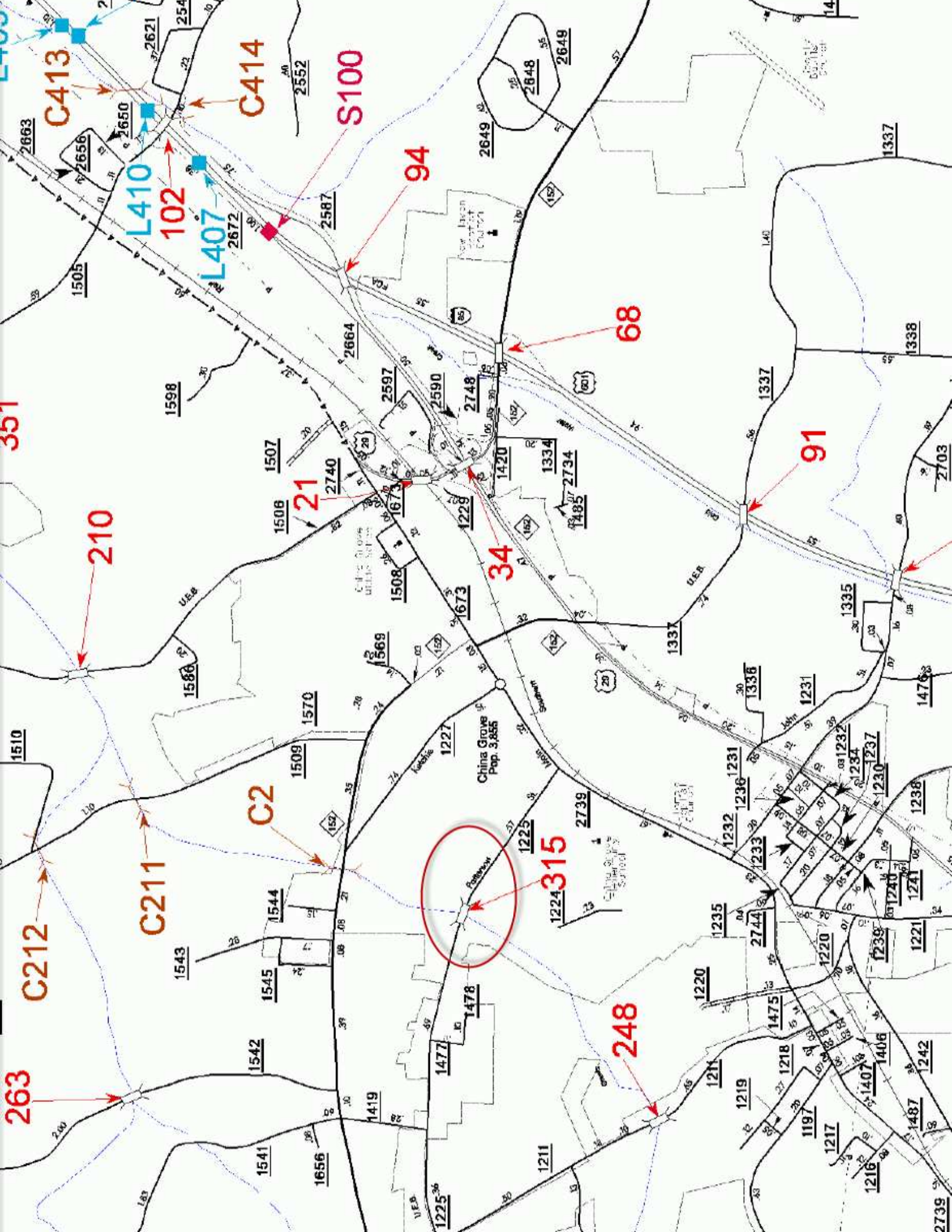
Initiated as:Date Initiated:

Man-days Estimated:

Date Surveyed:Date Completed:

Personnel	Hours	Pay Period
Riverine		

Comments:





NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY ROWAN BRIDGE NUMBER 790315 INSPECTION CYCLE 2 YRS
ROUTE SR1225 ACROSS PRONG OF GRANTS CREEK M.P. 0

0.3 MI. E. JCT. SR 1477

LOCATION **0.35 MI. E. JCT. SR1477**

SUPERSTRUCTURE TIMBER DECK ON I-BEAMS

SUBSTRUCTURE END BENTS:TIMBER CAP ON TIMBER PILES,TIMBER BULKHEADS

SPANS 1@30'6

LONGITUDE	80° 35' 17.1"	80° 35' 16.9"	LATITUDE	35° 34' 31.0"	35° 34' 30.2"
PRESENT CONDITION	<u>FAIR</u>		INVENTORY RATING	<u></u>	
INSPECTION DATE	<u>07/13/2010</u>		OPERATING RATING	<u></u>	
PRESENT POSTING	<u>Not Posted</u>		PROPOSED POSTING	<u></u>	
COMPUTER UPDATE	<u></u>		ANALYSIS DATE	<u></u>	
POSTING LETTER DATE	<u></u>		SUFFICIENCY RATING	<u></u>	
OTHER SIGNS PRESENT	<u>4 DELINEATORS</u>				



LOOKING WEST

SIGN NOTICE ISSUED FOR	NUMBERED REQUIRED
<u>No</u> WEIGHT LIMIT	<u></u>
<u>No</u> DELINEATORS	<u></u>
<u>No</u> NARROW BRIDGE	<u></u>
<u>No</u> ONE LANE BRIDGE	<u></u>
<u>No</u> LOW CLEARANCE	<u></u>

NATIONAL BRIDGE INVENTORY----- STRUCTURE INVENTORY AND APPRAISAL Run Date: 08/20/2010

IDENTIFICATION							
(1) STATE NAME -NORTH CAROLINA	BRIDGE	790315		SUFFICIENCY RATING =		73.6	
(8) STRUCTURE NUMBER(FEDERAL)		000000001590315		STATUS =	Functionally Obsolete		
INVENTORY ROUTE (ON/UNDER) - ON		131012250					
(2) STATE HIGHWAY DEPARTMENT DISTRICT		9					
(3) COUNTY CODE	159	(4) PLACE CODE	00000				
(6) FEATURE INTERSECTED - PRONG OF GRANTS CREEK							
(7) FACILITY CARRIED SR1225							
(9) LOCATION 0.3 MI. E. JCT. SR1477							
(11)MILEPOINT		0					
(16)LAT 35° 34' 30.2"	(17)LONG	80° 35' 16.9"					
(98)BORDER BRIDGE STATE CODE	PCT SHARE						
(99)BORDER BRIDGE STRUCTURE NO							
STRUCTURE TYPE AND MATERIAL				CLASSIFICATION			
(43) STRUCTURE TYPE MAIN: Steel				(112)NBIS BRIDGE SYSTEM -		YES	
TYPE - Stringer Multibeam or Girder	CODE	302		(104)HIGHWAY SYSTEM NON NHS Route		0	
(44) STRUCTURE TYPE APPR :				(26) FUNCTIONAL CLASS - Collector		17	
TYPE -	CODE			(100)STRAHNET HIGHWAY - Not a STRAHNET Route		0	
(45) NUMBER OF SPANS IN MAIN UNIT		1		(101)PARALLEL STRUCTURE - No Parallel Structure		N	
(46) NUMBER OF APPROACH SPANS				(102)DIRECTION OF TRAFFIC - 2-way Traffic		2	
(107)DECK STRUCTURE TYPE - Timber	CODE	8		(103)TEMPORARY STRUCTURE - Not Temporary			
(108)WEARING SURFACE / PROTECTIVE SYSTEM :				(110)DESIGNATED NATIONAL NETWORK - Not Part of		0	
(A) TYPE OF WEARING SURFACE - Bituminous	CODE	6		(20) TOLL On Free Road		3	
(B) TYPE OF MEMBRANE - None	CODE	0		(31) MAINTAIN - State Highway Agency		01	
(C) TYPE OF DECK PROTECTION - None	CODE	0		(22) OWNER - State Highway Agency		01	
				(37) HISTORICAL SIGNIFICANCE - Not Eligible		5	
AGE AND SERVICE				CONDITION			
(27) YEAR BUILT		1961		(58) DECK		7	
(106)YEAR RECONSTRUCTED				(59) SUPERSTRUCTURE		7	
(42) TYPE OF SERVICE : ON - Highway				(60) SUBSTRUCTURE		6	
UNDER - Waterway	CODE	15		(61) CHANNEL & CHANNEL PROTECTION		7	
(28) LANES: ON STRUCTURE 2 UNDER STRUCTURE				(62) CULVERTS		N	
(29) AVERAGE DAILY TRAFFIC		2900					
(30) YEAR OF ADT 2004	(109) TRUCK ADT PCT	7 %		LOAD RATING AND POSTING			
(19) BYPASS OR DETOUR LENGTH		1 MI		(31) DESIGN LOAD Other or Unknown		0	
				(64) OPERATING RATING - HS-28		151	
				(66) INVENTORY RATING - HS-17		130	
				(70) BRIDGE POSTING - No Posting Required		5	
				(41) STRUCTURE OPEN, POSTED ,OR CLOSED		A	
				DESCRIPTION - Open, No Restriction			
GEOMETRIC DATA				APPRAISAL			
(48) LENGTH OF MAXIMUM SPAN		31 FT		(67) STRUCTURAL EVALUATION		6	
(49) STRUCTURE LENGTH		31 FT		(68) DECK GEOMETRY		2	
(50)CURB OR SIDEWALK: LEFT 0.0 FT RIGHT 0.0 FT				(69) UNDERCLEARANCES,VERTI & HORIZ		N	
(51) BRIDGE ROADWAY WIDTH CURB TO CURB		23.0 FT		(71) WATERWAY ADEQUACY		8	
(52) DECK WIDTH OUT TO OUT		24.2 FT		(72) APPROACH ROADWAY ALIGNMENT		8	
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)		19.0 FT		(36) TRAFFIC SAFETY FEATURES		0000	
(33) BRIDGE MEDIAN - No Median	CODE	0		(113)SCOUR CRITICAL BRIDGES		3	
(34) SKEW 0° (35) STRUCTURE FLARED		NO		SCOUR PLAN OF ACTION			
(10) INVENTORY ROUTE MIN VERT CLEAR		99 FT 99 IN		PROPOSED IMPROVEMENTS			
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR		23.0 FT		(75) TYPE OF WORK -	CODE	311	
(53) MIN VERT CLEAR OVER BRIDGE RDWY		99 FT 99 IN		(76) LENGTH OF STRUCTURE IMPROVEMENT		53 FT	
(54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad				(94) BRIDGE IMPROVEMENT COST		\$127,000	
(55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad		99.9 FT		(95) ROADWAY IMPROVEMENT COST		\$32,000	
(56) MIN LAT UNDERCLEAR LT REF -		0.0 FT		(96) TOTAL PROJECT COST		\$191,000	
				(97) YEAR OF IMPROVEMENT COST ESTIMATE		2007	
				(114)FUTURE ADT 5800	(115) YEAR FUTURE ADT	2025	
NAVIGATION DATA				INSPECTIONS			
(38) NAVIGATION CONTROL - No Navigational Control	CODE	0		(90) INSPECTION DATE		07/13/2010	
(111)PIER PROTECTION - Not Applicable	CODE			(92) CRITICAL FEATURE INSPECTION :	(93) CFI DATE		
(39) NAVIGATION VERTICAL CLEARANCE		0		A) FRACTURE CRIT DETAIL - NO	A)		
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR				B) UNDERWATER INSP - NO	B)		
(40) NAVIGATION HORIZONTAL CLEARANCE		0		C) OTHER SPECIAL INSP NO	C)		
				SCOUR			

BRIDGE MANAGEMENT UNIT
DATA ON EXISTING STRUCTURE

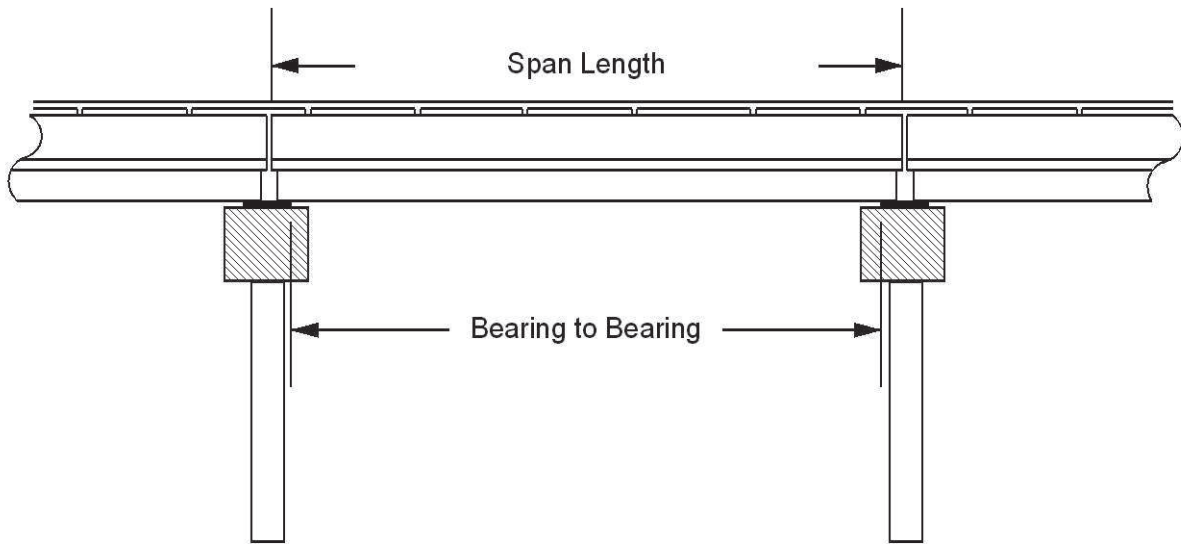
Run Date: 08/20/2010

COUNTY : ROWAN		DIV : 9		DIST : 1		STRUCTURE NUMBER : 790315		LENGTH : 31 FEET	
ROUTE CARRIED : SR1225				FEATURE INTERSECTED : PRONG OF GRANTS CREEK					
LOCATED : 0.3 MI. E. JCT. SR1477				BRIDGE NAME :				CITY :	
FUNC. CLASS : 17		SYST.ON : FA		SYST.UNDER : NFA		ADT & YR : 2900 2004		RAIL TYPE : LT 253 RT 253	
BUILT : 1961		BY : BMU		PROJ :		FED.AID PROJ :		DESIGN LOAD : Other or Unknown	
REHAB :		BY : BMU		PROJ : 5.6351		ALIGNMENT : TAN		SKEW : 90	
								LANES : ON 2 UNDER	
NAVIGATION : VC 0.0 FT HC 0.0 FT				HT. CRN. TO BED : 10 FT				WATER DEPTH : 1 FT	
SUPERSTRUCTURE : TIMBER DECK ON I-BEAMS									
SUBSTRUCTURE : END BENTS:TIMBER CAP ON TIMBER PILES,TIMBER BULKHEADS									
SPANS : 1@30'6									
BEAMS OR GIRDERS : 12 LINES OF W16X40 I-BEAMS @ 2'0 CENTERS									
FLOOR : 4X8 TIM,3.5 AWS		ENCROACHMENT :				DECK (OUT TO OUT) : 24.2 FT			
CLEAR ROADWAY : 23.0 FT		BETWEEN RAILS : 23.0 FT				SIDEWALK OR CURB : LT 0.0 FT RT 0.0 FT			
VERT.CL.OVER : 99 FT 99 IN		VERT.CL.UNDER : 00 FT 00 IN				HOR.CL.UNDER : 0.0 FT			
INV.RTG. : HS-17		OPE.RTG. : HS-28		CONTR.MEMBER : Int.bms		POSTED : SV		TTST DATE 09/13/1984	
SYSTEM : Secondary S.R. Route						GREEN LINE ROUTE : N			
2ND OPENING :		3RD OPENING :		4TH OPENING :		5TH OPENING :			
REMARKS :									

Structure Data Worksheet

Spans

County: ROWAN Structure No: 790315 Date: 07/13/2010 Inspected By: GDP



Span No	Span Length	Bearing to Bearing	Comments
1	30.5	29.583	NBIS BL 28.5

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 790315 County: ROWAN Date: 07/13/2010 By: GDP

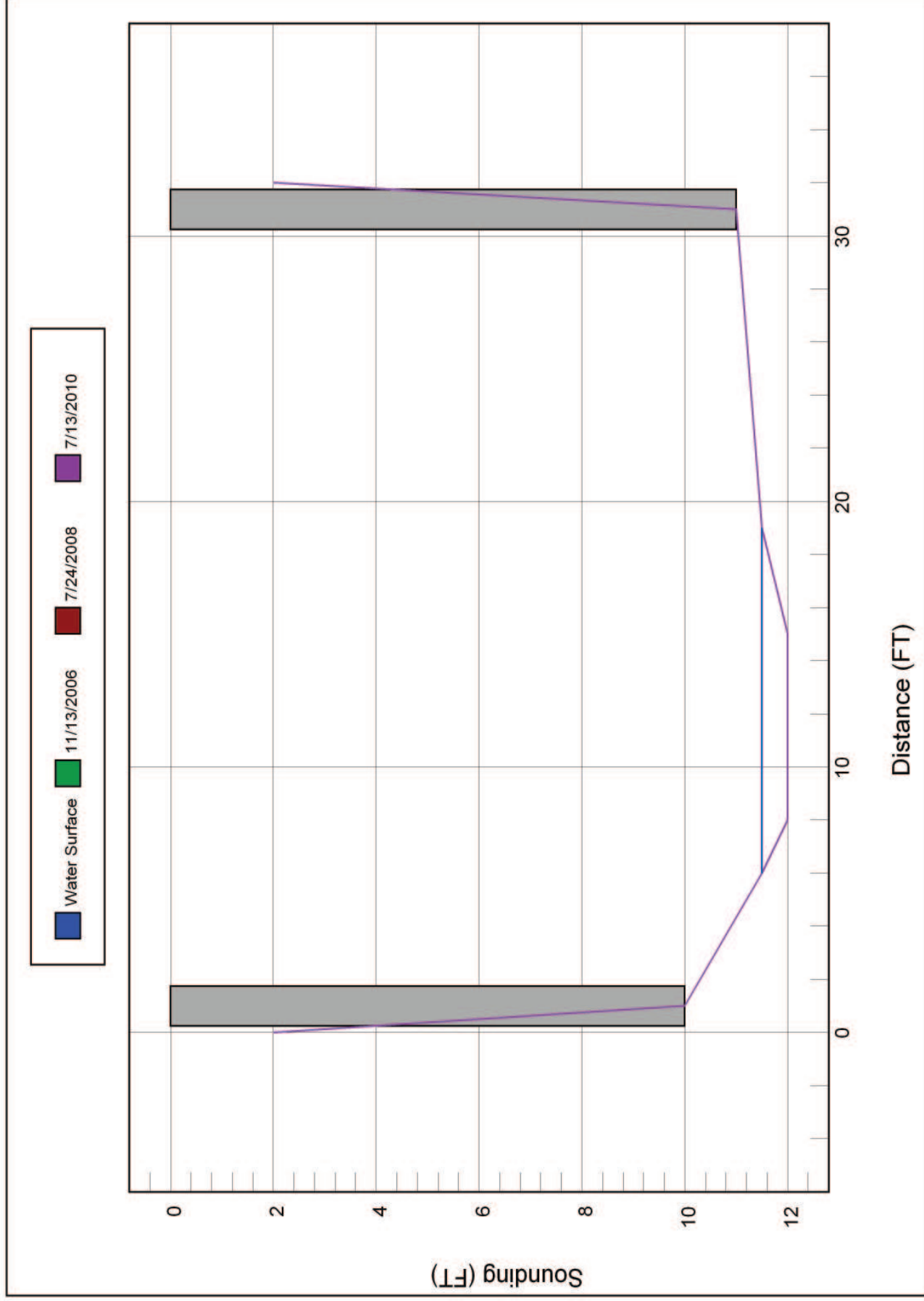
Record sounding from top of rail. Other location if needed: _____

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

DOWNSTREAM			UPSTREAM		
Distance (Station) (ft)	Sounding (ft)	Description	Distance (Station) (ft)	Sounding (ft)	Description
0	2				
1	10	END BENT 1	1	8	END BENT 1
6	11.5	WSWE			
8	12				
15	12				
19	11.5	WSWE			
31	11	END BENT 2	31	10	END BENT 2
32	2				

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



Bridge Inspection Field Sketch



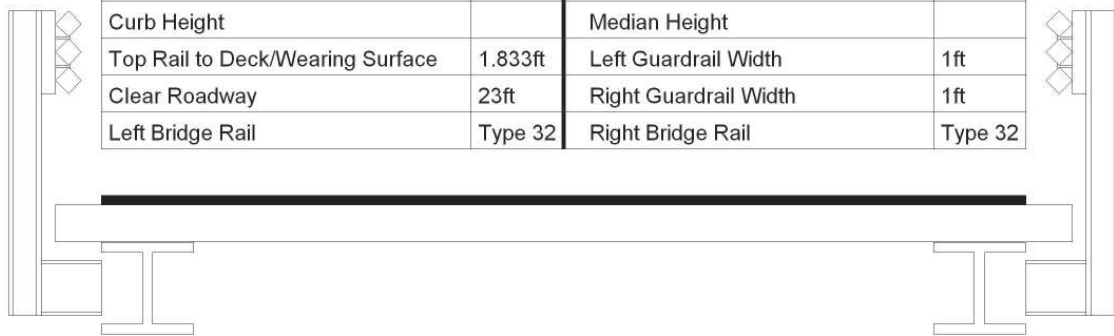
Roadway	19ft Wide	2 Paved Lanes	Looking East
Left Shoulder	6ft Wide		6ft Unpaved
Right Shoulder	6ft Wide		6ft Unpaved

verified by wc 7-13-10

Title		Description	
APPROACH ROADWAY SKETCH		APPROACH ROADWAY SKETCH	
Bridge No: 790315	Drawn By: GDP	Date: 07/24/08	File Name: S0066001612

Bridge Inspection Field Sketch

Deck Width/Out to Out	24.167ft	Wearing Surface	.29ft
Between Rails	23ft	Median Width	
Curb Height		Median Height	
Top Rail to Deck/Wearing Surface	1.833ft	Left Guardrail Width	1ft
Clear Roadway	23ft	Right Guardrail Width	1ft
Left Bridge Rail	Type 32	Right Bridge Rail	Type 32



Measurements for Span #	1		
Deck Thickness	.29	Left Overhang	1.083
Top of Rail to Bottom of Beam	4.25	Right Overhang	1.083

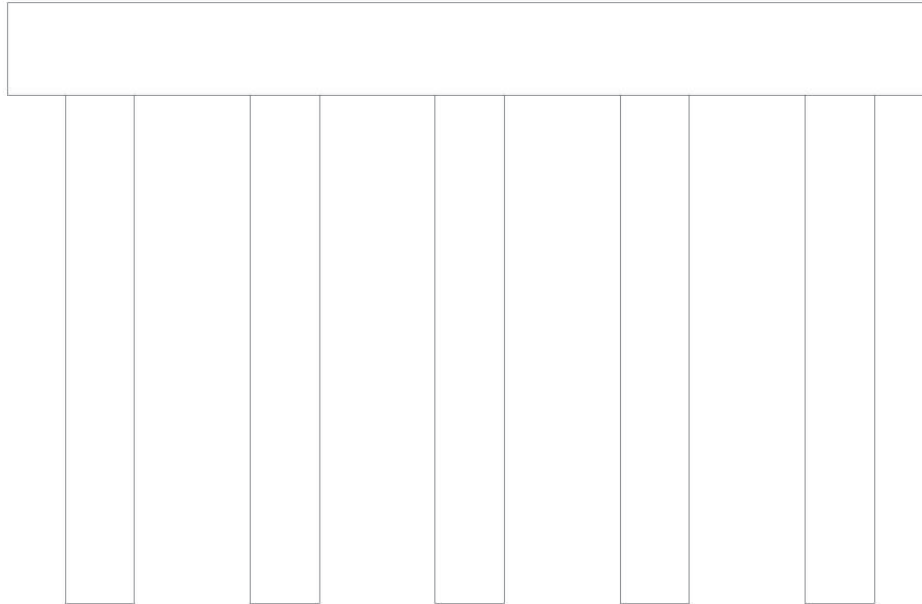
Beam No	Beam Type	Spacing	Comments
1	Steel I Beam	2ft	
2	Steel I Beam	2ft	
3	Steel I Beam	2ft	
4	Steel I Beam	2ft	
5	Steel I Beam	2ft	
6	Steel I Beam	2ft	
7	Steel I Beam	2ft	
8	Steel I Beam	2ft	
9	Steel I Beam	2ft	
10	Steel I Beam	2ft	
11	Steel I Beam	2ft	
12	Steel I Beam		

BEAM SIZE: 1.333ft HIGH X .583ft WIDE X .042ft FLANGE X .031ft WEB
 DIAPHRAMS: (["s) .219ft X .833 @ 1/2 POINT (3 - BOLT CONNECTION)

verified by wc 7-13-10

Title		Description	
STRUCTURE DATA SKETCH		STRUCTURE DATA SKETCH	
Bridge No: 790315	Drawn By: GDP	Date: 07/24/08	File Name: S0066001613

Bridge Inspection Field Sketch



Abutment #	1	Abutment 2 similar	
Cap - Beam Type (Wood or Steel)			
Cap Size	26ft Long	.98ft Wide	1ft High
Left Overhang	1ft	Lt Cap/Beam Overhang	1.083ft
Right Overhang	1ft	Rt Cap/Beam Overhang	1.083ft

Pile #	Material	Pile Type	Spacing	Length	Width/Diam.	Height	Orientation
1	Wood or Timber	Pile Bent	6		1		Vertical
2	Wood or Timber	Pile Bent	6		1		Vertical
3	Wood or Timber	Pile Bent	6		1		Vertical
4	Wood or Timber	Pile Bent	6		1		Vertical
5	Wood or Timber	Pile Bent			1		Vertical

verified by wc 7-13-10

Title		Description	
PILE DIAGRAM END BENTS		PILE DIAGRAM END BENTS	
Bridge No: 790315	Drawn By: GDP	Date: 07/24/08	File Name: S0066001614



EAST APPROACH



LOOKING DOWNSTREAM NORTH TOP



LOOKING UPSTREAM SOUTH TOP



WEST APPROACH



LOOKING EAST



SOUTH PROFILE

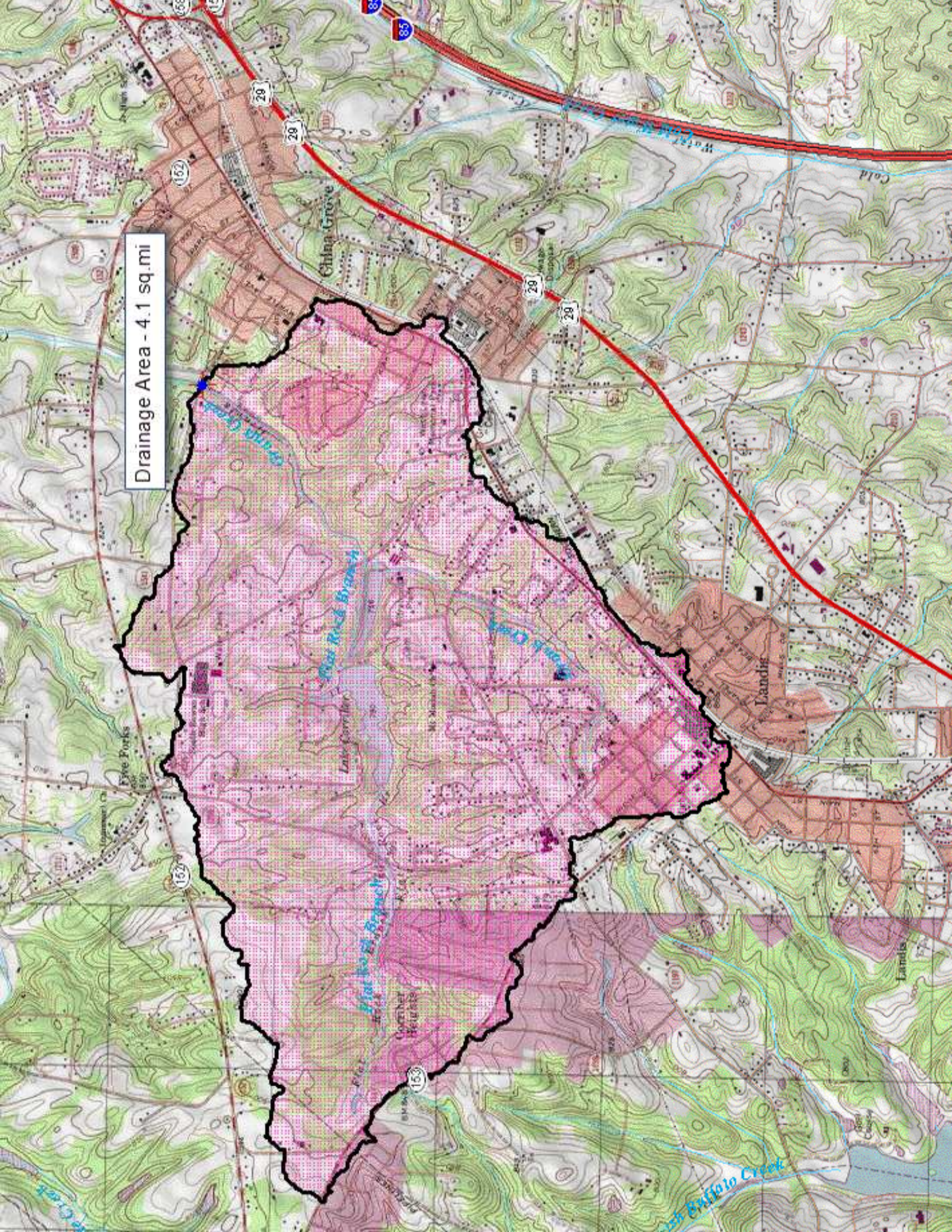


END BENT 2



LOOKING UPSTREAM SOUTH BOTTOM

Drainage Area - 4.1 sq. mi

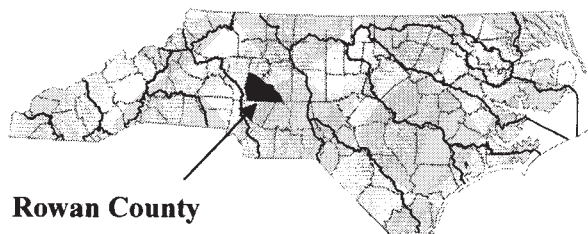


FLOOD INSURANCE STUDY

A Report of Flood Hazards in

ROWAN COUNTY, NORTH CAROLINA

AND INCORPORATED AREAS



Community Name	Community Number	River Basin
China Grove, Town of	370210	Yadkin
Cleveland, Town of	370097	Yadkin
East Spencer, Town of	370211	Yadkin
Faith, Town of	370352	Yadkin
Granite Quarry, Town of	370212	Yadkin
Landis, Town of	370213	Yadkin
Rockwell, Town of	370214	Yadkin
Rowan County (Unincorporated Areas)	370351	Yadkin
Salisbury, City of	370215	Yadkin
Spencer, Town of	370216	Yadkin



VOLUME 1 OF 3

June 16, 2009

**Federal Emergency Management Agency
State of North Carolina**

**Flood Insurance Study Number
37159CV001A**

www.fema.gov and www.ncfloodmaps.com



Section 4.0 – Area Studied

Table 6—Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
East Fork Creek	The confluence with Coddle Creek	Approximately 6.0 miles upstream of the confluence with Coddle Creek	Rowan County (Unincorporated Areas)
Fisher Branch	The confluence with Second Creek	Approximately 50 feet downstream of Fisher Road (SR 2320)	Town of Rockwell, Rowan County (Unincorporated Areas)
Flat Creek	The confluence with Yadkin River	Approximately 1.3 miles upstream of River Road (SR 2152)	Rowan County (Unincorporated Areas)
Flat Rock Branch	The confluence with Grants Creek	Approximately 800 feet downstream of Flat Rock Road (SR 1210)	Town of Landis, Rowan County (Unincorporated Areas)
Fourth Creek	The confluence with South Yadkin River	The Iredell/Rowan County boundary	Rowan County (Unincorporated Areas)
Fourth Creek Tributary 4	The confluence with Fourth Creek	Approximately 0.5 mile upstream of the confluence with Fourth Creek	Rowan County (Unincorporated Areas)
Fourth Creek Tributary 5	The confluence with Fourth Creek	Approximately 360 feet upstream of Baker Mill Road (SR 1957)	Rowan County (Unincorporated Areas)
Grants Creek Tributary 2	The confluence with Grants Creek	Approximately 870 feet downstream of the Par Drive	City of Salisbury
Grants Creek Tributary 3	The confluence with Grants Creek	Approximately 0.4 mile upstream of the confluence with Grants Creek	City of Salisbury
Grants Creek Tributary 4	The confluence with Grants Creek	Approximately 0.6 mile upstream of the confluence with Grants Creek	City of Salisbury
Irish Buffalo Creek Tributary 4	Approximately 0.7 mile upstream of the confluence with Irish Buffalo Creek	Approximately 0.9 mile upstream of the confluence with Irish Buffalo Creek	Town of Landis, Rowan County (Unincorporated Areas)
Irish Buffalo Creek Tributary 5	Approximately 0.7 mile upstream of the confluence with Irish Buffalo Creek	Approximately 0.8 mile upstream of the confluence with Irish Buffalo Creek	Town of Landis
Jump and Run Branch	The confluence with Grants Creek	Approximately 385 feet upstream of Willow Road	Rowan County (Unincorporated Areas), City of Salisbury
Kerr Creek	The confluence with Sloans Creek	Approximately 1.4 miles upstream of Corriher Springs Road (SR 1554)	Rowan County (Unincorporated Areas)
Little Creek (South)	The confluence with Third Creek	The Iredell/Rowan County boundary	Rowan County (Unincorporated Areas)

Section 5.0 – Engineering Methods

Table 8—Summary of Discharges

Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Grants Creek	Approximately 0.2 mile downstream of the confluence of Little Creek	28.0	4,240	6,290	6,973	8,841
	At the confluence of Little Creek	19.4	3,946	5,739	6,305	7,827
	Approximately 0.2 mile upstream of the confluence of Little Creek	19.2	3,876	5,655	6,219	7,736
	Approximately 0.9 mile upstream of the confluence of Little Creek	17.9	3,417	5,097	5,641	7,122
	Approximately 1.5 miles upstream of the confluence of Little Creek	16.6	2,957	4,528	5,051	6,493
	Approximately 2.0 miles upstream of the confluence of Little Creek	15.5	2,741	4,242	4,745	6,140
	Approximately 2.3 miles upstream of the confluence of Little Creek	14.7	2,654	4,116	4,605	5,961
	Approximately 0.3 mile downstream of the confluence of Petrea Branch	13.7	2,471	3,871	4,342	5,655
	At the confluence of Petrea Branch	12.9	2,287	3,625	4,081	6,037 ²
	At the confluence of Lake Wright Branch	5.3	1,881	2,856	3,148	3,938
	Approximately 0.2 mile downstream of Church Street / State Highway 152	4.9	1,791	2,729	3,009	3,769
	Approximately 0.5 mile upstream of Church Street / State Highway 152	4.1	1,526	2,372	2,629	3,331
	Approximately 0.9 mile upstream of Church Street / State Highway 152	3.9	1,462	2,283	2,532	3,215
	Approximately 0.4 mile downstream of the confluence of Flat Rock Branch	3.2	1,353	2,113	2,341	2,963

Section 5.0 – Engineering Methods

Table 11—Roughness Coefficients

Stream	Channel "n"	Overbank "n"
East Spencer High Creek	0.025 – 0.060	0.025 – 0.085
Faith Road Branch	0.025 – 0.070	0.025 – 0.100
Fisher Branch	0.050	0.100 – 0.160
Five Forks Tributary	0.025 – 0.070	0.025 – 0.010
Flat Creek	0.040 – 0.045	0.080 – 0.130
Flat Rock Branch	0.035 – 0.050	0.100 – 0.150
Fourth Creek	0.040 – 0.052	0.080 – 0.150
Fourth Creek Tributary 4	0.045	0.080 – 0.140
Fourth Creek Tributary 5	0.048	0.100 – 0.130
Grants Creek	0.035 – 0.045	0.035 – 0.150
Grants Creek Tributary 2	0.045	0.090
Grants Creek Tributary 3	0.050	0.100 – 0.150
Grants Creek Tributary 4	0.050	0.090 – 0.150
Gravel Pit Branch	0.025 – 0.070	0.025 – 0.100
Henderson Branch	0.025 – 0.070	0.025 – 0.100
Henderson Branch Tributary	0.025 – 0.070	0.025 – 0.100
Hopkins Street Branch	0.025 – 0.070	0.025 – 0.100
Ice Plant Creek	0.025 – 0.070	0.025 – 0.100
Innis Street Branch	0.025 – 0.070	0.025 – 0.100
Irish Buffalo Creek	0.050	0.080 – 0.140
Irish Buffalo Creek Tributary 4	0.035 – 0.050	0.080 – 0.140
Irish Buffalo Creek Tributary 5	0.035 – 0.050	0.080 – 0.140
Jackson Branch	0.025 – 0.060	0.025 – 0.085
Julian Tributary	0.025 – 0.070	0.025 – 0.100
Jump and Run Branch	0.0450	0.090 – 0.130
Kerr Creek	0.035 – 0.050	0.070 – 0.120
Klutz Branch	0.050	0.080 – 0.140
Lake Wright Branch	0.025 – 0.070	0.025 – 0.100
Legion Park Branch	0.050	0.080 – 0.150
Little Creek	0.025 – 0.070	0.025 – 0.100
Little Creek (South)	0.045	0.080 – 0.140
Lomax Creek	0.050	0.120 – 0.150
Mahaley Branch	0.025 – 0.070	0.025 – 0.100
Mahaley Branch Tributary	0.025 – 0.065	0.025 – 0.100
Main Street Tributary	0.025 – 0.070	0.025 – 0.100
Maple Avenue Branch	0.025 – 0.070	0.025 – 0.100
Mill Creek	0.040 – 0.050	0.080 – 0.140
Mill Creek (into Grants Creek)	0.025 – 0.040	0.025 – 0.060
Moose Branch	0.025 – 0.070	0.025 – 0.100
North Fork Tributary	0.025 – 0.070	0.025 – 0.100
North Second Creek	0.048	0.040 – 0.150

Section 5.0 – Engineering Methods

Table 12—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
FOURTH CREEK				
829	82,927	11,826	728.2	64 / 283
836	83,641	11,826	728.6	333 / 104
841	84,090	11,691	728.9	188 / 516
845	84,539	11,691	728.9	35 / 352
850	84,987	11,691	729.2	165 / 475
855	85,464	11,691	729.4	535 / 349
859	85,907	11,691	729.5	497 / 303
FOURTH CREEK TRIBUTARY 4				
008	800	524	707.7 ⁴	39 / 13
011	1,073	524	707.7 ⁴	13 / 14
013	1,314	524	707.7 ⁴	13 / 14
018	1,793	524	710.6	23 / 15
021	2,120	524	710.7	13 / 37
024	2,422	425	711.0	15 / 24
FOURTH CREEK TRIBUTARY 5				
007	680	1,501	709.4 ⁴	9 / 251
010	1,005	1,501	709.4 ⁴	13 / 198
015	1,500	1,501	709.4 ⁴	34 / 98
020	2,000	1,501	709.4 ⁴	88 / 17
025	2,500	1,501	709.4 ⁴	88 / 15
030	3,000	1,352	709.4 ⁴	127 / 9
035	3,500	1,352	709.4 ⁴	158 / 9
038	3,764	1,352	709.4 ⁴	114 / 43
040	4,035	1,352	709.4 ⁴	11 / 11
044	4,377	1,352	712.5	114 / 43
045	4,500	1,352	712.5	100 / 74
GRANTS CREEK TRIBUTARY 2				
007	675	812	674.2 ⁴	92 / 23
012	1,186	812	676.2	23 / 20
017	1,712	786	683.1	26 / 20
023	2,327	763	687.8	11 / 89
GRANTS CREEK TRIBUTARY 3				
006	595	1,204	676.9 ⁴	32 / 50
011	1,078	1,194	676.9 ⁴	38 / 46
014	1,430	1,194	676.9 ⁴	32 / 32
019	1,909	1,194	678.8	16 / 130
023	2,317	1,159	680.2	15 / 35
GRANTS CREEK TRIBUTARY 4				
007	654	933	679.9 ⁴	203 / 114
010	1,042	933	679.9 ⁴	250 / 32
015	1,531	933	679.9 ⁴	102 / 32
021	2,061	890	680.8	57 / 66
025	2,505	890	683.4	32 / 32

Section 5.0 – Engineering Methods

Table 12—Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width³ (feet)
GRANTS CREEK TRIBUTARY 4				
030	3,019	878	687.2	62 / 32
034	3,379	878	688.9	40 / 32
034	3,371	641	742.8	26 / 12
036	3,552	641	744.7	11 / 12
038	3,763	641	749.5	17 / 4
040	3,997	641	753.5	18 / 21
043	4,273	641	756.9	12 / 38
045	4,497	641	760.0	23 / 12
IRISH BUFFALO CREEK TRIBUTARY 4				
034	3,371	641	742.8	26 / 12
036	3,552	641	744.7	11 / 12
038	3,763	641	749.5	17 / 4
040	3,997	641	753.5	18 / 21
043	4,273	641	756.9	12 / 38
045	4,497	641	760.0	23 / 12
IRISH BUFFALO CREEK TRIBUTARY 5				
032	3,157	545	746.7	73 / 44
033	3,319	545	746.7	62 / 43
035	3,466	545	747.7	50 / 10
036	3,628	545	749.3	25 / 50
038	3,754	545	749.8	15 / 40
039	3,925	545	751.2	25 / 28
041	4,083	545	752.2	25 / 14
JUMP AND RUN BRANCH				
004	433	1,615	658.4 ⁴	144 / 110
009	929	1,615	658.4 ⁴	76 / 23
015	1,462	1,615	658.4 ⁴	180 / 89
017	1,700	1,615	658.4 ⁴	119 / 21
020	1,977	1,615	658.4 ⁴	52 / 21
027	2,655	1,550	660.0	21 / 102
033	3,290	1,550	662.9	20 / 23
040	3,989	1,525	664.6	196 / 27
043	4,319	1,525	665.3	20 / 8
050	4,998	1,336	669.0	15 / 52
055	5,497	1,336	671.4	7 / 35
064	6,388	1,268	677.4	13 / 23
070	6,961	1,092	681.0	158 / 12
073	7,338	1,092	682.2	147 / 12
076	7,552	1,028	682.8	50 / 97
078	7,820	1,028	684.0	14 / 12
082	8,239	1,028	687.9	71 / 12
085	8,480	972	690.0	52 / 27
087	8,701	972	692.6	12 / 51

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Grants Creek								
090	9,000	843	7,233	1.7	644.2	634.5 ²	635.5	1.0
100	10,027	1,210	10,695	1.2	644.2	634.7 ²	635.7	1.0
110	11,000	675	4,741	2.6	644.2	634.9 ²	635.9	1.0
120	12,000	1,197	11,465	1.1	644.2	635.7 ²	636.6	0.9
130	13,000	1,167	10,500	1.2	644.2	635.8 ²	636.7	0.9
140	14,000	842	7,406	1.6	644.2	636.3 ²	637.2	0.9
150	15,000	520	5,008	2.4	644.2	637.2 ²	638.1	0.9
160	16,000	687	6,573	1.8	644.2	637.9 ²	638.8	0.9
170	17,000	620	5,922	2.0	644.2	638.4 ²	639.4	1.0
180	18,000	606	6,230	1.9	644.2	639.4 ²	640.3	0.9
187	18,696	677	6,806	1.8	644.2	639.8 ²	640.7	0.9
196	19,571	492	5,080	2.4	644.2	640.8 ²	641.5	0.7
205	20,500	856	8,569	1.4	644.2	641.3 ²	642.1	0.8
215	21,500	862	7,574	1.5	644.2	641.6 ²	642.5	0.9
231	23,066	532	3,907	3.0	644.2	643.3 ²	644.2	0.9
240	24,000	591	5,325	2.2	645.3	645.3	645.8	0.5
255	25,500	707	5,718	2.0	646.5	646.5	647.4	0.9
265	26,500	995	6,356	1.8	647.1	647.1	648.1	1.0
275	27,500	1,178	8,134	1.4	648.0	648.0	648.8	0.8
286	28,565	679	5,103	2.1	649.4	649.4	650.2	0.8
295	29,500	900	6,628	1.6	650.1	650.1	650.9	0.8
305	30,500	832	5,380	2.0	650.6	650.6	651.5	0.9

¹Feet above mouth

²Elevations computed without consideration of backwater effects from Yadkin River

FEDERAL EMERGENCY MANAGEMENT AGENCY

ROWAN COUNTY, NC AND INCORPORATED AREAS

FLOODWAY DATA

GRANTS CREEK

TABLE 14

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Grants Creek								
314	31,369	215	1,611	6.7	651.2	651.2	652.2	1.0
319	31,942	292	2,320	4.6	655.5	655.5	655.7	0.2
325	32,500	304	3,244	3.3	657.5	657.5	657.7	0.2
334	33,383	616	6,952	1.6	658.1	658.1	659.1	1.0
339	33,937	921	9,764	1.1	658.3	658.3	659.3	1.0
345	34,500	848	8,641	1.2	658.5	658.5	659.5	1.0
355	35,465	535	4,760	2.2	658.8	658.8	659.8	1.0
366	36,599	441	5,199	2.0	662.8	662.8	663.4	0.6
374	37,383	670	7,467	1.4	663.0	663.0	663.8	0.8
381	38,068	682	6,360	1.6	663.3	663.3	664.1	0.8
387	38,699	397	4,148	2.5	663.6	663.6	664.4	0.8
396	39,597	208	2,029	5.1	663.9	663.9	664.6	0.7
404	40,444	409	5,169	2.0	667.4	667.4	667.9	0.5
410	41,000	291	3,578	2.9	667.8	667.8	668.5	0.7
420	42,000	198	2,080	5.0	668.7	668.7	669.4	0.7
430	43,000	609	5,496	1.7	670.7	670.7	671.3	0.6
443	44,337	987	14,088	0.7	671.6	671.6	672.5	0.9
454	45,355	906	11,189	0.8	671.6	671.6	672.6	1.0
460	46,000	928	11,267	0.8	671.7	671.7	672.7	1.0
470	47,000	928	10,979	0.8	671.8	671.8	672.8	1.0
481	48,124	383	3,384	2.5	672.0	672.0	672.9	0.9
493	49,269	281	3,075	2.8	673.9	673.9	674.4	0.5

¹Feet above mouth

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ROWAN COUNTY, NC
AND INCORPORATED AREAS**

TABLE 14

FLOODWAY DATA

GRANTS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Grants Creek								
500	50,000	447	4,733	1.8	674.4	674.4	675.1	0.7
510	51,000	241	2,178	3.8	674.7	674.7	675.4	0.7
519	51,895	467	4,700	1.8	676.9	676.9	677.6	0.7
530	53,000	274	2,738	2.9	677.8	677.8	678.6	0.8
540	53,970	398	4,902	1.6	678.9	678.9	679.6	0.7
549	54,912	492	4,932	1.6	679.2	679.2	680.1	0.9
559	55,917	330	3,436	2.3	679.7	679.7	680.6	0.9
577	57,699	466	4,291	1.8	681.2	681.2	682.1	0.9
585	58,500	860	8,502	0.9	681.7	681.7	682.6	0.9
595	59,500	682	6,074	1.3	681.9	681.9	682.8	0.9
605	60,500	735	6,215	1.3	682.3	682.3	683.2	0.9
615	61,500	664	5,130	1.5	682.6	682.6	683.5	0.9
624	62,387	328	2,047	3.7	683.1	683.1	684.0	0.9
635	63,457	260	2,094	3.6	686.3	686.3	686.8	0.5
645	64,500	619	6,591	1.1	688.8	688.8	689.4	0.6
655	65,500	673	6,717	1.1	689.0	689.0	689.7	0.7
662	66,164	562	5,235	1.4	689.2	689.2	690.0	0.8
670	67,000	518	4,586	1.5	689.8	689.8	690.5	0.7
680	68,000	395	3,062	2.3	690.2	690.2	691.0	0.8
695	69,500	183	1,606	3.9	692.3	692.3	692.9	0.6
710	71,000	600	5,383	1.2	693.8	693.8	694.5	0.7
720	72,000	641	5,077	1.2	694.1	694.1	694.8	0.7

¹Feet above mouth

FEDERAL EMERGENCY MANAGEMENT AGENCY

ROWAN COUNTY, NC AND INCORPORATED AREAS

TABLE 14

FLOODWAY DATA

GRANTS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Grants Creek								
731	73,097	447	3,201	1.9	694.7	694.7	695.5	0.8
740	74,000	192	1,199	4.7	695.9	695.9	696.5	0.6
751	75,080	148	1,533	3.7	701.8	701.8	702.0	0.2
760	76,000	538	5,147	1.1	702.2	702.2	702.9	0.7
770	76,961	646	5,492	0.9	702.6	702.6	703.3	0.7
781	78,084	644	4,930	1.0	702.8	702.8	703.6	0.8
796	79,605	195	1,078	4.4	704.1	704.1	704.7	0.6
806	80,551	77	729	6.5	706.2	706.2	707.2	1.0
816	81,614	225	1,798	2.6	709.5	709.5	709.7	0.2
825	82,500	368	2,578	1.8	709.8	709.8	710.4	0.6
837	83,651	318	1,959	2.4	710.3	710.3	711.2	0.9
845	84,500	198	1,134	3.8	711.4	711.4	712.3	0.9
855	85,535	542	3,168	1.4	714.2	714.2	715.0	0.8
865	86,500	319	1,586	2.6	714.9	714.9	715.6	0.7
877	87,672	74	492	6.4	718.5	718.5	718.8	0.3
889	88,941	75	402	7.8	722.2	722.2	722.8	0.6
900	89,983	125	792	4.0	726.7	726.7	727.7	1.0
910	90,981	83	534	5.6	729.6	729.6	730.4	0.8
920	92,041	142	631	4.8	734.4	734.4	734.5	0.1
930	93,000	220	1,029	2.9	736.1	736.1	736.9	0.8

¹Feet above mouth

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ROWAN COUNTY, NC
AND INCORPORATED AREAS**

TABLE 14

FLOODWAY DATA

GRANTS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Grants Creek								
940	94,000	166	879	3.0	740.1	740.1	740.7	0.6
951	95,092	155	804	3.2	743.0	743.0	743.7	0.7
960	96,014	52	311	8.2	744.9	744.9	745.8	0.9
970	97,000	55	262	8.9	749.1	749.1	749.8	0.7
980	98,031	50	337	7.0	754.9	754.9	755.8	0.9
990	98,997	42	289	5.0	760.4	760.4	760.9	0.5
1000	100,000	38	201	7.3	774.1	774.1	774.9	0.8
1010	101,000	101	482	2.5	782.6	782.6	783.2	0.6
1020	102,000	25	101	9.7	785.5	785.5	785.5	0.0
1030	103,000	35	120	6.6	792.9	792.9	792.9	0.0
1039	103,920	33	83	9.0	801.0	801.0	801.0	0.0
1046	104,597	25	73	6.7	808.9	808.9	809.3	0.4
1052	105,247	25	118	4.2	820.0	820.0	821.0	1.0
1060	105,982	26	117	4.2	835.3	835.3	835.4	0.1

¹Feet above mouth

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ROWAN COUNTY, NC
AND INCORPORATED AREAS**

TABLE 14

FLOODWAY DATA

GRANTS CREEK



Grants Creek Detailed Study Plan: Multiple Run 2/5/2007
Patterson Road (Grants Creek) TORStructure ID: RN_GC_18Detaila

