

# PREDESIGN/PRESURVEY REPORT

County: Rowan

Project No.:

TIP No.:

Let Date:

WBS No.: 17BP.9.R.48

Bridge No.: 790188

Road No.: SR2564 (Shive Rd)

Stream: Second Creek

## Type of Request:

Date: 7/8/2013

Name:

Assigned to: EMT

Checked by:

Prior Survey Date (attach copy of prior survey): 9/1/1982

Study by Scour Section:

Flood Zone: A

Detail Study: LDS

Date: 06/16/09

Panel No.: 5665

BM Info:

Quad Map: Rockwell

Drainage Area: 2.85 sq.mi

From: Quad/Stream Stats

Q25: 1000cfs

Q50: 1200cfs

Q100: 1400cfs

Method: USGS Rural Regression: Region 1

## EXISTING BRIDGE INFORMATION

Location: 0.4 Miles West of JCT SR1006 (Faith Rd)

Average Daily Traffic: 2010 - 270

Length: 36'

Bed-to-Crown: 10'

Water Depth: 1'

Type of Structure: Tim Deck on I-Beams; End Bts: Tim Caps, Posts&Sills, Tim Bulkheads

Type of Span(s): 1@35'6"

Upstream Structure: 790189 – Tim Deck on I-Beams; End Bts: Tim Caps, Posts&Sills, Tim Bulkheads

Location: 0.8 Miles East of JCT SR2559

Bed-to-Crown: 9'

Prior Survey: 09/1982

Downstream Structure: 790176 – 3 Lines 84 CM Pipe, 60' Along Centerline of Pipe; Soil Cement Headwalls

Location: 0.15 Miles North of JCT SR2564 (Shive Rd)

Bed-to-Crown: 15'

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

|                                                       |  |
|-------------------------------------------------------|--|
| <p align="center"><b>MAINTENANCE COORDINATION</b></p> |  |
|-------------------------------------------------------|--|

**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:**

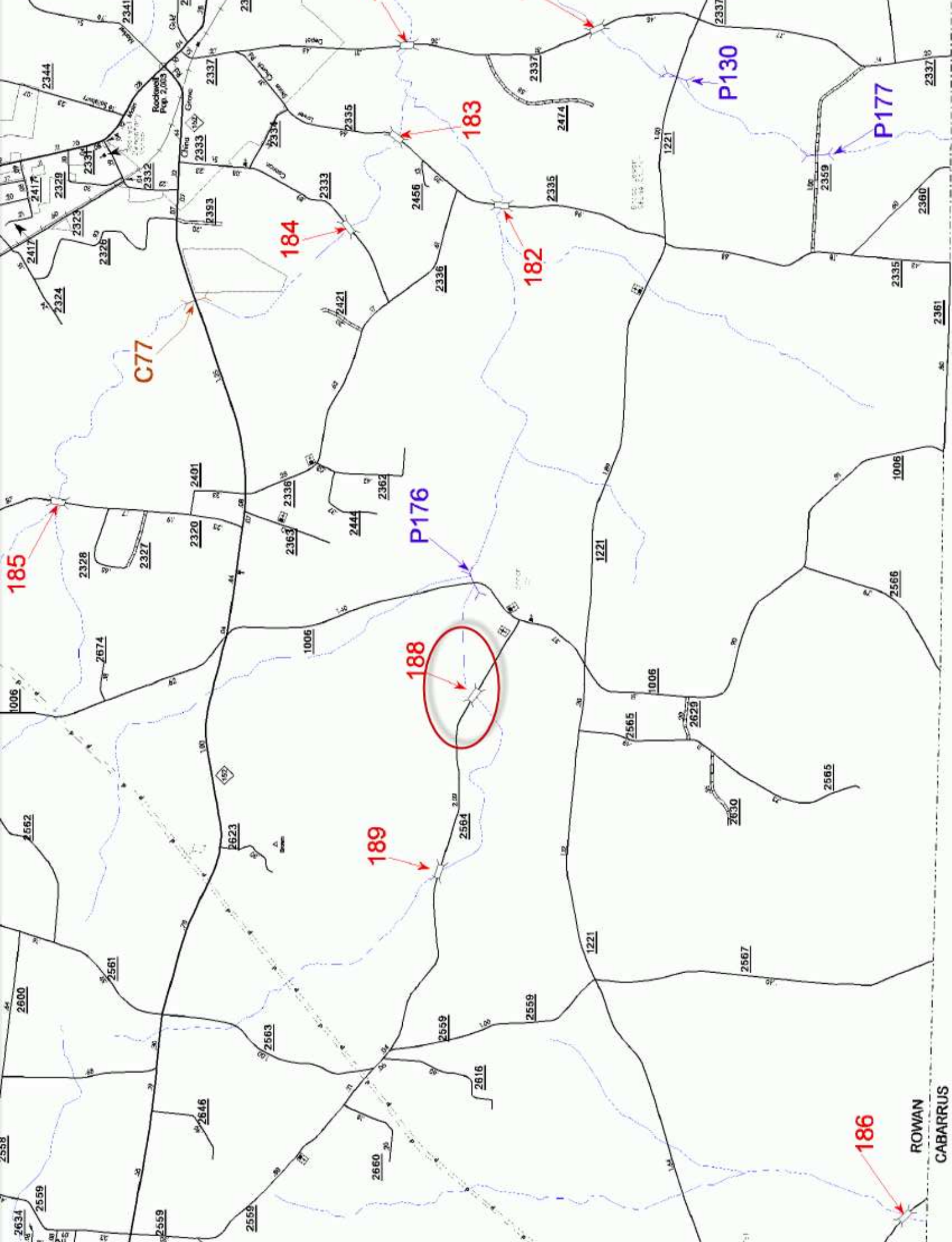
**Man-days Estimated:**

**Date Surveyed:****Date Completed:**

## Personnel

## Hours

**Pay Period****Comments:**





NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
BRIDGE MANAGEMENT UNIT

ATTENTION

# BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY ROWAN BRIDGE NUMBER 790188 INSPECTION CYCLE 2 YRS  
SR2564 SHIVIS RD.  
ROUTE SR2564 ACROSS CREEK M.P. 0

LOCATION 0.4 MI.W.JCT.SR1006

SUPERSTRUCTURE TIMBER DECK ON I-BEAMS

SUBSTRUCTURE END BENTS: TIMBER CAPS, POSTS & SILLS, TIMBER BULKHEADS

SPANS 1@35'6

LONGITUDE 80° 27' 23.39"

LATITUDE 35° 31' 54.59"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 09/13/2012

OPERATING RATING

PRESENT POSTING SV 14 TTST 18 SV 14 TTST 18

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT 4 DELINEATORS



LOOKING EAST

| SIGN NOTICE<br>ISSUED FOR |                 | NUMBERED<br>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: 11/01/2012

| IDENTIFICATION                                                       |                         |        |                            |
|----------------------------------------------------------------------|-------------------------|--------|----------------------------|
| (1) STATE NAME -NORTH CAROLINA                                       | BRIDGE                  | 790188 | SUFFICIENCY RATING = 48.06 |
| (8) STRUCTURE NUMBER(FEDERAL)                                        | 000000001590188         |        | STATUS = Not Deficient     |
| (5) INVENTORY ROUTE (ON/UNDER) - ON                                  | 31025640                |        |                            |
| (2) STATE HIGHWAY DEPARTMENT DISTRICT                                | 1                       |        |                            |
| (3) COUNTY CODE 159                                                  | (4) PLACE CODE          | 0      |                            |
| (6) FEATURE INTERSECTED - SECOND CREEK                               |                         |        |                            |
| (7) FACILITY CARRIED SR2564                                          |                         |        |                            |
| (9) LOCATION 0.4 MI.W.JCT.SR1006                                     |                         |        |                            |
| (11)MILEPOINT                                                        | 0                       |        |                            |
| (16)LAT 35° 31' 54.59"                                               | (17)LONG 80° 27' 23.39" |        |                            |
| (98)BORDER BRIDGE STATE CODE                                         | PCT SHARE               |        |                            |
| (99)BORDER BRIDGE STRUCTURE NO                                       |                         |        |                            |
| STRUCTURE TYPE AND MATERIAL                                          |                         |        |                            |
| (43) STRUCTURE TYPE MAIN: Steel                                      |                         |        |                            |
| TYPE - Stringer Multibeam or Girder                                  | CODE                    | 302    |                            |
| (44) STRUCTURE TYPE APPR :                                           |                         |        |                            |
| TYPE -                                                               | CODE                    | 000    |                            |
| (45) NUMBER OF SPANS IN MAIN UNIT                                    | 1                       |        |                            |
| (46) NUMBER OF APPROACH SPANS                                        |                         |        |                            |
| (107)DECK STRUCTURE TYPE - 8                                         | CODE                    |        |                            |
| (108)WEARING SURFACE / PROTECTIVE SYSTEM :                           |                         |        |                            |
| (A) TYPE OF WEARING SURFACE -                                        | CODE                    |        |                            |
| (B) TYPE OF MEMBRANE -                                               | CODE                    |        |                            |
| (C) TYPE OF DECK PROTECTION -                                        | CODE                    |        |                            |
| AGE AND SERVICE                                                      |                         |        |                            |
| (27) YEAR BUILT                                                      | 1960                    |        |                            |
| (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                                           | 270                     |        |                            |
| (30) YEAR OF ADT 2010                                                | (109) TRUCK ADT PCT     | 6%     |                            |
| (19) BYPASS OR DETOUR LENGTH                                         | 1 MI                    |        |                            |
| GEOMETRIC DATA                                                       |                         |        |                            |
| (48) LENGTH OF MAXIMUM SPAN                                          | 35 FT                   |        |                            |
| (49) STRUCTURE LENGTH                                                | 36 FT                   |        |                            |
| (50)CURB OR SIDEWALK: LEFT .2915 FT RIGHT .2915 FT                   |                         |        |                            |
| (51) BRIDGE ROADWAY WIDTH CURB TO CURB                               | 24.667 FT               |        |                            |
| (52) DECK WIDTH OUT TO OUT                                           | 25.5 FT                 |        |                            |
| (32) APPROACH ROADWAY WIDTH (W/SHOULDERS)                            | 18 FT                   |        |                            |
| (33) BRIDGE MEDIAN - No Median                                       | CODE                    | 0      |                            |
| (34) SKEW 30°                                                        | (35) STRUCTURE FLARED   | 0      |                            |
| (10) INVENTORY ROUTE MIN VERT CLEAR                                  | 999.9 FT                |        |                            |
| (47) INVENTORY ROUTE TOTAL HORIZ CLEAR                               | 24.667 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                  |        |                            |
| 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                    |        |                            |
| CLASSIFICATION                                                       |                         |        |                            |
| (112)NBIS BRIDGE SYSTEM -                                            |                         |        | YES                        |
| (104)HIGHWAY SYSTEM Is not on NHS                                    |                         |        | 0                          |
| (26) FUNCTIONAL CLASS - Local                                        |                         |        | 09                         |
| (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                          |
| CONDITION                                                            |                         |        |                            |
| (58) DECK                                                            |                         |        | 7                          |
| (59) SUPERSTRUCTURE                                                  |                         |        | 5                          |
| (60) SUBSTRUCTURE                                                    |                         |        | 5                          |
| (61) CHANNEL & CHANNEL PROTECTION                                    |                         |        | 7                          |
| (62) CULVERTS                                                        |                         |        | N                          |
| LOAD RATING AND POSTING                                              |                         |        |                            |
| (31) DESIGN LOAD Unknown                                             |                         |        | 0                          |
| (63) OPERATING RATING METHOD - Load Factor                           |                         |        |                            |
| (64) OPERATING RATING - HS-12                                        |                         |        | 121                        |
| (65) INVENTORY RATING METHOD - Load Factor                           |                         |        |                            |
| (66) INVENTORY RATING - HS-7                                         |                         |        | 113                        |
| (70) BRIDGE POSTING - Posting Required                               |                         |        | 0                          |
| (41) STRUCTURE OPEN, POSTED, OR CLOSED DESCRIPTION - Posted for Load |                         |        | P                          |
| APPRAISAL                                                            |                         |        |                            |
| (67) STRUCTURAL EVALUATION                                           |                         |        | 4                          |
| (68) DECK GEOMETRY                                                   |                         |        | 5                          |
| (69) UNDERCLEARANCES,VERTI & HORIZ                                   |                         |        | N                          |
| (71) WATERWAY ADEQUACY                                               |                         |        | 7                          |
| (72) APPROACH ROADWAY ALIGNMENT                                      |                         |        | 7                          |
| (36) TRAFFIC SAFETY FEATURES                                         |                         |        | 0000                       |
| (113)SCOUR CRITICAL BRIDGES                                          |                         |        | U                          |
| 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 460                                                  | (115) YEAR FUTURE ADT   | 2025   |                            |
| INSPECTIONS                                                          |                         |        |                            |
| (90) INSPECTION DATE                                                 |                         |        | 09/13/2012                 |
| (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                                                                |                         |        |                            |

## BRIDGE MANAGEMENT UNIT

## DATA ON EXISTING STRUCTURE

Run Date: 11/01/2012

|          |            |            |                    |          |      |
|----------|------------|------------|--------------------|----------|------|
| COUNTY : | DIVISION : | DISTRICT : | STRUCTURE NUMBER : | LENGTH : |      |
| ROWAN    | 9          | 1          | 790188             | 36       | FEET |

|                 |                       |
|-----------------|-----------------------|
| ROUTE CARRIED : | FEATURE INTERSECTED : |
| SR2564          | SECOND CREEK          |

|                     |               |        |
|---------------------|---------------|--------|
| LOCATED :           | BRIDGE NAME : | CITY : |
| 0.4 MI.W.JCT.SR1006 |               |        |

|               |           |              |            |               |
|---------------|-----------|--------------|------------|---------------|
| FUNC. CLASS : | SYST.ON : | SYST.UNDER : | ADT & YR : | RAIL TYPE :   |
| 09            | NFA       | NFA          | 270 2010   | LT 227 RT 227 |

|         |      |        |                |               |
|---------|------|--------|----------------|---------------|
| BUILT : | BY : | PROJ : | FED.AID PROJ : | DESIGN LOAD : |
| 1960    | BMU  |        |                | Unknown       |

|         |      |        |             |        |              |
|---------|------|--------|-------------|--------|--------------|
| REHAB : | BY : | PROJ : | ALIGNMENT : | SKEW : | LANES :      |
|         |      |        | TAN         | 120    | ON 2 UNDER 0 |

|                            |                   |               |
|----------------------------|-------------------|---------------|
| NAVIGATION :               | HT. CRN. TO BED : | WATER DEPTH : |
| VC 0 FT HC 0 FT 10 FT 1 FT |                   |               |

|                  |                        |
|------------------|------------------------|
| SUPERSTRUCTURE : | TIMBER DECK ON I-BEAMS |
|------------------|------------------------|

|                |                                                         |
|----------------|---------------------------------------------------------|
| SUBSTRUCTURE : | END BENTS: TIMBER CAPS, POSTS & SILLS, TIMBER BULKHEADS |
|----------------|---------------------------------------------------------|

|         |         |
|---------|---------|
| SPANS : | 1@35'6" |
|---------|---------|

|                    |                                           |
|--------------------|-------------------------------------------|
| BEAMS OR GIRDERS : | 10 LINES OF W16X37 I-BEAMS @ 2'7" CENTERS |
|--------------------|-------------------------------------------|

|                  |                |                     |
|------------------|----------------|---------------------|
| FLOOR :          | ENCROACHMENT : | DECK (OUT TO OUT) : |
| 4X8 TIM, 1.5 AWS |                | 25.5 FT             |

|                 |                 |                         |
|-----------------|-----------------|-------------------------|
| CLEAR ROADWAY : | BETWEEN RAILS : | SIDEWALK OR CURB :      |
| 24.667 FT       | 25.25 FT        | LT .2915 FT RT .2915 FT |

|                |
|----------------|
| VERT.CL.OVER : |
| 999.9 FT       |

|            |            |                 |          |      |            |
|------------|------------|-----------------|----------|------|------------|
| INV.RTG. : | OPE.RTG. : | CONTR.MEMBER :  | POSTED : | TTST | DATE       |
| HS-7       | HS-12      | InBm (Sec.Loss) | SV 14    | 18   | 10/26/2010 |

|                      |                    |
|----------------------|--------------------|
| SYSTEM :             | GREEN LINE ROUTE : |
| Secondary S.R. Route | N                  |

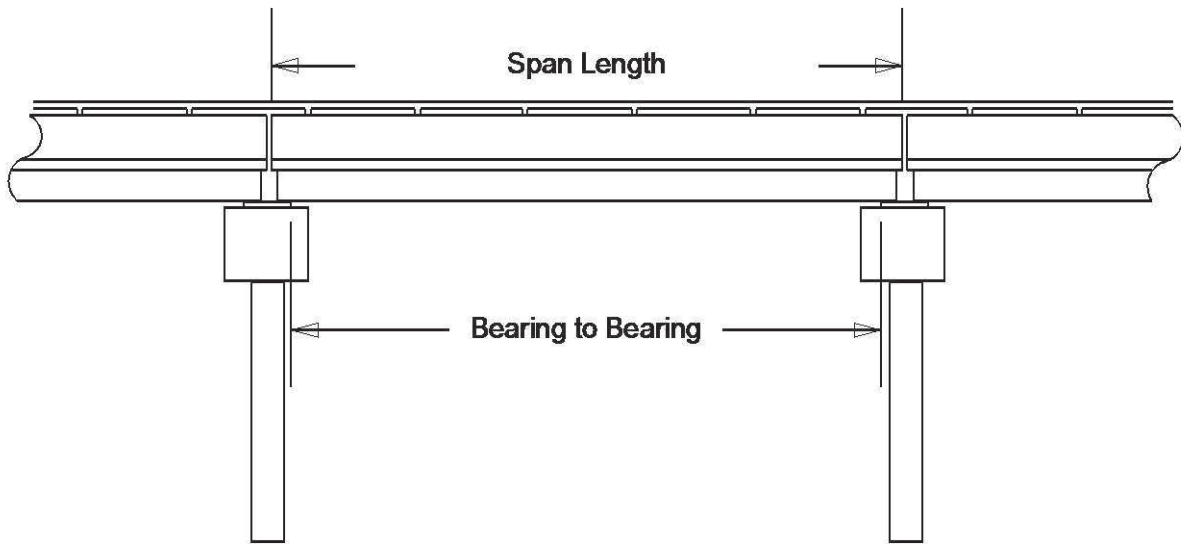
|                             |
|-----------------------------|
| UNDER ROUTES AND CLEARANCES |
|-----------------------------|

|           |
|-----------|
| REMARKS : |
|-----------|

# Structure Data Worksheet

*Spans*

County: ROWAN      Structure No: 790188      Date: 09/13/2012      Inspected By: TFM



| Span No | Span Length | Bearing to Bearing | Comments     |
|---------|-------------|--------------------|--------------|
| 1       | 35.5        | 34.5               | NBIS BL 33.5 |

# Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 790188 County: ROWAN Date: 09/13/2012 By: TFM

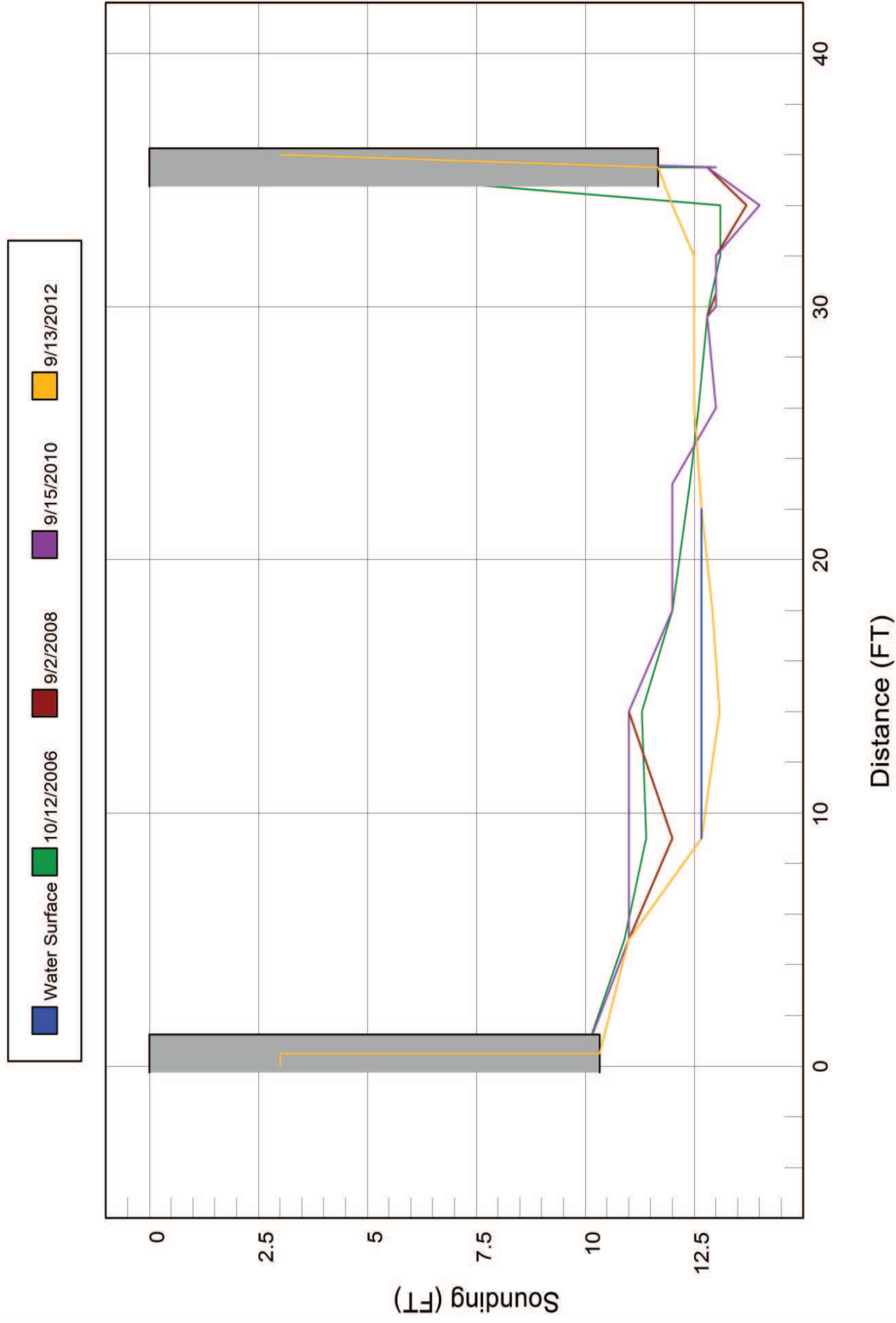
Record sounding from top of rail. Other location if needed:

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

| DOWNSTREAM                 |                  |                                 | UPSTREAM                   |                  |             |
|----------------------------|------------------|---------------------------------|----------------------------|------------------|-------------|
| Distance<br>(Station) (ft) | Sounding<br>(ft) | Description                     | Distance<br>(Station) (ft) | Sounding<br>(ft) | Description |
| 0                          | 3                |                                 |                            |                  |             |
| 0.5                        | 3                |                                 | 0.5                        | 11               | END BENT 1  |
| 0.5                        | 10.33            | END BENT 1                      |                            |                  |             |
| 5                          | 11               |                                 |                            |                  |             |
| 9                          | 12.67            | Water Surface/Water Edge (WSWE) |                            |                  |             |
| 14                         | 13.083           |                                 |                            |                  |             |
| 18                         | 12.92            |                                 |                            |                  |             |
| 22                         | 12.67            | Water Surface/Water Edge (WSWE) |                            |                  |             |
| 26                         | 12.5             |                                 |                            |                  |             |
| 30                         | 12.5             |                                 |                            |                  |             |
| 32                         | 12.5             |                                 |                            |                  |             |
| 34                         | 12               |                                 |                            |                  |             |
| 35.5                       | 11.67            | END BENT 2                      | 35.5                       | 13               | END BENT 2  |
| 36                         | 3                |                                 |                            |                  |             |

**STREAMBED PROFILE (Downstream)**

Top of Rail = 0 FT (Sounding)





## Bridge Inspection Field Sketch



|                |           |               |              |
|----------------|-----------|---------------|--------------|
| Roadway        | 18ft Wide | 2 Paved Lanes | Looking East |
| Left Shoulder  | 4ft Wide  |               | 4ft Unpaved  |
| Right Shoulder | 4ft Wide  |               | 4ft Unpaved  |

MEASUREMENTS VERIFIED BY DH 9/13/2012

**Title**

APPRAOCH ROADWAY SKETCH

**Description**

APPRAOCH ROADWAY SKETCH

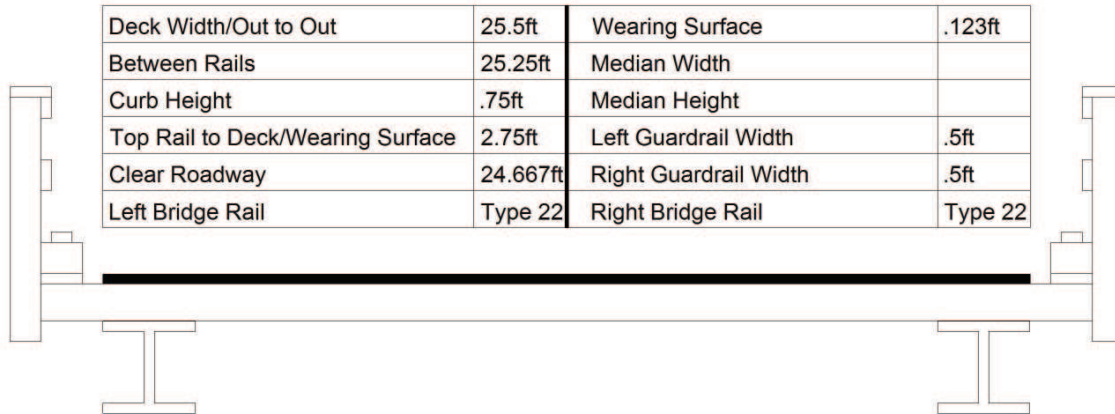
Bridge No: 790188

Drawn By: GDP

Date: 09/02/08

File Name: S0066001634

# Bridge Inspection Field Sketch



| Beam No | Beam Type    | Spacing | Comments |
|---------|--------------|---------|----------|
| 1       | Steel I Beam | 2.583ft |          |
| 2       | Steel I Beam | 2.583ft |          |
| 3       | Steel I Beam | 2.583ft |          |
| 4       | Steel I Beam | 2.583ft |          |
| 5       | Steel I Beam | 2.583ft |          |
| 6       | Steel I Beam | 2.583ft |          |
| 7       | Steel I Beam | 2.583ft |          |
| 8       | Steel I Beam | 2.583ft |          |
| 9       | Steel I Beam | 2.583ft |          |
| 10      | Steel I Beam |         |          |

BEAM SIZE: 1.333ft HIGH X .603ft WIDE X .031ft FLANGE X .026ft WEB

MEASUREMENTS VERIFIED BY DH 9/13/2012

## Title

STRUCTURE DATA SKETCH

## Description

STRUCTURE DATA SKETCH

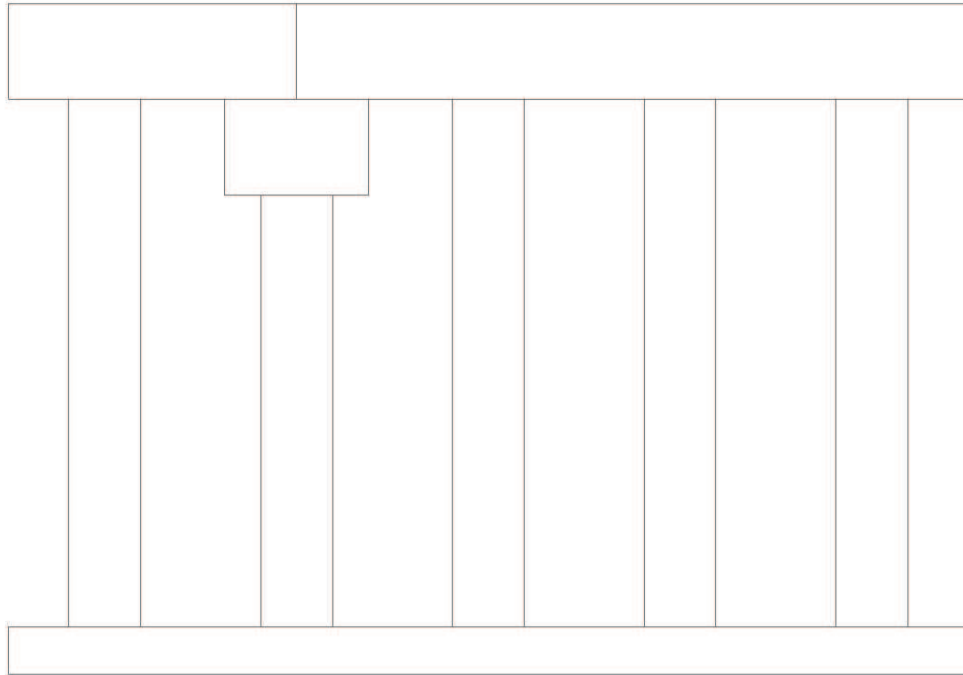
Bridge No: 790188

Drawn By: GDP

Date: 09/02/08

File Name: S0066001635

# Bridge Inspection Field Sketch



|                                 |               |                      |            |
|---------------------------------|---------------|----------------------|------------|
| Abutment #                      | 1             |                      |            |
| Cap - Beam Type (Wood or Steel) |               |                      |            |
| Cap Size                        | 29.375ft Long | .833ft Wide          | .98ft High |
| Left Overhang                   | 1.25ft        | Lt Cap/Beam Overhang | 2.167ft    |
| Right Overhang                  | .792ft        | Rt Cap/Beam Overhang | 1.5ft      |
| Timber Sub Cap                  |               |                      |            |
| Size                            | 4ft Long      | .833ft Wide          | .98ft High |
| Left pile to splice             | 0ft           |                      |            |
| Left Overhang                   | 1.5ft         |                      |            |
| Right Overhang                  | 1.5ft         |                      |            |
| Sill - Sill                     |               |                      |            |
| Sill Size                       |               |                      |            |

| Pile # | Material       | Pile Type | Spacing | Length | Width/Diam. | Height | Orientation |
|--------|----------------|-----------|---------|--------|-------------|--------|-------------|
| 1      | Wood or Timber | Pile Bent | 6.833   |        | .792 X .833 | POST   | Vertical    |
| 2      | Wood or Timber | Pile Bent | 6.833   |        | .792 X .833 | POST   | Vertical    |
| 3      | Wood or Timber | Pile Bent | 6.833   |        | .792 X .833 | POST   | Vertical    |
| 4      | Wood or Timber | Pile Bent | 6.833   |        | .792 X .833 | POST   | Vertical    |
| 5      | Wood or Timber | Pile Bent |         |        | .792 X .833 | POST   | Vertical    |

MEASUREMENTS VERIFIED BY DH 9/13/2012

|                         |               |                         |                        |
|-------------------------|---------------|-------------------------|------------------------|
| <b>Title</b>            |               | <b>Description</b>      |                        |
| PILE DIAGRAM END BENT 1 |               | PILE DIAGRAM END BENT 1 |                        |
| Bridge No: 790188       | Drawn By: GDP | Date: 09/02/08          | File Name: S0066001636 |

# Bridge Inspection Field Sketch



|                           |          |          |                        |                |                          |                           |         |              |          |         |
|---------------------------|----------|----------|------------------------|----------------|--------------------------|---------------------------|---------|--------------|----------|---------|
| <b>Cap Information</b>    |          |          | <b>Material Timber</b> |                |                          |                           |         |              |          |         |
| Length                    | Width    | Height   | Left Overhang          | Right Overhang | Left Beam to End of Cap. | Right Beam to End of Cap. |         |              |          |         |
| 29.375 ft.                | .830 ft. | .980 ft. | 2.250 ft.              | 1.500 ft.      | 2.167 ft.                | 2.167 ft.                 |         |              |          |         |
| <b>Subcap Information</b> |          |          | <b>Material Timber</b> |                |                          |                           |         |              |          |         |
| Length                    | Width    | Height   | Left Overhang          | Right Overhang | Left Pile to Splice.     |                           |         |              |          |         |
| 4.000 ft.                 | .830 ft. | .980 ft. | 1.500 ft.              | 1.500 ft.      | 0 ft.                    |                           |         |              |          |         |
| <b>Sill Information</b>   |          |          | <b>Material</b>        |                |                          |                           |         |              |          |         |
| Length                    | Width    | Height   |                        |                |                          |                           |         |              |          |         |
| Pile #                    | Material | Spacing  | Width/Dia.             | Height         | Length                   | Orientation               | Driven? | Replacement? | Removed? | Collar? |
| 1                         | Timber   | 0.92 ft. |                        |                |                          |                           | No      | No           | No       | No      |
| 2                         | Timber   | 5.92 ft. |                        |                |                          |                           | No      | No           | No       | No      |
| 3                         | Timber   | 6 ft.    |                        |                |                          |                           | No      | No           | No       | No      |
| 4                         | Timber   | 6.83 ft. |                        |                |                          |                           | No      | No           | No       | No      |
| 5                         | Timber   | 6.3 ft.  |                        |                |                          |                           | No      | No           | No       | No      |
| 6                         |          |          |                        |                |                          |                           | No      | No           | No       | No      |
|                           |          |          |                        |                |                          |                           |         |              |          |         |
| Bent/Abutment #: 2        |          |          | Similar Bents:         |                |                          |                           |         |              |          |         |

|                         |              |                         |                        |
|-------------------------|--------------|-------------------------|------------------------|
| <b>Title</b>            |              | <b>Description</b>      |                        |
| PILE DIAGRAM END BENT 2 |              | PILE DIAGRAM END BENT 2 |                        |
| Bridge No: 790188       | Drawn By: DH | Date: 09/13/2012        | File Name: S0066001637 |





WEST END APPROACH



WEAR SURFACE AT END BENT 1





LOOKING WEST



LOOKING UPSTREAM





LOOKING DOWNSTREAM



LOOKING AT NORTH SIDE





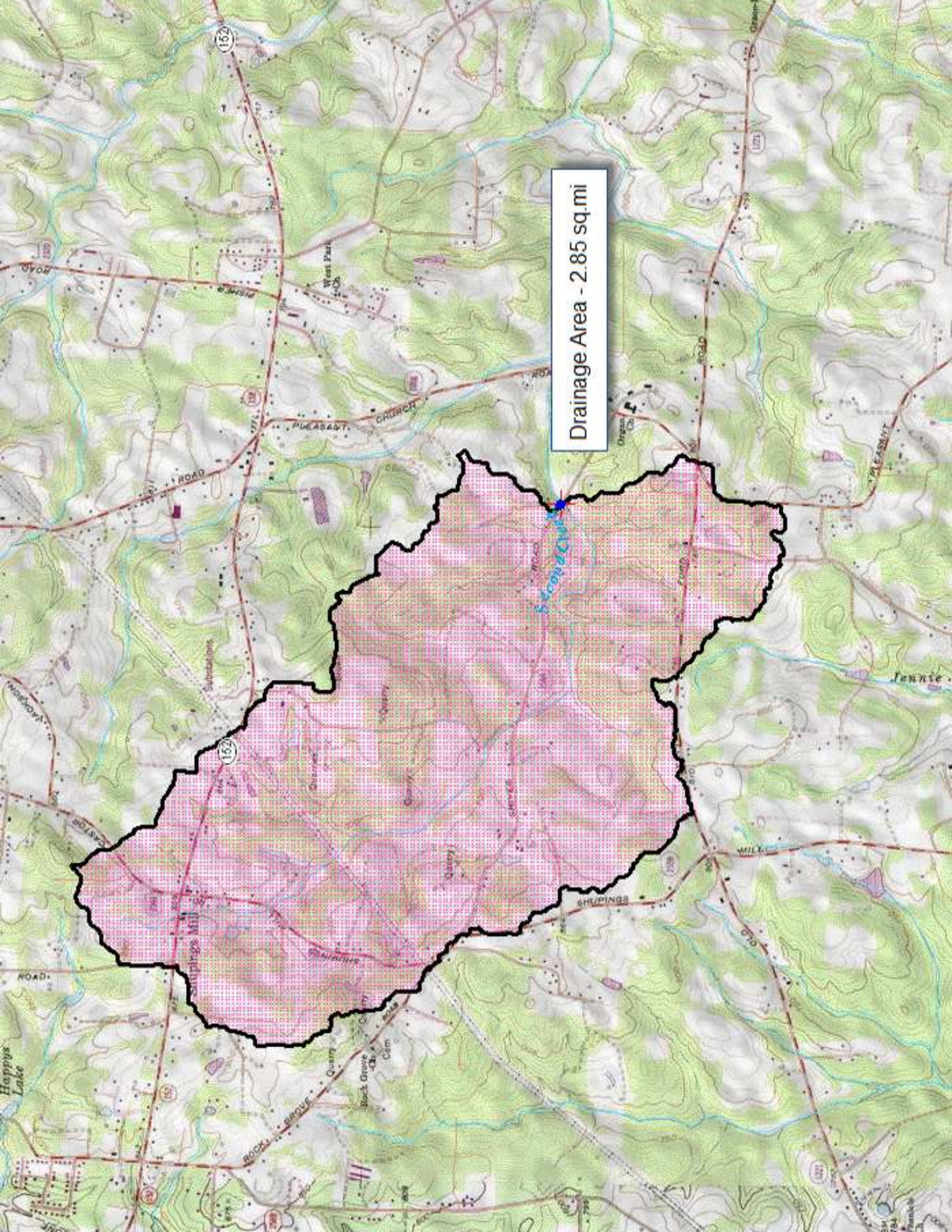
LOOKING DOWNSTREAM



LOOKING UPSTREAM



Drainage Area - 2.85 sq.mi



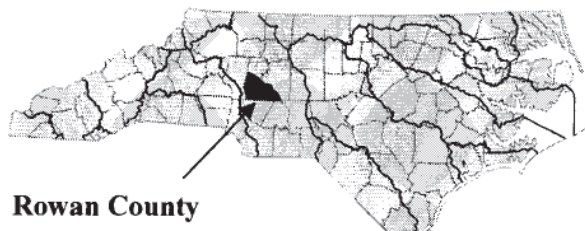


# FLOOD INSURANCE STUDY

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](http://www.fema.gov) and [www.ncfloodmaps.com](http://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                                                                            |                                                                         |
| Mill Creek               | The Rowan/Cabarrus County boundary           | Approximately 385 feet upstream of Smith Road (SR 1361)                       | Rowan County (Unincorporated Areas)                                     |
| North Second Creek       | The confluence with South Yadkin River       | The confluence with Sloan Creek and Back Creek                                | Rowan County (Unincorporated Areas)                                     |
| Park Creek               | The Rowan/Cabarrus County boundary           | Approximately 0.5 mile upstream of Smith Road (SR 1360)                       | Rowan County (Unincorporated Areas)                                     |
| Peeler Branch            | The confluence with Second Creek Tributary 1 | Approximately 500 feet upstream of Sides Road                                 | Town of Rockwell, Rowan County (Unincorporated Areas)                   |
| Riles Creek              | The confluence with Yadkin River             | Approximately 430 feet upstream of Stokes Ferry Road                          | Rowan County (Unincorporated Areas)                                     |
| Rocky Branch Tributary 1 | The confluence with Rocky Branch             | Approximately 0.5 mile upstream of Pickett Avenue                             | Rowan County (Unincorporated Areas), Town of Spencer, City of Salisbury |
| Second Creek             | The confluence with Yadkin River             | Approximately 0.6 mile upstream of the confluence of Second Creek Tributary 3 | Town of Rockwell, Rowan County (Unincorporated Areas)                   |
| Second Creek Tributary 1 | The confluence with Second Creek             | Approximately 200 feet upstream of the confluence of Peeler Branch            | Rowan County (Unincorporated Areas)                                     |
| Second Creek Tributary 2 | The confluence with Second Creek             | Approximately 440 feet upstream of Miller Street                              | Rowan County (Unincorporated Areas), Town of Rockwell                   |
| Second Creek Tributary 3 | The confluence with Second Creek             | Approximately 0.5 mile upstream of Winding Brook Lane                         | Rowan County (Unincorporated Areas)                                     |
| Sills Creek              | The confluence with Back Creek               | The Iredell/Rowan County boundary                                             | Rowan County (Unincorporated Areas)                                     |
| Sills Creek Tributary 1  | The confluence with Sills Creek              | Approximately 0.6 mile upstream of the confluence with Sills Creek            | Rowan County (Unincorporated Areas)                                     |
| Sloans Creek             | The confluence with North Second Creek       | Approximately 0.4 mile upstream of Brown Road (SR 1211)                       | Rowan County (Unincorporated Areas)                                     |
| South Yadkin River       | The confluence with Yadkin River             | The Iredell/Rowan/Davie County boundary                                       | Rowan County (Unincorporated Areas), City of Salisbury                  |



## Section 5.0 – Engineering Methods

**Table 8—Summary of Discharges**

| Flooding Source          | Location                                                              | Drainage Area<br>(square miles) | Discharges (cfs)  |                  |                  |                    |
|--------------------------|-----------------------------------------------------------------------|---------------------------------|-------------------|------------------|------------------|--------------------|
|                          |                                                                       |                                 | 10% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Riles Creek              | Approximately 60 feet upstream of the Stanly / Rowan County boundary  | 26.5                            | *                 | *                | 5,774            | *                  |
| Rocky Branch             | *                                                                     | *                               | *                 | *                | *                | *                  |
| Rocky Branch Tributary 1 | At the confluence with Rocky Branch                                   | 0.3                             | *                 | *                | 607              | *                  |
|                          | Approximately 60 feet downstream of Private Road                      | 0.3                             | *                 | *                | 590              | *                  |
|                          | Approximately 283 feet upstream of Private Road                       | 0.2                             | *                 | *                | 549              | *                  |
|                          | Approximately 0.2 mile upstream of Private Road                       | 0.1                             | *                 | *                | 430              | *                  |
|                          | Approximately 0.3 mile upstream of Private Road                       | 0.1                             | *                 | *                | 418              | *                  |
| Rowan Avenue Park Stream | *                                                                     | *                               | *                 | *                | *                | *                  |
| Second Creek             | At the confluence with Yadkin River                                   | 54.0                            | *                 | *                | 9,014            | *                  |
|                          | Approximately 0.4 mile upstream of Bringle Ferry Road (SR 1002)       | 44.3                            | *                 | *                | 7,963            | *                  |
|                          | Approximately 0.7 mile upstream of Bringle Ferry Road (SR 1002)       | 42.6                            | *                 | *                | 7,767            | *                  |
|                          | Approximately 1.3 miles downstream of Stokes Ferry Road (SR 1004)     | 40.5                            | *                 | *                | 7,531            | *                  |
|                          | Approximately 460 feet downstream of Stokes Ferry Road (SR 1004)      | 36.7                            | *                 | *                | 7,080            | *                  |
|                          | Approximately 320 feet upstream of Stokes Ferry Road (SR 1004)        | 34.2                            | *                 | *                | 6,771            | *                  |
|                          | Approximately 0.8 mile downstream of St. Peters Church Road (SR 2370) | 30.6                            | *                 | *                | 6,315            | *                  |

## Section 5.0 – Engineering Methods

**Table 8—Summary of Discharges**

| Flooding Source | Location                                                                        | Drainage Area<br>(square miles) | Discharges (cfs)  |                  |                  |                    |
|-----------------|---------------------------------------------------------------------------------|---------------------------------|-------------------|------------------|------------------|--------------------|
|                 |                                                                                 |                                 | 10% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Second Creek    | Approximately 137 feet downstream of St. Peters Church Road (SR 2370)           | 25.2                            | *                 | *                | 5,599            | *                  |
|                 | At St. Peters Church Road (SR 2370)                                             | 24.2                            | *                 | *                | 5,459            | *                  |
|                 | Approximately 0.2 mile downstream of US Highway 52                              | 21.6                            | *                 | *                | 5,090            | *                  |
|                 | Approximately 0.3 mile upstream of Emanuel Church Road                          | 15.5                            | *                 | *                | 4,131            | *                  |
|                 | At the confluence of Second Creek Tributary 2                                   | 15.2                            | *                 | *                | 4,088            | *                  |
|                 | At the confluence of Bost Branch                                                | 14.6                            | *                 | *                | 3,978            | *                  |
|                 | At the confluence of Fisher Branch                                              | 9.3                             | *                 | *                | 2,993            | *                  |
|                 | Approximately 850 feet upstream of Lower Stone Church Road                      | 7.5                             | *                 | *                | 2,633            | *                  |
|                 | Approximately 0.8 mile upstream of Lower Stone Church Road                      | 6.8                             | *                 | *                | 2,460            | *                  |
|                 | Approximately 1.2 miles upstream of Lower Stone Church Road                     | 5.5                             | *                 | *                | 2,154            | *                  |
|                 | Approximately 0.5 mile downstream of Organ Church Road (SR 1006)                | 5.2                             | *                 | *                | 2,087            | *                  |
|                 | Approximately 210 feet downstream of Organ Church Road (SR 1006)                | 3.1                             | *                 | *                | 1,517            | *                  |
|                 | Approximately 390 feet upstream of Shive Road (SR 2564)                         | 2.5                             | *                 | *                | 1,307            | *                  |
|                 | Approximately 0.3 mile upstream of Shive Road (SR 2564)                         | 2.2                             | *                 | *                | 1,209            | *                  |
|                 | Approximately 0.3 mile downstream of the confluence of Second Creek Tributary 3 | 2.1                             | *                 | *                | 1,174            | *                  |

## Section 5.0 – Engineering Methods

**Table 8—Summary of Discharges**

| Flooding Source          | Location                                                                      | Drainage Area<br>(square miles) | Discharges (cfs)  |                  |                  |                    |
|--------------------------|-------------------------------------------------------------------------------|---------------------------------|-------------------|------------------|------------------|--------------------|
|                          |                                                                               |                                 | 10% Annual Chance | 2% Annual Chance | 1% Annual Chance | 0.2% Annual Chance |
| Second Creek             | At the confluence of Second Creek Tributary 3                                 | 0.3                             | *                 | *                | 358              | *                  |
|                          | Approximately 770 feet upstream of the confluence of Second Creek Tributary 3 | 0.2                             | *                 | *                | 283              | *                  |
|                          | Approximately 0.4 mile upstream of the confluence of Second Creek Tributary 3 | 0.1                             | *                 | *                | 158              | *                  |
| Second Creek Tributary 1 | At the confluence with Second Creek                                           | 5.0                             | *                 | *                | 2,030            | *                  |
|                          | Approximately 0.4 mile upstream of Linker Road (SR 2368)                      | 4.2                             | *                 | *                | 1,931            | *                  |
|                          | At the confluence of Peeler Branch                                            | 2.6                             | *                 | *                | 1,931            | *                  |
| Second Creek Tributary 2 | At the confluence with Second Creek                                           | 0.2                             | *                 | *                | 396              | *                  |
|                          | Approximately 0.4 mile downstream of Miller Street                            | 0.1                             | *                 | *                | 293              | *                  |
| Second Creek Tributary 3 | At the confluence with Second Creek                                           | 1.6                             | *                 | *                | 1,002            | *                  |
|                          | Approximately 220 feet upstream of Shive Road (SR 2564)                       | 1.5                             | *                 | *                | 955              | *                  |
|                          | Approximately 0.4 mile upstream of Shive Road (SR 2564)                       | 1.3                             | *                 | *                | 859              | *                  |
|                          | Approximately 0.5 mile upstream of Shive Road (SR 2564)                       | 0.9                             | *                 | *                | 719              | *                  |
|                          | Approximately 0.4 mile downstream of Winding Brook Lane                       | 0.6                             | *                 | *                | 542              | *                  |
|                          | Approximately 1,257 feet downstream of Winding Brook Lane                     | 0.5                             | *                 | *                | 480              | *                  |
|                          | Approximately 550 feet downstream of Winding Brook Lane                       | 0.4                             | *                 | *                | 415              | *                  |
| Sides Branch             | *                                                                             | *                               | *                 | *                | *                | *                  |
| Sills Creek              | At the confluence with Back Creek                                             | 18.0                            | *                 | *                | 4,537            | *                  |



## Section 5.0 – Engineering Methods

**Table 11—Roughness Coefficients**

| Stream                         | Channel "n"   | Overbank "n"  |
|--------------------------------|---------------|---------------|
| Park Avenue Branch             | 0.025 – 0.070 | 0.025 – 0.100 |
| Park Creek                     | 0.040 – 0.048 | 0.080 – 0.130 |
| Park Creek (into Quarry Creek) | 0.025 – 0.070 | 0.025 – 0.100 |
| Peeler Branch                  | 0.040 – 0.045 | 0.080 – 0.140 |
| Petrea Branch                  | 0.045 – 0.060 | 0.080 – 0.140 |
| Pine Ridge Branch              | 0.025 – 0.070 | 0.025 – 0.100 |
| Quarry Creek                   | 0.025 – 0.070 | 0.025 – 0.100 |
| Railroad Branch                | 0.025 – 0.060 | 0.025 – 0.085 |
| Riles Creek                    | 0.040 – 0.045 | 0.080 – 0.130 |
| Rocky Branch                   | 0.050         | 0.135 – 0.150 |
| Rocky Branch Tributary 1       | 0.050         | 0.130 – 0.140 |
| Rowan Avenue Park Stream       | 0.050         | 0.090 – 0.160 |
| Second Creek                   | 0.040         | 0.090 – 0.160 |
| Second Creek Tributary 1       | 0.045         | 0.080 – 0.140 |
| Second Creek Tributary 2       | 0.050         | 0.090 – 0.150 |
| Second Creek Tributary 3       | 0.050         | 0.100 – 0.150 |
| Sides Branch                   | 0.025 – 0.070 | 0.025 – 0.100 |
| Sills Creek                    | 0.048         | 0.048 – 0.140 |
| Sills Creek Tributary 1        | 0.048 – 0.050 | 0.100 – 0.150 |
| Sixth Street Branch            | 0.050         | 0.125 – 0.150 |
| Sloans Creek                   | 0.048         | 0.035 – 0.150 |
| South Yadkin River             | 0.040 – 0.055 | 0.110 – 0.200 |
| Southside Tributary            | 0.025 – 0.070 | 0.025 – 0.100 |
| Southern Railroad Branch       | 0.050         | 0.120 – 0.140 |
| Spring Hill Branch             | 0.050         | 0.110 – 0.150 |
| Swearington Branch             | 0.025 – 0.035 | 0.025 – 0.055 |
| Tar Branch                     | 0.025 – 0.070 | 0.025 – 0.100 |
| Tar Branch Tributary           | 0.025 – 0.070 | 0.025 – 0.100 |
| Third Creek                    | 0.040 – 0.050 | 0.035 – 0.150 |
| Third Street Creek             | 0.025 – 0.065 | 0.025 – 0.100 |
| Thomas Street Creek            | 0.025 – 0.065 | 0.025 – 0.100 |
| Town Branch                    | 0.025 – 0.070 | 0.025 – 0.100 |
| Town Creek                     | 0.035 – 0.055 | 0.060 – 0.160 |
| Town Creek Tributary           | 0.025 – 0.070 | 0.025 – 0.100 |
| Town Creek Tributary 1         | 0.035 – 0.050 | 0.070 – 0.150 |
| Trexler Creek                  | 0.035 – 0.050 | 0.080 – 0.150 |
| Unnamed Stream 1               | 0.045         | 0.050 – 0.130 |
| Unnamed Stream 2               | 0.045         | 0.130         |
| Vance Avenue Branch            | 0.025 – 0.065 | 0.025 – 0.100 |
| Walnut Street Branch           | 0.025 – 0.070 | 0.025 – 0.100 |
| Walton Branch                  | 0.025 – 0.070 | 0.025 – 0.100 |

## Section 5.0 – Engineering Methods

**Table 12—Limited Detailed Flood Hazard Data**

| Cross Section <sup>1</sup>      | Stream Station <sup>2</sup> | Flood Discharge (cfs) | 1% Annual Chance Water-Surface Elevation (feet NAVD 88) | Non-Encroachment Width <sup>3</sup> (feet) |
|---------------------------------|-----------------------------|-----------------------|---------------------------------------------------------|--------------------------------------------|
| <b>PEELER BRANCH</b>            |                             |                       |                                                         |                                            |
| 045                             | 4,498                       | 904                   | 701.0                                                   | 99 / 38                                    |
| 050                             | 4,979                       | 904                   | 703.6                                                   | 10 / 70                                    |
| 056                             | 5,554                       | 904                   | 707.1                                                   | 30 / 10                                    |
| 060                             | 6,016                       | 904                   | 711.1                                                   | 22 / 37                                    |
| 063                             | 6,272                       | 904                   | 711.3                                                   | 10 / 15                                    |
| <b>RILES CREEK</b>              |                             |                       |                                                         |                                            |
| 017                             | 1,729                       | 6,259                 | 571.6 <sup>4</sup>                                      | 237 / 223                                  |
| 024                             | 2,372                       | 6,259                 | 571.6 <sup>4</sup>                                      | 133 / 299                                  |
| 030                             | 2,963                       | 6,259                 | 571.6 <sup>4</sup>                                      | 229 / 296                                  |
| 037                             | 3,718                       | 6,259                 | 571.6 <sup>4</sup>                                      | 237 / 94                                   |
| 042                             | 4,196                       | 6,259                 | 571.6 <sup>4</sup>                                      | 229 / 296                                  |
| 049                             | 4,872                       | 6,259                 | 571.6 <sup>4</sup>                                      | 307 / 307                                  |
| 057                             | 5,656                       | 5,975                 | 571.6 <sup>4</sup>                                      | 328 / 296                                  |
| 063                             | 6,302                       | 5,975                 | 571.6 <sup>4</sup>                                      | 170 / 108                                  |
| 068                             | 6,836                       | 5,975                 | 571.6 <sup>4</sup>                                      | 128 / 155                                  |
| 075                             | 7,492                       | 5,975                 | 571.6 <sup>4</sup>                                      | 179 / 199                                  |
| 081                             | 8,065                       | 5,975                 | 571.6 <sup>4</sup>                                      | 109 / 204                                  |
| 087                             | 8,691                       | 5,975                 | 571.6 <sup>4</sup>                                      | 160 / 145                                  |
| 092                             | 9,209                       | 5,975                 | 571.6 <sup>4</sup>                                      | 114 / 173                                  |
| 099                             | 9,926                       | 5,975                 | 571.6 <sup>4</sup>                                      | 292 / 279                                  |
| 105                             | 10,461                      | 5,975                 | 571.6 <sup>4</sup>                                      | 283 / 346                                  |
| 110                             | 10,994                      | 5,975                 | 571.6 <sup>4</sup>                                      | 274 / 225                                  |
| 119                             | 11,857                      | 5,975                 | 571.6 <sup>4</sup>                                      | 306 / 502                                  |
| <b>ROCKY BRANCH TRIBUTARY 1</b> |                             |                       |                                                         |                                            |
| 001                             | 95                          | 603                   | 648.9 <sup>4</sup>                                      | 11 / 5                                     |
| 005                             | 468                         | 603                   | 654.6                                                   | 7 / 37                                     |
| 012                             | 1,222                       | 590                   | 669.5                                                   | 32 / 32                                    |
| 019                             | 1,869                       | 549                   | 681.6                                                   | 4 / 40                                     |
| 029                             | 2,918                       | 430                   | 701.7                                                   | 12 / 15                                    |
| 032                             | 3,162                       | 418                   | 707.5                                                   | 30 / 45                                    |
| <b>SECOND CREEK</b>             |                             |                       |                                                         |                                            |
| 037                             | 3,731                       | 9,014                 | 625.5 <sup>4</sup>                                      | 1,107 / 1,287                              |
| 053                             | 5,297                       | 9,014                 | 625.5 <sup>4</sup>                                      | 779 / 599                                  |
| 067                             | 6,731                       | 9,014                 | 625.5 <sup>4</sup>                                      | 505 / 766                                  |
| 078                             | 7,752                       | 9,014                 | 625.5 <sup>4</sup>                                      | 444 / 666                                  |
| 088                             | 8,836                       | 9,014                 | 625.5 <sup>4</sup>                                      | 774 / 588                                  |
| 096                             | 9,591                       | 9,014                 | 625.5 <sup>4</sup>                                      | 570 / 524                                  |
| 109                             | 10,937                      | 9,014                 | 625.5 <sup>4</sup>                                      | 556 / 465                                  |
| 129                             | 12,946                      | 9,014                 | 625.5 <sup>4</sup>                                      | 921 / 694                                  |
| 141                             | 14,059                      | 7,963                 | 625.5 <sup>4</sup>                                      | 1,072 / 1,373                              |
| 150                             | 14,973                      | 7,963                 | 625.5 <sup>4</sup>                                      | 1,337 / 1,418                              |
| 162                             | 16,194                      | 7,767                 | 625.5 <sup>4</sup>                                      | 1,202 / 925                                |
| 175                             | 17,469                      | 7,767                 | 625.5 <sup>4</sup>                                      | 692 / 1,044                                |

## Section 5.0 – Engineering Methods

**Table 12—Limited Detailed Flood Hazard Data**

| Cross Section <sup>1</sup> | Stream Station <sup>2</sup> | Flood Discharge (cfs) | 1% Annual Chance Water-Surface Elevation (feet NAVD 88) | Non-Encroachment Width <sup>3</sup> (feet) |
|----------------------------|-----------------------------|-----------------------|---------------------------------------------------------|--------------------------------------------|
| <b>SECOND CREEK</b>        |                             |                       |                                                         |                                            |
| 184                        | 18,432                      | 7,767                 | 625.5 <sup>4</sup>                                      | 993 / 938                                  |
| 195                        | 19,538                      | 7,767                 | 625.5 <sup>4</sup>                                      | 613 / 783                                  |
| 208                        | 20,807                      | 7,531                 | 625.5 <sup>4</sup>                                      | 657 / 720                                  |
| 220                        | 22,013                      | 7,531                 | 625.5 <sup>4</sup>                                      | 446 / 425                                  |
| 227                        | 22,651                      | 7,531                 | 625.5 <sup>4</sup>                                      | 362 / 376                                  |
| 234                        | 23,362                      | 7,531                 | 625.5 <sup>4</sup>                                      | 460 / 535                                  |
| 240                        | 23,962                      | 7,531                 | 625.5 <sup>4</sup>                                      | 674 / 606                                  |
| 248                        | 24,801                      | 7,531                 | 625.5 <sup>4</sup>                                      | 253 / 430                                  |
| 256                        | 25,607                      | 7,531                 | 625.5 <sup>4</sup>                                      | 337 / 439                                  |
| 262                        | 26,170                      | 7,531                 | 625.5 <sup>4</sup>                                      | 247 / 297                                  |
| 268                        | 26,828                      | 7,531                 | 625.5 <sup>4</sup>                                      | 255 / 246                                  |
| 280                        | 27,973                      | 6,771                 | 625.5 <sup>4</sup>                                      | 291 / 365                                  |
| 285                        | 28,477                      | 6,771                 | 625.5 <sup>4</sup>                                      | 219 / 222                                  |
| 291                        | 29,071                      | 6,771                 | 625.5 <sup>4</sup>                                      | 252 / 146                                  |
| 295                        | 29,473                      | 6,771                 | 625.5 <sup>4</sup>                                      | 220 / 89                                   |
| 301                        | 30,077                      | 6,771                 | 625.5 <sup>4</sup>                                      | 220 / 145                                  |
| 306                        | 30,591                      | 6,771                 | 625.6                                                   | 220 / 53                                   |
| 311                        | 31,103                      | 6,771                 | 628.1                                                   | 53 / 205                                   |
| 315                        | 31,467                      | 6,771                 | 628.9                                                   | 82 / 220                                   |
| 320                        | 31,968                      | 6,771                 | 629.5                                                   | 291 / 318                                  |
| 323                        | 32,286                      | 6,771                 | 629.6                                                   | 353 / 81                                   |
| 328                        | 32,803                      | 6,771                 | 629.8                                                   | 353 / 81                                   |
| 335                        | 33,496                      | 6,771                 | 630.2                                                   | 297 / 53                                   |
| 340                        | 33,953                      | 6,771                 | 630.6                                                   | 261 / 53                                   |
| 345                        | 34,534                      | 6,771                 | 631.1                                                   | 227 / 74                                   |
| 350                        | 35,025                      | 6,771                 | 631.7                                                   | 53 / 254                                   |
| 355                        | 35,457                      | 6,771                 | 632.3                                                   | 27 / 395                                   |
| 359                        | 35,898                      | 6,771                 | 632.8                                                   | 53 / 405                                   |
| 365                        | 36,505                      | 6,771                 | 633.4                                                   | 232 / 329                                  |
| 370                        | 36,968                      | 6,771                 | 633.7                                                   | 523 / 225                                  |
| 375                        | 37,454                      | 6,771                 | 633.9                                                   | 492 / 53                                   |
| 380                        | 38,011                      | 6,771                 | 634.3                                                   | 222 / 26                                   |
| 385                        | 38,529                      | 6,315                 | 635.2                                                   | 68 / 107                                   |
| 390                        | 39,033                      | 6,315                 | 636.2                                                   | 213 / 311                                  |
| 396                        | 39,610                      | 6,315                 | 636.5                                                   | 288 / 52                                   |
| 402                        | 40,157                      | 6,315                 | 637.0                                                   | 256 / 52                                   |
| 405                        | 40,515                      | 6,315                 | 637.2                                                   | 165 / 133                                  |
| 410                        | 40,997                      | 6,315                 | 637.9                                                   | 52 / 471                                   |
| 413                        | 41,336                      | 6,315                 | 638.1                                                   | 52 / 446                                   |
| 425                        | 42,479                      | 5,599                 | 640.6                                                   | 49 / 69                                    |
| 430                        | 43,010                      | 5,599                 | 641.4                                                   | 46 / 125                                   |
| 434                        | 43,409                      | 5,599                 | 641.8                                                   | 37 / 117                                   |
| 439                        | 43,948                      | 5,599                 | 642.5                                                   | 367 / 136                                  |



## Section 5.0 – Engineering Methods

**Table 12—Limited Detailed Flood Hazard Data**

| Cross Section <sup>1</sup> | Stream Station <sup>2</sup> | Flood Discharge (cfs) | 1% Annual Chance Water-Surface Elevation (feet NAVD 88) | Non-Encroachment Width <sup>3</sup> (feet) |
|----------------------------|-----------------------------|-----------------------|---------------------------------------------------------|--------------------------------------------|
| <b>SECOND CREEK</b>        |                             |                       |                                                         |                                            |
| 445                        | 44,494                      | 5,599                 | 642.6                                                   | 364 / 256                                  |
| 450                        | 44,978                      | 5,599                 | 642.8                                                   | 741 / 49                                   |
| 455                        | 45,534                      | 5,599                 | 643.0                                                   | 750 / 49                                   |
| 460                        | 45,998                      | 5,599                 | 643.0                                                   | 669 / 49                                   |
| 465                        | 46,494                      | 5,599                 | 643.2                                                   | 335 / 49                                   |
| 468                        | 46,837                      | 5,599                 | 643.4                                                   | 130 / 49                                   |
| 475                        | 47,495                      | 5,459                 | 644.5                                                   | 405 / 61                                   |
| 480                        | 48,026                      | 5,459                 | 644.9                                                   | 333 / 145                                  |
| 486                        | 48,566                      | 5,459                 | 645.3                                                   | 49 / 258                                   |
| 487                        | 48,743                      | 5,459                 | 645.2                                                   | 41 / 136                                   |
| 492                        | 49,153                      | 5,459                 | 645.6                                                   | 25 / 136                                   |
| 495                        | 49,490                      | 5,459                 | 646.3                                                   | 41 / 49                                    |
| 500                        | 50,025                      | 5,459                 | 647.8                                                   | 143 / 81                                   |
| 504                        | 50,366                      | 5,459                 | 648.2                                                   | 92 / 246                                   |
| 510                        | 51,017                      | 5,459                 | 648.7                                                   | 327 / 36                                   |
| 515                        | 51,513                      | 5,459                 | 649.2                                                   | 132 / 81                                   |
| 519                        | 51,876                      | 5,459                 | 649.6                                                   | 152 / 73                                   |
| 525                        | 52,484                      | 5,459                 | 650.3                                                   | 30 / 257                                   |
| 530                        | 52,988                      | 5,459                 | 650.8                                                   | 256 / 49                                   |
| 534                        | 53,448                      | 5,459                 | 651.1                                                   | 398 / 87                                   |
| 540                        | 53,964                      | 5,459                 | 651.4                                                   | 320 / 155                                  |
| 545                        | 54,482                      | 5,459                 | 651.7                                                   | 877 / 81                                   |
| 551                        | 55,066                      | 5,090                 | 652.0                                                   | 724 / 97                                   |
| 555                        | 55,464                      | 5,090                 | 652.0                                                   | 204 / 150                                  |
| 566                        | 56,609                      | 5,090                 | 655.3                                                   | 224 / 70                                   |
| 570                        | 56,993                      | 5,090                 | 655.5                                                   | 238 / 47                                   |
| 576                        | 57,590                      | 5,090                 | 655.8                                                   | 383 / 47                                   |
| 580                        | 57,989                      | 5,090                 | 655.9                                                   | 212 / 47                                   |
| 585                        | 58,457                      | 5,090                 | 656.2                                                   | 47 / 243                                   |
| 589                        | 58,918                      | 5,090                 | 656.5                                                   | 47 / 199                                   |
| 599                        | 59,949                      | 5,090                 | 658.5                                                   | 221 / 97                                   |
| 606                        | 60,633                      | 5,090                 | 658.9                                                   | 96 / 66                                    |
| 611                        | 61,115                      | 5,090                 | 659.6                                                   | 141 / 47                                   |
| 616                        | 61,554                      | 5,090                 | 660.3                                                   | 396 / 75                                   |
| 623                        | 62,327                      | 5,090                 | 661.8                                                   | 175 / 407                                  |
| 626                        | 62,558                      | 5,090                 | 661.8                                                   | 47 / 516                                   |
| 629                        | 62,939                      | 5,090                 | 661.9                                                   | 126 / 322                                  |
| 633                        | 63,270                      | 5,090                 | 662.0                                                   | 363 / 87                                   |
| 636                        | 63,590                      | 5,090                 | 662.1                                                   | 376 / 47                                   |
| 639                        | 63,911                      | 4,131                 | 662.4                                                   | 102 / 222                                  |
| 644                        | 64,365                      | 4,131                 | 662.9                                                   | 81 / 423                                   |
| 650                        | 64,964                      | 4,088                 | 663.3                                                   | 99 / 201                                   |
| 655                        | 65,453                      | 4,088                 | 663.9                                                   | 43 / 76                                    |

## Section 5.0 – Engineering Methods

**Table 12—Limited Detailed Flood Hazard Data**

| <b>Cross<br/>Section<sup>1</sup></b> | <b>Stream<br/>Station<sup>2</sup></b> | <b>Flood<br/>Discharge<br/>(cfs)</b> | <b>1% Annual<br/>Chance Water-<br/>Surface Elevation<br/>(feet NAVD 88)</b> | <b>Non-<br/>Encroachment<br/>Width<sup>3</sup> (feet)</b> |
|--------------------------------------|---------------------------------------|--------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>SECOND CREEK</b>                  |                                       |                                      |                                                                             |                                                           |
| 658                                  | 65,755                                | 4,088                                | 665.5                                                                       | 464 / 43                                                  |
| 660                                  | 66,015                                | 4,088                                | 665.6                                                                       | 217 / 100                                                 |
| 665                                  | 66,493                                | 4,088                                | 666.3                                                                       | 320 / 164                                                 |
| 674                                  | 67,422                                | 3,978                                | 669.3                                                                       | 345 / 255                                                 |
| 679                                  | 67,906                                | 3,978                                | 669.4                                                                       | 374 / 43                                                  |
| 686                                  | 68,602                                | 2,993                                | 669.7                                                                       | 266 / 192                                                 |
| 691                                  | 69,125                                | 2,993                                | 670.0                                                                       | 40 / 235                                                  |
| 697                                  | 69,680                                | 2,993                                | 670.7                                                                       | 65 / 150                                                  |
| 700                                  | 70,011                                | 2,993                                | 671.4                                                                       | 184 / 49                                                  |
| 706                                  | 70,616                                | 2,993                                | 672.7                                                                       | 104 / 82                                                  |
| 710                                  | 71,015                                | 2,993                                | 673.7                                                                       | 194 / 106                                                 |
| 716                                  | 71,613                                | 2,993                                | 674.4                                                                       | 513 / 175                                                 |
| 725                                  | 72,500                                | 2,993                                | 677.4                                                                       | 40 / 40                                                   |
| 729                                  | 72,922                                | 2,993                                | 679.5                                                                       | 117 / 40                                                  |
| 735                                  | 73,469                                | 2,633                                | 680.5                                                                       | 83 / 117                                                  |
| 739                                  | 73,876                                | 2,633                                | 680.7                                                                       | 39 / 36                                                   |
| 744                                  | 74,390                                | 2,633                                | 682.9                                                                       | 108 / 148                                                 |
| 749                                  | 74,887                                | 2,633                                | 683.6                                                                       | 39 / 90                                                   |
| 756                                  | 75,572                                | 2,633                                | 685.1                                                                       | 207 / 193                                                 |
| 760                                  | 75,982                                | 2,633                                | 685.6                                                                       | 113 / 39                                                  |
| 765                                  | 76,502                                | 2,633                                | 687.0                                                                       | 16 / 141                                                  |
| 770                                  | 76,998                                | 2,460                                | 689.7                                                                       | 38 / 203                                                  |
| 775                                  | 77,463                                | 2,460                                | 689.7                                                                       | 34 / 38                                                   |
| 780                                  | 77,999                                | 2,460                                | 692.7                                                                       | 9 / 26                                                    |
| 785                                  | 78,472                                | 2,460                                | 697.9                                                                       | 38 / 101                                                  |
| 790                                  | 79,044                                | 2,154                                | 698.9                                                                       | 44 / 203                                                  |
| 795                                  | 79,456                                | 2,154                                | 699.1                                                                       | 105 / 37                                                  |
| 800                                  | 79,980                                | 2,087                                | 701.4                                                                       | 67 / 37                                                   |
| 803                                  | 80,301                                | 2,087                                | 702.2                                                                       | 37 / 37                                                   |
| 809                                  | 80,938                                | 2,087                                | 705.6                                                                       | 124 / 70                                                  |
| 815                                  | 81,511                                | 2,087                                | 707.0                                                                       | 125 / 103                                                 |
| 820                                  | 81,953                                | 2,087                                | 707.9                                                                       | 37 / 43                                                   |
| 829                                  | 82,911                                | 1,517                                | 714.0                                                                       | 57 / 34                                                   |
| 834                                  | 83,431                                | 1,517                                | 716.3                                                                       | 120 / 34                                                  |
| 840                                  | 84,008                                | 1,517                                | 718.0                                                                       | 34 / 34                                                   |
| 845                                  | 84,503                                | 1,517                                | 720.6                                                                       | 7 / 84                                                    |
| 857                                  | 85,654                                | 1,307                                | 724.4                                                                       | 37 / 120                                                  |
| 860                                  | 86,028                                | 1,307                                | 726.1                                                                       | 35 / 100                                                  |
| 865                                  | 86,494                                | 1,209                                | 728.5                                                                       | 33 / 107                                                  |
| 870                                  | 87,007                                | 1,209                                | 730.6                                                                       | 47 / 47                                                   |
| 875                                  | 87,528                                | 1,209                                | 734.8                                                                       | 33 / 33                                                   |
| 880                                  | 88,002                                | 1,209                                | 738.6                                                                       | 34 / 33                                                   |
| 885                                  | 88,530                                | 1,174                                | 741.5                                                                       | 33 / 82                                                   |

## Section 5.0 – Engineering Methods

**Table 12—Limited Detailed Flood Hazard Data**

| Cross Section <sup>1</sup>      | Stream Station <sup>2</sup> | Flood Discharge (cfs) | 1% Annual Chance Water-Surface Elevation (feet NAVD 88) | Non-Encroachment Width <sup>3</sup> (feet) |
|---------------------------------|-----------------------------|-----------------------|---------------------------------------------------------|--------------------------------------------|
| <b>SECOND CREEK</b>             |                             |                       |                                                         |                                            |
| 890                             | 88,995                      | 1,174                 | 743.7                                                   | 65 / 54                                    |
| 894                             | 89,431                      | 1,174                 | 746.3                                                   | 85 / 143                                   |
| 900                             | 89,983                      | 358                   | 747.8                                                   | 10 / 12                                    |
| 905                             | 90,457                      | 358                   | 754.1                                                   | 65 / 41                                    |
| 910                             | 91,009                      | 283                   | 761.5                                                   | 32 / 32                                    |
| 915                             | 91,489                      | 283                   | 769.7                                                   | 32 / 32                                    |
| 921                             | 92,069                      | 158                   | 781.3                                                   | 16 / 15                                    |
| 925                             | 92,533                      | 158                   | 796.1                                                   | 29 / 16                                    |
| 931                             | 93,070                      | 158                   | 809.8                                                   | 32 / 20                                    |
| <b>SECOND CREEK TRIBUTARY 1</b> |                             |                       |                                                         |                                            |
| 003                             | 326                         | 2,030                 | 640.1 <sup>4</sup>                                      | 70 / 17                                    |
| 006                             | 644                         | 2,030                 | 640.1 <sup>4</sup>                                      | 42 / 17                                    |
| 010                             | 1,001                       | 2,030                 | 640.8                                                   | 34 / 43                                    |
| 016                             | 1,601                       | 2,030                 | 645.8                                                   | 158 / 17                                   |
| 019                             | 1,948                       | 2,030                 | 646.2                                                   | 136 / 69                                   |
| 024                             | 2,440                       | 2,030                 | 646.7                                                   | 88 / 82                                    |
| 030                             | 3,045                       | 2,030                 | 647.8                                                   | 73 / 132                                   |
| 035                             | 3,472                       | 2,030                 | 648.8                                                   | 24 / 153                                   |
| 040                             | 3,985                       | 1,931                 | 649.9                                                   | 140 / 142                                  |
| 044                             | 4,421                       | 1,931                 | 650.7                                                   | 128 / 30                                   |
| 048                             | 4,829                       | 1,931                 | 652.4                                                   | 17 / 74                                    |
| 054                             | 5,432                       | 1,931                 | 655.8                                                   | 49 / 62                                    |
| 057                             | 5,689                       | 1,931                 | 657.1                                                   | 55 / 15                                    |
| <b>SECOND CREEK TRIBUTARY 2</b> |                             |                       |                                                         |                                            |
| 003                             | 267                         | 396                   | 663.1 <sup>4</sup>                                      | 30 / 27                                    |
| 007                             | 733                         | 396                   | 668.3                                                   | 42 / 10                                    |
| 012                             | 1,239                       | 396                   | 676.7                                                   | 40 / 17                                    |
| 019                             | 1,913                       | 293                   | 690.7                                                   | 12 / 10                                    |
| 024                             | 2,443                       | 293                   | 701.3                                                   | 21 / 17                                    |
| 029                             | 2,946                       | 293                   | 715.9                                                   | 30 / 30                                    |
| 038                             | 3,816                       | 293                   | 735.3                                                   | 32 / 32                                    |
| <b>SECOND CREEK TRIBUTARY 3</b> |                             |                       |                                                         |                                            |
| 001                             | 106                         | 1,002                 | 746.6 <sup>4</sup>                                      | 32 / 57                                    |
| 005                             | 509                         | 1,002                 | 748.9                                                   | 49 / 32                                    |
| 009                             | 909                         | 1,002                 | 751.5                                                   | 32 / 32                                    |
| 017                             | 1,650                       | 955                   | 756.1                                                   | 32 / 32                                    |
| 020                             | 2,022                       | 955                   | 759.3                                                   | 32 / 32                                    |
| 024                             | 2,437                       | 955                   | 761.9                                                   | 15 / 32                                    |
| 029                             | 2,861                       | 955                   | 765.5                                                   | 32 / 32                                    |
| 033                             | 3,322                       | 719                   | 767.1                                                   | 115 / 27                                   |
| 040                             | 3,996                       | 719                   | 769.3                                                   | 34 / 33                                    |
| 044                             | 4,443                       | 719                   | 773.1                                                   | 32 / 7                                     |
| 049                             | 4,911                       | 719                   | 777.2                                                   | 33 / 19                                    |

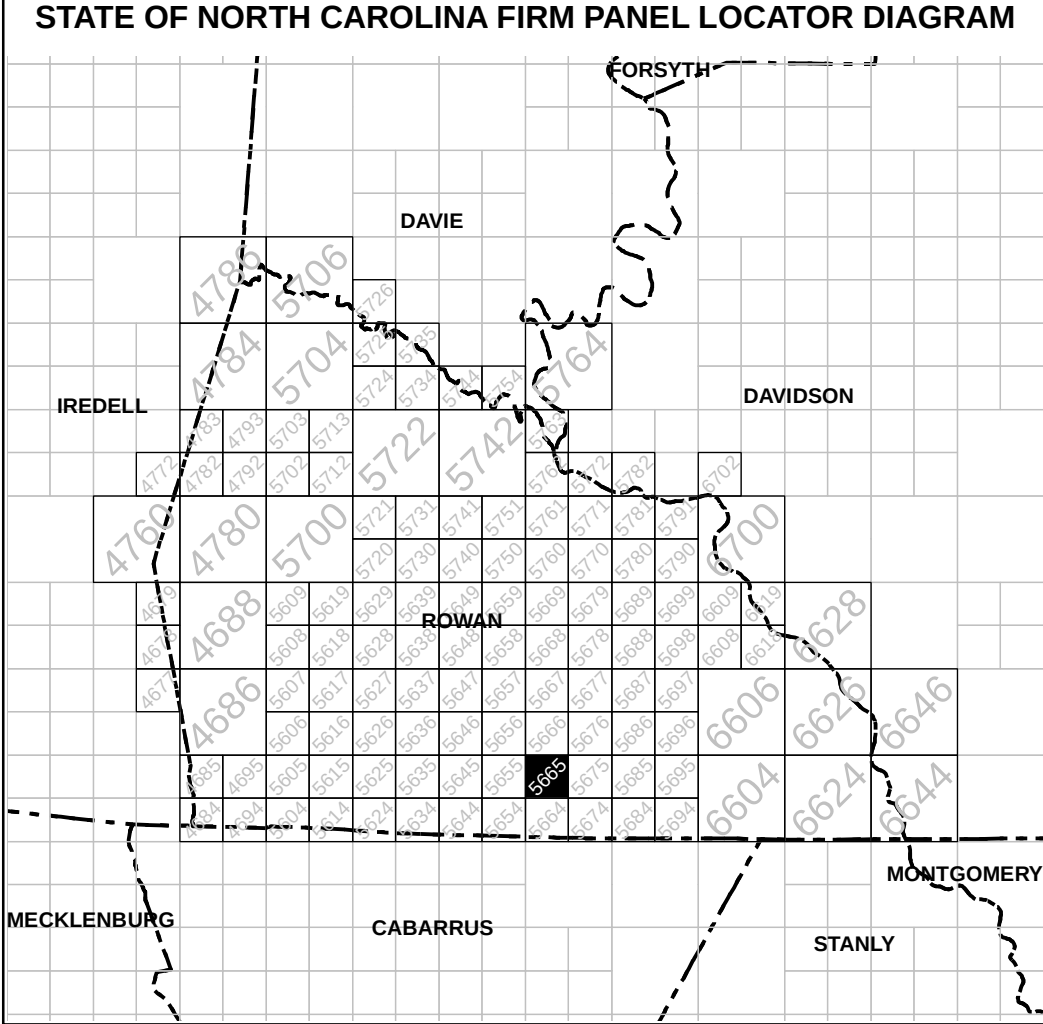


## Section 5.0 – Engineering Methods

**Table 12—Limited Detailed Flood Hazard Data**

| <b>Cross<br/>Section<sup>1</sup></b> | <b>Stream<br/>Station<sup>2</sup></b> | <b>Flood<br/>Discharge<br/>(cfs)</b> | <b>1% Annual<br/>Chance Water-<br/>Surface Elevation<br/>(feet NAVD 88)</b> | <b>Non-<br/>Encroachment<br/>Width<sup>3</sup> (feet)</b> |
|--------------------------------------|---------------------------------------|--------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>SECOND CREEK TRIBUTARY 3</b>      |                                       |                                      |                                                                             |                                                           |
| 054                                  | 5,376                                 | 719                                  | 780.7                                                                       | 32 / 32                                                   |
| 057                                  | 5,736                                 | 542                                  | 782.0                                                                       | 82 / 32                                                   |
| 060                                  | 6,000                                 | 542                                  | 782.5                                                                       | 32 / 32                                                   |
| 062                                  | 6,234                                 | 542                                  | 784.6                                                                       | 24 / 32                                                   |
| 069                                  | 6,929                                 | 415                                  | 796.7                                                                       | 105 / 106                                                 |
| 072                                  | 7,199                                 | 415                                  | 797.9                                                                       | 6 / 12                                                    |
| 074                                  | 7,357                                 | 415                                  | 814.1                                                                       | 32 / 32                                                   |
| 074                                  | 7,442                                 | 415                                  | 815.9                                                                       | 32 / 32                                                   |
| 080                                  | 8,000                                 | 415                                  | 826.9                                                                       | 45 / 4                                                    |
| <b>SILLS CREEK</b>                   |                                       |                                      |                                                                             |                                                           |
| 005                                  | 450                                   | 4,537                                | 679.7 <sup>4</sup>                                                          | 83 / 51                                                   |
| 009                                  | 900                                   | 4,537                                | 679.7 <sup>4</sup>                                                          | 310 / 43                                                  |
| 014                                  | 1,350                                 | 4,537                                | 679.7 <sup>4</sup>                                                          | 271 / 252                                                 |
| 018                                  | 1,800                                 | 4,537                                | 679.7 <sup>4</sup>                                                          | 145 / 447                                                 |
| 023                                  | 2,250                                 | 4,537                                | 679.7 <sup>4</sup>                                                          | 32 / 461                                                  |
| 027                                  | 2,700                                 | 4,537                                | 679.7                                                                       | 25 / 363                                                  |
| 032                                  | 3,150                                 | 4,537                                | 680.1                                                                       | 157 / 112                                                 |
| 036                                  | 3,600                                 | 4,537                                | 680.9                                                                       | 88 / 102                                                  |
| 038                                  | 3,828                                 | 4,537                                | 681.2                                                                       | 36 / 76                                                   |
| 041                                  | 4,050                                 | 4,537                                | 682.5                                                                       | 134 / 27                                                  |
| 046                                  | 4,576                                 | 4,537                                | 683.4                                                                       | 63 / 147                                                  |
| 048                                  | 4,767                                 | 4,537                                | 683.8                                                                       | 55 / 180                                                  |
| 054                                  | 5,400                                 | 4,537                                | 685.7                                                                       | 40 / 353                                                  |
| 060                                  | 5,950                                 | 4,537                                | 685.7                                                                       | 57 / 310                                                  |
| 062                                  | 6,172                                 | 4,537                                | 685.8                                                                       | 226 / 191                                                 |
| 068                                  | 6,750                                 | 4,537                                | 686.1                                                                       | 277 / 236                                                 |
| 072                                  | 7,200                                 | 4,370                                | 686.2                                                                       | 233 / 287                                                 |
| 077                                  | 7,650                                 | 4,370                                | 686.5                                                                       | 218 / 216                                                 |
| 078                                  | 7,803                                 | 4,370                                | 686.6                                                                       | 291 / 74                                                  |
| 082                                  | 8,246                                 | 4,370                                | 687.1                                                                       | 260 / 165                                                 |
| 086                                  | 8,550                                 | 4,370                                | 687.3                                                                       | 179 / 192                                                 |
| 088                                  | 8,820                                 | 4,370                                | 687.6                                                                       | 136 / 308                                                 |
| 090                                  | 9,000                                 | 4,370                                | 687.7                                                                       | 30 / 369                                                  |
| 095                                  | 9,450                                 | 4,370                                | 688.3                                                                       | 68 / 336                                                  |
| 099                                  | 9,900                                 | 4,370                                | 689.1                                                                       | 176 / 314                                                 |
| 104                                  | 10,350                                | 4,370                                | 689.7                                                                       | 102 / 389                                                 |
| 108                                  | 10,800                                | 4,370                                | 690.2                                                                       | 213 / 249                                                 |
| 113                                  | 11,250                                | 4,370                                | 690.9                                                                       | 300 / 262                                                 |
| 117                                  | 11,700                                | 4,370                                | 691.6                                                                       | 246 / 142                                                 |
| 122                                  | 12,150                                | 4,224                                | 692.4                                                                       | 313 / 36                                                  |
| 126                                  | 12,600                                | 4,224                                | 693.0                                                                       | 109 / 129                                                 |
| 131                                  | 13,050                                | 4,224                                | 694.0                                                                       | 183 / 183                                                 |
| 140                                  | 13,950                                | 4,224                                | 696.1                                                                       | 373 / 185                                                 |





**DATUM INFORMATION**

The **projection** used in the preparation of this map was the North Carolina State Plane (NAD83/ZONE 3200). The **horizontal datum** was the North American Datum of 1983 (NAD83) ellipsoid. Differences in datum, ellipsoid, projection, or Universal Transverse Mercator zones used in the production of FIRMS for adjacent jurisdictions may result in slight positional differences in map features across jurisdictional boundaries. These differences do not affect the accuracy of this FIRM. All coordinates on this map are in U.S. Survey Feet, where 1 U.S. Survey Foot = 1200/3937 Meters.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. An average offset between NAVD 88 and the National Geodetic Vertical Datum of 1929 (NGVD 29) has been computed for each North Carolina county. This offset was then applied to the NGVD 29 flood elevations that were not revised during the creation of this statewide format FIRM. The offsets for each county shown on this FIRM panel are shown in the vertical datum offset table below. Where a county boundary and a flooding source with unrevised NGVD 29 flood elevations are coincident, an individual offset has been calculated and applied during the creation of this statewide format FIRM. See Section 6.1 of the accompanying Flood Insurance Study report to obtain further information on the conversion of elevations between NAVD 88 and NGVD 29. To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the North Carolina Geodetic Survey at the address shown below. You may also contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

| North Carolina Geodetic Survey<br>121 West Jones Street<br>Raleigh, NC 27601<br>(919) 733-3836<br><a href="http://www.ncgs.state.nc.us">http://www.ncgs.state.nc.us</a> | County Average Vertical Datum Offset Table<br><table><tr><th>County</th><th>Vertical Datum Offset (ft)</th></tr><tr><td>ROWAN</td><td>-0.75</td></tr></table><br>Example: NAVD 88 = NGVD 29 + (-0.75) | County | Vertical Datum Offset (ft) | ROWAN | -0.75 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------|-------|-------|
| County                                                                                                                                                                  | Vertical Datum Offset (ft)                                                                                                                                                                            |        |                            |       |       |
| ROWAN                                                                                                                                                                   | -0.75                                                                                                                                                                                                 |        |                            |       |       |

All streams listed in the **Flood Hazard Data Table** below were studied by detailed methods using field survey. Other flood hazard data shown on this map may have been derived using either a coastal analysis or limited detailed Riverine analysis. More information on the flooding sources studied by these analyses is contained in the Flood Insurance Study report.



**LEGEND**

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

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

**ZONE A** No Base Flood Elevation determined.

**ZONE AE** Base Flood Elevations determined.

**ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

**ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

**ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

**ZONE A99** Areas to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

**ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

**FLOODWAY AREAS IN ZONE AE**

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

**OTHER FLOOD AREAS**

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

**OTHER AREAS**

**ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.

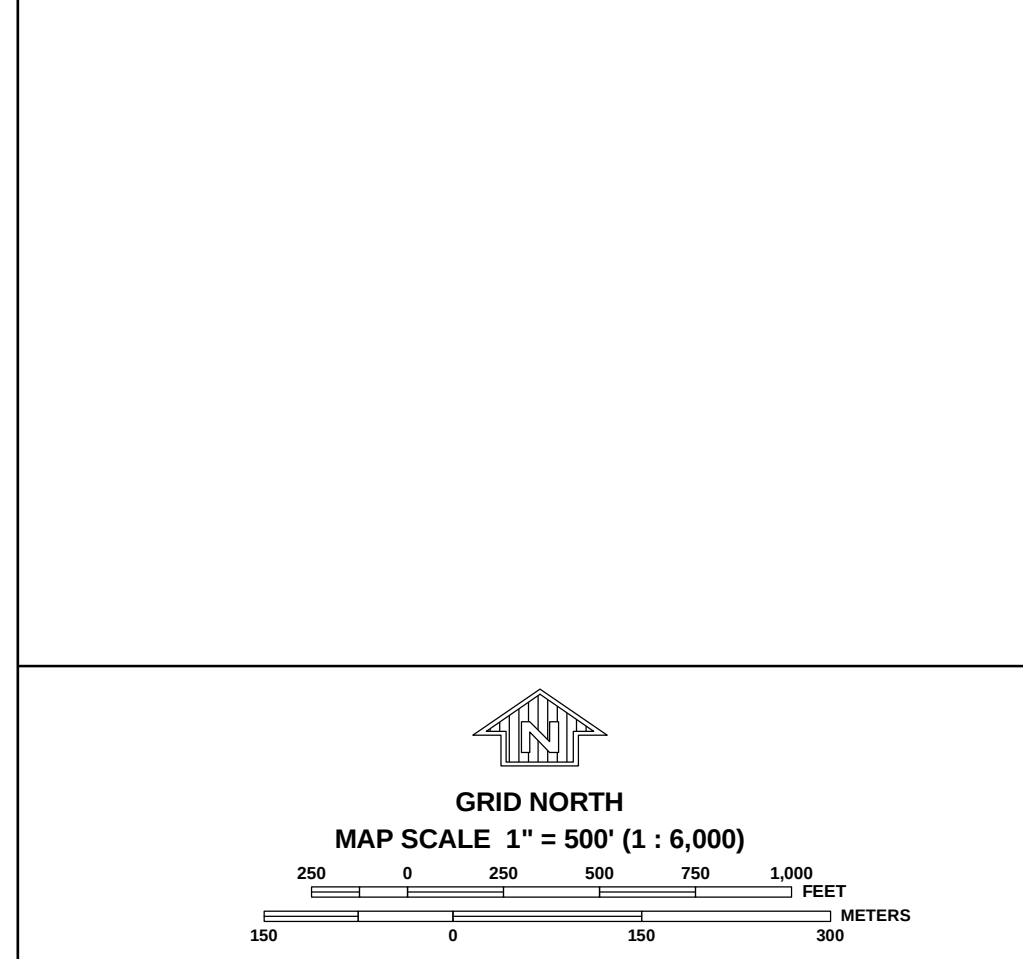
**ZONE D** Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

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

1% annual chance floodplain boundary  
0.2% annual chance floodplain boundary  
Floodway boundary  
Zone D boundary  
CBRS and OPA boundary  
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.  
Base Flood Elevation line and value; elevation in feet\*  
Base Flood Elevation value where uniform within zone; elevation in feet\*  
\* Referenced to the North American Vertical Datum of 1988  
Cross section line  
Transect line  
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)  
1000-meter Universal Transverse Mercator grid ticks, zone 17  
2500-foot grid values North Carolina State Plane coordinate system (FIPSZONE 3200, State Plane NAD 83 feet)  
North Carolina Geodetic Survey bench mark (for more information visit <http://www.ncgs.state.nc.us>)  
National Geodetic Survey bench mark (for more information visit <http://www.ngs.noaa.gov>)  
NGS-58 GPS 2-5 cm Vertical Control Marks or Contractor-Established NCMP Bench Marks (for more information visit <http://www.ncgs.state.nc.us>)  
River Mile



**NOTES TO USERS**

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles, Floodway Data, Limited Detailed Flood Hazard Data, and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of **regulatory floodways** shown on the FIRM for flooding sources studied by detailed methods were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data for flooding sources studied by detailed methods as well as **non-encroachment widths** for flooding sources studied by limited detailed methods are provided in the Flood Insurance Study (FIS) report for this jurisdiction. The FIS report also provides instructions for determining a floodway using non-encroachment widths for flooding sources studied by limited detailed methods.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 4.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

**Base map** information and geospatial data used to develop this FIRM were obtained from various organizations, including the participating local community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by Rowan County. The time period of collection for the imagery is 2005. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map. See geospatial metadata for the associated digital FIRM for additional information about base map preparation.

Base map features shown on this map, such as **corporate limits**, are based on the most up-to-date data available at the time of publication. **Changes in the corporate limits may have occurred since this map was published.** Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

If you have **questions about this map**, or questions concerning the National Flood Insurance Program in general, please call **1 - 877 - FEMA MAP** (1-877-336-2627) or visit the FEMA website at <http://www.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** at 1-800-358-9616 for information on all related products associated with this FIRM. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov>.

**MAP REPOSITORY**  
Refer to listing of Map Repositories on Map Index or visit <http://www.ncfloodmaps.com>.

**EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL**  
JUNE 16, 2009

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

For community map revision history prior to statewide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent, the North Carolina Division of Emergency Management or the National Flood Insurance Program at the following phone numbers or websites:

NC Division of Emergency Management (919) 715-8000 <http://www.ncdcmecentral.org/hdp> National Flood Insurance Program 1-800-638-6620 <http://www.fema.gov/business/nfip/>

**Cooperating Technical State**

FEMA'S COOPERATING TECHNICAL PARTNER

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 of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain 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.

[www.ncfloodmaps.com](http://www.ncfloodmaps.com)

**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 5665J**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**NORTH CAROLINA**

**PANEL 5665**

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

|                  |                |                     |
|------------------|----------------|---------------------|
| <b>COMMUNITY</b> | <b>CID No.</b> | <b>PANEL SUFFIX</b> |
| ROWAN COUNTY     | 370351         | 5665 J              |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**EFFECTIVE DATE**  
JUNE 16, 2009

**MAP NUMBER**  
3710566500J

State of North Carolina  
Federal Emergency Management Agency



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