LETTER OF MAP REVISION

SC 707 CULVERT REPLACEMENT

Community Name: Horry County, SC
Community Number: 450104
Flooding Source: Collins Creek

Prepared for:

Horry County
SOUTH CAROLINA
Committed to Excellence

In conjunction with:

SCDOT

Prepared by:

Kimley-Horn and Associates

March 2021

SOUTH CAROLINA PROFESSIONAL ENGINEER
LARRY DANIEL ROBINSON
DocuSigned by:
CE17B2971D5643E...
3/31/2021

LETTER OF MAP REVISION

TABLE OF CONTENTS

1.0 Background

This Letter of Map Revision (LOMR) request was prepared on the behalf of Horry County in conjunction with SCDOT for the replacement of a double 10-ft x 10-ft reinforced concrete box culvert (RCBC) that carries Collins Creek under SC 707. The existing culvert was replaced with a 120-ft long cored slab bridge. A Conditional Letter of Map Revision (CLOMR) for this culvert replacement was approved on December 2, 2011 (Case Number 11-04-6268R). The bridge replacement was constructed as proposed by the CLOMR. Modeling results from CLOMR showed no increase in base flood elevations and a max decrease of 0.17 feet occurring directly upstream of the proposed SC 707 bridge. The LOMR shows similar results with no increase in base flood elevations and a max decrease of 0.18 feet occurring directly upstream of the constructed SC 707 bridge. Collins Creek is a FEMA studied stream as documented on the Horry County Flood Insurance Rate Map (FIRM) map numbers 45051C0730H and 45051C0731H. The flood hazards for this stream are mapped as Zone AE with a mapped floodway. Flood hazards along the lower reach controlled by flooding from the Atlantic Ocean. The effective FIRM maps were revised August 23, 1999. Detailed data associated with the effective study of Collins Creek is reported in the Flood Insurance Study (FIS) Number 45051CV000A for Horry County dated September 17, 2003.

2.0 Data Analysis

2.1 Duplicate Effective Modeling Plan

An electronic copy of the effective HEC-2 model input data was obtained from the FEMA Library. The HEC-2 data included the reach of study from effective printed cross sections A through L. The HEC-2 data was used to create a duplicate effective modeling plan using HEC-RAS version 5.0.7. The stations within the HEC-2 pdf did not match the stations recorded in the effective FIS. The reach lengths provided in the HEC-2 data was used to assign cross-sections stationing based on the stationing provided in the FIS. The effective FIS references elevations to the NGVD29 vertical

datum. The vertical datum for the received HEC-2 data was adjusted by -1.03 ft to reference the duplicate effective model to the NAVD88 datum. The magnitude of this adjustment was calculated using the U.S Army Corps of Engineers Corpscon Program. The duplicate effective modeling plan duplicated the effective 100-yr FIS profile to within 0.5 ft.

2.2 Corrected Effective Modeling Plan

A corrected effective HEC-RAS modeling plan was created by importing the effective FIRMs into ArcGIS and tracing the effective stream centerline and printed cross sections. Corrections were made to the stream centerline based on 2009 Horry County Lidar contours. Four cross-sections were added to this layer to capture the topography at the upstream and downstream face of the SC 707 crossing and at the contraction and expansion sections for the proposed bridge. The duplicate effective model showed the stationing of the cross-section data points for effective cross-sections B and F through L was reversed in order. Correction was made to the cross-section points for these sections to provide representation from left to right looking downstream. Site survey and field investigation data was used to update the SC 707 culvert information and n-values within the project area. Flow data from the duplicate effective model was maintained in the corrected effective model. Starting conditions were set at the effective flood profile water surface elevations at cross section B taken from the HEC-2 output file. The NGVD29 elevations for the 10-, 50-, 100- and 500-year events from the HEC-2 data are 3.72, 4.78, 5.23 and 6.66. Accounting for the -1.03 ft datum adjustment, the starting water surface elevations were adjusted to 2.69, 3.75, 4.20 and 5.63 feet NAVD88. The corrected effective encroachment analysis was performed using encroachment settings from the duplicate effective data in conjunction with scaled widths from the effective floodway limits. The encroachment analysis demonstrated surcharge magnitudes between 0.00 and 1.00.

2.3 Post-Project Modeling Plan

A post-project HEC-RAS modeling plan was created from the corrected effective modeling plan. The post-project bridge plans were used to input the bridge geometry within the post-project geometry. Ineffective areas were revised at the bridge based on this geometry. Flow data, starting conditions and encroachment data were maintained from the corrected effective modeling plan. The post-project encroachment analysis demonstrated surcharge magnitudes between 0.00 and 1.00. Effective base flood and floodway tie-ins were demonstrated at effective cross-sections B and F. The post-project modeling plan demonstrated that the project results in decreases in base flood elevations along the study reach when compared to corrected effective conditions, with a maximum decrease of 0.18 feet. The post-project analysis demonstrated the widening and narrowing of the effective floodway with a maximum widening of approximately 280 ft and maximum narrowing of approximately 120 ft.

3.0 Combined Effects Analysis

Using the *Guidelines and Specifications for Flood Hazard Mitigation Partners* section on Combined Effects: Surge Plus Riverine Runoff, the Atlantic Ocean surge effects along Collins Creek were examined starting at Section B. Section B is controlled by the surge for both the 100-year and 500-year events. The 100-year water surface elevations for 12018 and 13726 were determined using the combined probability of the riverine and surge elevations. The 500-year elevation for 12018 is controlled by the surge elevations and the 500-year for 13726 is controlled by the riverine elevations. The 100-year and 500-year water surface elevations for sections upstream of 13726 are controlled by the riverine elevations.

Table 1. Base Flood Elevation Comparison

Stream Stations[1]				Base Flood Elevation (Feet NAVD)				Duplicate minus Effective	Post-Project minus Corrected
Effective		Duplicate Effective	Corrected Effective and Post-Project	Effective	Duplicate Effective	Corrected Effective	Post-Project		
B	10,040	10,040	10040	4.17	4.20	4.20	4.20	0.0	0.00
			12018+			5.59	5.59		0.00
			13726+			6.44	6.44		0.00
C	14,540	14,540	-	7.07	6.99			-0.1	
D	14,640	14,640	-	6.97	6.98			0.0	
			14969+			7.68	7.53		-0.15
		14,740	-		7.06				
		14,763	15052	SC 707					
		14,785	-		7.07				
			15135+			8.39	8.21		-0.18
E	14,885	14,885	-	7.27	7.28			0.0	
			16106+			8.52	8.35		-0.17
			17532+			8.75	8.60		-0.15
F	19,115	19,115	19526	9.87	9.98	9.67	9.60	0.1	-0.07
G	21,165	21,165	21576	11.47	11.39	11.51	11.51	-0.1	0.00
		21,177	21588		11.41	11.53	11.52		-0.01
H	21,327	21,327	21738	11.67	11.64	11.76	11.75	0.0	-0.01
I	24,277	24,277	24688	14.47	14.49	14.62	14.62	0.0	0.00
		24,477	24888		14.65	14.83	14.83		0.00
J	24,493	24,493	24904	14.77	14.70	14.86	14.86	-0.1	0.00
		24,658	25069		15.04	15.15	15.15		0.00
K	27,558	27,558	27969	19.07	19.07	19.11	19.11	0.0	0.00
		28,448	28859		20.54	20.59	20.59		0.00
		28,548	28959		20.79	20.81	20.81		0.00
		28,565	28976	Unnamed Road					
L	28,581	28,581	28992	21.07	21.04	21.04	21.04	0.0	0.00
		28,681	29092		21.06	21.07	21.07		0.00

[1] Feet above county boundary

\+ Cross section added to corrected effective model

\- Cross section deleted from duplicate effective model

Table 2. Regulatory Base Flood Elevation Comparison

Stream Stations[1]				Base Flood Elevation (Feet NAVD)				Duplicate minus Effective	Post-Project minus Corrected
Effective		Duplicate Effective	Corrected Effective and Post-Project	Effective	Duplicate Effective	Corrected Effective	Post-Project		
B	10,040	10,040	10040	6.1	N/A	6.0	6.0	N/A	0.00
			12018+			6.4	6.4		0.00
			13726+			6.9	6.9		0.00
C	14,540	14,540	-	7.3	N/A			N/A	
D	14,640	14,640	-	7.3	N/A			N/A	
			14969+			7.71	7.55		-0.16
		14,740	-		N/A				
		14,763	15052	**SC 707**					
		14,785	-		N/A				
			15135+			8.39	8.21		-0.18
E	14,885	14,885	-	7.50	N/A			N/A	
			16106+			8.52	8.35		-0.17
			17532+	8.6*		8.75	8.60		-0.15
F	19,115	19,115	19526	10.00	9.95	9.67	9.60	-0.1	-0.07
G	21,165	21,165	21576	11.47	11.50	11.51	11.51	0.0	0.00
		21,177	21588		11.51	11.53	11.52		-0.01
H	21,327	21,327	21738	11.67	11.73	11.76	11.75	0.1	-0.01
I	24,277	24,277	24688	14.47	14.46	14.62	14.62	0.0	0.00
		24,477	24888		14.69	14.83	14.83		0.00
J	24,493	24,493	24904	14.77	14.73	14.86	14.86	0.0	0.00
		24,658	25069		15.06	15.15	15.15		0.00
K	27,558	27,558	27969	19.07	19.09	19.11	19.11	0.0	0.00
		28,448	28859		20.54	20.59	20.59		0.00
		28,548	28959		20.79	20.81	20.81		0.00
		28,565	28976	**Unnamed Road**					
L	28,581	28,581	28992	21.07	21.04	21.04	21.04	0.0	0.00
		28,681	29092		21.06	21.07	21.07		0.00

[1] Feet above county boundary

\+ Cross section added to corrected effective model

\- Cross section deleted from duplicate effective model

Table 3. Floodway Width Comparison

Stream Stations[1]				Effective	Duplicate Effective[3]			Corrected Effective			Post-Project			Post-Project minus Effective Width (For Tie-In Determination)
Effective		Duplicate Effective	Corrected Effective and Post-Project	Total	Left[2]	Right[2]	Total	Left[2]	Right[2]	Total	Left[2]	Right[2]	Total	
B	10,040	10,040	10040	416	812	1228	416	669	1085	416	669	1085	416	0
			12018+					167	618	452	167	618	452	
			13726+					450	825	375	450	825	375	
C	14,540	14,540	-	293	429	722	293							
D	14,640	14,640	-	72	439	511	72							
			14969+					287	375	88	278	412	134	
		14,740	-		475	500	25							
		14,763	15052	SC 707										
		14,785	-		475	500	25							
			15135+					205	356	151	198	381	183	
E	14,885	14,885	-	48	454	502	48							
			16106+					320	720	400	320	720	400	
			17532+					202	394	192	202	394	192	
F	19,115	19,115	19526	229	618	847	229	349	578	229	349	578	229	0
G	21,165	21,165	21576	114	2294	2408	114	3392	3506	114	3392	3506	114	0
		21,177	21588		2293	2408	115	3392	3507	115	3392	3507	115	
H	21,327	21,327	21738	164	288	452	164	217	381	164	217	381	164	0
I	24,277	24,277	24688	171	2841	3012	171	411	582	171	411	582	171	0
		24,477	24888		3088	3109	21	1441	1462	21	1441	1462	21	
J	24,493	24,493	24904	21	3088	3109	21	1441	1462	21	1441	1462	21	0
		24,658	25069		3088	3200	112	1350	1462	112	1350	1462	112	
K	27,558	27,558	27969	80	755	835	80	865	945	80	865	945	80	0
		28,448	28859		3659	4008	349	2492	2841	349	2492	2841	349	
		28,548	28959		3454	4002	548	2498	3046	548	2498	3046	548	
		28,565	28976	Unnamed Road										
L	28,581	28,581	28992	628	3374	4002	628	2498	3126	628	2498	3126	628	0
		28,681	29092		3354	4008	654	2492	3146	654	2492	3146	654	

[1] Feet above county boundary

+ Cross section added to corrected effective model

- Cross section deleted from duplicate effective model

[2] Left/Right encroachment stations

[3] The Duplicate Effective HEC-2 file provided cross-sections data in order from left to right looking upstream. This error was corrected in the Corrected Effective HEC-RAS model by recoding the data in reverse order. Because of this, the Corrected Effective and Proposed Conditions encroachment stations when compared to the duplicate effective stations, are reversed.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
COLLINS CREEK								
A	2300[1]	101	819	1.8	7.0	1.2[2]	1.2	0.0
B	10040[1]	416	1455	0.8	7.0	5.2[2]	5.8	0.6
C	Deleted							
D	Deleted							
E	Deleted							
F	19526[1]	229	853	0.7	10.6	10.6	11.5	0.8
G	21576[1]	114	461	1.2	12.5	12.5	13.5	0.9
H	21738[1]	164	693	0.8	12.8	12.8	13.7	0.9
I	24688[1]	171	581	0.8	15.7	15.7	16.3	0.7
J	24904[1]	21	134	3.5	15.9	15.9	16.5	0.6
K	27969[1]	80	186	1.6	20.1	20.1	21.1	0.9
L	28992[1]	628	1099	0.3	22.1	22.1	22.8	0.7

[1] Feet Above Boundary

[2] Elevation computed without consideration of storm surge from the Atlantic Ocean

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

HORRY COUNTY, SC AND INCORPORATED AREAS

FLOODWAY DATA

COLLINS CREEK

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
450104	HORRY COUNTY	SC	45051C	0730	08/23/99

2. a. Flooding Source: COLLINS CREEK

b. Types of Flooding: ☒ Riverine ☒ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: SC 707 CULVERT REPLACEMENT

4. FEMA zone designations affected: AE (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☒ Improved Methodology/Data ☒ Regulatory Floodway Revision ☐ Base Map Changes
☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☐ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert
☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $8250
☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: JOHN BOYLSTON, P.E.	Company: SCDOT	
Mailing Address: 955 PARK STREET COLUMBIA, SC 29202	Daytime Telephone No.: 803-737-1527	Fax No.:
	E-Mail Address: BOYLSTONJD@SCDOT.ORG	
Signature of Requester (required): John D. Boylston 2021.06.07 08:22:13 -04'00'	Date:	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: TOMMY SMITH, BUILDING OFFICIAL	Community Name: HORRY COUNTY	
Mailing Address: HORRY COUNTY ENFORCEMENT DEPARTMENT GOVERNMENT & JUSTICE CENTER - SUITE 1D09	Daytime Telephone No.: 843-915-5090	Fax No.: 843-915-6090
	E-Mail Address: smithto@horrycounty.org	
Community Official's Signature (required): Digitally signed by TOMMY SMITH Date: 2021.10.21 07:46:31 -04'00'	Date: October 21, 2021	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: DAN ROBINSON	License No.: 21413	Expiration Date: 06/30/2022	
Company Name: KIMLEY-HORN AND ASSOCIATES, INC.	Telephone No.: 919-677-2178	Fax No.:	
Signature: DocuSigned by: CE17B2971D5643E...	Date: 3/31/2021	E-Mail Address: DAN.ROBINSON@KIMLEY-HORN.COM	

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if …
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: COLLINS CREEK

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model → Specify Model: _____
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	APPROX. 2 MI UPSTREAM OF COUNTY BOUNDARY	(B) 10, 040	6.1	6.0
Upstream Limit*	ARRPOX. 0.8 MI UPSTREAM OF SC 707	(F) 19, 115	10.0	9.6

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS 5.0.7 STEADY-STATE

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name: SEE ATTACHED	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Revised or Post-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: 2014 Horry County SC LiDAR

Source: coast.noaa.gov Date: 2014

Accuracy: 16 cm

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

   - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No
   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☒ Yes ☐ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

Models Submitted:

Duplicate Effective Model (Datum: NAVD 88)

Multiple Profile Run:	File: collins_crk.p01	Plan: Duplicate Effective Multiple
FEMA Floodway Run:	File: collins_crk.p02	Plan: Duplicate Effective Floodway

Corrected Effective Model (Datum: NAVD 88)

Multiple Profile Run:	File: collins_crk.p03	Plan: Corrected Effective Multiple
FEMA Floodway Run:	File: collins_crk.p09	Plan: Corrected Effective Floodway

Post-Project Model (Datum: NAVD 88)

Multiple Profile Run:	File: collins_crk.p10	Plan: Post-Project Multiple
FEMA Floodway Run:	File: collins_crk.p08	Plan: Post-Project Floodway

MT2 Form 2 Riverine Hydrology and Hydraulics Attachment
Section D1b. Draft Property Owner Notification

Date

(Affected property owner name)

(Affected property owner mailing address)

Re: Notification of Flood Hazard Revisions

Dear Mr./Ms./Mr. and Mrs. (Affected property owner)

The Flood Insurance Rate Map (FIRM) for a community depicts the Special Flood Hazard Area (SFHA), the area which has been determined to be subject to a 1% (100-year) or greater chance of flooding in any given year. The floodway is the portion of the floodplain that includes the channel of a river or other watercourse and the adjacent land area that must be reserved in order to discharge the 1% annual chance (base) flood without cumulatively increasing the water-surface elevation by more than a designated height. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

The South Carolina Department of Transportation (SCDOT) in conjunction with Horry County is applying for a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (DHS-FEMA) to revise FIRM 45051C0730H and 45051C0731H for Horry County, South Carolina along Collins Creek. SCDOT is proposing to revise the FIRM to reflect the replacement of the replacement of double 10-feet by 10-feet RCBC with a 120-feet long cored slab bridge.

The Horry County Enforcement Department, in accordance with National Flood Insurance Program regulation at 4 CFR 65.7(b)(1), hereby gives notice of the County's intent to revise the 1-percent annual-chance floodway along Collins Creek upstream and downstream of SC 707. Specifically, the floodway shall be revised from a point generally located 2 miles upstream of the County Boundary to a point 0.8 miles upstream of SC 707 along Collins Creek. As a result of the LOMR, the regulatory floodway will narrow and widen within the area of revision.

This letter is to inform you of the flood hazard revisions on your property at (Address).

Maps and a detailed analysis of the flood hazard revision can be reviewed at the (insert location) at (insert location address). If you have any questions or concerns about the proposed project or its effect on your property, you may contact (name of appropriate community official) of (name of community) at (community official contact information) from …to … (insert dates during which community contact person can be contacted).

Sincerely,

Floodplain Administrator

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: COLLINS CREEK

Note**:** Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: SC 707

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: COLLINS CREEK AND SC 707

   Downstream Limit/Cross Section: EFFECTIVE CROSS-SECTION D

   Upstream Limit/Cross Section: EFFECTIVE CROSS-SECTION E

2. Name of Structure: _____

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: _____

   Downstream Limit/Cross Section: _____

   Upstream Limit/Cross Section: _____

3. Name of Structure: _____

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: _____

   Downstream Limit/Cross Section: _____

   Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: _____

Name of Structure: _____

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the _____-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: COLLINS CREEK

Name of Structure: SC 707

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☒ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☒ Dimensions (height, width, span, radius, length)
☐ Shape (culverts only)
☒ Material
☐ Beveling or Rounding
☐ Wing Wall Angle
☒ Skew Angle
☐ Distances Between Cross Sections
☒ Erosion Protection
☒ Low Chord Elevations – Upstream and Downstream
☒ Top of Road Elevations – Upstream and Downstream
☐ Structure Invert Elevations – Upstream and Downstream
☐ Stream Invert Elevations – Upstream and Downstream
☐ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

SCOUR ANALYSIS SHOWED MAX VELOCITIES LESS THAN CRITICAL VELOCITIES

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name:

Project Identifier: SC 707

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Please make check or money order payable to the National Flood Insurance Program.

Type of Request:

☐ MT-1 application
☒ MT-2 application

LOMC Clearinghouse
3601 Eisenhower Ave. Suite 500
Alexandria, VA 22304-6426
Attn.: LOMC Manager

☐ EDR application

FEMA Project Library
3601 Eisenhower Ave. Suite 500
Alexandria, VA 22304-6426
FAX (703) 960-9125

Request No. (if known): _____ **Check No.:** _____ **Amount:** $8250

☐ INITIAL FEE* ☒ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

****Note: Check only if submitting a corrected fee for an ongoing request.**

COMPLETE THIS SECTION *ONLY* IF PAYING BY CREDIT CARD

CARD NUMBER EXP. DATE

				–					–					–				–		
1	2	3	4		5	6	7	8		9	10	11	12		13	14	15	16	Month		Year

_____ _____
Date Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(*for your credit card receipt-please print or type*) _____

DAYTIME PHONE: _____

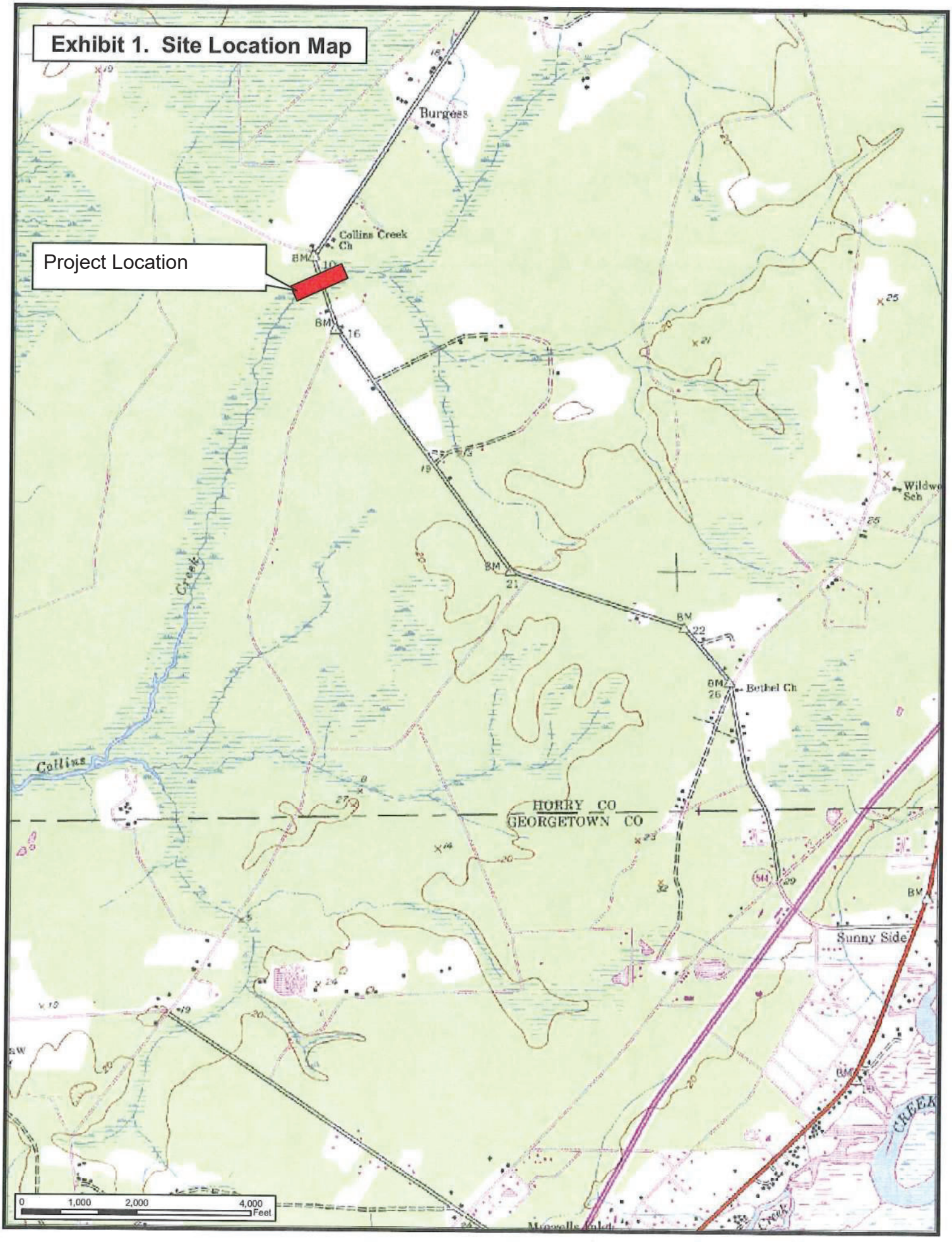


EXHIBIT 2: SITE PHOTOS

Upstream Face of SC 707/Collins Creek Bridge – looking at left overbank

Underneath SC 707/Collins Creek Bridge – looking downstream

Downstream Face of SC 707/Collins Creek Bridge – looking at right overbank

PCN	SHEET NO.	TOTAL SHEETS
36778 BR01	1	32

INDEX OF SHEETS

SCDOT

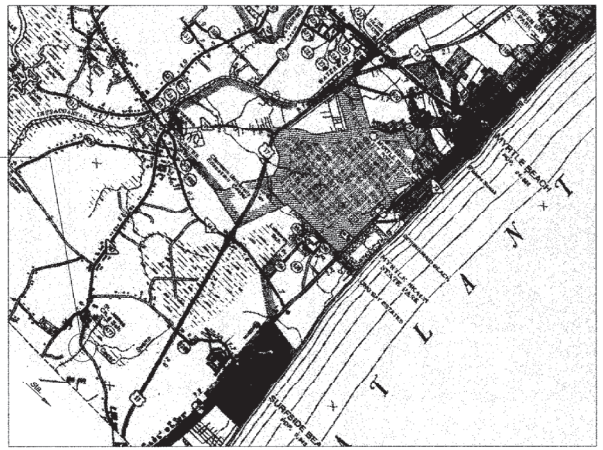
South Carolina Department of Transportation

PROPOSED PLANS FOR HORRY COUNTY FILE NO. 26.036778A.1 ROUTE SC 707 CONSTRUCT BRIDGE OVER COLLINS CREEK

I HEARBY CERTIFY THAT THIS PROJECT WAS CONSTRUCTED ACCORDING TO THE PLANS EXCEPT AS NOTED HEREIN

Submit Shop Plans to:
HDR Engineering, Inc.
of the Carolinas
c/o Rick Fauteux
3955 Faber Place Dr
Suite 300
North Charleston, SC 29405
Telephone: (843) 414-3700

SITE LOCATION



LAYOUT

Approximate Location of Bridge is

Latitude	33° - 35' - 51"
Longitude	79° - 03' - 42"

SCDOT REVIEW	FOR CONSTRUCTION INITIAL	FOR CONSTRUCTION DATE
PRECONSTRUCTION SUPPORT - ROAD		
PRECONSTRUCTION SUPPORT - STRUCTURES		
RPG - DESIGN MANAGER		
RPG - PROGRAM MANAGER		

THE INITIALS ABOVE DO NOT RELIEVE THE ENGINEER OF RECORD OF THE RESPONSIBILITY TO DESIGN THIS PROJECT IN ACCORDANCE WITH ALL APPLICABLE CRITERIA.

3 DAYS BEFORE DIGGING IN SOUTH CAROLINA

CALL 811

PALMETTO UTILITY PROTECTION SERVICES, INC. (PUPS)
ALL UTILITIES MAY NOT BE A MEMBER OF PUPS.

NET LENGTH OF ROADWAY	0.000	MILES
NET LENGTH OF BRIDGES	0.023	MILES
NET LENGTH OF PROJECT	0.023	MILES
LENGTH OF EXCEPTIONS	0.000	MILES
GROSS LENGTH OF PROJECT	0.023	MILES

TRAFFIC DATA

2007 ADT 18000 V.P.D.

2027 ADT 43000 V.P.D.

TRUCKS 5 %

NOTE: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2007 EDITION) AND THE STANDARD DRAWINGS FOR ROAD CONSTRUCTION IN EFFECT AT THE TIME OF LETTING.

CONSULTING ENGINEERING FIRM

HDR Engineering, Inc. of the Carolinas
3955 Faber Place
Suite 300
North Charleston, SC 29405
(843) 414-3700

ENGINEER OF RECORD

FOR CONSTRUCTION: _____ DATE 8-2-10

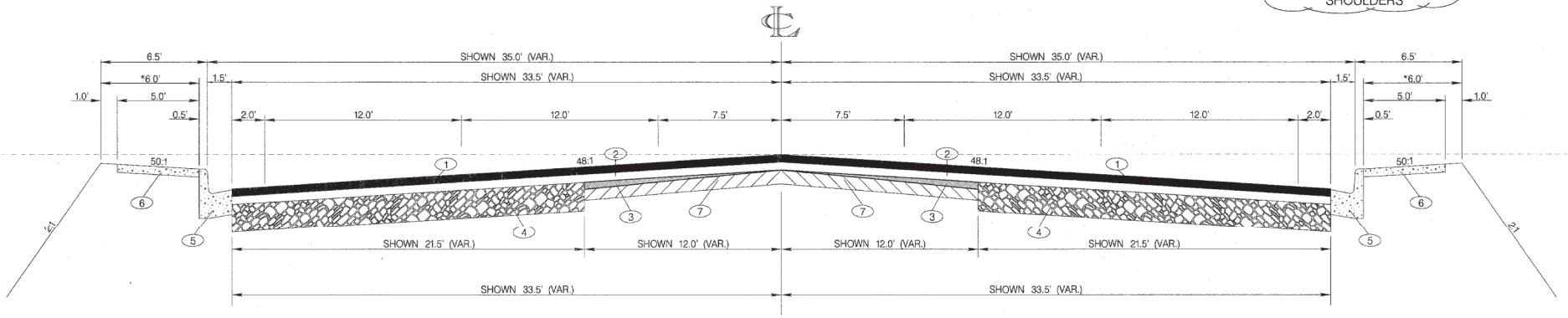
REVIEWED			
DR.	CAA	MKT	05/13
	3Y	CHK	DATE

PIN No. 36779BA

FED.AID PROJ. NO.	STATE	COUNTY	FILE NO.	ROAD/ROUTE NO.	SHEET NO.
3	SC	HORRY	26.0367798A	S.C.707	6

TYPICAL SECTION OF IMPROVEMENT
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
COLUMBIA, S.C.

NOTE:
DURING CONSTRUCTION, REMOVE EXISTING PAVED SHOULDERS



USE THIS SECTION

STA. 283+00.00 TO STA. 475+35.60 ROUTE S.C. 707 (SOCASTEE BLVD.)

NOTE:
SEE STD. No. 720-1 FOR DETAIL OF 2'-0" CONC. CURB AND GUTTER

1. ASPHALT CONCRETE SURFACE COURSE TYPE B (200 LBS./S.Y.)
2. ASPHALT CONCRETE INTERMEDIATE COURSE TYPE B (200 LBS./S.Y.)
3. ASPHALT CONCRETE INTERMEDIATE COURSE TYPE B (VAR.FOR BUILDUP)
4. CEMENT AGGREGATE BASE COURSE TYPE I (9 INCHES)
5. CONCRETE CURB AND GUTTER (2'-0")
6. CONCRETE SIDEWALK (4" UNIFORM)
7. PAVEMENT AND BASE IN PLACE RETAIN

FOR INFORMATION ONLY
DO NOT USE FOR CONSTRUCTION

RTE. S.C. 707	DESIGN SPEED	
MPH	FROM STA.	TO STA.
45	14+81.74	266+20.25
EXCEPTIONS TO DESIGN SPEED		

PAVEMENT DESIGN

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

TYPICAL SECTION

SCALE 1"V= N.T.S. SCALE 1"H= N.T.S. RTE./RD.

$$user$$
$$$$$$$$$$path$$$$$$$$$$filename$$$$$$$$$$
$$$$date$$$$

PIN NO. 36779

FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	NO.	SHEET NO.
3	S.C.	HORRY	26.036779A	SC 707	7

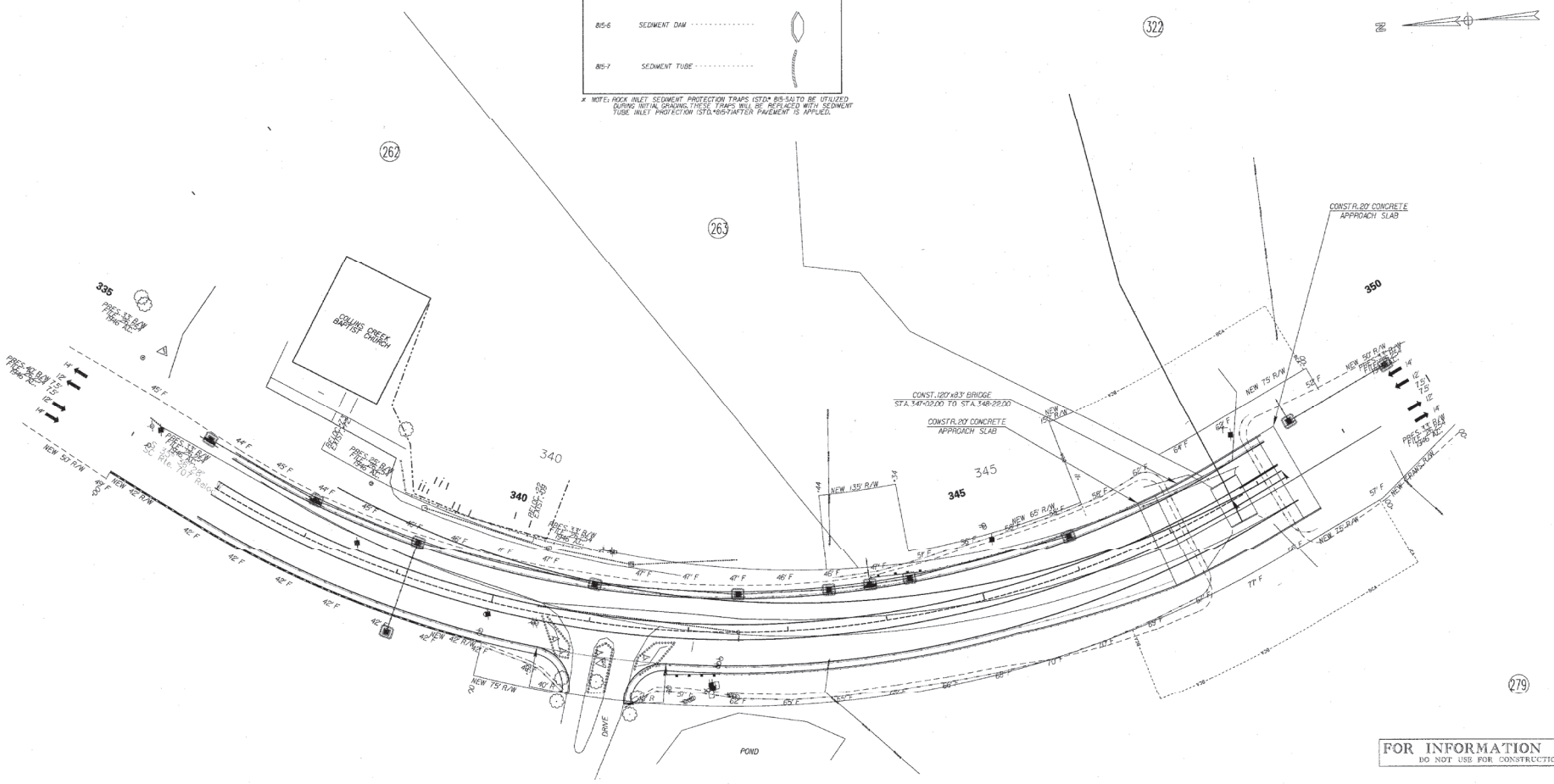
SC ROUTE 707

EROSION CONTROL DETAILS AND SPECIFICATIONS

STD.*	DESCRIPTION	SYMBOL
815-1	TEMPORARY SILT FENCE	
* 815-5A	ROCK INLET SEDIMENT PROTECTION TRAP TYPE A	OR
815-6	SEDIMENT DAM	
815-7	SEDIMENT TUBE	

* NOTE: ROCK INLET SEDIMENT PROTECTION TRAPS (STD.* 815-5A) TO BE UTILIZED DURING INITIAL GRADING. THESE TRAPS WILL BE REPLACED WITH SEDIMENT TUBE INLET PROTECTION (STD. 815-7) AFTER PAVEMENT IS APPLIED.

RELOCATE CENTERLINE BETWEEN STA. 318+28.16 TO STA. 348+26.58



FOR INFORMATION ONLY
DO NOT USE FOR CONSTRUCTION

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2	B. Andrews	6-14-10	REVISED OBTAINS ON TRACT 263
1	B. Andrews	6-2-10	REVISED OBTAINS ON TRACT 278

TOPO. _____ DATE _____
DWG. _____ DATE _____ GROUP 2 - P.D.B.
R/W _____ DATE _____

SOUTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROAD DESIGN COLUMBIA, S.C.

S.C. ROUTE 707
PLAN
STA. 335+00 TO 350+00

SCALE 1"= 50' RTE. SC.707 DWG. NO. PN1

$$user$$
$$$$$$$path$$$$$$$$$filename$$$$$$$$$
$$$$date=$$$$

DocuSign Envelope ID: E017A991-CFBA-4BEA-BFE1-F44D77185936

PIN NO. 36778

FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.
3	S.C.	HORRY	26.036778A	SC 707	7A

LEFT

STATION-OFFSET DESCRIPTION

335+40--71.0' TREE 24 OAK
335+46--66.2' TREE 24 OAK
335+70--18.7' SEWER VENT
335+85--34.1' LIGHT POLE
335+97--32.3' FENCE
337+04--87.2' BLDG.
337+41--73.7' SIGN
337+48--73.8' SIGN
337+99--90.5' BLDG.
338+14--97.1' CEMETERY
338+32--19.3' W.VALVE
338+40--81.7' TREE 36 CEDAR
338+48--53.7' FENCE 8 BRICK
338+51--71.1' CEMETERY
338+68--26.4' FENCE
338+76--29.1' CEMETERY
338+79--44.2' GRAVE
338+79--34.2' GRAVE
338+83--34.0' GRAVE
338+83--43.9' GRAVE
338+88--34.1' GRAVE
338+89--39.0' GRAVE
338+91--46.2' GRAVE
338+92--55.5' GRAVE
338+92--19.8' C.BASIN
338+97--45.2' GRAVE
338+99--55.2' GRAVE
339+05--53.5' GRAVE
339+05--45.3' GRAVE
339+15--27.2' FENCE
339+19--30.2' GRAVE
339+19--38.3' GRAVE
339+25--29.6' GRAVE
339+25--38.5' GRAVE
339+37--28.9' GRAVE
339+38--37.3' GRAVE
339+41--28.4' CEMETERY
339+83--50.6' GRAVE
339+83--42.1' GRAVE
340+01--38.2' GRAVE
340+01--46.7' GRAVE
340+22--32.2' CEMETERY
340+24--29.6' FENCE
340+27--22.8' C.BASIN
340+29--95.5' CEMETERY
340+81--39.7' FENCE
340+83--31.0' FENCE
340+91--34.4' T.PED.
340+92--32.7' T.PED.
340+95--33.2' T.V.PED.
341+14--24.2' D.INLET 24X36
342+16--118.9' WDS.LINE
342+64--56.5' WDS.LINE
343+67--43.1' WDS.LINE
344+20--51.7' WDS.LINE
344+76--58.4' WDS.LINE
344+86--60.1' G.WIRE
344+87--57.9' G.WIRE
344+92--44.1' P.POLE
346+10--67.8' WDS.LINE
346+50--30.5' SAN.SEWER 2 LINE
347+21--24.3' WINGWALL
347+23--17.5' CULVERT
347+23--17.6' CULVERT
347+23--18.4' HEADWALL
347+25--18.9' WINGWALL
347+52--19.5' WINGWALL
347+53--19.3' HEADWALL
347+53--18.9' CULVERT
347+56--25.6' WINGWALL
347+60--24.8' SAN.SEWER
347+64--65.6' MISC PT.WATER ELEV.
347+68--56.0' P.POLE BE
349+68--76.1' WDS.LINE

RIGHT

STATION-OFFSET DESCRIPTION

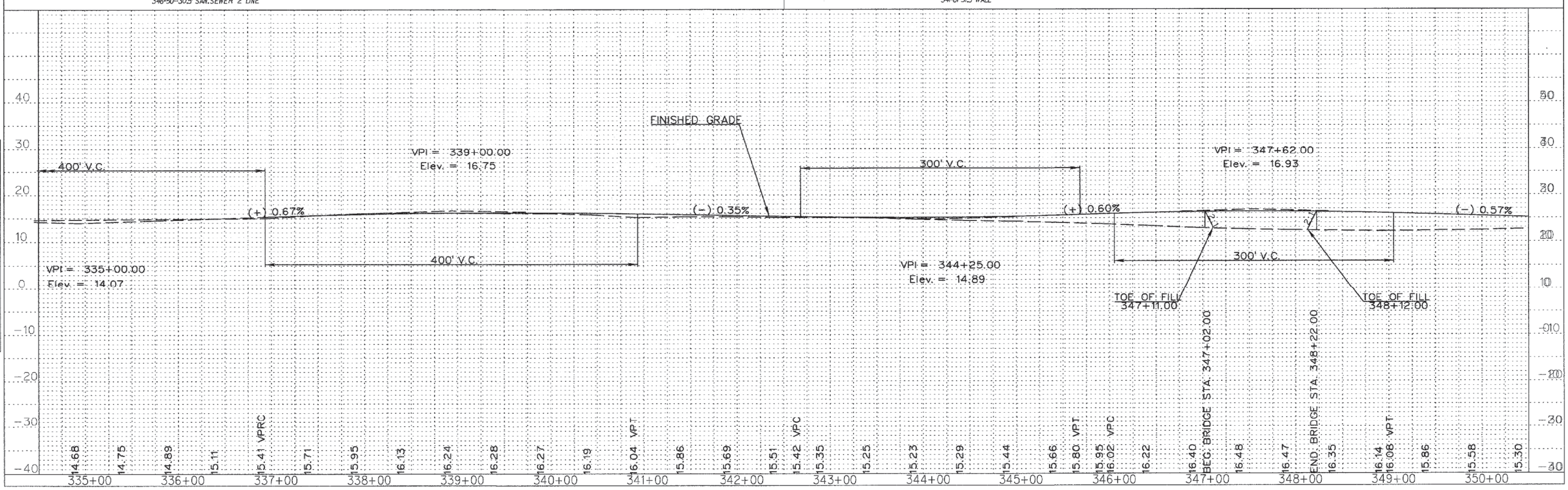
335+78-52.5' WDS.LINE
335+78-47.5' FENCE
335+94-47.8' FENCE
336+06-58.1' FENCE
336+12-37.4' T.PED.
336+18-55.2' G.WIRE
336+22-36.6' P.POLE
336+71-59.3' FENCE
336+71-64.3' WDS.LINE
337+35-61.5' FENCE
337+35-59.5' WDS.LINE
337+85-57.9' WDS.LINE
337+88-62.4' FENCE
338+42-59.1' FENCE
338+46-40.2' P.POLE
338+91-59.0' FENCE
339+31-60.3' FENCE
339+37-71.8' FENCE
339+86-80.2' G.WIRE
339+86-76.5' G.WIRE
339+86-59.9' I.PIN
339+88-59.1' P.POLE
340+31-54.4' T.PED.
340+34-54.0' T.PED.
340+38-45.2' SHRUB LINE
340+41-43.9' SHRUB LINE
340+43-49.8' WALL 8 BRICK
340+53-55.3' WALL
340+58-63.2' WALL
340+59-63.5' FLOOD LIGHT
340+59-80.3' SHRUB LINE
340+60-72.0' WALL
340+68-73.3' FLOOD LIGHT
340+69-73.8' WALL
340+69-101.3' TREE 12 OAK
340+70-66.7' SHRUB LINE
340+70-126.0' TREE 12 OAK
340+71-80.4' SHRUB LINE
340+95-110.9' SHRUB LINE
340+95-63.9' SHRUB LINE
340+96-74.2' WALL
341+00-97.3' TREE 12 OAK
341+02-67.4' FLOOD LIGHT
341+02-78.2' LIGHT POLE
341+03-58.1' SHRUB LINE
341+03-57.9' SHRUB LINE
341+08-74.1' WALL 0 BRICK
341+09-107.3' SHRUB LINE
341+10-62.6' SHRUB LINE
341+33-79.5' SHRUB LINE
341+35-66.2' SHRUB LINE
341+35-125.4' TREE 12 OAK
341+36-75.0' WALL 0 BRICK
341+38-83.6' SHRUB LINE
341+40-106.4' TREE 12 OAK
341+46-64.2' FLOOD LIGHT
341+46-71.3' WALL
341+49-49.7' SHRUB LINE
341+54-53.9' WALL
341+55-67.9' SHRUB LINE
341+61-51.3' WALL
341+68-46.8' SHRUB LINE
341+83-105.1' G.WIRE
341+84-105.2' G.WIRE
341+84-54.0' SIGN
341+85-44.1' SIGN
341+87-103.1' G.WIRE
341+89-101.9' G.WIRE
341+90-100.9' G.WIRE
342+03-90.4' T.V.PED.
342+05-85.0' SERVICE/METER POLE
342+08-87.7' P.POLE
342+09-85.0' ELEC.TRAN.BOX
342+10-66.2' G.WIRE
342+11-63.0' G.WIRE
342+13-58.2' G.WIRE
342+23-94.1' G.WIRE
342+24-94.5' G.WIRE
342+27-95.9' G.WIRE
342+28-30.7' M.HOLE
342+30-96.2' G.WIRE
342+65-97.5' WDS.LINE
342+65-69.2' WDS.LINE
344+21-48.8' WDS.LINE
344+85-48.4' WDS.LINE
346+09-58.6' WDS.LINE
346+69-54.7' WDS.LINE
347+00-36.0' WDS.LINE
347+23-31.3' WINGWALL
347+25-27.8' WINGWALL
347+25-25.1' CULVERT
347+25-25.8' HEADWALL
347+54-27.2' WINGWALL
347+54-24.4' CULVERT
347+54-25.3' HEADWALL
347+56-31.0' WINGWALL
347+97-34.1' WDS.LINE
349+91-27.6' WDS.LINE
349+94-76.9' WDS.LINE

FOR INFORMATION ONLY
DO NOT USE FOR CONSTRUCTION

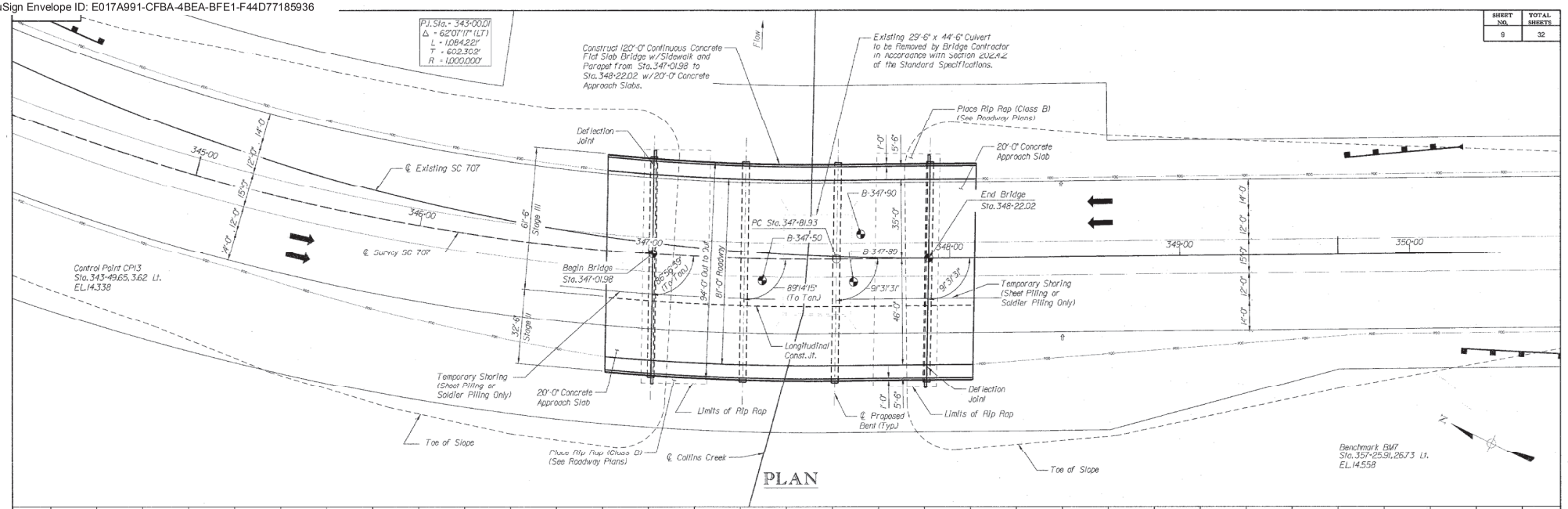
PLAN NOTE BOOK No.

$$user$$
$$$$$$path$$$$$$$$filename$$$$$$$$
$$$date$$$$

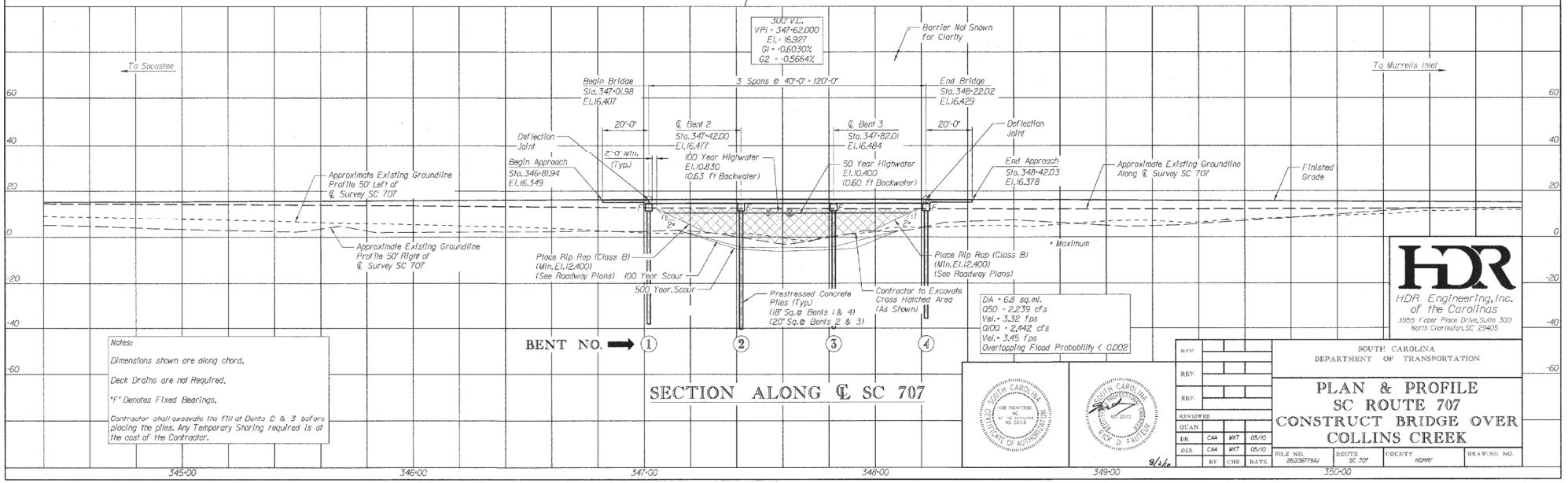
PROFILE NOTE BOOK No.



SHEET NO.	TOTAL SHEETS
9	32



PLAN



SECTION ALONG ℄ SC 707

Notes:

Dimensions shown are along chord.

Deck Drains are not Required.

"F" Denotes Fixed Bearings.

Contractor shall excavate the fill at Bents 2 & 3 before placing the piles. Any Temporary Shoring required is at the cost of the Contractor.

HDR Engineering, Inc. of the Carolinas
5955 Fleet Place Drive, Suite 300
North Charleston, SC 29405

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN & PROFILE SC ROUTE 707 CONSTRUCT BRIDGE OVER COLLINS CREEK

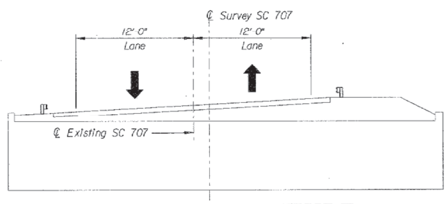
REV.	REV.	REV.	REVIEWED	QUAN.	DR.	CAA	MKT	05/10	DES.	CAA	MKT	05/10		BY	CHK	DATE

FILE NO.	ROUTE	COUNTY	DRAWING NO.
26036779A	SC 707	HORRY	

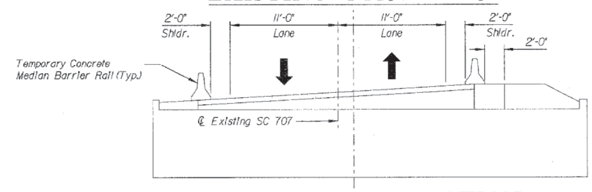
8/2/10

$$DATE$$

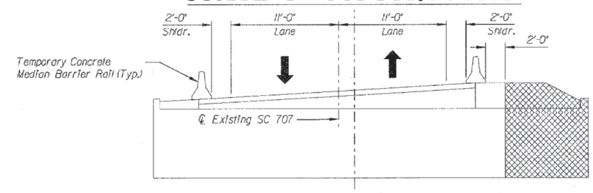
SHEET NO.	TOTAL SHEETS
8	32



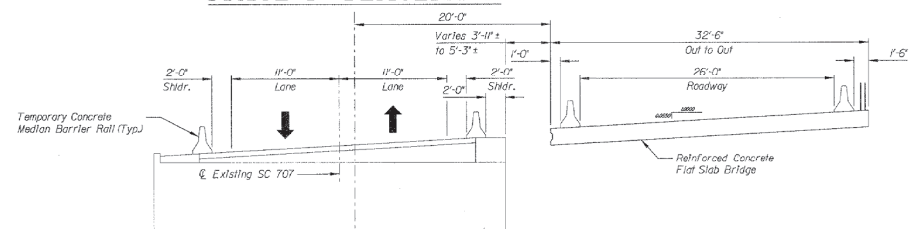
EXISTING STRUCTURE



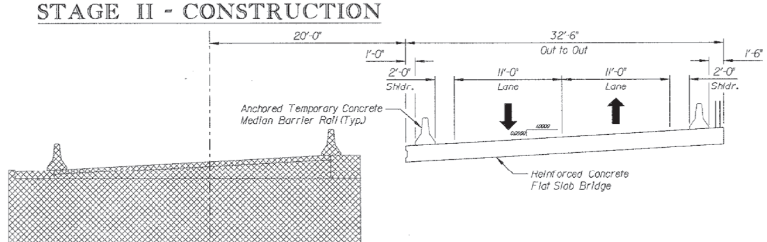
STAGE I - CONSTRUCTION



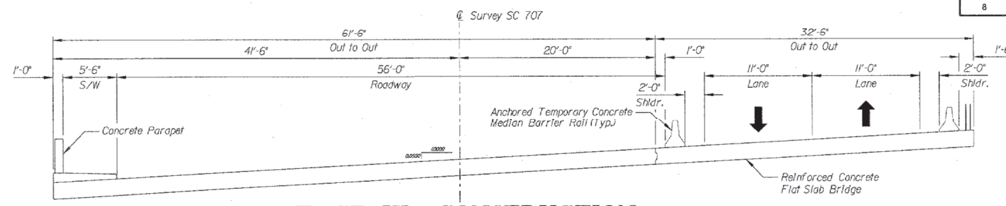
STAGE I - DEMOLITION



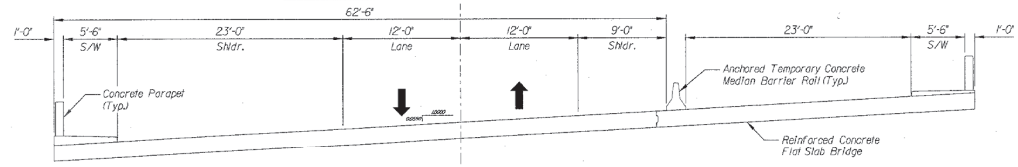
STAGE II - CONSTRUCTION



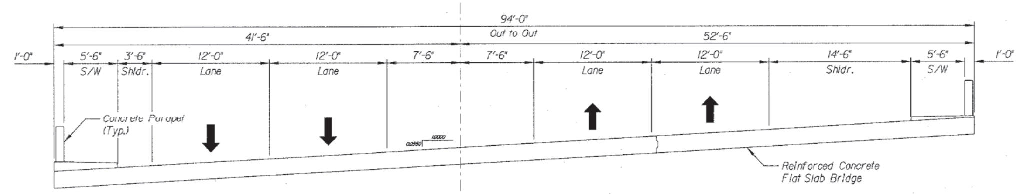
STAGE II - DEMOLITION



STAGE III - CONSTRUCTION



STAGE IV - CONSTRUCTION



FINAL PROPOSED STRUCTURE

HDR Engineering, Inc. of the Carolinas
3955 Faber Place Drive, Suite 300
North Charleston, SC 29405

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION — HDR ENGINEERING, INC. OF THE CAROLINAS NO. C0016

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — RICK D. FAUTEUX — NO. 23702

2/3/10

REV.			
REV.			
REV.			
REVIEWED R. FAUTEUX			
QUAN.			
DR.	CAA	MKT	05/10
DES.	CAA	MKT	05/10
	BY	CHK.	DATE

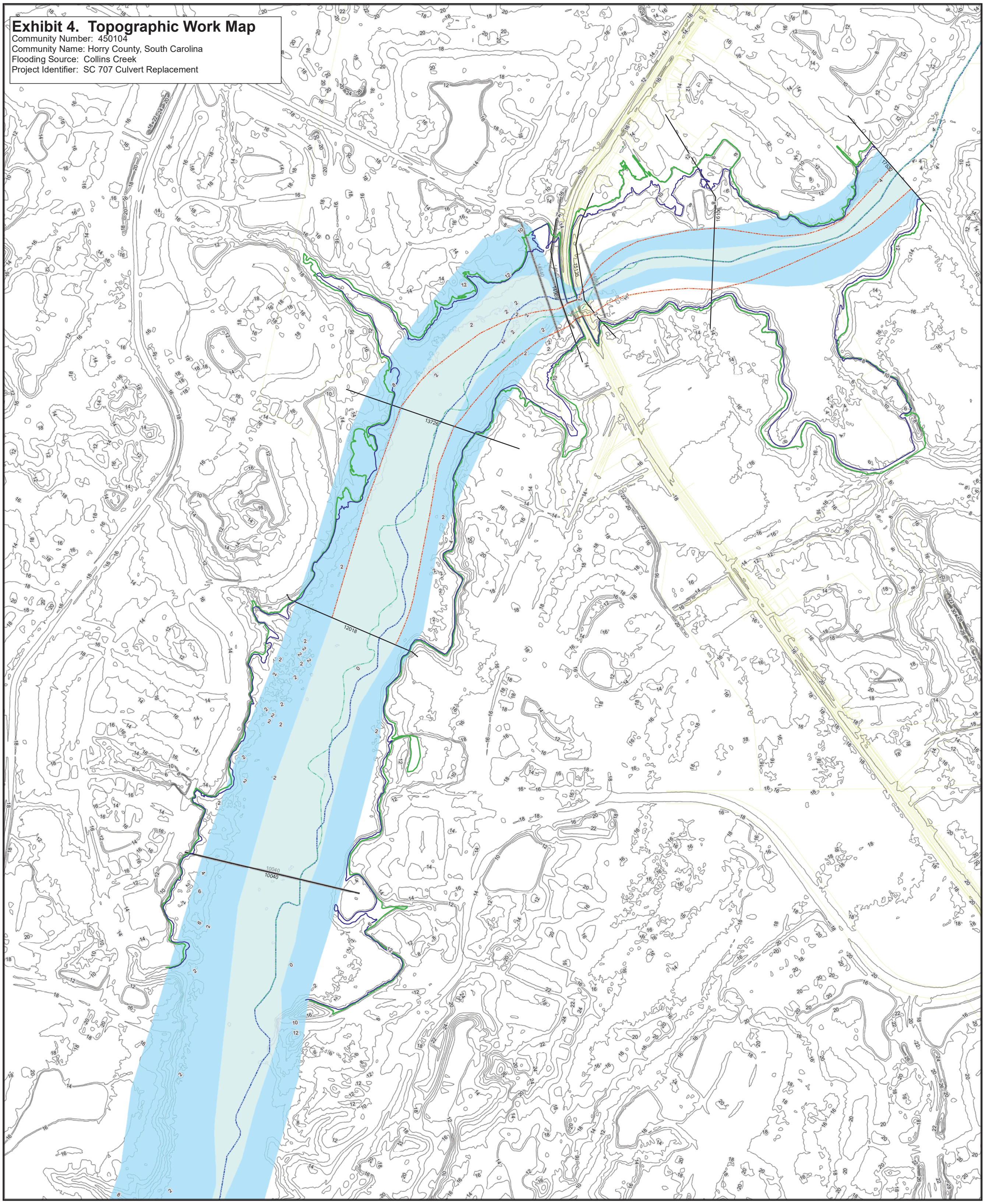
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

STAGES OF CONSTRUCTION

FILE NO.	ROUTE	COUNTY	DRAWING NO.
26.036778AJ	SC 707	HORRY	

Exhibit 4. Topographic Work Map

Community Number: 450104
Community Name: Horry County, South Carolina
Flooding Source: Collins Creek
Project Identifier: SC 707 Culvert Replacement



Revised Floodway
Revised 1% Annual Chance Floodplain
Revised 0.2% Annual Chance Floodplain
Corrected Effective Sections
Corrected Effective Collins Creek Centerline
Effective FIS Cross-Sections
Effective_StreamCenterline
Effective Floodway
Effective 1% Annual Chance Floodplain
SC-707
2-FT LiDAR Contours (NAVD 88)

SOUTH CAROLINA PROFESSIONAL ENGINEER SEAL
LARRY DANIEL ROBINS
DocuSigned by:
CE17D2971D5813E...
3/31/2021

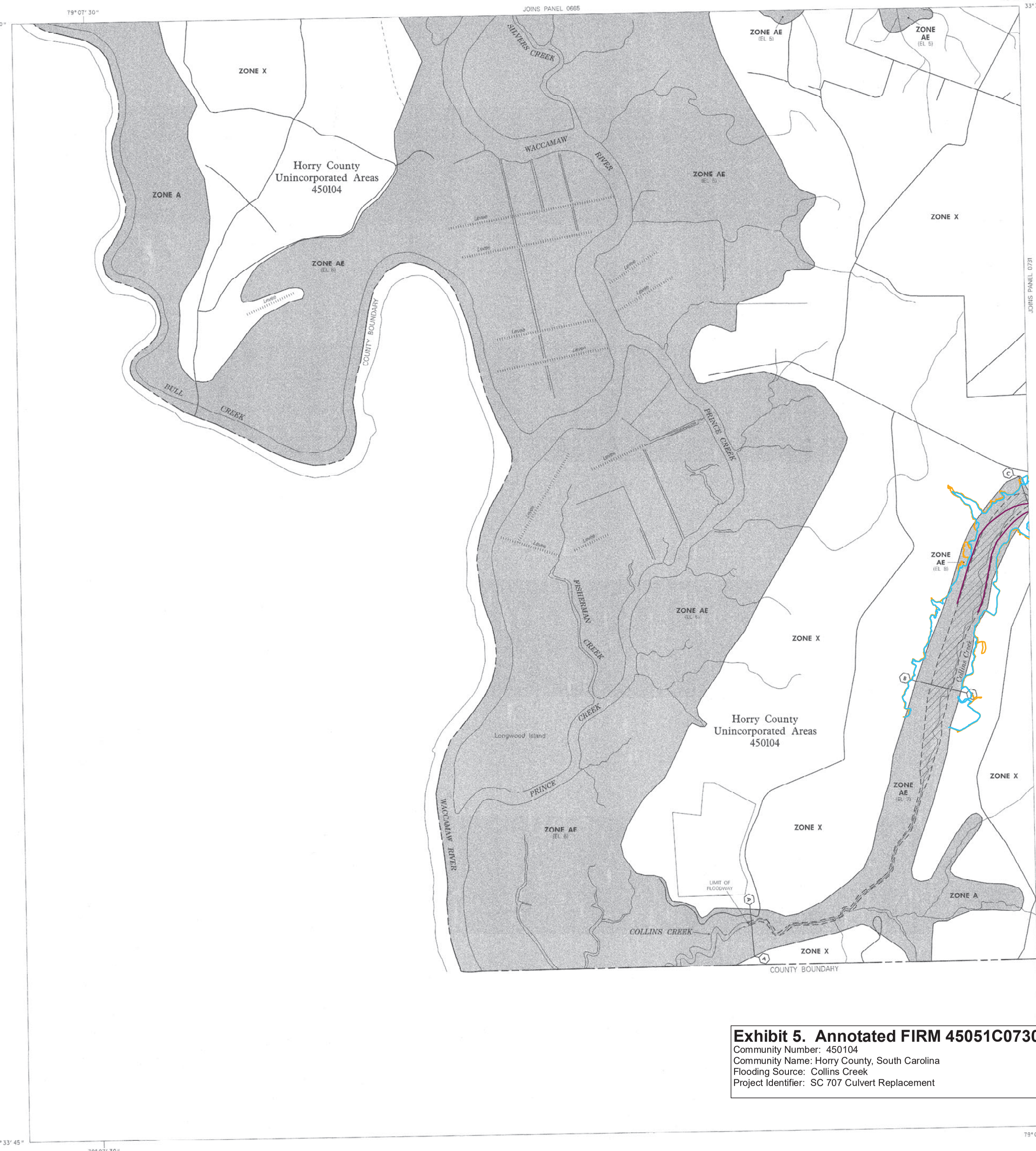


Exhibit 5. Annotated FIRM 45051C0730H

Community Number: 450104
Community Name: Horry County, South Carolina
Flooding Source: Collins Creek
Project Identifier: SC 707 Culvert Replacement

- Revised Floodway
- Revised 1% Annual Chance Floodplain
- Revised 0.2% Annual Chance Floodplain

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE A99	To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
ZONE V	Coastal flood with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X	Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X	Areas determined to be outside 500-year floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

UNDEVELOPED COASTAL BARRIERS*

Identified 1983 — Identified 1990 or Later — Otherwise Protected Areas Identified 1991 or Later

*Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
- ~~~513~~~ Base Flood Elevation Line; Elevation in Feet**
- A—A Cross Section Line
- (EL 987) Base Flood Elevation in Feet Where Uniform Within Zone**
- RM7 x Elevation Reference Mark
- • M1.5 River Mile

**Referenced to the National Geodetic Vertical Datum of 1929

MAP REPOSITORY

Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 30, 1988

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

April 2, 1991 – to change zone designations and base flood elevations.

September 3, 1992 – to incorporate Coastal Barrier Resources System areas and/or otherwise protected areas.

June 16, 1994 – to increase base flood elevations, to change special flood hazard areas, to reflect updated topographic information and to add Coastal Barrier Resources System units.

August 23, 1999 – to update corporate limits, to change base flood elevations and special flood hazard areas, to update map format, to add roads and road names, to incorporate previously issued letters of map revision and to modify Coastal Barrier Resources System units.

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

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
HORRY COUNTY,
SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 730 OF 753
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HORRY COUNTY	450104	0730	H

MAP NUMBER
45051C0730 H

MAP REVISED:
AUGUST 23, 1999

Federal Emergency Management Agency

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, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD), and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Corporate limits shown on this map are based on the best data available. The user should contact appropriate community officials to verify the corporate limit delineations shown on this map.

For community map revision history prior to countywide mapping, see section 6.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

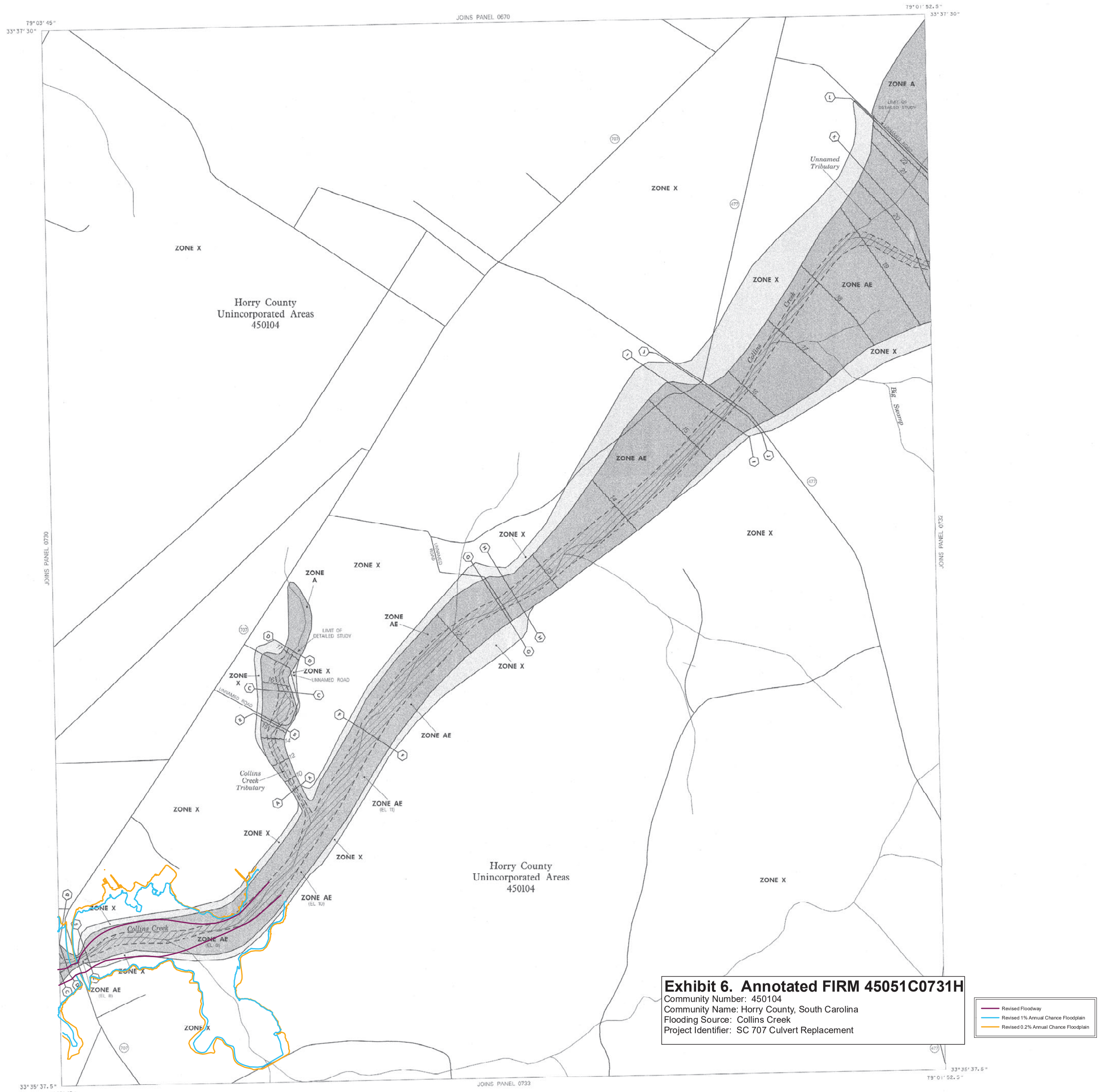
DIGITAL DATA AVAILABILITY: Digital files containing the thematic floodplain information shown on these maps are published by the Federal Emergency Management Agency in DLG-3 Optional format on CD-ROM. Requests for data should include the full name of the community or county and the Flood Insurance Rate Map panel numbers covered by the request. Contact the Federal Emergency Management Agency, Map Service Center, 6730 Santa Barbara Court, Baltimore, Maryland 21227-5832. Telephone 1-800-358-9616.

NOTE: The coordinate system used for the production of this Flood Insurance Rate Map (FIRM) is Universal Transverse Mercator (UTM), North American Datum of 1927 (NAD27), Clarke 1866 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the Universal Transverse Mercator projection, NAD27. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of the information shown on the FIRM.

ATTENTION: Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

BASE MAP SOURCE: Planimetric base map information was derived from multiple sources. The City of Myrtle Beach provided planimetric data based on 1990 aerial photography. The City of North Myrtle Beach also provided planimetric data. Additional information for the county was derived from U.S. Geological Survey 1:24,000 and 1:100,000 scale Digital Line Graphs and other sources. Users of this FIRM should be aware that minor adjustments may have been made to specific base map features.



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A	No base flood elevations determined.
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ZONE VE	Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X	Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X	Areas determined to be outside 500-year floodplain.
ZONE D	*Areas in which flood hazards are undetermined, but possible.*

UNDEVELOPED COASTAL BARRIERS*

Identified 1983 | Identified 1990 or Later | Otherwise Protected Areas *Identified* 1991 or Later

*Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet**

(A)—(A) Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone**

RM7 × Elevation Reference Mark

• M1.5 River Mile

**Referenced to the National Geodetic Vertical Datum of 1929

MAP REPOSITORY

Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 30, 1988

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

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

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

HORRY COUNTY,
SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 731 OF 753

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

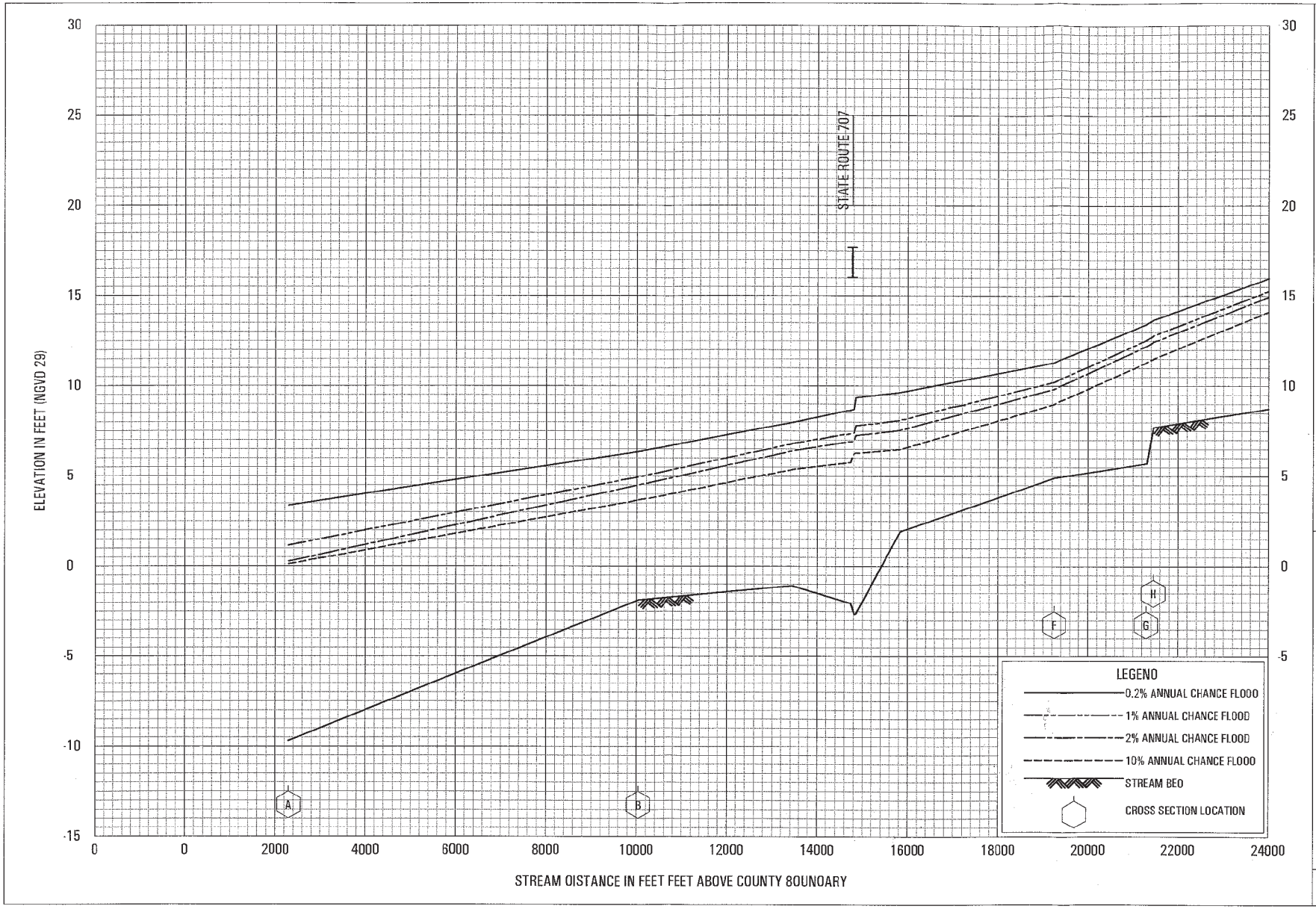
COMMUNITY	NUMBER	PANEL	SUFFIX
HORRY COUNTY	450104	0731	H

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
45051C0731 H

MAP REVISED:
AUGUST 23, 1999

Federal Emergency Management Agency



FLOOD PROFILES

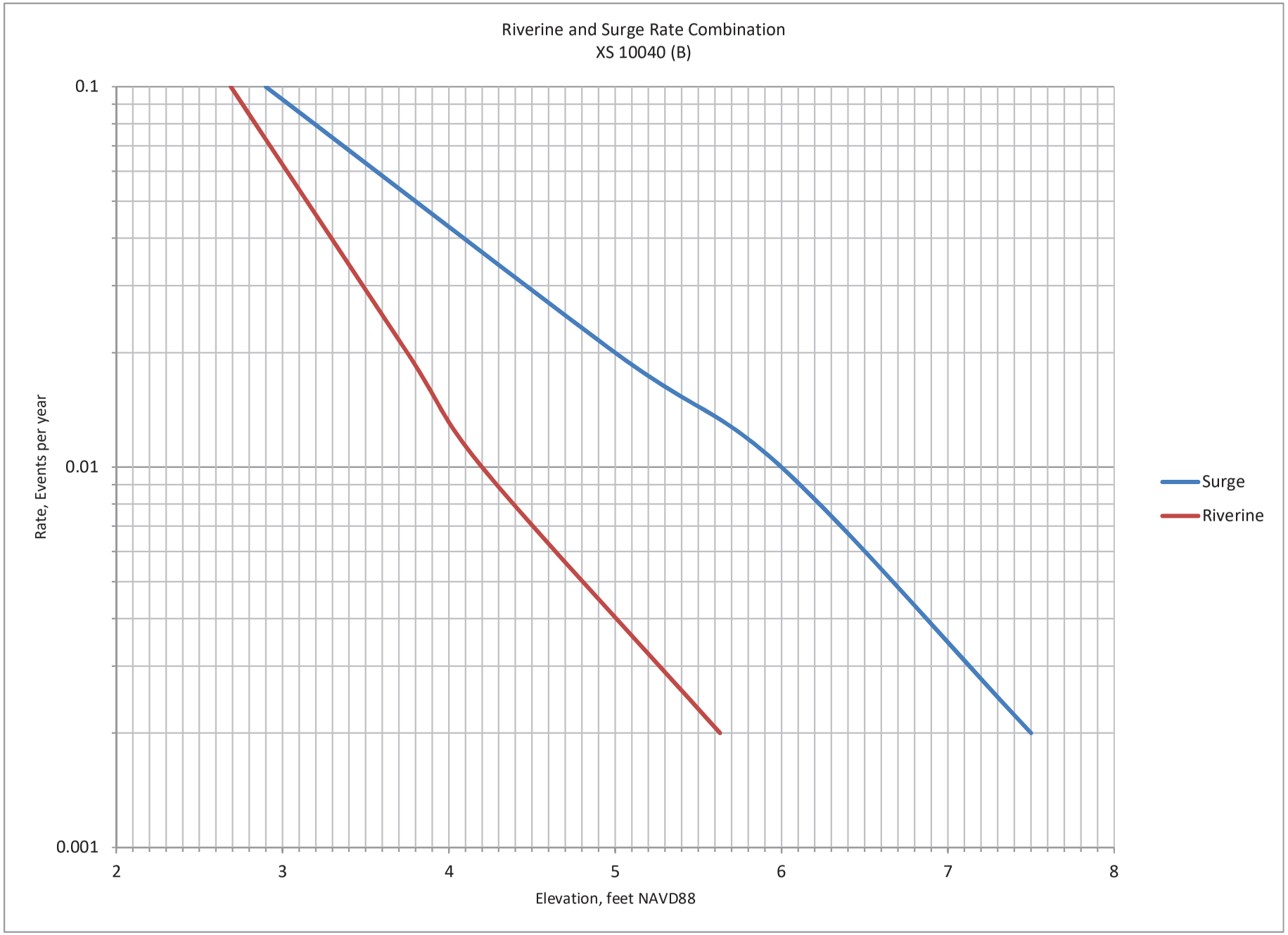
COLLINS CREEK REVISED FLOOD PROFILES

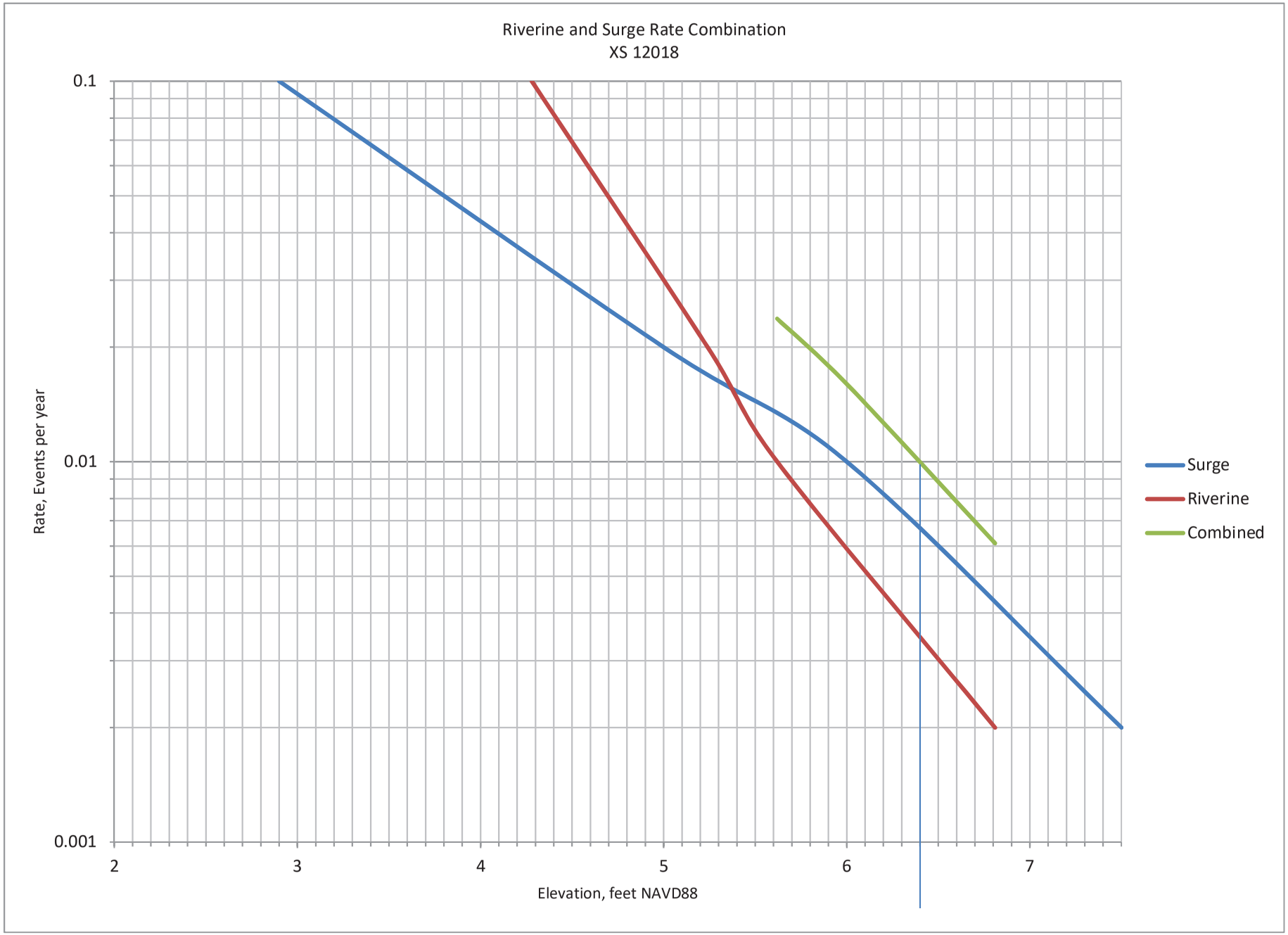
FEDERAL EMERGENCY MANAGEMENT AGENCY

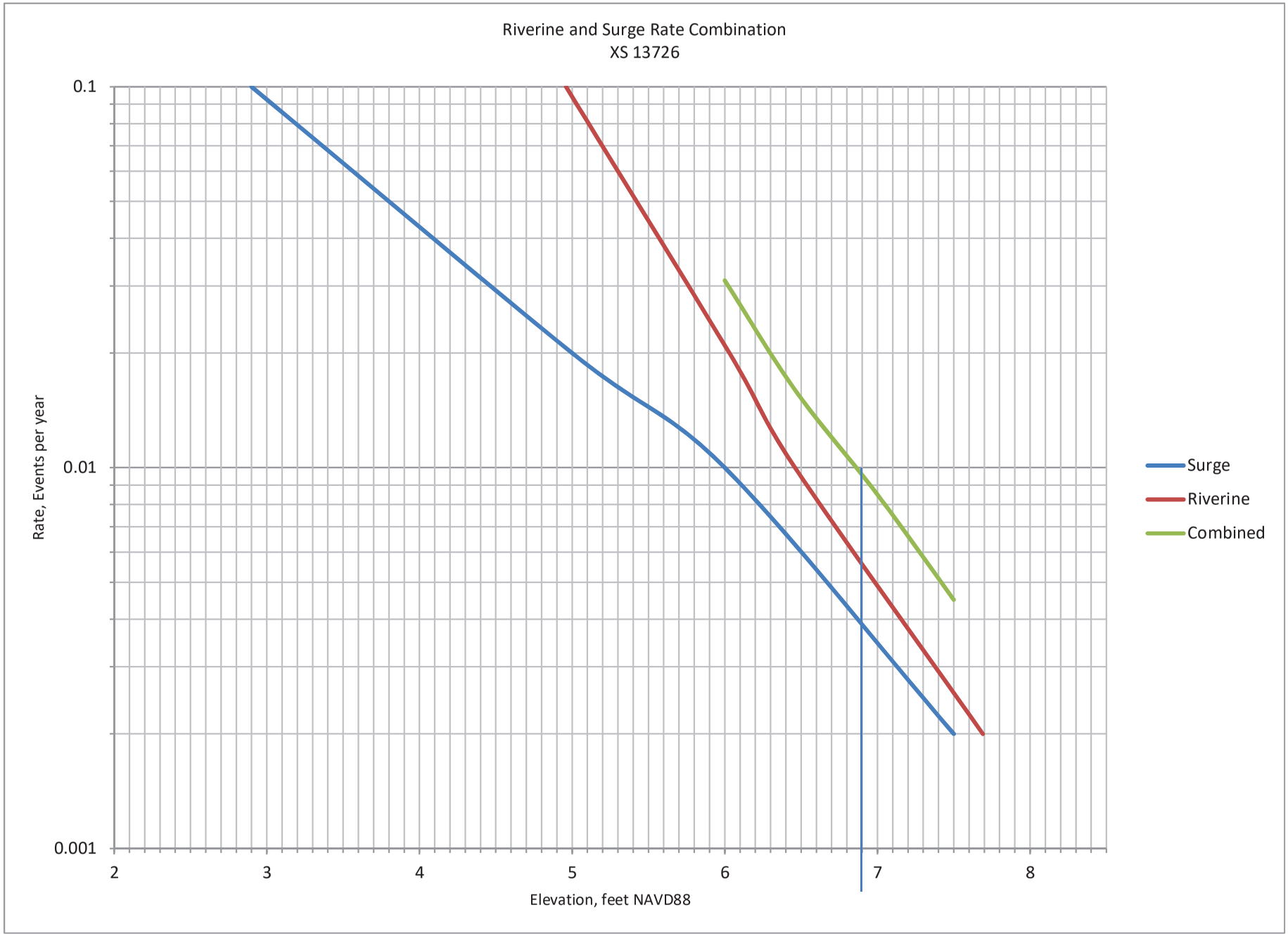
HORRY COUNTY, SC

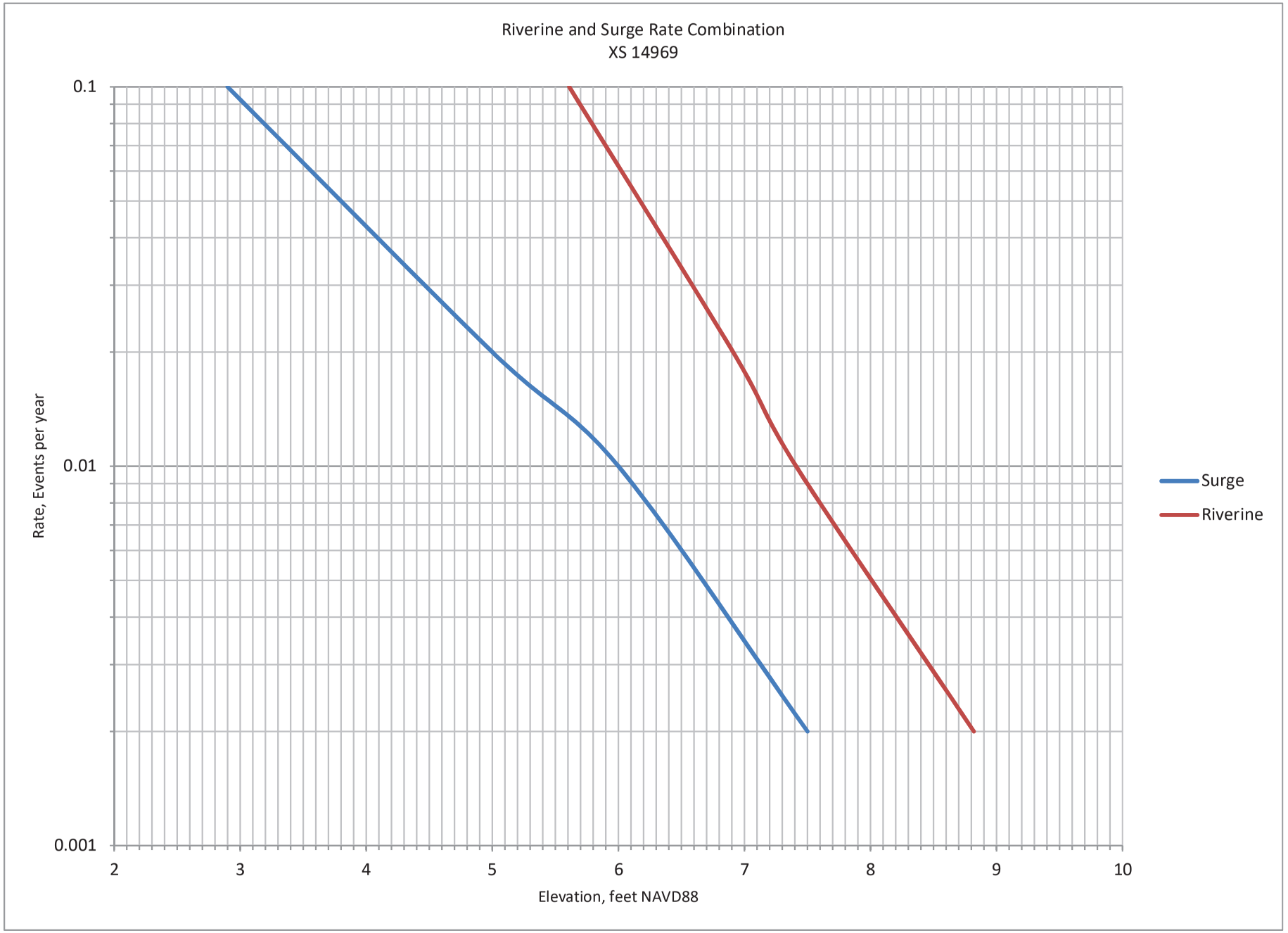
AND INCORPORATED AREAS

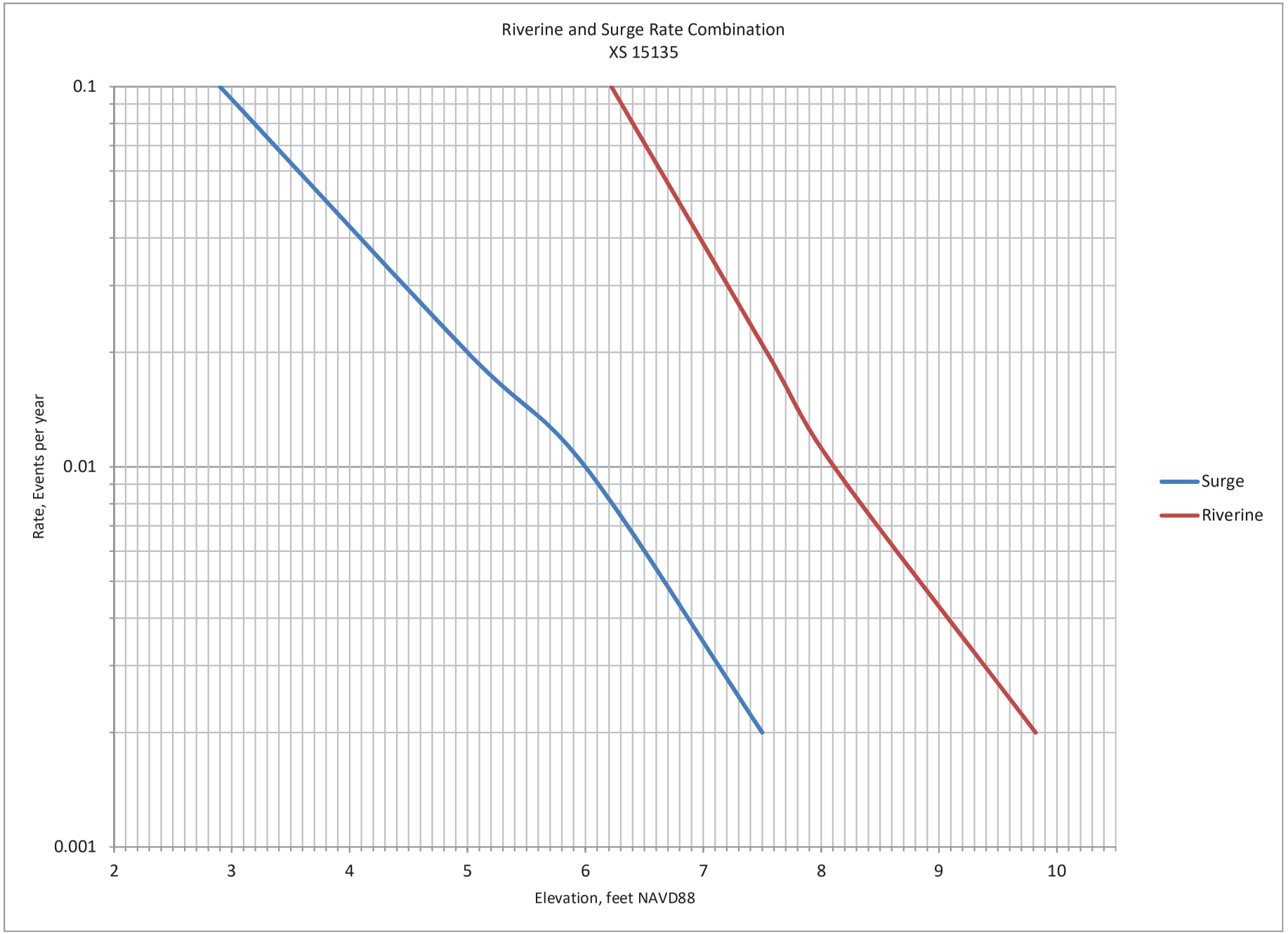
13P

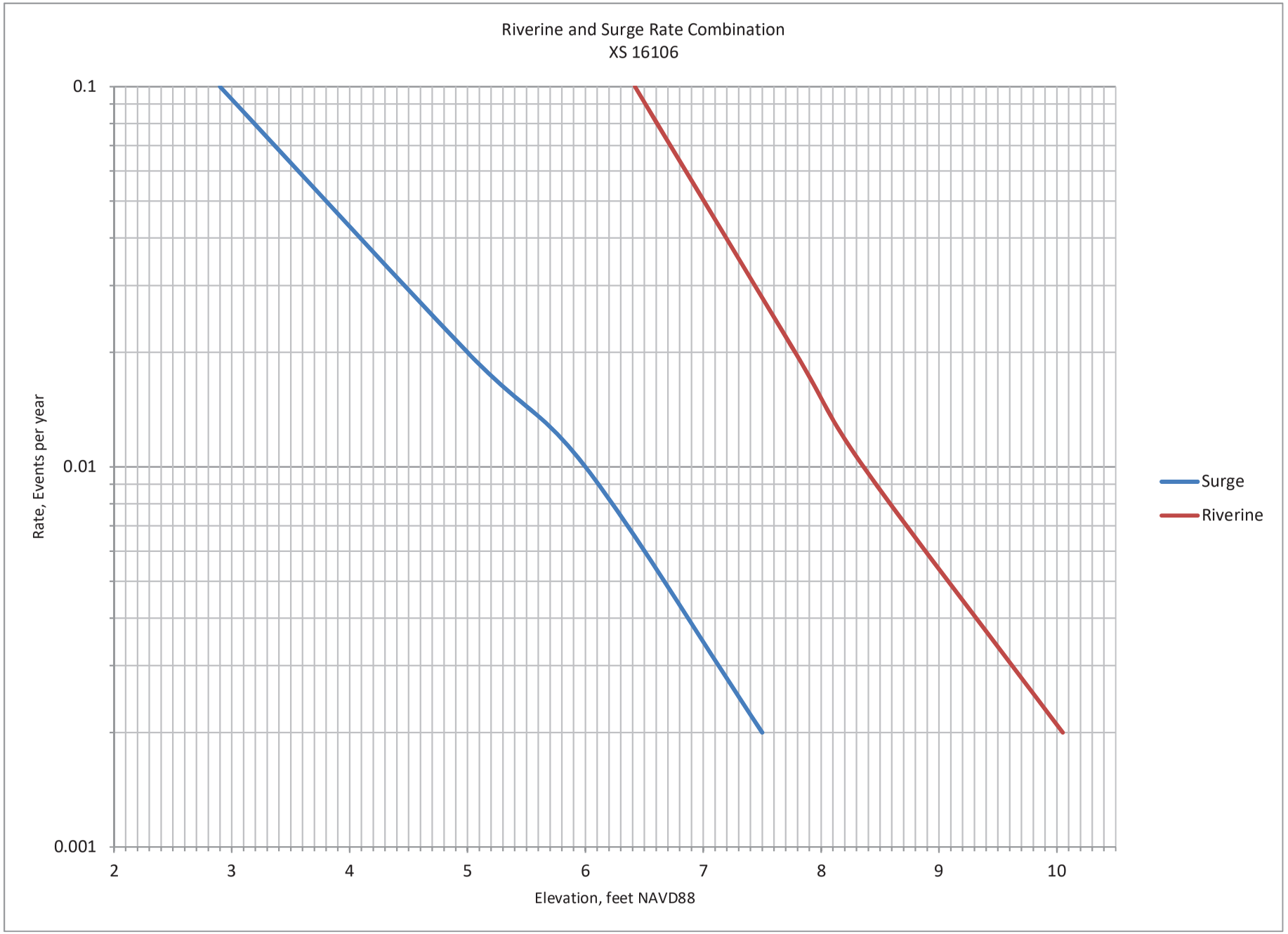


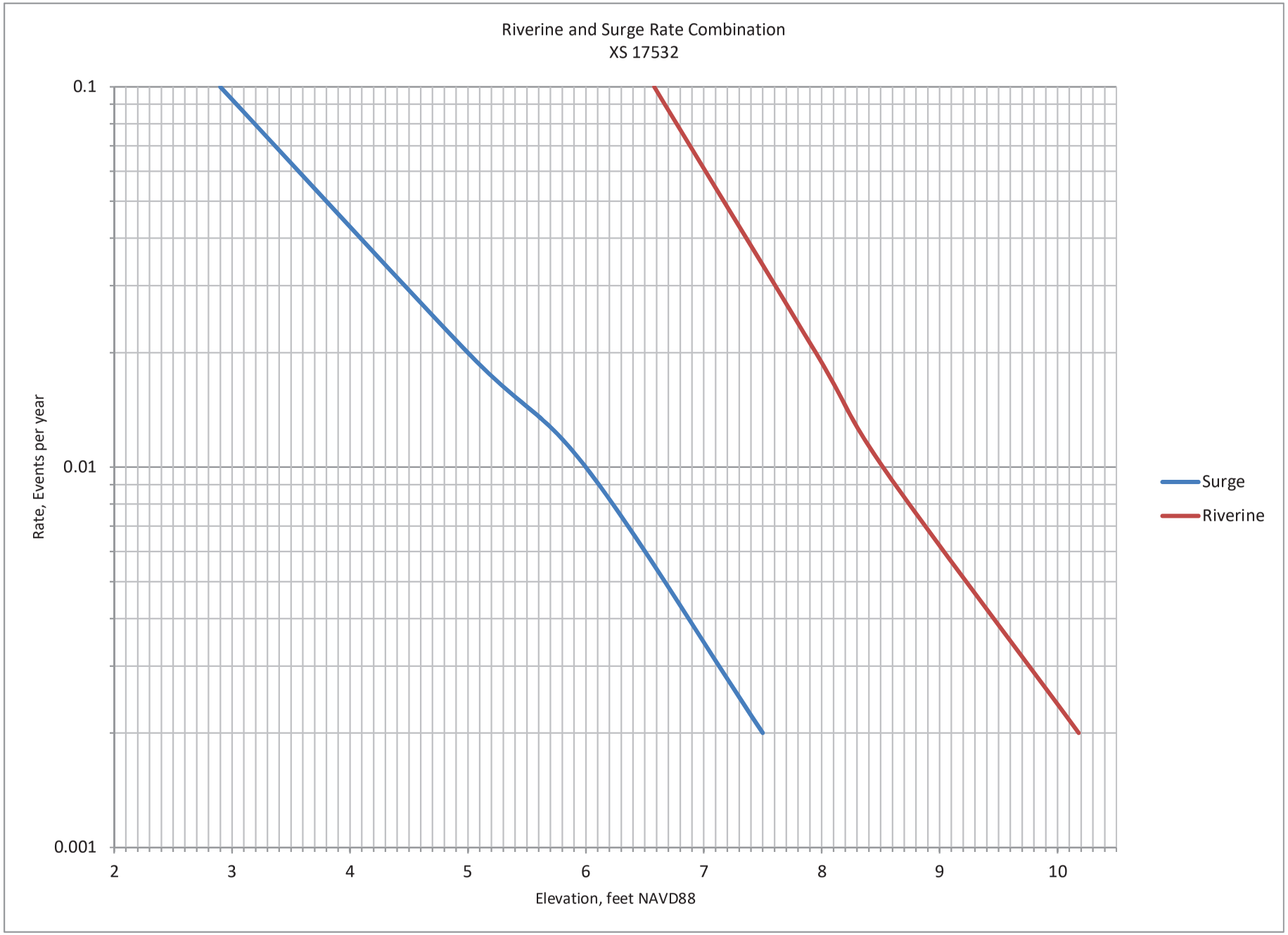




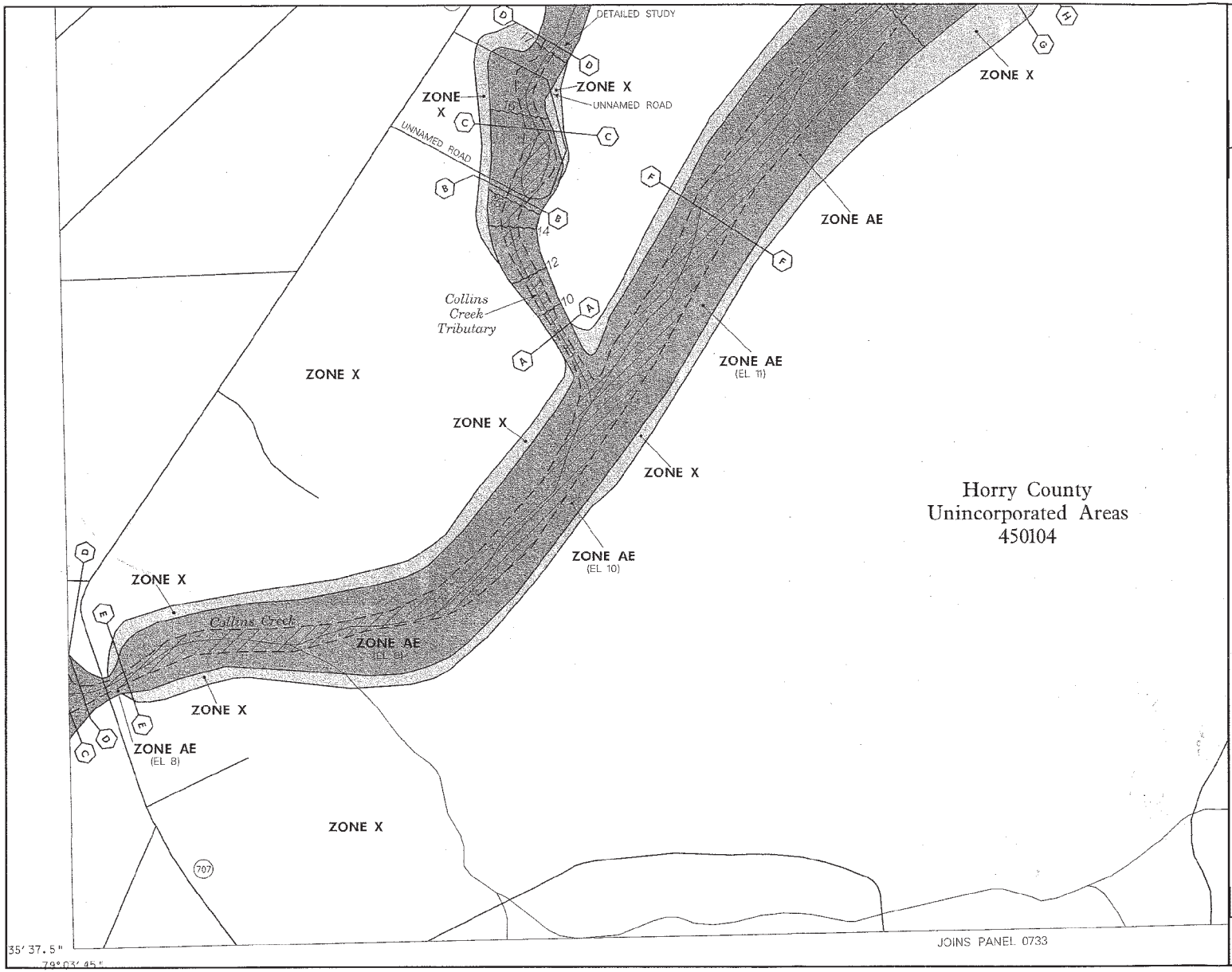








APPENDIX A



APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
HORRY COUNTY,
SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 731 OF 753

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HORRY COUNTY	450104	0731	H

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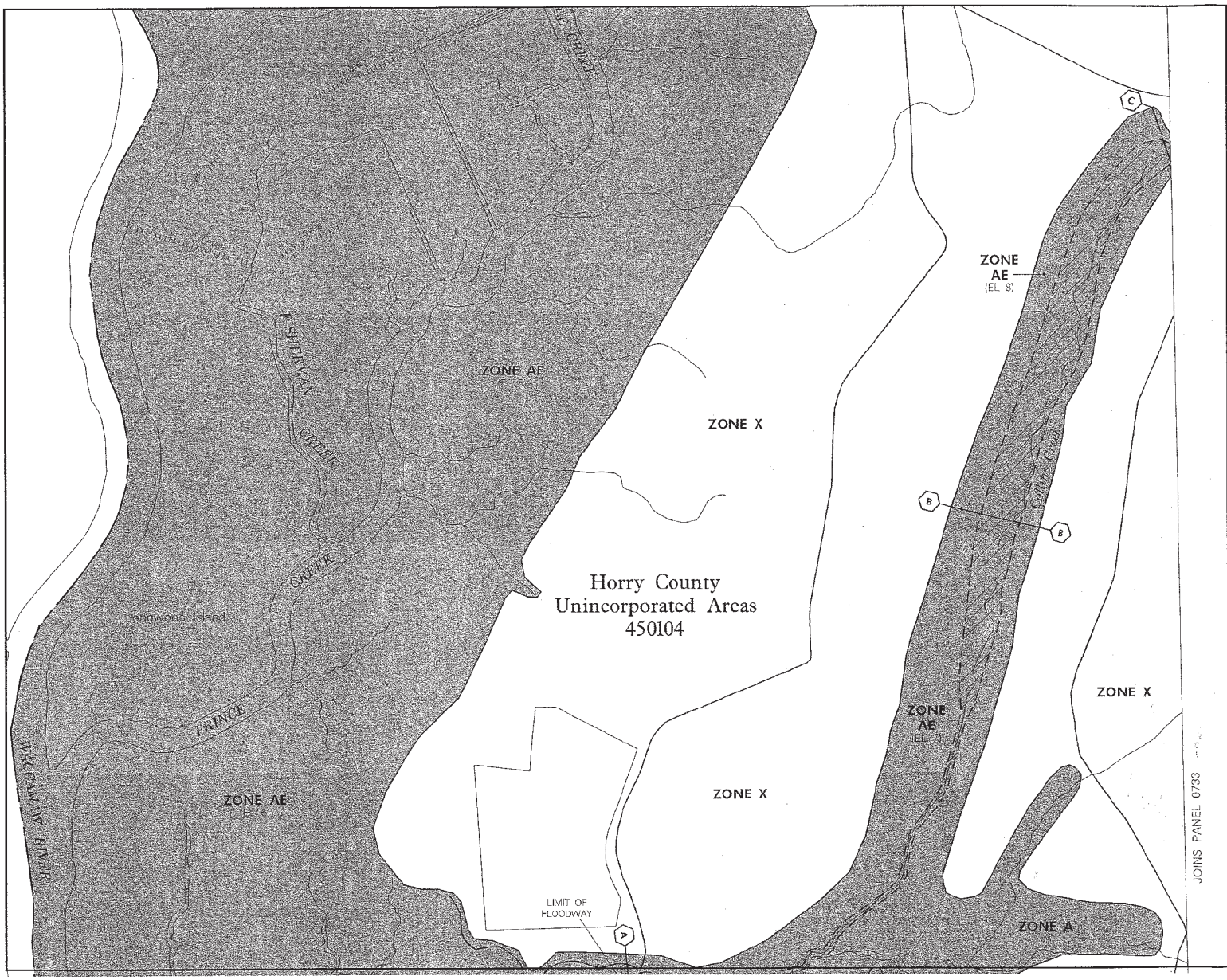
MAP NUMBER
45051C0731 H

MAP REVISED:
AUGUST 23, 1999

Federal Emergency Management Agency



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

HORRY COUNTY,
SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 730 OF 753

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HORRY COUNTY	450104	0730	H

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
45051C0730 H

MAP REVISED:
AUGUST 23, 1999

Federal Emergency Management Agency

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Collins Creek								
A	2,300[1]	101	644	2.3	7.0	1.2[3]	1.2	0.0
B	10,040[1]	416	1,450	0.8	7.1	5.2[3]	5.8	0.6
C	14,540[1]	293	1,449	0.8	8.3	8.1[3]	9.1	1.0
D	14,640[1]	72	517	2.1	8.3	8.0[3]	9.0	1.0
E	14,885[1]	48	404	2.7	8.5	8.3[3]	9.2	0.9
F	19,115[1]	229	1,015	0.6	11.0	10.9[3]	11.9	1.0
G	21,165[1]	114	461	1.2	12.5	12.5	13.5	1.0
H	21,327[1]	164	693	0.8	12.7	12.7	13.7	1.0
I	24,277[1]	171	581	0.8	15.5	15.5	16.3	0.8
J	24,493[1]	21	134	3.5	15.8	15.8	16.6	0.8
K	27,558[1]	80	186	1.6	20.1	20.1	21.0	0.9
L	28,581[1]	628	1,099	0.3	22.1	22.1	23.0	0.9
Collins Creek Tributary								
A	400[2]	22	60	3.2	10.3	9.7[3]	10.7	1.0
B	1,200[2]	87	241	0.8	15.3	15.3	16.1	0.8
C	1,535[2]	112	1,154	0.2	15.4	15.4	16.2	0.8
D	2,020[2]	49	167	0.8	16.9	16.9	17.9	1.0

[1]Feet above county boundary
[2]Feet above mouth
[3]Elevation computed without consideration of storm surge from the Atlantic Ocean

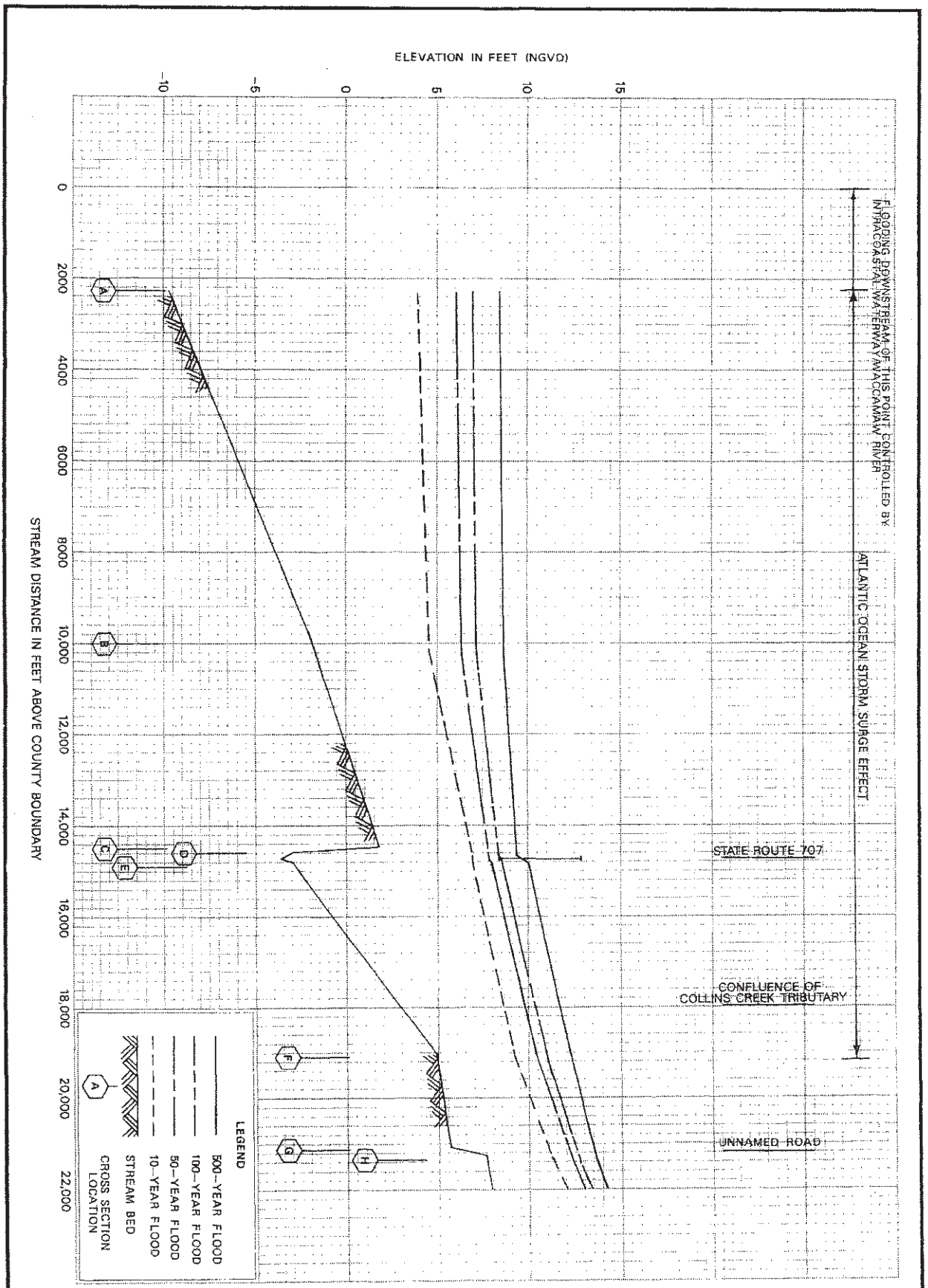
TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

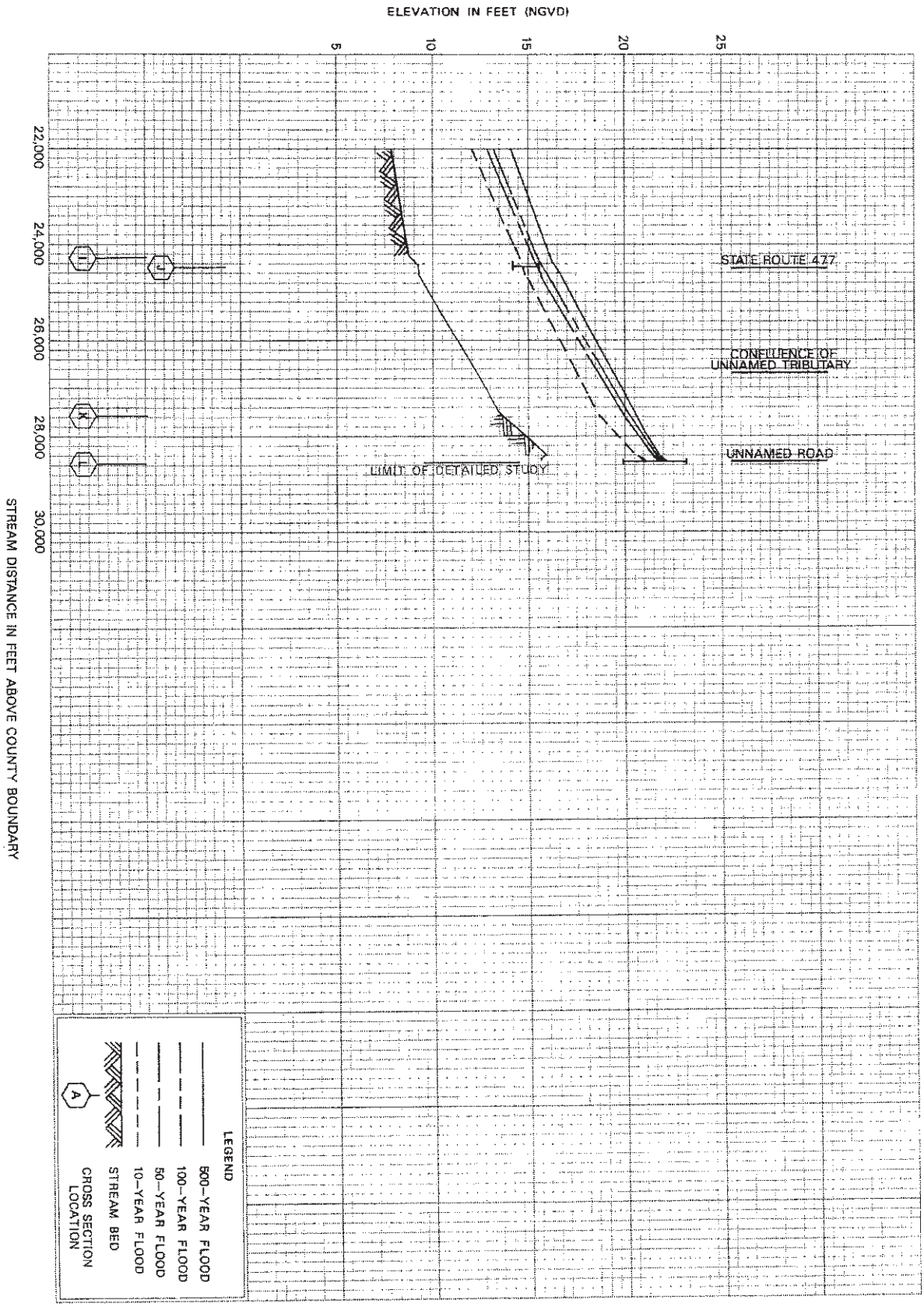
HORRY COUNTY, SC AND INCORPORATED AREAS

FLOODWAY DATA

COLLINS CREEK - COLLINS CREEK TRIBUTARY



13P	FEDERAL EMERGENCY MANAGEMENT AGENCY HORRY COUNTY, SC AND INCORPORATED AREAS	FLOOD PROFILES COLLINS CREEK



14P	FEDERAL EMERGENCY MANAGEMENT AGENCY HORRY COUNTY, SC AND INCORPORATED AREAS	FLOOD PROFILES COLLINS CREEK

APPENDIX B

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
*************************************************

T1 COLLINS CREEK
T2 BROOKGREEN
T3 500 YR FLOOD

J1  ICHECK   INQ     NINV    IDIR    STRT      METRIC   HVINS    Q       WSEL     FQ
       0.      6       0       0  0.000000     0.00     0.0      0      1.160    0.000

J2  NPROF    IPLOT   PRFVS   XSECV   XSECH     FN       ALLDC    IBW     CHNIM    ITRACE
   15.000    0.000  -1.000   0.000   0.000     0.000   -1.000    0.000   0.000    0.000

DETAILS
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*****************************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
*****************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOOD

SUMMARY PRINTOUT TABLE 110

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
1.000	1.16	0.00	1.24	101.32	0.00	1488.00	0.00	0.00	0.00	[illegible]	733.[illegible]	[illegible]
1.000	1.16	0.00	1.24	101.32	0.00	1488.00	0.00	0.00	[illegible]	[illegible]	733.[illegible]	[illegible]
2.000	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1172.00	1200.00	[illegible]
3.000	8.05	0.00	8.08	671.81	611.79	247.86	245.15	0.00	0.00	482.00	499.00	0.00
3.000	9.07	1.01	9.13	293.14	701.64	326.28	77.08	0.34	428.96	482.00	499.00	722.10
1.100	8.04	0.00	8.20	225.40	103.47	933.77	27.79	0.00	0.00	471.30	502.[illegible]	[illegible]
1.100	9.09	1.04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	471.[illegible]	502.[illegible]	[illegible]
1.200	8.12	0.00	8.[illegible]	24.90	0.00	1105.90	0.00	0.00	0.00	474.60	499.50	0.00
1.200	9.15	1.03	9.24	24.90	0.00	1105.90	0.00	0.05	474.60	474.60	499.50	499.50
1.300	8.13	0.00	8.35	24.90	0.00	1105.80	0.00	0.00	0.00	474.30	499.50	0.00
1.300	9.16	1.03	9.35	24.90	0.00	1105.00	0.00	0.09	474.30	474.30	499.50	499.50
1.400	8.34	0.00	8.48	237.72	114.21	917.62	73.18	0.00	0.00	471.80	502.20	0.00
1.400	9.28	0.94	9.45	48.02	51.71	1051.39	0.00	0.17	414.18	471.80	502.20	502.20
1.900	10.94	0.00	10.97	446.51	162.40	201.39	313.21	0.00	0.00	630.00	650.00	0.00
1.900	11.73	0.79	11.76	388.90	21.35	354.16	341.29	0.28	613.79	630.00	650.00	842.89
2.200	12.87	0.00	12.96	846.96	180.38	314.35	64.77	0.00	0.00	2380.00	2409.00	0.00
2.200	13.88	1.01	13.97	114.05	213.96	354.04	0.00	0.36	2293.98	2380.00	2409.00	2409.00
2.300	12.48	0.00	12.87	548.93	169.03	313.83	83.14	0.00	0.00	2372.00	2408.00	0.00
2.300	13.49	1.01	13.57	114.54	213.26	352.74	0.00	0.36	2293.36	2372.00	2408.00	2408.00
5.000	12.71	0.00	12.74	413.31	271.40	178.85	117.73	0.00	0.00	403.00	418.00	0.00
5.000	13.71	1.00	13.75	163.63	278.34	229.31	60.15	0.34	288.27	403.00	418.00	471.90

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
6.000	15.54	0.00	15.57	964.94	238.67	192.65	42.67	0.00	0.00	2991.00	3012.00	0.00
6.000	16.28	0.95	16.53	170.94	123.71	250.29	0.00	0.47	2841.06	2990.00	3012.00	3012.00
3.200	15.76	0.00	15.92	682.58	4.01	386.18	93.01	0.00	0.00	3088.00	3109.00	0.00
3.200	16.58	0.93	16.70	21.00	0.00	474.00	0.00	0.46	3088.00	3088.00	3109.00	3109.00
3.300	15.80	0.00	15.93	704.06	6.09	391.33	86.38	0.00	0.00	3088.00	3109.00	0.00
3.300	16.42	0.82	16.71	21.00	0.00	474.00	0.00	0.47	3088.00	3088.00	3109.00	3109.00
3.400	16.11	0.00	16.19	943.77	25.23	328.58	120.08	0.00	0.00	3088.00	3109.00	0.00
3.400	16.97	0.86	17.06	111.94	0.00	403.71	70.27	0.48	3089.00	3088.00	3109.00	3109.44
7.000	20.10	0.00	20.13	1042.07	37.71	206.00	56.99	0.00	0.00	755.00	771.00	0.00
7.000	21.01	0.90	21.13	79.72	0.00	264.04	36.96	0.62	755.07	755.00	771.00	834.72
4.100	21.38	0.00	21.44	1728.25	127.61	148.77	4.62	0.00	0.00	3991.00	4008.00	0.00
4.100	22.48	0.90	22.08	348.96	77.77	223.23	0.00	0.73	3659.04	3991.00	4008.00	4008.00
4.200	21.83	0.00	21.84	2712.03	234.38	44.67	19.78	0.00	0.00	[illegible]	[illegible]	[illegible]
4.200	[illegible]	0.91	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4.300	[illegible]	0.01	22.00	[illegible]	[illegible]	32.43	0.00	0.00	0.00	3996.00	4002.00	0.00
4.300	23.00	0.97	23.09	627.42	269.73	31.07	0.00	0.68	3374.08	3996.00	4002.00	4002.00
4.400	22.12	0.01	22.12	2339.98	193.19	83.77	23.84	0.00	0.00	3991.00	4000.00	0.00
4.400	23.03	0.91	23.04	653.77	198.91	102.09	0.06	0.66	2351.22	3991.00	4000.00	[illegible]

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
*****************************************************

T1 CULLINS CREEK
T2 BROOKGREEN,  HORRY CO      SC
T3 10-YR FLOOD

J1  ICHECK     INQ      NINV     IDIR      STRT     METRIC    HVINS      Q       WSEL      FQ
      0.        2.       0.       0.    0.000000    0.00      0.0      0.     0.100    0.000

J2  NPROF     IPLOT    PRFVS    XSECV     XSECH      FN      ALLDC     IBW     CHNIM    ITRACE
    0.000     [illegible]  -1.000   0.000     0.000    0.000    -1.000    0.000    0.000    0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.000   201.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

J5  IHLEQ     ICOPY

    1.000     0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

NC    0.200     0.200     0.050     0.100     0.300     0.000     0.000     0.000     0.000     0.000
ET    5.000   718.000  1250.000  1488.000  2332.000  1488.000     0.000     0.000     0.000     0.000
X1    1.000    15.000   620.000   733.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   20.000     0.000    19.400   220.000    18.700   406.000     3.200   552.00      3.000   628.000
GR    8.500   633.000    -9.400   658.000    -9.700   683.000    -2.500   708.000     0.300   733.000
GR    2.800   733.000     2.800  1296.000    10.400  1770.000    11.600  1470.000    12.400  1570.000

ET    3.000   525.000   547.000  1138.000  1772.000  1138.000     0.000     0.000     0.000     0.000
X1    2.000    17.000  1172.000  1704.000  6500.000  7000.000  7740.000     0.000     0.000     0.000
GR   15.000     0.000    13.700   400.000    13.800   367.000    11.100   376.000    10.700   432.000
GR    8.600   499.000     2.700   692.000     2.700  1172.000    -1.500  1172.000    -1.900  1187.000
GR   -0.300  1202.000     2.100  1204.000     2.700  1420.000    11.500  1498.000    11.500  1541.000
GR   15.100  1697.000    15.400  1897.000     0.000     0.000     0.000     0.000     0.000     0.000

ET    5.000   519.000   919.000  1105.000  1721.000  1105.000     0.000     0.000     0.000     0.000
X1    5.000    12.000   680.000   697.000  4700.000  2900.000  4800.000     0.000     0.000     0.000
GR   12.800     0.000     7.600   200.000     5.300   387.000     3.600   682.000     2.600   684.000
GR    1.800   689.500     3.600   695.000     3.100   699.000     5.800   834.000    13.400   899.000
GR   14.800  1009.000    14.900  1109.000     0.000     0.000     0.000     0.000     0.000     0.000
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X1	3.200	11.000	3098.000	[illegible]	200.000	200.000	200.000	0.000	0.000	0.000
X4	1.000	16.100	2648.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	20.000	0.000	15.500	2950.000	15.600	3088.000	10.200	3088.000	9.400	3100.000
GR	12.300	3109.000	15.600	3109.000	14.600	3190.000	14.800	3329.000	15.900	3530.000
GR	20.000	4550.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3.350	11.000	3088.000	3109.000	16.000	16.000	16.000	0.000	0.000	0.000
X4	1.000	16.100	2648.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	20.000	0.000	15.500	2950.000	15.600	3088.000	10.200	3088.000	9.400	3100.000
GR	12.300	3109.000	15.600	3109.000	14.600	3190.000	14.800	3329.000	15.900	3530.000
GR	20.000	4550.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3.400	0.000	0.000	0.000	165.000	165.000	165.000	0.000	0.000	0.000
GT	5.000	125.000	232.000	301.000	455.000	301.000	0.000	0.000	0.000	0.000
X1	7.000	11.000	755.000	771.000	3000.000	2600.000	2900.000	0.000	0.000	0.000
GR	20.600	0.000	20.100	321.000	19.500	532.000	19.500	755.000	14.400	759.000
GR	13.400	763.000	14.400	767.000	19.500	771.000	19.500	1171.000	20.000	1263.000
GR	20.500	1700.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
[illegible]	[illegible]	[illegible]	3991.000	4008.000	[illegible]	[illegible]	[illegible]	0.000	0.000	[illegible]
[illegible]	[illegible]	[illegible]	3771.000	17.100	3996.000	0.000	0.000	0.000	0.000	0.000
GR	23.000	0.000	20.700	3503.000	21.600	3991.000	16.000	4000.000	16.900	4004.000
GR	21.100	4008.000	21.700	4208.000	21.700	4420.000	25.000	6500.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	[illegible]
X1	4.200	10.000	3998.000	4002.000	100.000	100.000	[illegible]	0.000	0.000	[illegible]
X3	10.000	0.000	0.000	0.000	0.000	0.000	[illegible]	[illegible]	21.400	[illegible]
[illegible]	[illegible]	[illegible]	3791.000	[illegible]	3991.000	[illegible]	0.000	0.000	0.000	0.000
GR	25.000	0.000	20.700	3503.000	19.700	3998.000	15.700	3998.000	15.700	4002.000
GR	17.700	4002.000	21.100	4008.000	21.700	4208.000	21.700	4420.000	25.000	6500.000
SE	0.000	1.340	2.800	0.000	2.300	0.000	12.600	0.210	16.000	16.000
X1	4.300	0.000	0.000	0.000	33.000	33.000	33.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	20.000	21.700	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	21.700	23.000	0.000
ET	6.000	0.000	23.000	0.000	3503.000	21.700	0.000	3791.000	23.100	0.000
ET	4000.000	23.100	0.000	4420.000	23.100	0.000	6300.000	25.000	0.000	0.000
X1	4.400	9.000	3991.000	4008.000	100.000	100.000	100.000	0.000	0.000	0.000
X4	2.000	21.600	3791.000	17.100	3996.000	0.000	0.000	0.000	0.000	0.000
GR	23.000	0.000	20.700	3503.000	21.600	3991.000	16.000	4000.000	16.700	4004.000
GR	21.100	4008.000	21.700	4208.000	21.700	4420.000	25.000	6500.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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*****************************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
ERROR CORR -  01,02,03,04,05,06
MODIFICATION -  50,51,52,53,54,55,56
*****************************************************

T1 COLLINS CREEK
T2 BROOKGREEN
T3 50-YR FLOOD

J1   ICHECK     ING      NINV      IDIR      STRT      METRIC    HVINS     Q       WSEL      FQ
        0        3.       0.        0.    0.000595     0.00      0.0      0.     1.410    0.000

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH      FN       ALLDC     IBW     CHNIM    ITRACE
     2.000     0.000    -1.000     0.006     0.000     0.000    -1.000    0.000    0.000    0.000
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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
*****************************************************

T1 COLLINS CREEK
T2 BROOKGREEN
T3 100-YR FLOOD

J1  ICHECK    INQ      NINV      IDIR     STRT      METRIC    HVINS     Q       WSEL      FQ
       0        4        0.        0.   0.000535    0.00      0.0      0      1.000    0.000

J2  NPROF    IPLOT    PRFVS     XSECV    XSECH      FN       ALLDC     IBW      CHNIM    ITRACE
    3.000    0.000   -1.000     0.000    0.000     0.000    -1.000    0.000    0.000    [illegible]
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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
*****************************************************

T1 COLLINS CREEK
T2 BROOKGREEN
T3 500-YR FLOOD

J1  ICHECK    INQ     NINV     IDIR     STRT      METRIC    HVINS     Q       WSEL      FQ
        0       5       0.       0.  0.000500      0.00      0.0      0.     1.000    0.000
J2  NPROF    IPLOT    PREVS    XSECV    XSECH       FN      ALLDC     IBW     CHNIM    ITRACE
   15.000    0.000   -1.000    0.000    0.000    0.000    -1.000    0.000    0.000    0.000
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21-M 10:4

PAGE 27

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
*****************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOOD

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1.000	0.00	0.00	0.00	-3.70	718.00	0.10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.000	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.000	[illegible]	[illegible]	[illegible]	-7.20	[illegible]	1.16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.000	0.00	0.00	0.00	-4.70	2332.00	3.34	-4.87	3.47	5.03	2.63	1208.75	1040.[illegible]
2.000	7740.00	0.00	0.00	-1.90	535.00	3.72	0.74	3.77	7.49	2.13	1013.27	192.45
2.000	7740.00	0.00	0.00	-1.90	947.00	4.78	2.77	4.81	6.03	2.18	1922.12	[illegible]
2.000	7740.00	0.00	0.00	-1.90	1138.00	5.[illegible]	2.11	[illegible]	5.38	[illegible]	[illegible]	[illegible]
2.000	7740.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3.000	[illegible]	0.00	[illegible]	1.80	515.00	6.82	4.93	6.84	6.05	2.04	1191.04	198.52
3.000	4500.00	0.00	0.00	1.80	919.00	7.71	5.53	7.74	7.76	2.46	1744.38	305.99
3.000	4500.00	0.00	0.00	1.80	1105.00	8.05	5.65	8.08	7.93	2.60	1575.81	372.27
3.000	4500.00	0.00	0.00	1.80	1721.00	9.12	6.06	9.15	7.88	2.91	2717.30	613.18
1.100	100.00	0.00	0.00	-2.90	519.00	6.83	0.85	6.89	3.35	2.00	480.93	280.44
1.100	100.00	0.00	0.00	-2.90	919.00	7.72	2.06	7.84	6.65	3.03	654.10	336.43
1.100	100.00	0.00	0.00	-2.90	1105.00	8.04	2.54	8.20	8.17	3.45	725.54	366.69
1.100	100.00	0.00	0.00	-2.90	1721.00	9.06	2.79	9.51	12.23	4.53	976.07	492.12
1.200	100.00	0.00	0.00	-3.50	519.00	6.87	-1.22	6.93	4.41	1.99	260.91	247.14
1.200	100.00	0.00	0.00	-1.60	919.00	7.78	-0.13	7.95	11.03	3.34	283.57	176.67
1.200	100.00	0.00	0.00	-3.60	1105.00	8.13	0.34	8.34	14.75	7.79	291.93	287.71
1.200	100.00	0.00	0.00	-3.50	1721.00	9.14	1.58	9.60	27.47	9.42	317.47	328.38
1.300	45.00	12.90	8.40	-3.60	519.00	6.87	0.00	6.93	4.42	1.99	260.79	248.99
1.300	45.00	12.90	8.40	-3.60	919.00	7.79	0.00	7.95	11.03	3.24	280.62	278.74
1.300	45.00	12.90	8.40	-3.60	1105.00	8.13	0.00	8.35	14.72	3.78	292.14	287.44
1.300	45.00	12.90	8.40	-3.60	1721.00	9.38	0.00	9.83	25.85	5.32	323.29	330.47
1.400	100.00	0.00	0.00	-2.90	519.00	6.72	0.84	6.97	[illegible]	1.97	498.53	289.74
1.400	100.00	0.00	0.00	-2.70	919.00	7.93	2.07	8.05	5.97	2.92	700.92	376.39
1.400	100.00	0.00	0.00	-2.90	1105.00	8.34	2.54	8.48	7.08	3.28	797.38	415.24
1.400	100.00	0.00	0.00	-2.70	1721.00	9.84	3.79	10.33	8.45	4.70	1197.75	585.83

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
4.000	4230.00	0.00	0.00	4.90	274.00	9.28	7.72	9.31	7.90	1.88	594.49	97.50
4.000	4230.00	0.00	0.00	4.90	502.00	10.45	8.42	10.47	5.60	1.93	1079.16	212.13
4.000	4230.00	0.00	0.00	4.90	617.00	10.94	8.62	10.97	5.10	1.97	1296.64	273.17
4.000	4230.00	0.00	0.00	4.90	948.00	12.29	8.93	12.31	3.98	2.03	1925.04	475.39
2.200	2050.00	0.00	0.00	5.70	250.00	11.14	8.38	11.23	10.76	2.71	276.09	76.20
2.200	2050.00	0.00	0.00	5.70	460.00	12.06	9.35	12.18	11.64	3.18	637.03	134.82
2.200	2050.00	0.00	0.00	5.70	568.00	12.47	9.87	12.56	11.15	3.26	835.26	170.13
2.200	2050.00	0.00	0.00	5.70	871.00	13.48	11.37	13.54	8.50	3.15	1510.61	298.79
2.300	12.00	0.00	0.00	5.70	250.00	11.16	8.37	11.25	10.62	2.70	279.36	76.70
2.300	12.00	0.00	0.00	5.70	460.00	12.09	9.36	12.19	11.52	3.17	641.02	135.52
2.300	12.00	0.00	0.00	5.70	568.00	12.48	9.83	12.57	11.01	3.24	841.05	171.18
2.300	12.00	0.00	0.00	5.70	871.00	13.49	11.34	13.55	8.42	3.14	1518.02	300.13
5.000	150.00	0.00	0.00	7.70	250.00	11.39	10.11	11.42	12.01	2.18	463.92	76.14
5.000	150.00	0.00	0.00	7.70	460.00	12.33	10.62	12.36	10.68	2.42	801.58	140.74
5.000	150.00	0.00	0.00	7.70	568.00	12.71	10.84	12.74	10.51	2.54	952.66	175.21
5.000	150.00	0.00	0.00	7.70	871.00	13.66	11.71	13.69	9.44	2.72	1391.10	[illegible]
6.000	2750.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6.000	2750.00	[illegible]	0.00	8.90	382.00	15.06	13.72	15.29	9.27	2.08	838.94	123.47
6.000	2750.00	0.00	0.00	8.90	474.00	15.54	13.98	15.57	8.79	2.12	1085.55	159.90
6.000	2750.00	0.00	0.00	8.90	724.00	16.15	14.44	16.17	7.57	2.15	1803.37	263.20
3.200	200.00	0.00	0.00	9.40	205.00	14.73	11.57	14.81	10.85	2.17	101.03	[illegible]
3.200	200.00	0.00	0.00	9.40	382.00	15.48	[illegible]	15.61	19.37	2.11	[illegible]	[illegible]
3.200	200.00	0.00	0.00	9.40	474.00	15.74	[illegible]	15.90	21.07	2.34	448.01	[illegible]
3.200	200.00	0.00	0.00	9.40	724.00	16.45	13.98	16.47	19.45	2.44	986.46	164.15
3.300	16.00	0.00	0.00	9.40	205.00	14.75	11.59	14.82	10.73	2.17	103.20	62.54
3.300	16.00	0.00	0.00	9.40	382.00	15.51	12.41	15.64	18.64	3.06	300.64	88.67
3.300	16.00	0.00	0.00	9.40	474.00	15.80	12.74	15.93	20.18	3.28	465.71	105.53
3.300	16.00	0.00	0.00	9.40	724.00	16.39	13.58	16.50	18.54	3.37	1020.41	166.10
3.400	165.00	0.00	0.00	9.40	205.00	14.92	11.59	14.99	9.32	2.05	136.07	67.13
3.400	165.00	0.00	0.00	9.40	382.00	15.85	12.40	15.89	12.58	2.60	486.64	107.71
3.400	165.00	0.00	0.00	9.40	474.00	16.11	12.74	16.19	12.38	2.67	732.85	134.73
3.400	165.00	0.00	0.00	9.40	724.00	16.68	13.36	16.73	11.37	2.72	1410.19	214.70
7.000	2900.00	0.00	0.00	13.40	125.00	18.67	15.82	18.76	16.69	2.30	52.53	30.63
7.000	2900.00	0.00	0.00	13.40	228.00	19.90	16.77	19.99	16.32	2.70	362.28	59.92
7.000	2900.00	0.00	0.00	13.40	301.00	20.10	17.19	20.18	15.95	2.75	557.13	75.38
7.000	2900.00	0.00	0.00	13.40	455.00	20.48	18.10	20.52	15.40	2.84	1007.81	115.93
4.100	890.00	0.00	0.00	16.00	125.00	20.54	19.41	20.66	25.71	2.74	45.36	24.56
4.100	890.00	0.00	0.00	16.00	238.00	21.43	19.32	21.50	19.62	2.66	540.41	83.73
4.100	890.00	0.00	0.00	16.00	301.00	21.58	19.74	21.64	19.82	2.72	775.69	68.14
4.100	890.00	0.00	0.00	16.00	455.00	21.82	21.41	21.88	18.68	2.75	1047.40	105.20

21-M 10.4

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
4.200	100.00	0.00	0.00	15.70	125.00	21.02	18.81	21.31	120.54	4.78	114.18	11.39
4.200	100.00	0.00	0.00	15.70	238.00	21.69	21.33	21.71	18.31	2.02	984.09	55.62
4.200	100.00	0.00	0.00	15.70	301.00	21.83	21.39	21.84	15.98	1.91	1315.56	75.29
4.200	100.00	0.00	0.00	15.70	455.00	22.05	21.50	22.05	14.17	1.84	1962.61	120.58
4.300	33.00	21.70	20.00	15.70	125.00	21.89	0.00	21.89	2.44	0.75	1328.83	80.06
4.300	33.00	21.70	20.00	15.70	238.00	22.03	0.00	22.04	4.93	1.09	1687.80	107.18
4.300	33.00	21.70	20.00	15.70	301.00	22.08	0.00	22.08	6.68	1.27	1803.02	116.43
4.300	33.00	21.70	20.00	15.70	455.00	22.17	0.00	22.17	11.11	1.65	2044.01	136.93
4.400	100.00	0.00	0.00	16.00	125.00	21.90	18.41	21.90	1.11	0.69	1538.41	119.86
4.400	100.00	0.00	0.00	16.00	238.00	22.06	17.32	22.07	2.27	1.01	2044.07	157.90
4.400	100.00	0.00	0.00	16.00	301.00	22.11	19.75	22.12	3.04	1.18	2223.08	172.65
4.400	100.00	0.00	0.00	16.00	455.00	22.23	21.42	22.24	4.85	1.52	2617.08	206.58

APPENDIX C

NATIONAL FLOOD INSURANCE PROGRAM

FEMA PRODUCTION AND TECHNICAL SERVICES CONTRACTOR

July 6, 2011

Mr. Dan Robinson, P.E.
Kimley-Horn and Associates, Inc.
Post Office Box 33068
Raleigh, NC 27636-3068

IN REPLY REFER TO:
Case No.: 11-04-6268R
Community: Horry County, SC
Community No.: 450104

316-AD

Dear Mr. Robinson:

This is in regard to your request dated May 16, 2011, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a conditional revision to the Flood Insurance Rate Map (FIRM) for Horry County, South Carolina and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	SC 707 Culvert Replacement
Flooding Sources:	Collins Creek
FIRM Panels Affected:	45051C0730H and 0731H

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register*, is available on the FEMA website at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for your information.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data **must** be submitted within 90 days of the date of the letter. Any fees already paid will be forfeited for any request for which the requested data are not received within 90 days.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Information eXchange (FMIX), toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case

reviewer, Mr. Daniel Habete, by e-mail at dhabete@mbakercorp.com or by telephone at (571) 357-6043, or the Revisions Coordinator for your request, M. Saleem Ashraf, Ph.D., P.E., by e-mail at msashraf@mbakercorp.com or by telephone at (703) 317-6223.

Sincerely,

Syed Qayum

Syed Qayum, CFM
LOMR Technical Manager
BakerAECOM

Enclosures

cc: Mr. Mike Odea
Flood Control Officer
Horry County
Government and Justice Center

Ms. Mitchell D. Metts, P.E
Director of Preconstruction
South Carolina Department of Transportation

Summary of Additional Data Required to Support a
Conditional Letter of Map Revision (CLOMR)

Case No.: 11-04-6268R

Requester: Mr. Dan Robinson, P.E.

Community: Horry County, SC

Community No.: 450104

The issues listed below must be addressed before we can continue the review of your request.

1. This CLOMR request can be processed by the Federal Emergency Management Agency (FEMA) only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service or the US Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat.

   If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the CLOMR request. Please see the attached guidance for additional information about the ESA and compliance requirements and for responses to frequently asked questions.

2. Our review of the effective information revealed that the revision area is subjected to flooding by both the Atlantic Ocean and Collins Creek. However, you only submitted proposed conditions HEC-RAS hydraulic analysis that takes into account the riverine runoff effect from Collins Creek. Please submit a combined effect analyses that determines the base(1-percent-annual-chance), 10-percent, 2-percent, and 0.2 percent –annual-chance stillwater elevations along the revised reach of Collins Creek that takes into account both the a riverine effect from Collins Creek and a storm surge effect from the Atlantic Ocean. Please refer to section D.2.4.5.4 entitled "Combined effects: Surge Plus Riverine Runoff" of Appendix D entitled "Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update," last updated on April 18, 2008, which can be accessed at http://www.fema.gov/library/viewRecord.do?id=2458

3. Based upon the above-referenced item 2, please submit a topographic work map, certified by a registered professional engineer, for the entire revision area that includes all applicable items listed on page 2, Section C, of MT-2 application/certification Form 2, entitled "Riverine Hydrology & Hydraulics Form," including the following information:

   - The revised conditions base (1-percent-annual-chance) floodplain, 0.2-percent-annual-chance floodplain and regulatory floodway boundary delineations;
   - The currently effective base floodplain, 0.2-percent-annual-chance floodplain and regulatory floodway boundary delineations;
   - Logical tie-ins between the revised and effective flood hazard boundary delineations;
   - The topographic contour information used for the base floodplain and 0.2-percent-annual-chance floodplain boundary delineations;

- Locations and alignments of all cross sections used in the proposed conditions hydraulic models;
- The flow line used in the proposed conditions hydraulic models;
- A reference to a datum, such as the National Geodetic Vertical Datum of 1929;
- All items labeled for easy cross-referencing to the proposed conditions hydraulic models; and
- If available, a digital file for the work map in addition to the paper copy.

4. Our review of the submitted proposed conditions HEC-RAS hydraulic analysis for Collins Creek revealed that the base floodplain and regulatory floodway width tie into the effective elevations at Cross Sections B and F. Please extend the boundary delineations of the proposed conditions base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway on the topographic work map requested above so that the revised floodplains and floodway boundary delineations at the upstream and downstream ends of the revised reach along Collins Creek tie into the effective floodplain and floodway boundary delineations. In addition, please make sure that floodplains and floodway boundary delineations along Collins Creek tributary take into account the backwater effect from Collins Creek.

5. Based upon the above-referenced item 2, please submit a revised annotated Flood Insurance Rate Map (FIRM), at the scale of the effective FIRM, that shows the revised base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway boundary delineations shown on the requested work map and how they tie into the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.

Please send the required data directly to us at the address shown at the bottom of the first page. For identification purposes, please include the case number referenced above on all correspondence.

Kimley-Horn and Associates, Inc.

CLOMR Case No.: 11-04-6268R
Identifier: SC 707 Culvert Replacement

September 7, 2011

3001 Weston Parkway
Cary, North Carolina
27513

Mr. Daniel Habete
LOMC Clearinghouse
7390 Coca Cola Drive
Suite 204
Hanover, MD 21076

Re: Additional Data Required to Support a Conditional Letter of Map Revision (CLOMR)

Dear Mr. Habete:

We have reviewed the issues documented in your 316-AD Letter dated July 6, 2011. Please find our responses to your comments below and the attached information you have requested.

Comment 1: This CLOMR request can be processed by the Federal Emergency Management Agency (FEMA) only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service or the US Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat.

If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the CLOMR request. Please see the attached guidance for additional information about the ESA and compliance requirements and for responses to frequently asked questions.

Response 1: Documentation demonstrating compliance with the ESA is included with this submittal.

Comment 2: Our review of the effective information revealed that the revision area is subjected to flooding by both the Atlantic Ocean and Collins Creek. However, you only submitted proposed conditions HEC-RAS hydraulic analysis that takes into account the riverine runoff effect from Collins Creek. Please submit a combined effect analyses that determines the base(1-percent-annual-chance), 10-percent, 2-percent, and 0.2 percent – annual-chance stillwater elevations along the revised reach of Collins Creek that takes into account both the a riverine effect from Collins Creek and a storm surge effect from the Atlantic Ocean. Please refer to section D.2.4.5.4 entitled "Combined effects: Surge Plus Riverine Runoff" of Appendix D entitled "Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update," last updated on April 18, 2008, which can be accessed at http://www.fema.gov/library/viewRecord.do?id=2458

Response 2: Section D.2.4.5.4 of Appendix D (Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update- April 18, 2008) was used to perform the requested combined effect analyses for the 1-(base), 10-, 2-, and 0.2 percent-annual-chance stillwater elevations

along the revised reach of Collins Creek. The data associated with the analyses is included with this submittal.

Comment 3: Based upon the above-referenced item 2, please submit a topographic work map, certified by a registered professional engineer, for the entire revision area that includes all applicable items listed on page 2, Section C, of MT-2 application/certification Form 2, entitled "Riverine Hydrology & Hydraulics Form," including the following information:

- The revised conditions base (1-percent-annual-chance) floodplain, 0.2-percent-annual-chance floodplain and regulatory floodway boundary delineations;
- The currently effective base floodplain, 0.2-percent-annual-chance floodplain and regulatory floodway boundary delineations;
- Logical tie-ins between the revised and effective flood hazard boundary delineations;
- The topographic contour information used for the base floodplain and 0.2-percent-annual-chance floodplain boundary delineations;
- Locations and alignments of all cross sections used in the proposed conditions hydraulic models;
- The flow line used in the proposed conditions hydraulic models;
- A reference to a datum, such as the National Geodetic Vertical Datum of 1929;
- All items labeled for easy cross-referencing to the proposed conditions hydraulic models; and
- If available, a digital file for the work map in addition to the paper copy.

Response 3: A revised topographic work map that incorporates the requested information is included with this submittal.

Comment 4: Our review of the submitted proposed conditions HEC-RAS hydraulic analysis for Collins Creek revealed that the base floodplain and regulatory floodway width tie into the effective elevations at Cross Sections B and F. Please extend the boundary delineations of the proposed conditions base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway on the topographic work map requested above so that the revised floodplains and floodway boundary delineations at the upstream and downstream ends of the revised reach along Collins Creek tie into the effective floodplain and floodway boundary delineations. In addition, please make sure that floodplains and floodway boundary delineations along Collins Creek tributary take into account the backwater effect from Collins Creek.

Response 4: The boundary delineations of the proposed conditions base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway have been extended to tie into the effective floodplain and floodway boundary delineations at cross-sections B and F. The proposed conditions delineations match the effective delineations past the extent of the 1-foot-interval contour data. This is because USGS Quadrangle, 5-foot-interval contour data was utilized for these delineations; this contour data gives no indication of topography changes within a 5-foot tolerance. In addition, the proposed conditions elevations are less than the effective elevations for the base flood and 0.2-percent-annual-chance floodplain. As a result of these factors, the most conservative procedure for mapping the proposed delineations was to match the effective delineations. The Collins

Creek backwater delineations along Collins Creek Tributary were not revised for these same reasons.

Comment 5: Based upon the above-referenced item 2, please submit a revised annotated Flood Insurance Rate Map (FIRM), at the scale of the effective FIRM, that shows the revised base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway boundary delineations shown on the requested work map and how they tie into the boundary delineations shown on the effective FIRM at the downstream and upstream ends of the revised reach.

Response 5: A revised annotated FIRM that incorporates the requested information is included with this submittal. Note: The FIRM panels that include the revised reach are based on different scales (one panel at 500-scale and one at 1000-scale), so the Annotated FIRM has been referenced to the larger scale.

Please contact Tom Gray via phone (919-653-5845) or email (tom.gray@kimley-horn.com) if you have any further comments or questions.

Very truly yours,

Dan Robinson, PE, CFM
Project Manager

July 15, 2011

Kimley-Horn and Associates, Inc.
ATTN: Mr. Dan Robinson, P.E.
Post Office Box 33068
Raleigh, NC 27636-3068

Re: SC 707 Culvert Replacement at Collins Creek
FEMA Case No. 11-04-6268R
FWS Log No. 42410-2009-I-2003
Horry County, South Carolina

Dear Mr. Robinson,

This is in regard to the request dated July 6, 2011 for additional data to support a Conditional Letter of Map Revision (CLOMR) for the SC 707 Culvert Replacement at Collins Creek by Baker|AECOM, who is under contract with the Federal Emergency Management Agency (FEMA). The following is an excerpt from this request and is the only item addressed in this correspondence.

1. This CLOMR request can be processed by the Federal Emergency Management Agency (FEMA) only after FEMA receives documentation from the requestor that demonstrates compliance with the Endangered Species Act (ESA). The requestor must demonstrate ESA compliance by submitting to FEMA either an Incidental Take Permit, Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service or the US Fish and Wildlife Service (collectively known as "the Services"), or an official letter from the Services concurring that the project has "No Effect" on listed species or critical habitat.

   If the project is likely to cause jeopardy or adverse modification to species, then FEMA may deny the CLOMR request. Please see the attached guidance for additional information about the ESA and compliance requirements and for responses to frequently asked questions.

A Biological Assessment (BA) was conducted by HDR Engineering, Inc. of the Carolinas (HDR) for the proposed widening of SC 707 from its intersection with US Hwy 17 in Georgetown County to Enterprise Road in Horry County, which includes the crossing at Collins Creek in Horry County. A determination was made that the proposed work "may affect, but is not likely to affect" Bachman's warbler and wood storks, and have "no effect" on the remaining 14 federally-protected species for Horry and Georgetown Counties. The United States Fish and Wildlife Service (USFWS) provided concurrence with these findings in correspondence dated October 8, 2008 (included herein).

HDR Engineering, Inc. of the Carolinas
3955 Faber Place Drive
Suite 300
North Charleston, SC
29405-8560
Phone: (843) 414-3700
Fax: (843) 414-3701
www.hdrinc.com

If additional information is needed, please feel free to contact me at (843) 414-3708 or shannon.meder@hdrinc.com.

Respectfully,
HDR Engineering, Inc. of the Carolinas

Shannon R. Meder

Shannon R. Meder
Environmental Sections Manager
HDR Engineering, Inc. of the Carolinas

Cc: Ms. Leah Quattlebaum, SCDOT Program Manager
Mr. Ed Frierson, SCDOT Environmental Coordinator
Enclosures

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

October 8, 2008

Mr. Edward Frierson
Environmental Project Manager
S.C. Department of Transportation
Post Office Box 191
Columbia, SC 29202-0191

S.C. 707 Widening in Georgetown / Horry Cos.

Re: ~~SC-41 Bridge Replacement, Wando River, Charleston and Berkeley Counties, SC~~
FWS Log No. 42410-2009-I-0003

Dear Mr. Frierson:

The U.S. Fish and Wildlife Service (Service) has received the Biological Assessment (BA) regarding the proposed improvements to SC 707 in Georgetown and Horry Counties, SC. The proposed project entails a widening of SC 707 from its intersection with US Hwy 17 in Georgetown County to Enterprise Road in Horry County. This section of SC 707 consists of a two lane paved roadway and is approximately 9 miles in length. The proposed improvements will result in a five lane curb and gutter roadway with sidewalks.

This BA includes a review of each of the threatened and endangered (T&E) species that are known to occur, or may occur, within the two counties. A survey for these species was performed in order to facilitate consultation with the Service as required by the Endangered Species Act of 1973 (Act), as amended. The results are detailed and tabulated in the BA with a final determination of effect.

Upon review of the information provided, the Service concurs with the determination that the SC 707 project may affect, but is not likely to adversely affect the wood stork and Bachman's warbler. Further, the Service concurs that the SC 707 project will have no effect upon the additional species listed in Table 1 of the BA. However, obligations under section 7 of the Act must be reconsidered if (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner which was not considered in this assessment, or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

If you have any questions regarding the Service's determination, please do not hesitate to contact Mark Caldwell at (843) 727-4707 ext 215.

Sincerely,

Timothy N. Hall
Field Supervisor

TNH/MAC/km

D.2.4.5.4 Combined Effects: Surge Plus Riverine Runoff

The final instance of combined stillwater frequency to be described here, concerns the determination of the 1-percent SWEL in a tidal location subject to flooding by both coastal and riverine mechanisms. This is the case in the lower reaches of all tidal rivers.

The simplest assumption is that the extreme levels from coastal and riverine processes are independent, or at least widely separated in time. This assumption is generally acceptable because the storms that produce extreme rainfall and runoff may not be from the same set as the storms that produce the greatest storm surge. Furthermore, if a single storm produces both large surge and large runoff, the runoff may be significantly delayed by the time required for overland flow, causing the runoff elevation to peak after the storm surge. Clearly, there may be particular storms and locations for which these assumptions are not true, but even so they are not expected to be so common as to strongly influence the final statistics. If, for a steep terrain area of the east US coast, it is thought that peak runoff and peak surge may commonly coincide owing to local conditions, then the Mapping Partner must consider the likely correlation between the two, and discuss with the FEMA Study Representative whether a departure from the method given here should be used.

The simplified procedure is straightforward, beginning with development of curves or tables for rate of occurrence vs. flood level for each flood source (riverine and coastal). Rate of occurrence can be assumed equal to the reciprocal of the recurrence interval, so the 100-year flood has a rate of occurrence of 0.01 times per year. This is numerically equal to what is more loosely called the *flood elevation probability*. Then one proceeds as follows at each point of interest, P, within the mixed surge/runoff tidal reach.

1. Select a flood level Z within the elevation range of interest at point P.
2. Determine the rates of occurrence $R_{P,R}(Z)$ and $R_{P,S}(Z)$ of rainfall runoff and storm surge elevations exceeding Z at site P (number of events per year).
3. Find the total rate $R_{P,T}(Z) = R_{P,R}(Z) + R_{P,S}(Z)$ at which Z is exceeded at point P, irrespective of flood source.
4. Repeat steps (1) through (3) for the necessary range of flood elevations.
5. Plot the combined rates $R_{P,T}(Z)$ vs Z and find $Z_{P,100}$ by interpolation at $R_{P,T} \approx 0.01$.
6. Repeat steps (1) through (5) for a range of sites covering the length of the mixed tidal reach.
7. Construct the 100 year composite profile passing through the several combined 100-year elevation points, and blending smoothly into the pure-riverine and pure-surge 100-year profiles at the ends of the mixed reach.

The procedure is shown schematically in Figure D.2.4-3 in which the combined curve has been constructed by addition of the rates at elevations of 6, 8, 10, and 12 feet. The entire procedure can be implemented in a simple hand calculator program, with the input at point P being the 10-, 50-, 100-, and 500-year levels for both runoff and surge, as obtained from standard FIS report tables.

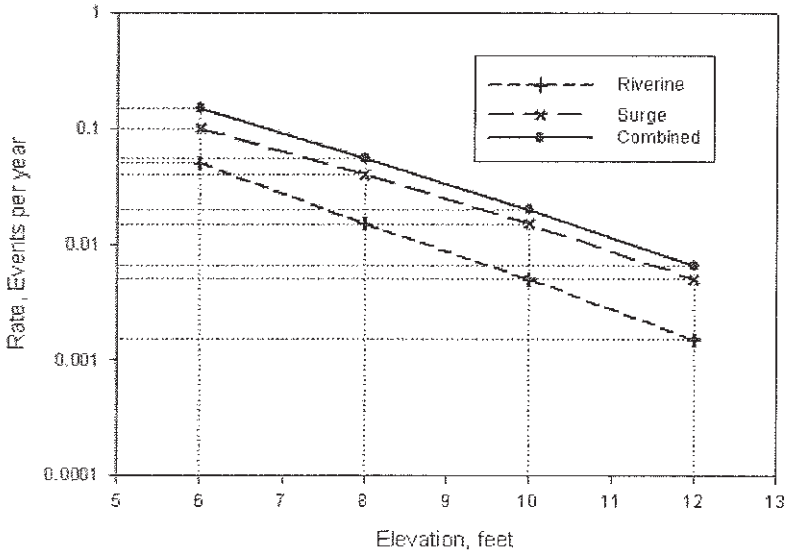


Figure D.2.4-3 Schematic Illustration of Riverine and Surge Rate Combination

D.2.4.6 Nonstationary Processes

Conceptually, a *stationary process* may be thought of as one that does not change in its essential characteristics over time; its descriptors are fixed or stationary. For example, a stationary random process would be one for which its mean, standard deviation, and other moments are unchanging over time. A nonstationary process is one for which these measures do change. Whether a fluctuating process is thought to be, or appears to be, nonstationary can depend upon the time window through which it is viewed. Processes that appear to display definite nonstationary trends when viewed at a short scale, may be seen to fluctuate around an unchanging mean when viewed from a more distant perspective. For example, the tide appears nonstationary when viewed over a period of one hour, but appears entirely stationary when viewed over an entire 19 year tidal epoch.

The appropriate time window for FEMA flood studies is established by the period of record covered by the available data on the one hand, and the probable lifetime of a particular study, on the other.

For practical FIS considerations, two sorts of nonstationarity seem significant. The first is the apparent change of sea level, which has been observed on all coasts. Because it is sea level relative to land that is most significant, an apparent change of sea level can be the result of either sea-level rise, or land subsidence.

The second type of nonstationarity that is important for coastal studies is the long-term change in tidal datums, which may occur as basins evolve through silting, dredging, migration and evolution of inlets, human construction including harbor improvements and breakwaters, and so forth. Both types are discussed below.

FLOODING SOURCE AND TRANSECT	FLOOD INSURANCE RATE MAP PANEL	STILLWATER ELEVATIONS (FEET NGVD)				ZONE	BASE FLOOD ELEVATION (FEET NGVD)[1,2]
		10% (10 YR.)	2% (50 YR.)	1% (100 YR.)	0.2% (500 YR.)		
Intracoastal Waterway/ Waccamaw River	660, 670, 679, 680	3.8	5.3	5.8	6.9	AE	6 – 8
		3.6	4.9	5.4	6.4	AE	5 – 7
	514, 518, 652, 655, 656, 660, 665, 670, 679, 680	3.8	5.3	5.8	6.9	AE	6 – 8
		3.6	4.9	5.4	6.4	AE	5 – 7
	665, 668, 730	3.5	4.8	5.4	6.5	AE	5 – 7
	665, 668, 730	3.7	5.4	5.9	7.4	AE#	6 – 8

[1]Rounded to Nearest Foot
[2]Due to map scale limitations, Base Flood Elevations (BFEs) shown on the FIRM may represent average elevations for the zones depicted

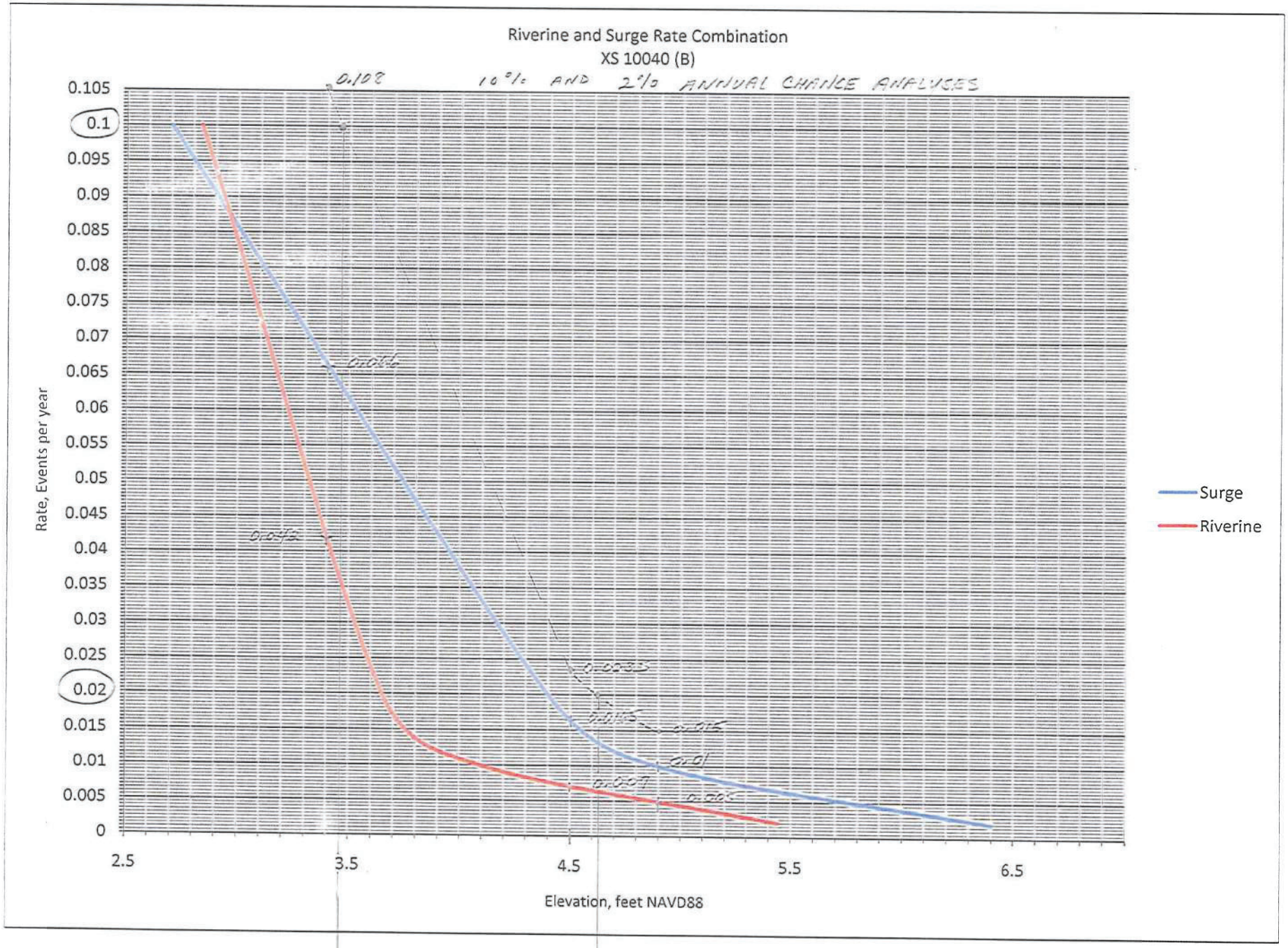
TABLE 3

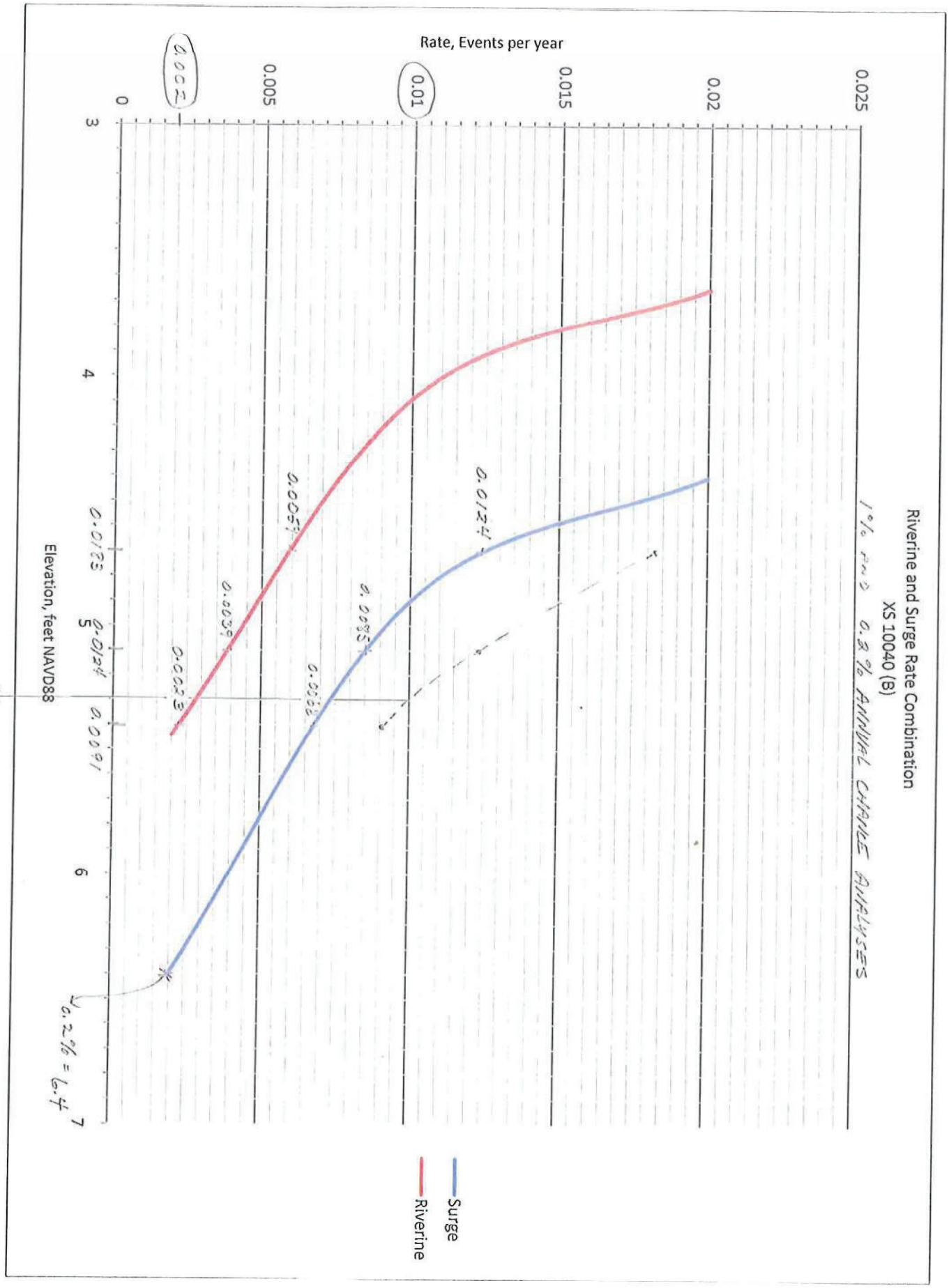
FEDERAL EMERGENCY MANAGEMENT AGENCY

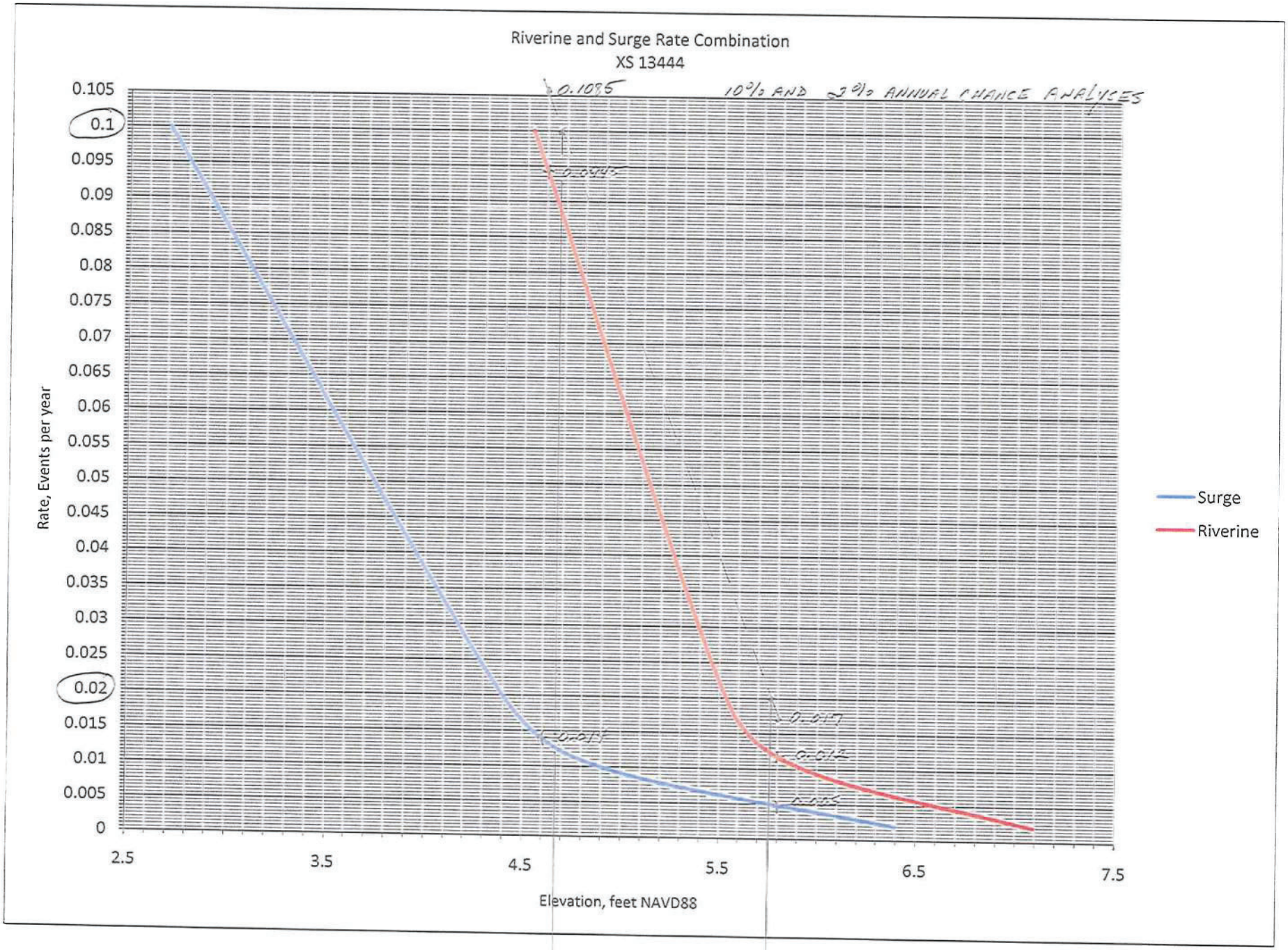
HORRY COUNTY, SC AND INCORPORATED AREAS

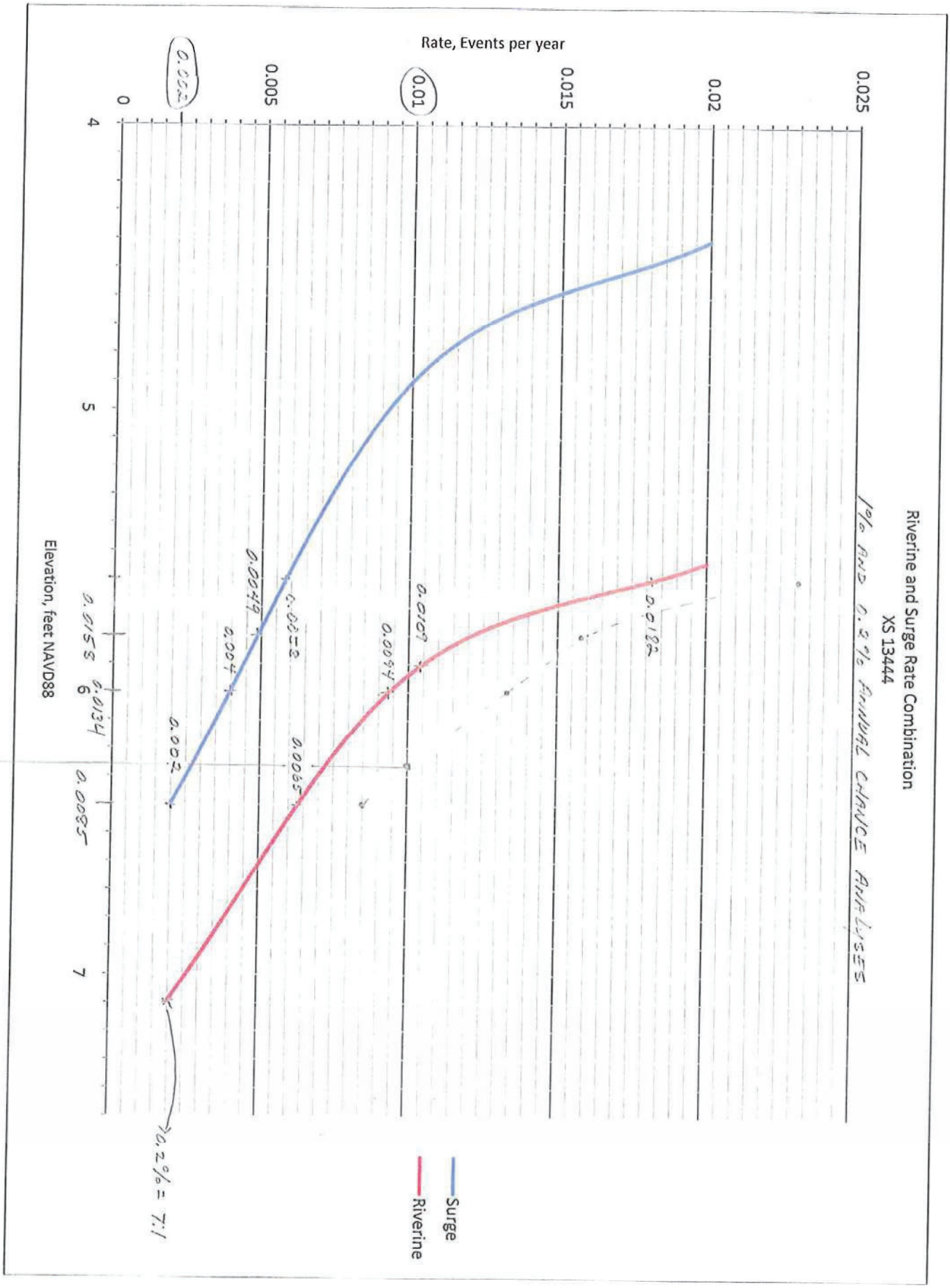
SUMMARY OF STILLWATER ELEVATIONS

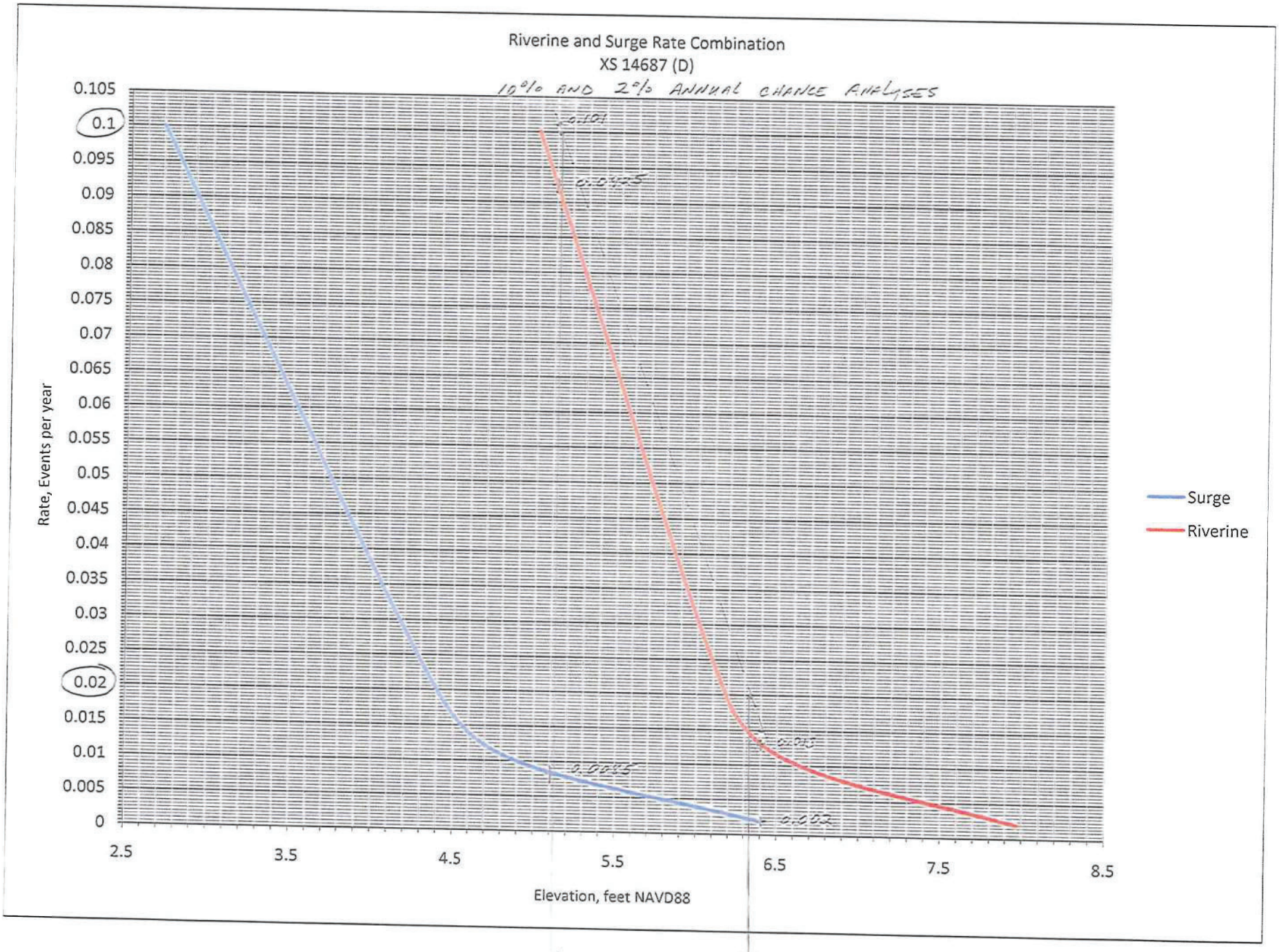
INTRACOASTAL WATERWAY/WACCAMAW RIVER

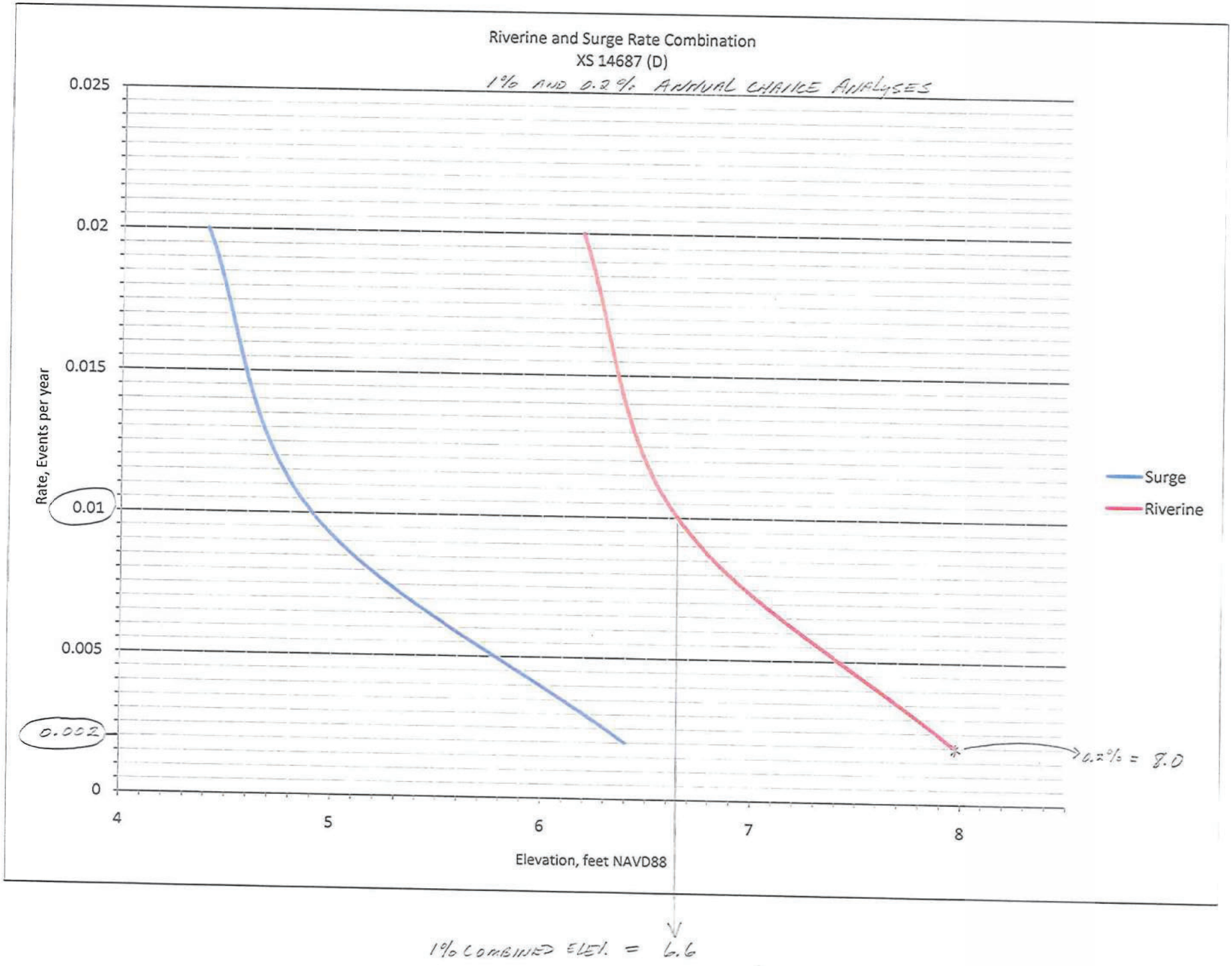












Kimley-Horn
and Associates, Inc.

CLOMR Case No.: 11-04-6268R
Identifier: SC 707 Culvert Replacement

December 1, 2011

3001 Weston Parkway
Cary, North Carolina
27513

Mr. Daniel Habete
LOMC Clearinghouse
7390 Coca Cola Drive
Suite 204
Hanover, MD 21076

Re: Additional Data Required to Support a Conditional Letter of Map Revision (CLOMR)

Dear Mr. Habete:

We have reviewed the issues documented in the attached electronic correspondence dated October 24, 2011. Please find our responses to your comments below and the attached information you have requested.

1. Paragraph 65.6(a) (2) of the National Flood Insurance Program (NFIP) regulations states that to avoid discontinuities between revised and unrevised flood data, hydraulic analyses must have a logical transition between revised elevations of the base (1-percent-annual-chance) flood elevations (BFEs) and those developed previously for areas not affected by the revision. Our review revealed that the proposed conditions hydraulic analyses along Collins Creek do not tie into the effective hydraulic analysis (with the regulatory BFEs) within 0.5 foot at the downstream and upstream ends of the revised reach. Please provide revised proposed conditions analyses for Collins Creek that tie into the effective hydraulic analysis within 0.5 foot, or within 0.0 feet if practical. Or, please extend the hydraulic analysis to show the tie-ins between the effective and revised BFEs.

The hydraulic analysis and mapping have been revised to meet the tie-in requirements between the effective and revised BFEs and Floodway.

2. The submitted topographic work map entitled" Topographic work Map," dated September 7, 2011, prepared by your firm, was not certified by a registered professional engineer. Please submit certified copy of the work map. In addition please include the following information:

- Please show the topographic contour information used for the base floodplain and 0.2-percent-annual-chance floodplain boundary delineations along the entire revision area, from downstream to upstream limits of the revised area.
- Please make sure that floodplains boundary delineations along Collins Creek tributary take into account the backwater effect from Collins Creek.
- On the submitted Exhibits entitled "Fox chase As-built Grading, Brookhaven As-built Grading, and Creekridge Plantation As-built Grading," clearly show the topographic information, with labeled contour lines for the entire revision area. And please certify them.

The topographic work map and annotated FIRM have been revised to include topographic contours (NAVD88) for the area of revision. The floodplain delineations represent the regulatory flood inundation levels for the 1- and 0.2-percent annual chance floods.

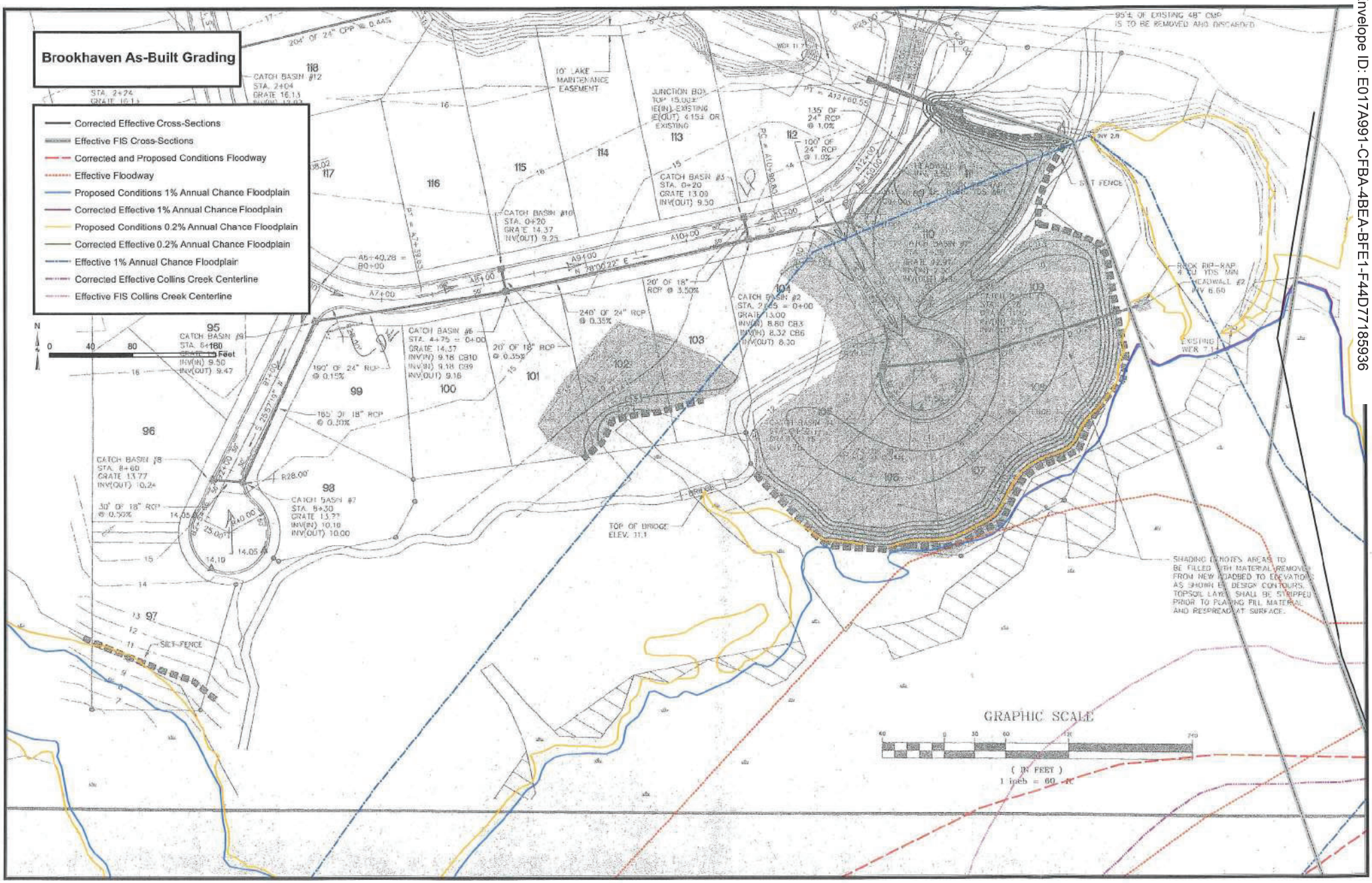
3. The submitted topographic contour information is referenced in National Geodetic Vertical Datum of 1929 (NGVD) and the associated hydraulic model are referenced to the North American Vertical Datum of 1988 (NAVD)]. Please note that the information on the effective Flood Insurance Rate Map and in the Flood Insurance Study report are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Please make sure that the appropriate datum conversions are made before u made boundary delineations.

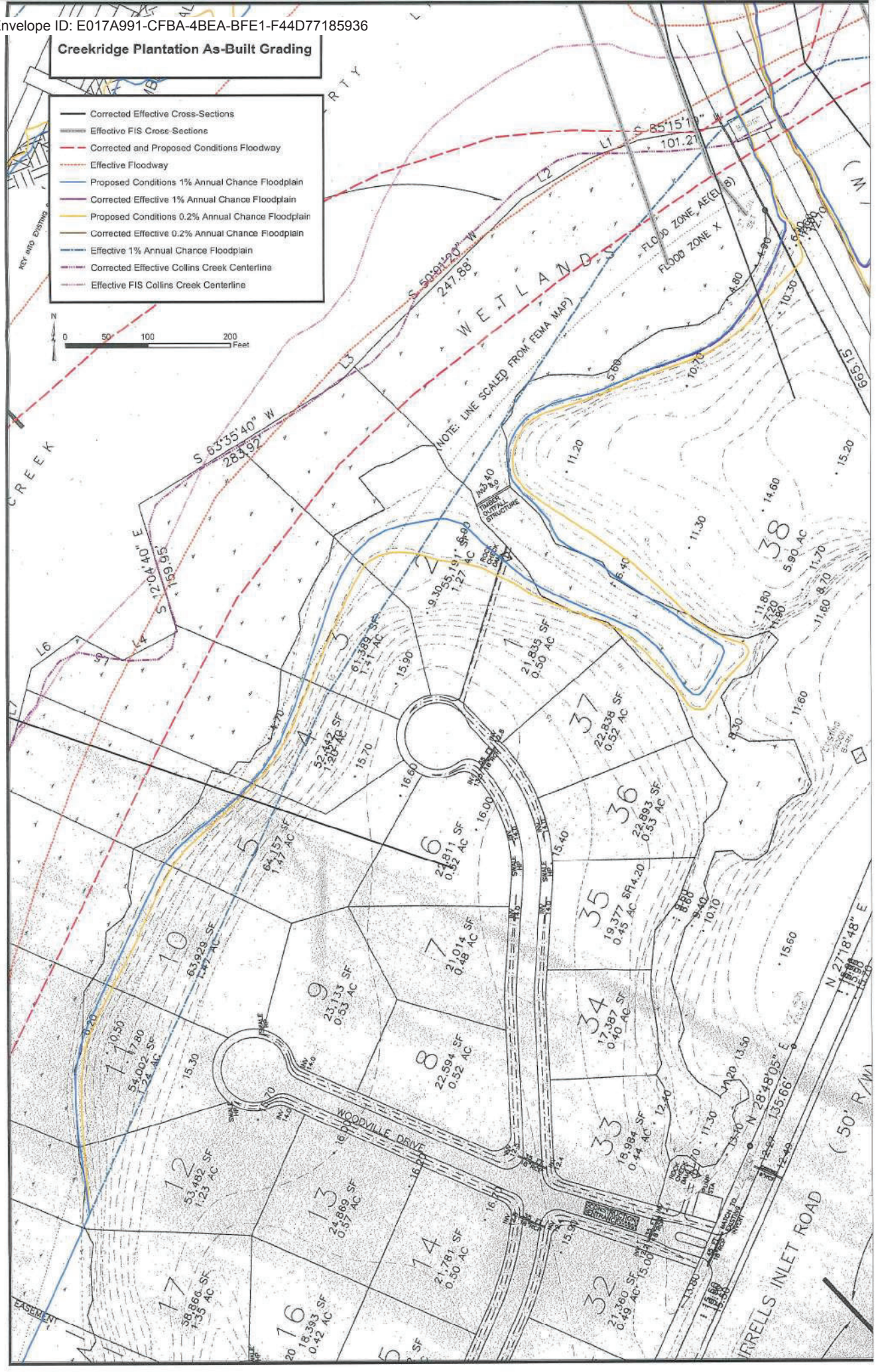
The vertical datum used for the hydraulic analysis and the mapping was NAVD88. This is noted on the topographic work map.

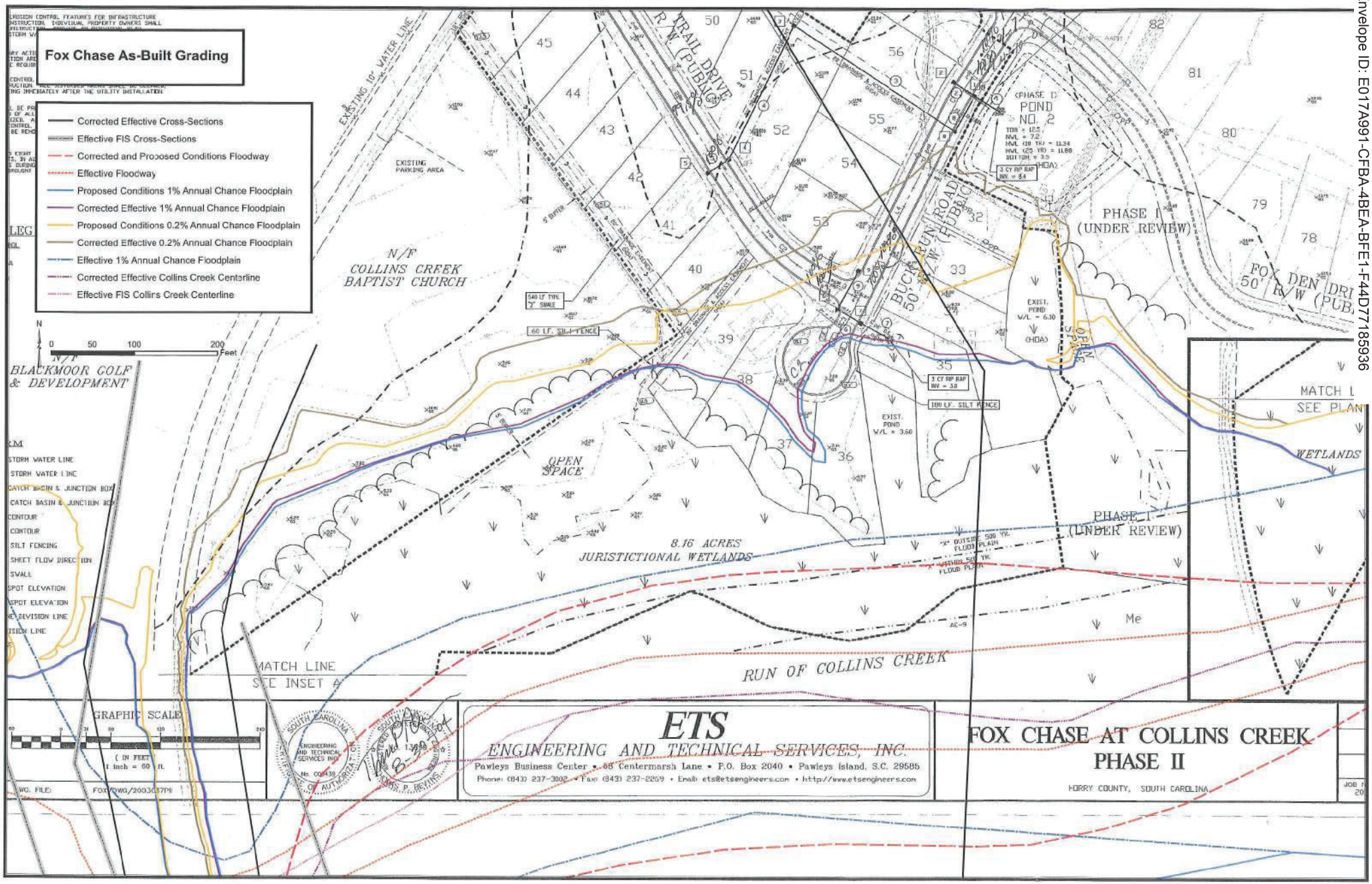
Please contact Tom Gray via phone (919-653-5845) or email (tom.gray@kimley-horn.com) if you have any further comments or questions.

Very truly yours,

Dan Robinson, PE, CFM
Project Manager







Federal Emergency Management Agency

Washington, D.C. 20472

December 22, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 11-04-6268R
Community Name: Horry County, SC
Community No.: 450104

The Honorable Tom Rice
Chairman, Horry County Council
Post Office Box 1236
Conway, SC 29528

Dear Mr. Rice:

We are providing our comments with the enclosed Conditional Letter of Map Revision (CLOMR) on a proposed project within your community that, if constructed as proposed, could revise the effective Flood Insurance Study report, and Flood Insurance Rate Map for your community.

If you have any questions regarding the floodplain management regulations for your community, the National Flood Insurance Program (NFIP) in general, or technical questions regarding this CLOMR, please contact the Director, Mitigation Division of the Federal Emergency Management Agency (FEMA) Regional Office in Atlanta, Georgia, at (770) 220-5400, or the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

For: Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

List of Enclosures:
Conditional Letter of Map Revision Comment Document

cc: Mr. Mike Odea
Flood Control Officer
Horry County

Mr. Mitchell D. Metts, P.E
Director of Preconstruction
South Carolina Department of Transportation

Mr. Dan Robinson, P.E., CFM
Kimley-Horn and Associates, Inc

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT

COMMUNITY INFORMATION		PROPOSED PROJECT DESCRIPTION	BASIS OF CONDITIONAL REQUEST
COMMUNITY	Horry County South Carolina (Unincorporated Areas)	BRIDGE	HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 450104		
IDENTIFIER	SC 707 Culvert Replacement	APPROXIMATE LATITUDE & LONGITUDE: 33.597, 79.062 SOURCE: Google Earth DATUM: NAD 83	

AFFECTED MAP PANELS			
TYPE: FIRM*	NO.: 45051C0730H	DATE: August 23, 1999	* FIRM - Flood Insurance Rate Map ** FBFM - Flood Boundary and Floodway Map *** FHBM - Flood Hazard Boundary Map
TYPE: FIRM*	NO.: 45051C0731H	DATE: August 23, 1999	

FLOODING SOURCE(S) AND REACH DESCRIPTION

Collins Creek - from approximately 12,750 feet downstream of State Highway 707 to approximately 2,500 feet upstream

PROPOSED PROJECT DESCRIPTION

Flooding Source	Proposed Project	Location of Proposed Project
Collins Creek	Bridge Modification	At State Highway 707

SUMMARY OF IMPACTS TO FLOOD HAZARD DATA

Flooding Source	Effective Flooding	Proposed Flooding	Increases	Decreases
Collins Creek	Zone AE	Zone AE	Yes	Yes
	BFEs*	BFEs	Yes	Yes
	Floodway	Floodway	Yes	Yes
	Zone X (shaded)	Zone X (shaded)	Yes	Yes

* BFEs - Base (1-percent-annual-chance) Flood Elevations

COMMENT

This document provides the Federal Emergency Management Agency's (FEMA's) comment regarding a request for a CLOMR for the project described above. This document is not a final determination; it only provides our comment on the proposed project in relation to the flood hazard information shown on the effective National Flood Insurance Program (NFIP) map. We reviewed the submitted data and the data used to prepare the effective flood hazard information for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. Your community is responsible for approving all floodplain development and for ensuring that all permits required by Federal or State/Commonwealth law have been received. State/Commonwealth, county, and community officials, based on their knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area (SFHA), the area subject to inundation by the base flood. If the State/Commonwealth, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional Information about the NFIP is available on the FEMA website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

To determine the changes in flood hazards that will be caused by the proposed project, we compared the hydraulic modeling reflecting the proposed project (referred to as the proposed conditions model) to the hydraulic modeling used to prepare the Flood Insurance Study (FIS) (referred to as the effective model). If the effective model does not provide enough detail to evaluate the effects of the proposed project, an existing conditions model must be developed to provide this detail. This existing conditions model is then compared to the effective model and the proposed conditions model to differentiate the increases or decreases in flood hazards caused by more detailed modeling from the increases or decreases in flood hazards that will be caused by the proposed project.

The table below shows the changes in the BFEs:

BFE Comparison Table

Flooding Source: Collins Creek		BFE Change (feet)	Location of maximum change
Existing vs. Effective	Maximum increase	0.5	Approximately 80 feet upstream of State Highway 707
	Maximum decrease	1.0	Approximately 3,040 feet downstream of State Highway 707
Proposed vs. Existing	Maximum increase	None	N/A
	Maximum decrease	0.2	Approximately 80 feet upstream of State Highway 707
Proposed vs. Effective	Maximum increase	0.3	Approximately 80 feet upstream of State Highway 707
	Maximum decrease	1.0	Approximately 3,040 feet downstream of State Highway 707

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional information about the NFIP is available on the FEMA website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR

Upon completion of the project, your community must submit the data listed below and request that we make a final determination on revising the effective FIRM, and FIS report. If the project is built as proposed and the data below are received, a revision to the FIRM, and FIS report would be warranted.

• Form 1, entitled "Overview & Concurrence Form." Detailed application and certification forms must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1 must be included. If as-built conditions differ from the proposed plans, please submit new forms, which may be accessed at http://www.fema.gov/plan/prevent/fhm/dl_mt-2.shtm, or annotated copies of the previously submitted forms showing the revised information.

• Hydraulic analyses, for as-built conditions, of the base flood; the 10-percent, 2-percent, and 0.2 percent annual chance floods; and the regulatory floodway, together with a topographic work map showing the revised floodplain and floodway boundaries along Collins Creek. Please ensure that the revised information ties in with the current effective information at the downstream and upstream ends of the revised reach.

• An annotated copy of the FIRM, at the scale of the effective FIRM, that shows the revised floodplain and floodway boundary delineations shown on the submitted work map and how they tie into the floodplain and floodway boundary delineations shown on the current effective FIRM at the downstream and upstream ends of the revised reach.

• As-built plans, certified by a registered professional engineer, of all proposed project elements.

• A copy of the public notice distributed by your community, stating its intent to revise the regulatory floodway, or a signed statement by your community that it has notified all affected property owners and affected adjacent jurisdictions.

• Documentation of the notification to property owners who will be affected by any widening/shifting of the base floodplain and/or any BFE increases along Collins Creek.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional information about the NFIP is available on the FEMA website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

• FEMA's fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps can be accessed at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm. The fee at the time of the map revision submittal must be received before we can begin processing the request. Payment of this fee can be made through a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). Please forward the payment, along with the revision application, to the following address:

LOMC Clearinghouse
7390 Coca Cola Drive, Suite 204
Hanover, Maryland 21076

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the flood hazard information (i.e., base flood elevations, base flood depths, SFHAs, zone designations, regulatory floodways) will change as a result of the project, a 90-day appeal period will be initiated for the revision, during which community officials and interested persons may appeal the revised flood hazard information based on scientific or technical data.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional information about the NFIP is available on the FEMA website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

COMMUNITY REMINDERS

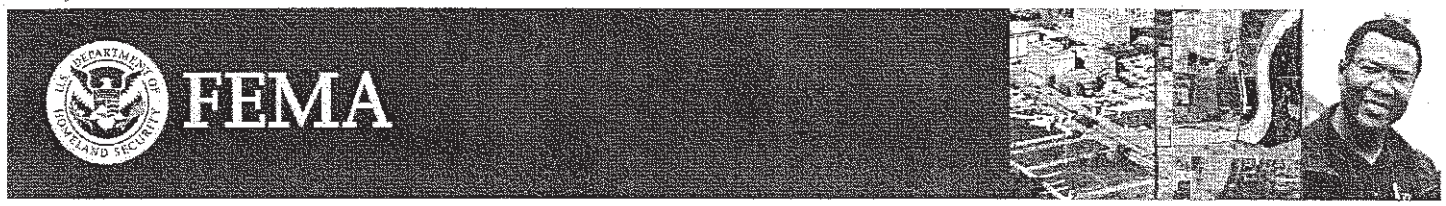
We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Brad Loar
Director, Mitigation Division
Federal Emergency Management Agency, Region IV
Koger Center – Rutgers Building
3003 Chamblee Tucker Road
Atlanta, GA 30341
(770) 220-5400

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 7390 Coca Cola Drive, Suite 204, Hanover, MD 21076. Additional information about the NFIP is available on the FEMA website at http://www.fema.gov/nfip.

Beth A Norton

Beth A. Norton, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration



Changes to FEMA's Appeals Process

FEMA has revised its existing appeal policy to expand the due process procedures currently provided for new or modified Base Flood Elevations (BFEs) to other new or modified flood hazard information shown on a Flood Insurance Rate Map (FIRM), including additions or modifications to any Special Flood Hazard Area (SFHA) boundary (both approximate and detailed floodplains), zone designation, and/or regulatory floodway boundary. This policy is known as the Expanded Appeals Process (EAP). The EAP, which became effective on December 1, 2011, affects Letters of Map Revision (LOMRs) issued on or after that date, and a 90-day appeal period will be required for LOMRs that result in **any change** to flood hazards.

To provide expanded due process rights for changes due to LOMRs, any LOMR that requires an appeal period in a community already compliant with the necessary requirements outlined in 44 CFR Section 60.3 **will become effective 120 days from the second newspaper publication date**, following FEMA's current policy for setting LOMR effective dates. This allows time to collect appeals and provides for newspaper publication schedule conflicts. LOMRs with an appeal period in communities that are not currently compliant with the necessary requirements outlined in 44 CFR Section 60.3, or in communities that require adoption of the LOMR, will become effective following a six-month compliance period.

Evidence of public notice or property owner notification of the changes effected by the LOMR will continue to be requested during the review of the LOMR request. This will help to ensure that the affected population is aware of the flood hazard changes in the affected area and the resultant LOMR. However, FEMA will no longer request evidence of property owner acceptance of the changes effected by a LOMR, as such acceptance will have no influence on the effective date of the LOMR. LOMR requests that are currently in-progress with FEMA when the EAP becomes effective will be reviewed to determine whether the notification already provided is sufficient, and such requests will proceed with processing.