

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 560008

Date: 04/12/2017

County: <u>Madison</u>	Stream: <u>Ivy Creek (River)</u>	Assigned to: <u></u>
Road #: <u>NC 251 NBL</u>	Road Name: <u>French Broad Overview Rd</u>	Prepared By: <u>wsh/REL</u>
Division: <u>13</u>	Location: <u>0.8 M S JCT US 25 /70</u>	Hydro Mgr: <u>PFF</u> Hydro Reviewer: <u>MTS</u>
Latitude: <u>35.77661</u>	Longitude: <u>-82.64739</u>	Project Type: <u>B-4777</u>

Existing Structure

Structure Type: <u>Bridge</u>	Yr Built: <u>1939</u>
Span Arrangement: <u>5 @ 47'6"</u>	OAL (ft): <u>238.0</u> Skew: <u>90</u> Abutment Type: <u>Vertical-Concrete</u>
Number of Barrels: <u></u> @ Span (ft): <u></u> x Rise (ft): <u></u>	
Bed to Crown (ft): <u>28.0</u>	Clear Roadway (ft): <u>15.0</u> Water Depth (ft): <u>4.0</u> Superstructure Depth: <u></u>
ADT: <u>980</u> Year ADT: <u>2012</u>	Scour Code (item113): <u>8</u> Prior Survey Completed: ☐ Survey Date: <u></u>
Drainage Area: <u>161.0</u> Sq. Mi.	Drainage Area Source: <u>Sel.-Sites</u> Roadway Overtops at Q100: ☐
Discharge Method: <u>USGS Regression Equations</u>	USGS Region: <u>2- Mountain</u> Stream Gage Number(if applicable): <u>345335112</u>
Q10 (cfs): <u></u> Q25 (cfs): <u>16,000</u> Q50 (cfs): <u>18,000</u> Q100 (cfs): <u>22,000</u> QBFE (cfs): <u>19,160</u>	
☐ Structure in Flood Hazard Zone Panel #: <u>9715</u> Panel Date: <u>06/09/2009</u>	Type of FIS: <u>LIMITED</u> Date of FIS: <u></u>

Enviromental

Quad Map: <u>MARSHALL, NC</u>	River Basin: <u>French Broad</u>	Buffer Rule: <u></u>
Primary Stream Classification		Other Stream Classification
☐ Class B ☒ Class C ☐ SA ☐ SB	☐ Anadromous Fish ☐ Area of Environmental Concern	
☐ SC ☐ SWL ☐ WL ☐ WS I	☐ CAMA County ☐ Federal Wild & Scenic Rivers	
☐ WS II ☐ WS III ☐ WS IV ☐ WS V	☐ HSB Required ☐ NC Natural & Scenic Rivers	
Supplemental Stream Classification	☐ Impaired [303d] ☐ Primary Nursery Area	
☐ FWS ☐ HQW ☐ NSW ☐ ORW	☐ TVA ☐ Designated Shellfish Harvesting Area	
☐ Sw ☐ Tr ☐ UWL ☐ w/in 0.5mi. of CA	☐ Designated Public Mountain Trout Waters	

Up/Down Stream Features

Upstream Feature: <u>Bridge</u>	Structure Type: <u>Bridge</u>
Location: <u>0.2 M N JCT SR 1587</u>	Span Arrangement: <u>4 @ 87' 6"</u> OAL (ft): <u>350.0</u>
Structure #: <u>560528</u> Route: <u>US 70/ 25</u>	Number of Barrels: <u></u> @ Span (ft): <u></u> x Rise (ft): <u></u>
Latitude: <u>35.76889</u> Longitude: <u>-82.61860</u>	
Prior Survey Completed: ☐ Survey Date: <u></u>	Bed to Crown (ft): <u>40.0</u> Year Built: <u>1981</u>
Downstream Feature: <u>Bridge</u>	Structure Type: <u>Bridge</u>
Location: <u>0.8 M S JCT US 25 70 INTERSECTION</u>	Span Arrangement: <u>5@ 47' 8" (+/-)</u> OAL (ft): <u>239.00</u>
Structure #: <u>560009</u> Route: <u>US 251 SBL</u>	Number of Barrels: <u></u> @ Span (ft): <u></u> x Rise (ft): <u></u>
Latitude: <u>35.77678</u> Longitude: <u>-82.64775</u>	
Prior Survey Completed: ☐ Survey Date: <u></u>	Bed to Crown (ft): <u>30.0</u> Year Built: <u>1957</u>

Preliminary Structure Estimate [Office Estimate]

Structure Type: <u></u> Skew: <u>90</u>
Dimensions/Spans: <u></u>

Notes

Stream Assigned #:6-96-(11.7)

PREDESIGN-PRESURVEY REPORT

Project# B-4777
TIP# _____
Let Date _____
WBS# _____

County MADISON (DIV. 13)

Bridge# 5600.08
Road# NC 251 NBL
Stream IVY CREEK

F14
FRENCH
BROAD
OVERVIEW
ROAD

Type Of Request: POC Force Account TIP NCMA

Date 4/11/17 Name Wsh

Assigned To PFF / MTS

Checked By REC 4-12-17

BRN: NONE CO. FILE: NONE
BKI: NONE BSR: NONE
PDR: NO

Prior Survey Date NONE (attach copy of prior survey)

Study By Scour Section YES (Attached) SCOUR CODE: 8

Flood Zone _____ Detail Study LIMITED Date 6-2-09 Panel# 9715

B.M. Info N/A (ESM DA = 163.4 SQ. MI.)

Quad Map MARSHALL Drainage Area 101 SQ. MI. From DASS STA: 345335112

Q25 = 16,000 cfs Q50 18,000 cfs Q100 22,000 cfs Method REG. EQU. REGION 2

LONG: -82.647388 FEMA 19,160 cfs IA = 0.68% USGS - 87-4096

LAT: 35.77661 CLEAR R.W. = 15

EXISTING BRIDGE INFORMATION

Location 0.8 M S. JCT US 25/70 INTERSECTION BUILT: 1939

Average Daily Traffic 980 (2012) 7% TRK. OAW 33.42

Length 238' Bed- To Crown 28' Water Depth 4'

Type Structure REINFORCED CONC. DECK ON GIRDERS

Type Spans 5 @ 47'6" (VERT. CONC. ABUT.)

Upstream Structure 560528 (4 @ 87'6") BUILT: 1981

Location 0.2 M N JCT SR 1587 (US 70/25) LONG: -82.618601

Bed- To Crown 40' (3' DEEP) Prior Survey N/A LAT: 35.768885

Downstream Structure 560009 (ON NC 251) (5 @ 47'8" +/-) CONC. DECK

Location 0.8 M S JCT US 25/70 INTERSECTION

Bed- To Crown 30' (3' DEEP) Prior Survey N/A LONG: -82.647753

LAT: 35.776775

BUILT: 1957

ENVIRONMENTAL

TVA: NO

Trout Stream NO Anadromous Fish NO Primary Nursery Area NO

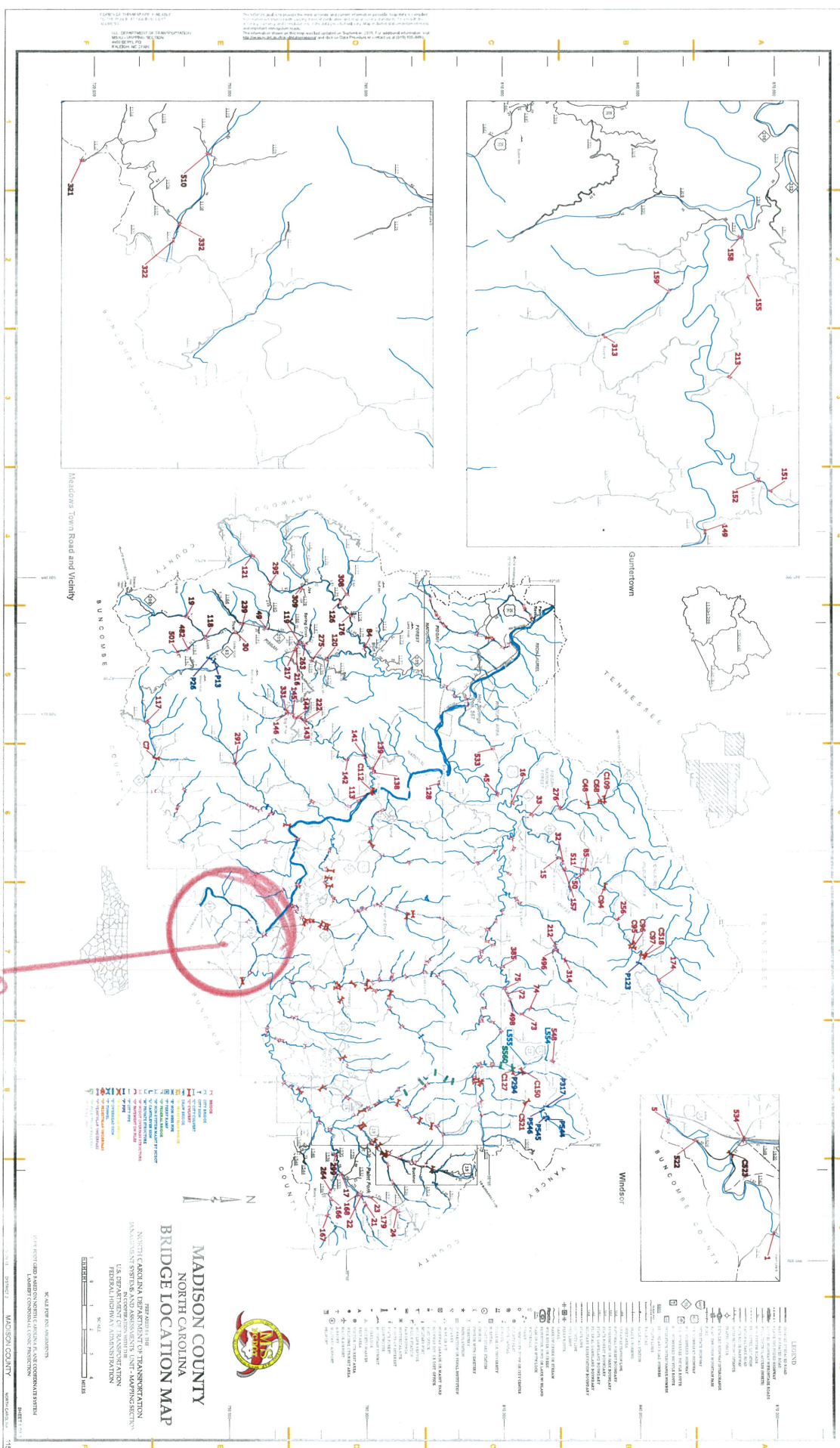
High Quality Waters NO Nutrient Sensitive Waters NO

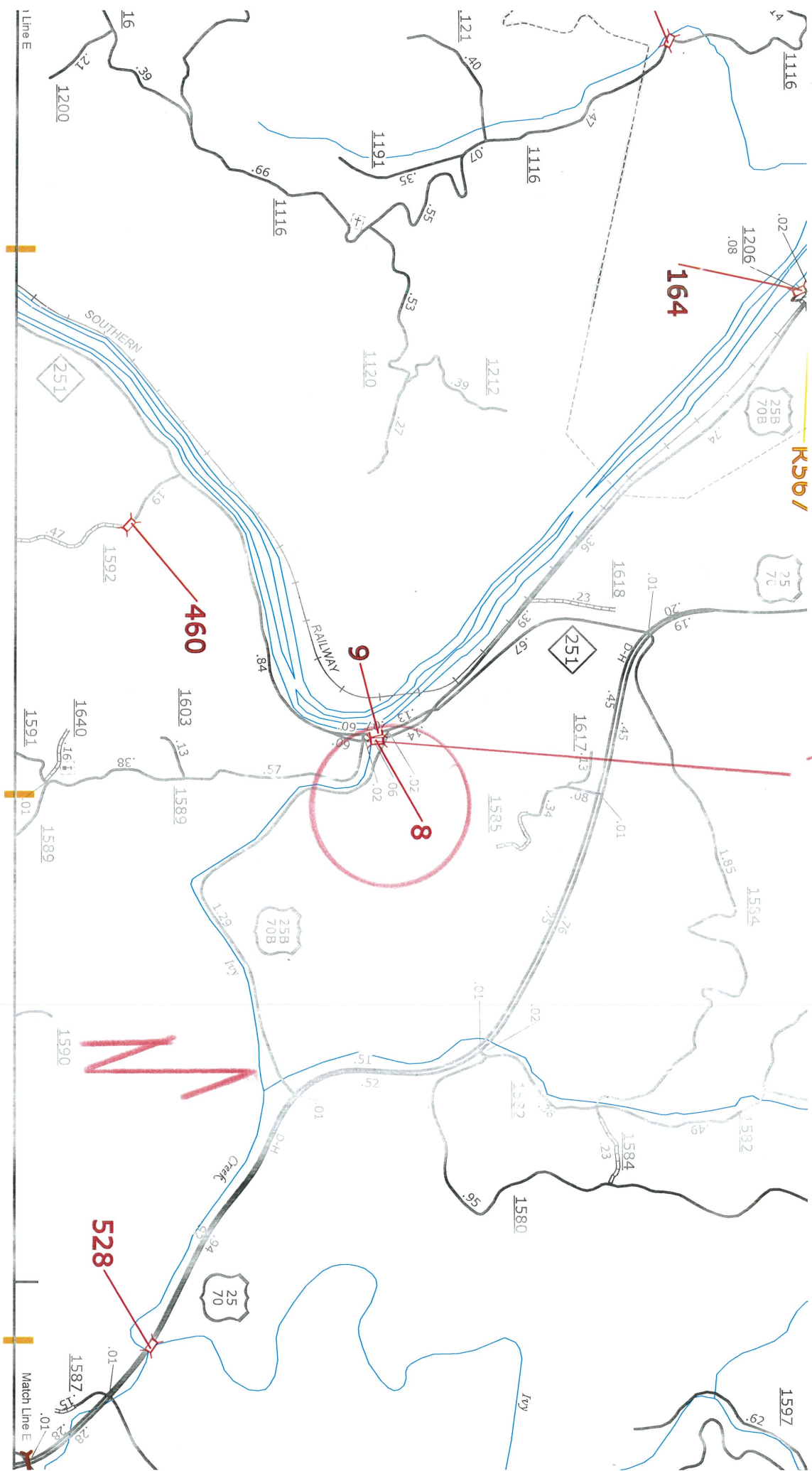
Near Water Supply Intake NO CAMA County NO

Stream Classification C STREAM #: 6-96-(11.7)

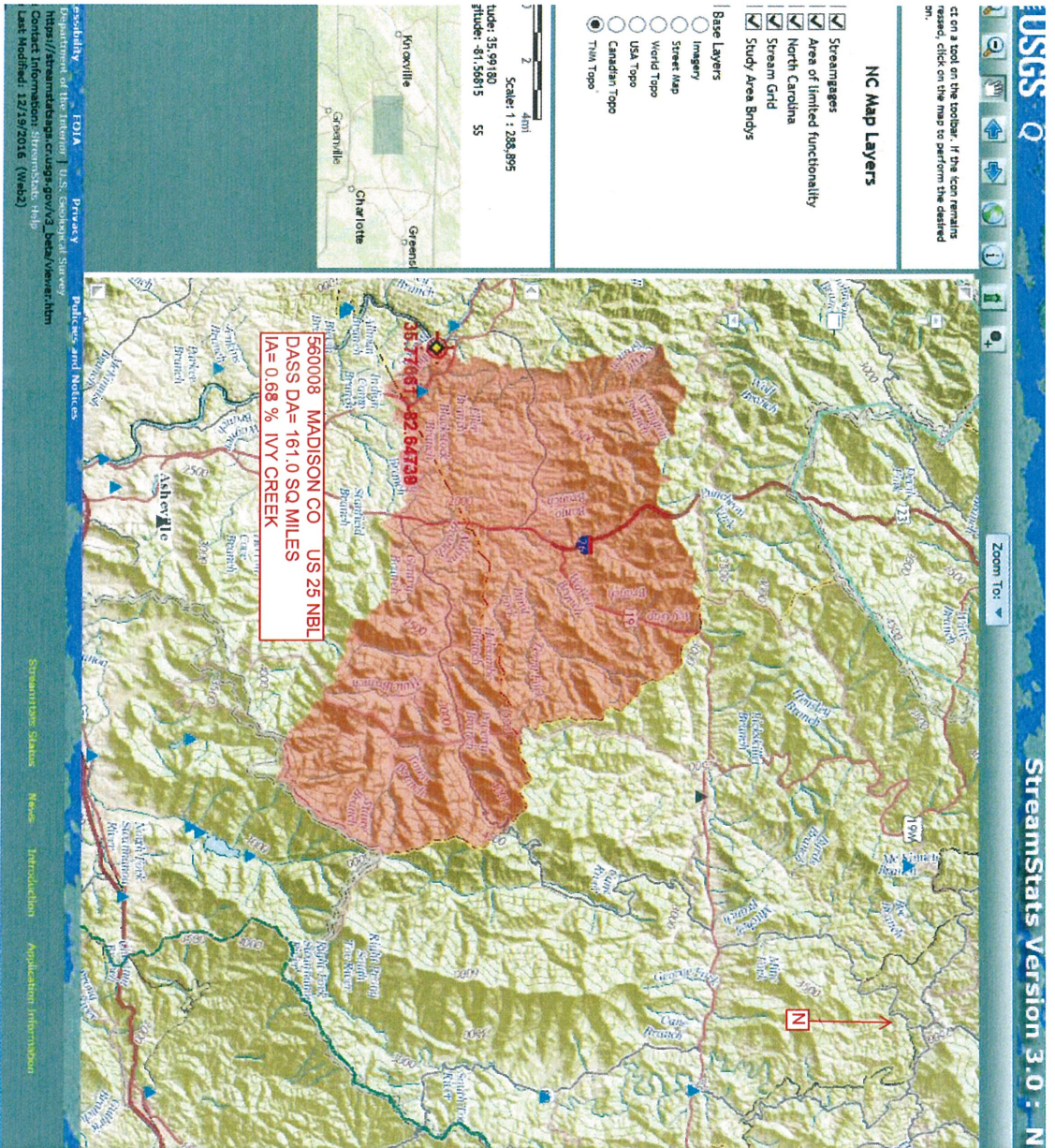
DENR River Basin Info. FRENCH BROAD

1, 66, 72, 112





008



USGS StreamStats Version 3.0

Flow Statistics Ungaged Site Report

https://streamstats.cr.usgs.gov/3_beta/Report.html?code=NC&wofkpacID=NC2017041108102384000

Date: Tues Apr 11, 2017 10:16:47 AM GMT-4
Study Area: North Carolina
MAD 1983 Latitude: 35.7766 (35 46 36)
MAD 1983 Longitude: -82.6472 (-82 38 50)
Drainage Area: 161 mi2

Peak Flows Region Grid Basin Characteristics

Parameter	Value	Regression Equation	Valid Range
Drainage Area (square miles)	161		Min Max
Percent Area in Region 1 (percent)	0.000	0	0 9000
Percent Area in Region 2 (percent)	100.000	0	0 100
Percent Area in Region 3 (percent)	0.000	0	0 100
Percent Area in Region 4 (percent)	0.000	0	0 100
Percent Area in Region 5 (percent)	0.000	0	0 100

Urban Flows Region Grid Basin Characteristics

Parameter	Value	Regression Equation	Valid Range
Area in square miles=161			
Percent imperviousness of basin area 2006 NLCD=0.66			
Percentage of impervious area determined from NLCD 2011 impervious dataset=0.68			
100% Region 2 Urban Blue Ridge FS007-00 (161 mi2)			
Parameter	Value	Regression Equation	Valid Range
Drainage Area (square miles)	161 (above max value 41)		Min Max
Percent impervious NLCD2011 (percent)	0.68 (below min value 2)		0.04 41
			2 54.6

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval
PK2	57.40	ft3/s	35		Min Max
PK5	9.400	ft3/s	3.4		3310 9980
PK10	12.100	ft3/s	35		5440 16200
PK25	15800	ft3/s	38		6920 21300
PK50	18400	ft3/s	40		8670 28700
PK100	21600	ft3/s	42		9790 34500
					11100 41900



008

COUNTY: MADISON STRUCTURE NUMBER: 560008 FREQUENCY: 24 MONTHS

FACILITY CARRIED: NC251 NBL MILE POST:

LOCATION: .1 MI.S.JCT.US 25,70

FEATURE INTERSECTED: IVY CREEK

LATITUDE: 35° 46' 35.9" **LONGITUDE:** 82° 38' 50.62"

SUPERSTRUCTURE: REINFORCED CONCRETE DECK GIRDERS

SUBSTRUCTURE: E.BTS:SPILL THRU;INT.BTS:RCRN POST & WEB

5 @ 47'-6"

SPANS: 5 @ 47'-6"

☐ FRACTURE CRITICAL ☐ TEMPORARY SHORING ☐ SCOUR CRITICAL ☐ SCOUR PLAN OF ACTION

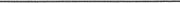
PRESENT CONDITION: Fair **INSPECTION DATE:** 06/03/2016

POSTED SV: 32 POSTED TTST: 36

OTHER SIGNS PRESENT: 2 DELINEATORS



LOOKING NORTH

INSPECTED BY KENNETH WING	SIGNATURE 	ASSISTED BY WESLEY SKINNER
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Structure: 560008

County: MADISON

Date: 06/03/2016

Structure Photos



DOWNSTREAM, LOOKING WEST



UPSTREAM, LOOKING EAST

560008

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 08/30/2016

COUNTY :	DIVISION :	DISTRICT :	STRUCTURE NUMBER :	LENGTH :	
MADISON	13	2	560008	238	FEET

ROUTE CARRIED :	FEATURE INTERSECTED :
NC251 NBL	IVY CREEK

LOCATED :	BRIDGE NAME :	CITY :
.1 MI.S.JCT.US 25,70		

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
07	FA	NFA	980 2012	LT 311 RT 311

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1939	SHPMC	9698		H 15

REHAB :	BY :	PROJ :	ALIGNMENT :	SKEW :	LANES :
	BMU	5.8641	LT.	120	ON 1 UNDER 0

NAVIGATION :	HT. CRN. TO BED :	WATER DEPTH :
VC 0 FT HC 0 FT 28 FT		4 FT

SUPERSTRUCTURE :	REINFORCED CONCRETE DECK GIRDERS
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SUBSTRUCTURE :	E.BTS:SPILL THRU;INT.BTS:RCRN POST & WEB
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SPANS :	5 @ 47'-6
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BEAMS OR GIRDERS :	5 LINES 30 RC DECK GIRDERS @ 6'-9 CENTERS
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FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
7 R.C./7 AWS		33.417 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
15 FT	31.167 FT	LT .5 FT RT .5 FT

VERT.CL.OVER :
999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :	TTST	36	DATE	12/16/2008
HS-1	HS-1	Int.grds	SV 32				

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

UNDER ROUTES AND CLEARANCES

REMARKS :

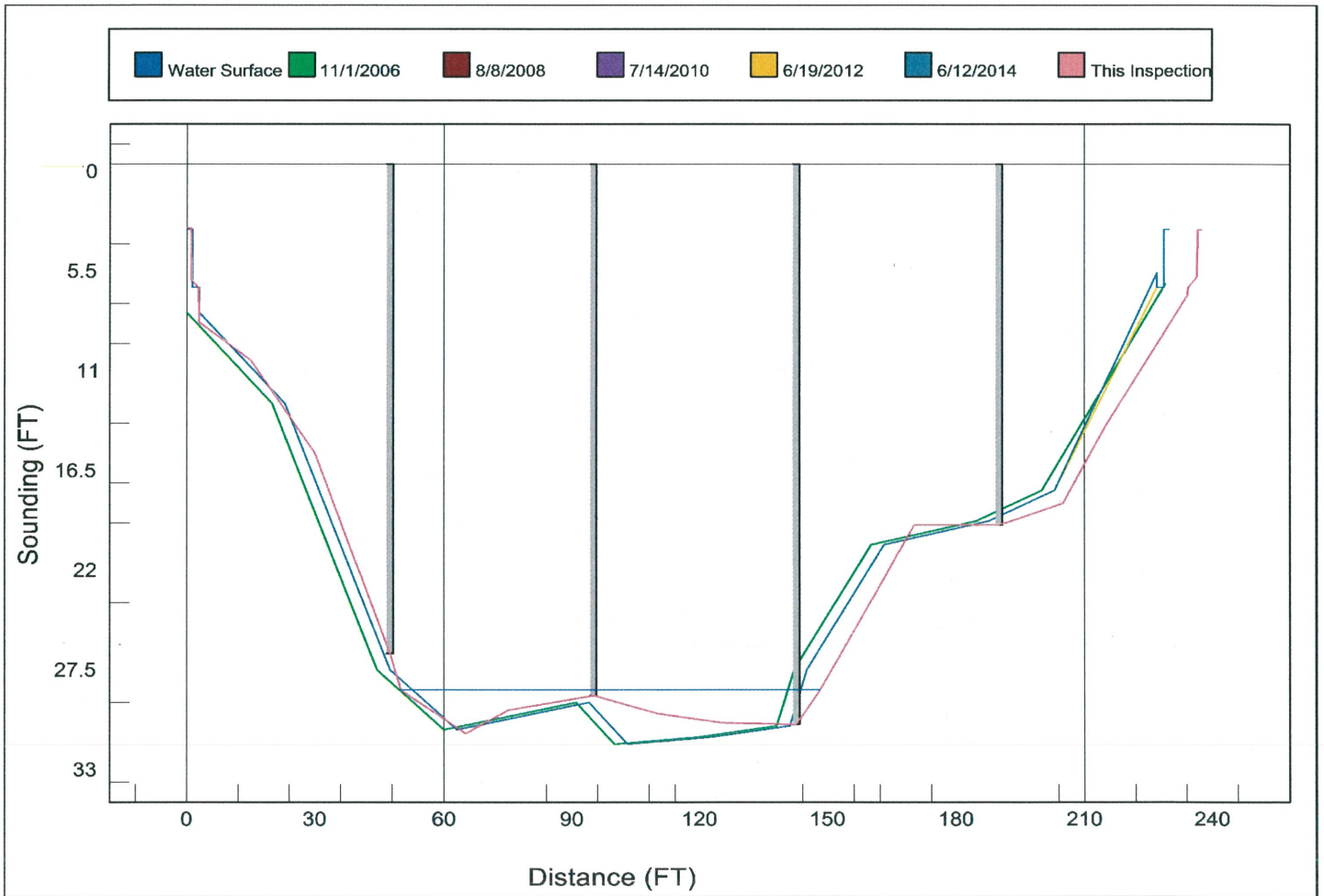
Bridge: 560008

County: MADISON

Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



U/S STR

560 008

Structure: 560528

County: MADISON

Date: 06/30/2016

Structure Photos



WEST PROFILE



EAST PROFILE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



NCDOT UNITS:
 BRIDGE MAINTENANCE UNIT
 HYDRAULIC DESIGN UNIT
 GEOTECHNICAL UNIT
 STRUCTURE DESIGN UNIT
 SOILS AND FOUNDATION SECTION

BRIDGE SCOUR REPORT

COUNTY: MADISON BRIDGE: 8 ROUTE: NC 251 STREAM CROSSED: Try River

ASSESSMENT ☒ EVALUATION ☐ BY: MEN DATE 4/9/97

FHWA STRUCTURE INVENTORY & APPRAISAL CODES:

SUBSTRUCTURE CONDITION (ITEM 60) _____
 CHANNEL AND CHANNEL PROTECTION (ITEM 61) _____
 WATERWAY ADEQUACY (ITEM 71) _____
 SCOUR CRITICAL BRIDGES ((ITEM 113) 8

FULL SCOUR REPORT AVAILABLE
 IN HYDRAULICS FILES

MONITORING:

PLAN REQUIRED? YES _____ NO ☒

FLOOD MONITORING EVENT : (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

CRITICAL MONITORING DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

CRITICAL HIGH WATER DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

SCOUR CRITICAL DEPTHS(UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

INCREASE UNDERWATER INSPECTION CYCLE? YES _____ NO ☒ FREQUENCY _____

COUNTERMEASURES:

PLAN REQUIRED? YES _____ NO ☒
 SUMMARY OF PLAN:

CONSTRUCTION COMPLETED DATE _____

FINAL CODING AFTER WORK IS COMPLETED (ITEM 113) _____ DATE _____

BRIDGE MAINTENANCE COMMENTS:

BRIDGE SCOUR EVALUATION ASSESSMENT



AND DATA SUMMARY REPORT

ASSESSED 11-6-95
BY: MOFFATT + NICHOL
CODE 8
CLASSIFIED LOW RISK
u) GEOTECH CONCURRENCE

SITE IDENTIFICATION:

COUNTY MADISON CITY/TOWN _____ BRIDGE NO. 8
ROUTE NC 251 STREAM IVY RIVER ROAD MILE _____
DUAL BRIDGE NO. _____ IS US/DS
ORIG. PROJECT NO. 9698 YEAR BUILT 1939
REHAB. PROJECT NO. 5.8641 YEAR REHAB. BY BMD
CURRENT ADT 600 YEAR 1995 FUTURE ADT 1000 YEAR 2010

INFORMATION RESOURCES AVAILABLE:

HYDRAULIC STUDY REPORT (DATE) NONE
AS-BUILT CONSTRUCTION PLANS (DATE) MARCH 1937
FOUNDATION REPORT (DATE) NONE
OTHER AGENCY STUDIES (DATE)
(FEMA, CORPS, T.V.A., SCS)
QUAD MAPS (NAME & DATE)
AERIAL PHOTOGRAPHY (DATE)
GAGE DATA (TYPE, NO., DRAINAGE AREA)
DISTANCE TO SITE (UP/DN STREAM)
BRIDGE INSPECTION REPORT (DATE) 6-26-96
UNDERWATER INSPECTION (DATE, CYCLE) NONE 7/95 NOT IN FOLDER
STRUCTURE DATA FILE (DATE) 6-26-96

HYDRAULIC DATA:

DRAINAGE AREA _____ SQ. MI. SOURCE _____
100 YR. WATERWAY OPENING (NORMAL TO FLOW) _____ SQ. FT.

HISTORICAL FLOODS

DATE	ELEV.(FT.)	APPROX. FREQ. (YRS.)	APPROX. DISCH.	ADJUSTED TO SITE

SOURCE _____

FLOOD FREQUENCY (YRS.)

ELEVATION (FT.)

DISCHARGE (CFS)

AVG. VELOCITY (Q/A)

SOURCE: _____

Q _____	Q _____	Q _____	Q _____

COMMENTS: _____

STRUCTURE DATA:

BRIDGE LENGTH 238 FT ✓
 SUFFICIENCY RATING 57.1 ✓
 NO. OF SPANS 5 SPAN LENGTHS 5 @ 47' 6"
 UNDERCLEARANCE (BED TO LOW BEAM) 28 FT EST. REMAINING LIFE (YRS.) 2125 DATE: 6-26-96
 SIMPLE OR CONTINUOUS ? SIMPLE

BENT NO. (W-E), (S-N)
 TYPE REVERSE BRIDGE
 PLANS

SKEW
 FTG. // FOUNDATION TYPE

COLUMN WIDTH

COLUMN // BENT SHAPE

FOOTING THICKNESS

TOP FTG. ELEV. LT.

CTR.

RT.

BOTTOM FTG. ELEV. LT.

CTR.

RT.

TOP SILL ELEV. LT.

CTR.

RT.

BOTTOM SILL ELEV. LT.

CTR.

RT.

CONC. // RIP RAP PROTECTION

PILE TYPE

PILE LENGTHS (AVERAGE)

PILE TIP ELEV. (AVERAGE)

PILE EMBEDMENT

MIN. BEARING CAPACITY

SPREAD FOOTING EMBED.

EMBEDMENT REFERENCE *

COMMENTS: TOP OF RAIL = $1689.5 - .11(16) + 3.83 = 1691.57$

* THALWEG OR NATURAL GROUND

* FTL IS STEEPED, USED HIGHER ELEV.

EB1	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21	B22	B23	B24	B25	B26	B27	B28	B29	B30	B31	B32	B33	B34	B35	B36	B37	B38	B39	B40	B41	B42	B43	B44	B45	B46	B47	B48	B49	B50	B51	B52	B53	B54	B55	B56	B57	B58	B59	B60	B61	B62	B63	B64	B65	B66	B67	B68	B69	B70	B71	B72	B73	B74	B75	B76	B77	B78	B79	B80	B81	B82	B83	B84	B85	B86	B87	B88	B89	B90	B91	B92	B93	B94	B95	B96	B97	B98	B99	B100	B101	B102	B103	B104	B105	B106	B107	B108	B109	B110	B111	B112	B113	B114	B115	B116	B117	B118	B119	B120	B121	B122	B123	B124	B125	B126	B127	B128	B129	B130	B131	B132	B133	B134	B135	B136	B137	B138	B139	B140	B141	B142	B143	B144	B145	B146	B147	B148	B149	B150	B151	B152	B153	B154	B155	B156	B157	B158	B159	B160	B161	B162	B163	B164	B165	B166	B167	B168	B169	B170	B171	B172	B173	B174	B175	B176	B177	B178	B179	B180	B181	B182	B183	B184	B185	B186	B187	B188	B189	B190	B191	B192	B193	B194	B195	B196	B197	B198	B199	B200	B201	B202	B203	B204	B205	B206	B207	B208	B209	B210	B211	B212	B213	B214	B215	B216	B217	B218	B219	B220	B221	B222	B223	B224	B225	B226	B227	B228	B229	B230	B231	B232	B233	B234	B235	B236	B237	B238	B239	B240	B241	B242	B243	B244	B245	B246	B247	B248	B249	B250	B251	B252	B253	B254	B255	B256	B257	B258	B259	B260	B261	B262	B263	B264	B265	B266	B267	B268	B269	B270	B271	B272	B273	B274	B275	B276	B277	B278	B279	B280	B281	B282	B283	B284	B285	B286	B287	B288	B289	B290	B291	B292	B293	B294	B295	B296	B297	B298	B299	B300	B301	B302	B303	B304	B305	B306	B307	B308	B309	B310	B311	B312	B313	B314	B315	B316	B317	B318	B319	B320	B321	B322	B323	B324	B325	B326	B327	B328	B329	B330	B331	B332	B333	B334	B335	B336	B337	B338	B339	B340	B341	B342	B343	B344	B345	B346	B347	B348	B349	B350	B351	B352	B353	B354	B355	B356	B357	B358	B359	B360	B361	B362	B363	B364	B365	B366	B367	B368	B369	B370	B371	B372	B373	B374	B375	B376	B377	B378	B379	B380	B381	B382	B383	B384	B385	B386	B387	B388	B389	B390	B391	B392	B393	B394	B395	B396	B397	B398	B399	B400	B401	B402	B403	B404	B405	B406	B407	B408	B409	B410	B411	B412	B413	B414	B415	B416	B417	B418	B419	B420	B421	B422	B423	B424	B425	B426	B427	B428	B429	B430	B431	B432	B433	B434	B435	B436	B437	B438	B439	B440	B441	B442	B443	B444	B445	B446	B447	B448	B449	B450	B451	B452	B453	B454	B455	B456	B457	B458	B459	B460	B461	B462	B463	B464	B465	B466	B467	B468	B469	B470	B471	B472	B473	B474	B475	B476	B477	B478	B479	B480	B481	B482	B483	B484	B485	B486	B487	B488	B489	B490	B491	B492	B493	B494	B495	B496	B497	B498	B499	B500	B501	B502	B503	B504	B505	B506	B507	B508	B509	B510	B511	B512	B513	B514	B515	B516	B517	B518	B519	B520	B521	B522	B523	B524	B525	B526	B527	B528	B529	B530	B531	B532	B533	B534	B535	B536	B537	B538	B539	B540	B541	B542	B543	B544	B545	B546	B547	B548	B549	B550	B551	B552	B553	B554	B555	B556	B557	B558	B559	B560	B561	B562	B563	B564	B565	B566	B567	B568	B569	B570	B571	B572	B573	B574	B575	B576	B577	B578	B579	B580	B581	B582	B583	B584	B585	B586	B587	B588	B589	B590	B591	B592	B593	B594	B595	B596	B597	B598	B599	B600	B601	B602	B603	B604	B605	B606	B607	B608	B609	B610	B611	B612	B613	B614	B615	B616	B617	B618	B619	B620	B621	B622	B623	B624	B625	B626	B627	B628	B629	B630	B631	B632	B633	B634	B635	B636	B637	B638	B639	B640	B641	B642	B643	B644	B645	B646	B647	B648	B649	B650	B651	B652	B653	B654	B655	B656	B657	B658	B659	B660	B661	B662	B663	B664	B665	B666	B667	B668	B669	B670	B671	B672	B673	B674	B675	B676	B677	B678	B679	B680	B681	B682	B683	B684	B685	B686	B687	B688	B689	B690	B691	B692	B693	B694	B695	B696	B697	B698	B699	B700	B701	B702	B703	B704	B705	B706	B707	B708	B709	B710	B711	B712	B713	B714	B715	B716	B717	B718	B719	B720	B721	B722	B723	B724	B725	B726	B727	B728	B729	B730	B731	B732	B733	B734	B735	B736	B737	B738	B739	B740	B741	B742	B743	B744	B745	B746	B747	B748	B749	B750	B751	B752	B753	B754	B755	B756	B757	B758	B759	B760	B761	B762	B763	B764	B765	B766	B767	B768	B769	B770	B771	B772	B773	B774	B775	B776	B777	B778	B779	B780	B781	B782	B783	B784	B785	B786	B787	B788	B789	B790	B791	B792	B793	B794	B795	B796	B797	B798	B799	B800	B801	B802	B803	B804	B805	B806	B807	B808	B809	B810	B811	B812	B813	B814	B815	B816	B817	B818	B819	B820	B821	B822	B823	B824	B825	B826	B827	B828	B829	B830	B831	B832	B833	B834	B835	B836	B837	B838	B839	B840	B841	B842	B843	B844	B845	B846	B847	B848	B849	B850	B851	B852	B853	B854	B855	B856	B857	B858	B859	B860	B861	B862	B863	B864	B865	B866	B867	B868	B869	B870	B871	B872	B873	B874	B875	B876	B877	B878	B879	B880	B881	B882	B883	B884	B885	B886	B887	B888	B889	B890	B891	B892	B893	B894	B895	B896	B897	B898	B899	B900	B901	B902	B903	B904	B905	B906	B907	B908	B909	B910	B911	B912	B913	B914	B915	B916	B917	B918	B919	B920	B921	B922	B923	B924	B925	B926	B927	B928	B929	B930	B931	B932	B933	B934	B935	B936	B937	B938	B939	B940	B941	B942	B943	B944	B945	B946	B947	B948	B949	B950	B951	B952	B953	B954	B955	B956	B957	B958	B959	B960	B961	B962	B963	B964	B965	B966	B967	B968	B969	B970	B971	B972	B973	B974	B975	B976	B977	B978	B979	B980	B981	B982	B983	B984	B985	B986	B987	B988	B989	B990	B991	B992	B993	B994	B995	B996	B997	B998	B999	B1000	B1001	B1002	B1003	B1004	B1005	B1006	B1007	B1008	B1009	B1010	B1011	B1012	B1013	B1014	B1015	B1016	B1017	B1018	B1019	B1020	B1021	B1022	B1023	B1024	B1025	B1026	B1027	B1028	B1029	B1030	B1031	B1032	B1033	B1034	B1035	B1036	B1037	B1038	B1039	B1040	B1041	B1042	B1043	B1044	B1045	B1046	B1047	B1048	B1049	B1050	B1051	B1052	B1053	B1054	B1055	B1056	B1057	B1058	B1059	B1060	B1061	B1062	B1063	B1064	B1065	B1066	B1067	B1068	B1069	B1070	B1071	B1072	B1073	B1074	B1075	B1076	B1077	B1078	B1079	B1080	B1081	B1082	B1083	B1084	B1085	B1086	B1087	B1088	B1089	B1090	B1091	B1092	B1093	B1094	B1095	B1096	B1097	B1098	B1099	B1100	B1101	B1102	B1103	B1104	B1105	B1106	B1107	B1108	B1109	B1110	B1111	B1112	B1113	B1114	B1115	B1116	B1117	B1118	B1119	B1120	B1121	B1122	B1123	B1124	B1125	B1126	B1127	B1128	B1129	B1130	B1131	B1132	B1133	B1134	B1135	B1136	B1137	B1138	B1139	B1140	B1141	B1142	B1143	B1144	B1145	B1146	B1147	B1148	B1149	B1150	B1151	B1152	B1153	B1154	B1155	B1156	B1157	B1158	B1159	B1160	B1161	B1162	B1163	B1164	B1165	B1166	B1167	B1168	B1169	B1170	B1171	B1172	B1173	B1174	B1175	B1176	B1177	B1178	B1179	B1180	B1181	B1182	B1183	B1184	B1185	B1186	B1187	B1188	B1189	B1190	B1191	B1192	B1193	B1194	B1195	B1196	B1197	B1198	B1199	B1200	B1201	B1202	B1203	B1204	B1205	B1206	B1207	B1208	B1209	B1210	B1211	B1212	B1213	B1214	B1215	B1216	B1217	B1218	B1219	B1220	B1221	B1222	B1223	B1224	B1225	B1226	B1227	B1228	B1229	B1230	B1231	B1232	B1233	B1234	B1235	B1236	B1237	B1238	B1239	B1240	B1241	B1242	B1243	B1244	B1245	B1246	B1247	B1248	B1249	B1250	B1251	B1252	B1253	B1254	B1255	B1256	B1257	B1258	B1259	B1260	B1261	B1262	B1263	B1264	B1265	B1266	B1267	B1268	B1269	B1270	B1271	B1272	B1273	B1274	B1275	B1276	B1277	B1278	B1279	B1280	B1281	B1282	B1283	B1284	B1285	B1286	B1287	B1288	B1289	B1290	B1291	B1292	B1293	B1294	B1295	B1296	B1297	B1298	B1299	B1300	B1301	B1302	B1303	B1304	B1305	B1306	B1307	B1308	B1309	B1310	B1311	B1312	B1313	B1314	B1315	B1316	B1317	B1318	B1319	B1320	B1321	B1322	B1323	B1324	B1325	B1326	B1327	B1328	B1329	B1330	B1331	B1332	B1333	B1334	B1335	B1336	B1337	B1338	B1339	B1340	B1341	B1342	B1343	B1344	B1345	B1346	B1347	B1348	B1349	B1350	B1351	B1352	B1353	B1354	B1355	B1356	B1357	B1358	B1359	B1360	B1361	B1362	B1363	B1364	B1365	B1366	B1367	B1368	B1369	B1370	B1371	B1372	B1373	B1374	B1375	B1376	B1377	B1378	B1379	B1380	B1381	B1382	B1383	B1384	B1385	B1386	B1387	B1388	B1389	B1390	B1391	B1392	B1393	B1394	B1395	B1396	B1397	B1398	B1399	B1400	B1401	B1402	B1403	B1404	B1405	B1406	B1407	B1408	B1409	B1410	B1411	B1412	B1413	B1414	B1415	B1416	B1417	B1418	B1419	B1420	B1421	B1422	B1423	B1424	B1425	B1426	B1427	B1428	B1429	B1430	B1431	B1432	B1433	B1434	B1435	B1436	B1437	B1438	B1439	B1440	B1441	B1442	B1443	B1444	B1445	B1446	B1447	B1448	B1449	B1450	B1451	B1452	B1453	B1454	B1455	B1456	B1457	B1458	B1459	B1460	B1461	B1462	B1463	B1464	B1465	B1466	B1467	B1468	B1469	B1470	B1471	B1472
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ASSESSMENT

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- 1) PIER AND/OR ABUTMENT SPREAD FOOTINGS WITHIN POTENTIAL CHANNEL SCOUR AREA ARE INDICATED ON THE PLANS TO BE ON SCOUR RESISTANT MATERIAL. THIS FINDING HAS BEEN REVIEWED AND CONCURRED WITH BY _____ YES
(GEOTECHNICAL UNIT.)
- 2) DO THE PILE BENTS OR PILE FOOTINGS (IN THE PIEDMONT AND MOUNTAIN PROVINCE) WITHIN THE POTENTIAL CHANNEL SCOUR AREA, HAVE PILES THAT PENETRATE 20 OR MORE FEET BELOW THE STREAM BED ? N/A
- 3) DO THE PILE BENTS OR PILE FOOTINGS (IN THE COASTAL PLAIN) WITHIN THE POTENTIAL CHANNEL SCOUR AREA, HAVE PILES THAT PENETRATATE 30 OR MORE FEET BELOW THE STREAM BED ? N/A
- 4) ARE ALL PIERS AND ABUTMENTS OUTSIDE THE NORMAL CHANNEL SECTION ? No
- 5) HAS THE CROSSING EXPERIENCED A FLOOD OF 50 OR MORE YEARS ESTIMATED MAGNITUDE WITH NO REPORTED OR INDICATED SCOUR PROBLEM ? _____
- 6) ARE THE BOTTOMS OF THE CHANNEL PIER SPREAD FOOTINGS MORE THAN 7 FEET BELOW BED ? No
- 7) IS THE AVERAGE VELOCITY IN BRIDGE OPENING (SIMPLE ANALYSIS $V=Q/A$) FOR THE ESTIMATED 100 YR. EVENT LESS THAN 4 FT./SEC ? _____
- 8) IS THE APPROACH ROADWAY OR BRIDGE OVERTOPPED DURING MINOR FLOODS (≤ 10 YR.) REQUIRING CLOSURE AND INSPECTION BEFORE REOPENING ? _____

THIS STRUCTURE MEETS CRITERIA DESCRIBED IN WHICH OF THE ABOVE LISTED ITEMS FOR CLASSIFICATION AS A LOW RISK STRUCTURE? 1

BASED ON AN EVALUATION OF THE AVAILABLE DATA AND REPORTS THE CLASSIFICATION OF THIS STRUCTURE AS LOW RISK FOR THE REASON(S) LISTED ABOVE APPEARS REASONABLE AND PRUDENT. YES

COMMENTS: _____

DECISION:

CLASSIFIED AS: SCOUR CRITICAL
 UNKNOWN FOUNDATION
 LOW RISK

 _____ ✓

RECOMMENDED SCOUR CODE 8 w/ GEOTECH CONCURRENCE

ASSESSMENT COMMENTS: NOTE ON PLANS CALLS FOR FOOTINGS TO
BE CARRIED AT LEAST 6" INTO ROCK. EXTRA CONCRETE WAS
PLACED AT ALL FOOTINGS AND BENT 2 FOOTING ELEV WAS
REVISED. IT SHOULD BE NOTED THAT THE THALWEG ELEV LOCATED
AT THE U/S END OF B-2 IS AT OR A LITTLE BELOW
THE U/S FOOTING ELEVATION. (1660.24 - 2.1 = 1658.1 VS 1658.4)
THE CHANNEL APPEARS FAIRLY STABLE SINCE CONST IN 1957. BRIDGE
ONLY HAS AN ESTIMATED LIFE OF 2 YRS. IT COULD BE SCHEDULED
FOR REPLACEMENT. NEED TO REVIEW UWI

SCHEDULE FOR DETAILED STUDY

SCHEDULE FOR FURTHER IN-HOUSE STUDY

ASSESSED BY: BRYAN FOX

APPROVED BY: P. FISHER

FIRM: MOFFATT + NICHOL

DATE: 4/9/97

DATE: 6 NOVEMBER 1996

CHECKED BY: BYRD

FIRM: KHA

DATE: 2/13/97

FINAL COMMENTS :

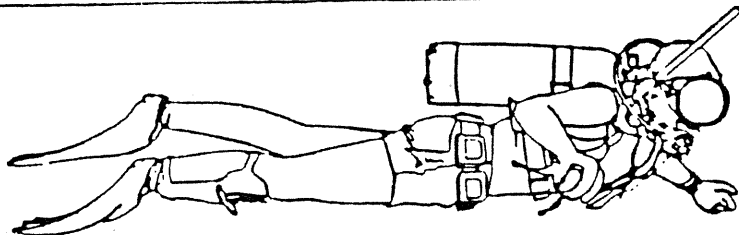
4/9/97: GEOTECH CONSIDERS THESE FOOTINGS TO BE LOW RISK.

TYPE INSPECTION Routine

NSP. BY M. S. CALLIS REVIEWED BY E. Wilber

TYPE WORK PERFORMED

MH (FOR SPEC. WORK ONLY)



EQUIPMENT USED: ☐ SCUBA ☐ DRY SUIT ☐ BOAT ☐ COMMUNICATION ☐ LIGHTS ☐ ROPE
☐ SURFACE SUPPLY ☒ WET SUIT SYSTEM
☐ UNDERWATER PHOTOGRAPHS TAKEN ☐ CONSTRUCTION EQUIP. _____

[illegible]

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
& HIGHWAY SAFETY

BRIDGE MAINTENANCE UNIT
BRIDGE INSPECTION SECT.

FIELD INSPECTION REPORT

BRIDGE INSPECTION & ANALYSIS

BRIDGE No. 8

ROUTE N.C. 251

COUNTY Madison

Team Leader: M.S. Callis

Date 7-18-95

Assisted By: T. Tolley, J. Bogue

Item No.

36 b.

Conc. Columns (6) All conc. columns are in fair condition with $\pm \frac{1}{2}$ " coarse agg. exposed, with random $\frac{1}{4}$ " cracks present throughout.

36 e.

Conc. Footings (6) Footing at BT#2 is in fair condition with $\pm \frac{1}{2}$ " coarse agg. exposed, with vertical exposures noted on sheet #4.

41.

Drift (8) Good; no drift.

45 A.

Waterway (8) Good.

45 b.

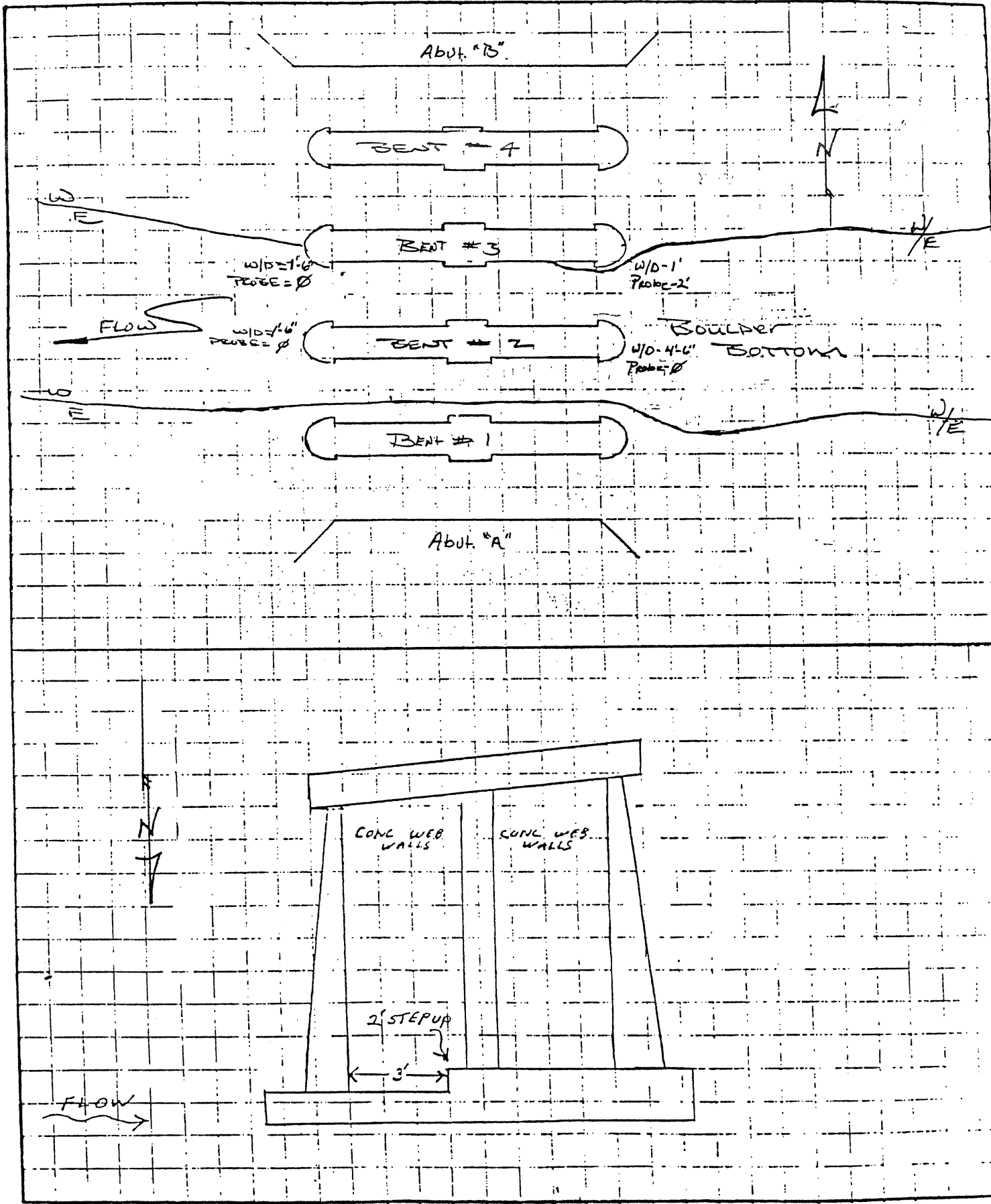
Alignment (8) Good.

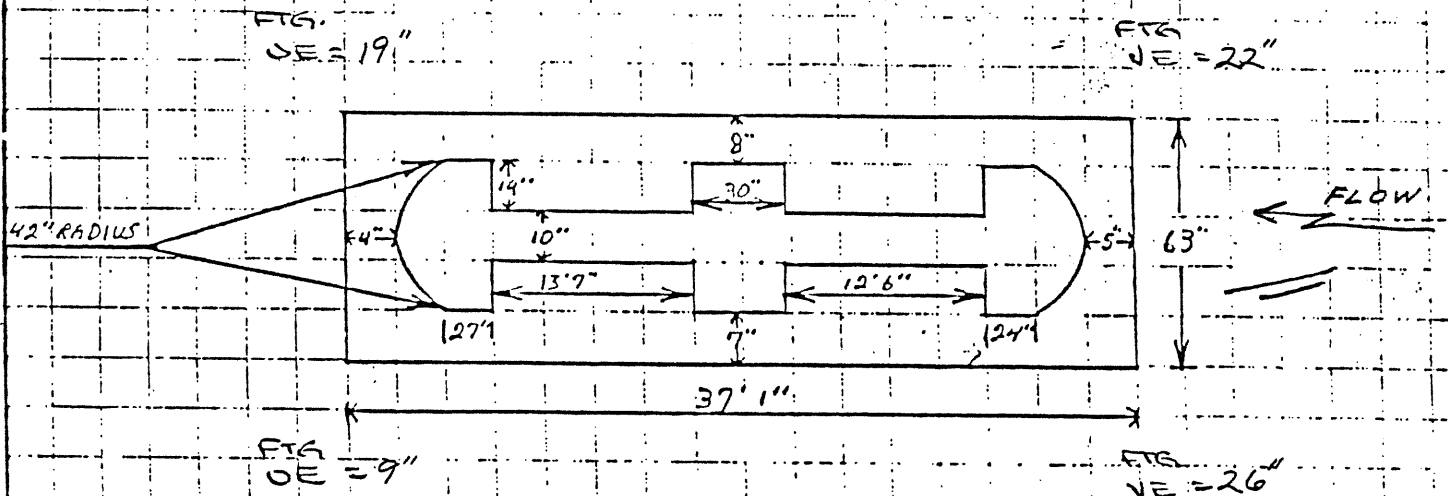
45 c.

Scour (7) Minor channel scour was noted on upstream end of BT#2 $\approx 2'$ below natural bottom.

DIVISION OF HIGHWAYS
HIGHWAY BUILDING
P. O. BOX 25201
RALEIGH, NORTH CAROLINA 27611

PREPARED BY W. J. J. DATE 6/18/81 STATION N.C. 251
CHECKED BY PI DATE 7-18-95 STR NO. _____ SHEET _____ OF _____

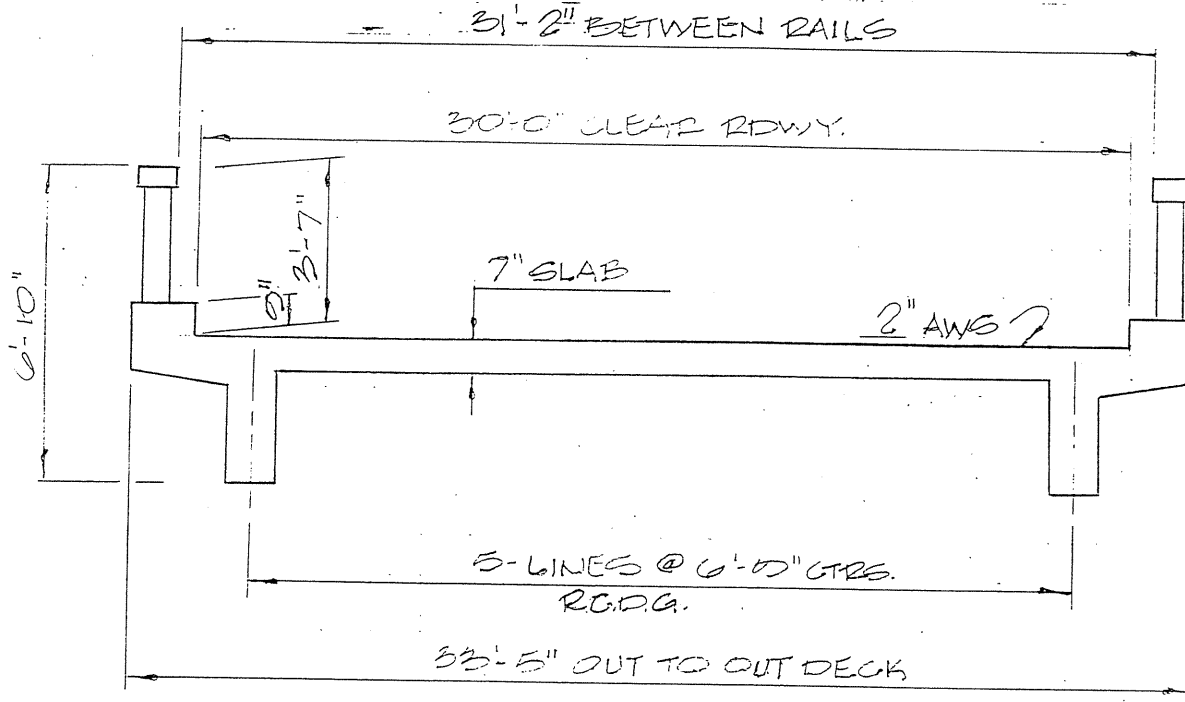




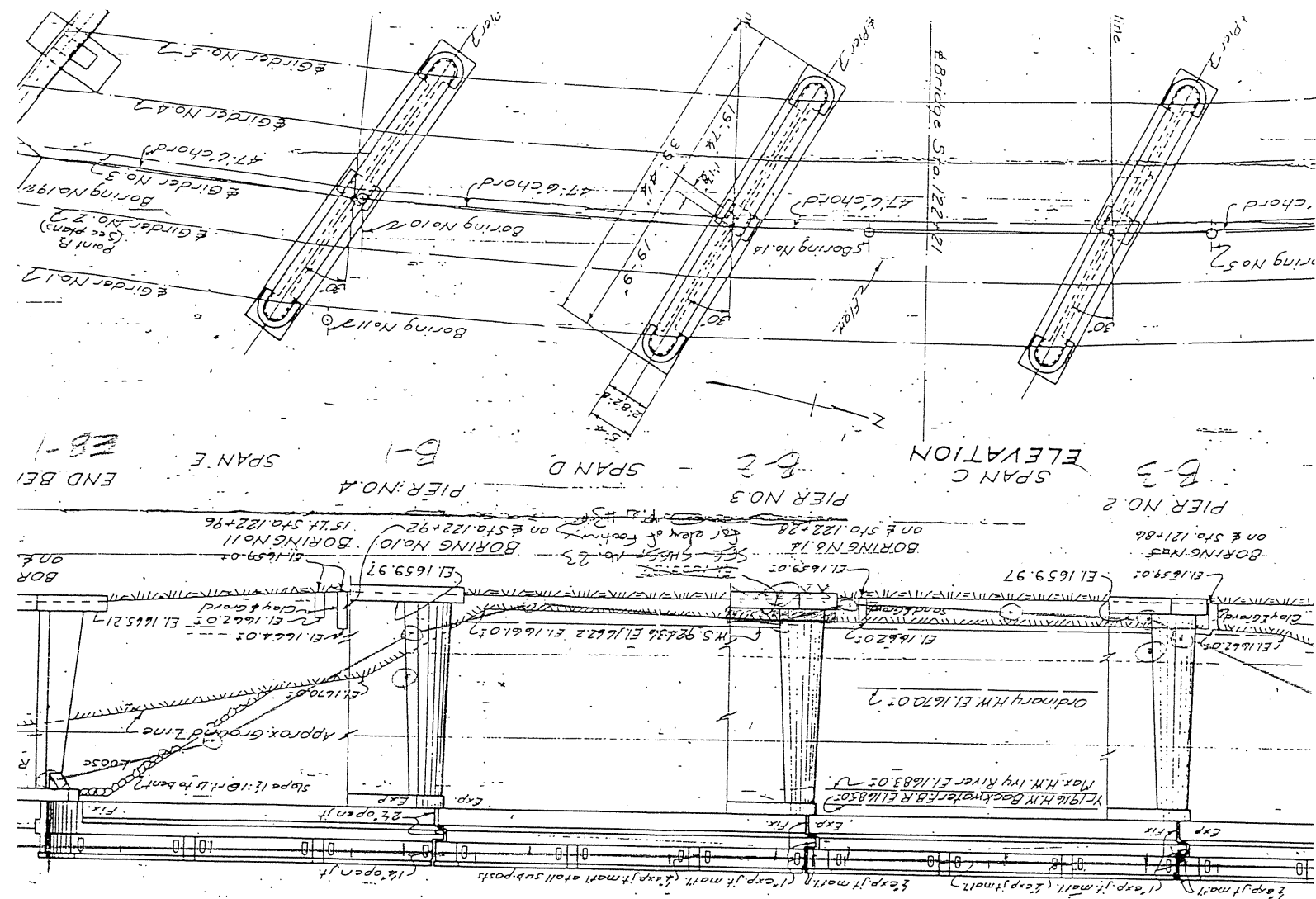
STRUCTURE DATA WORKSHEET

BR. # 8

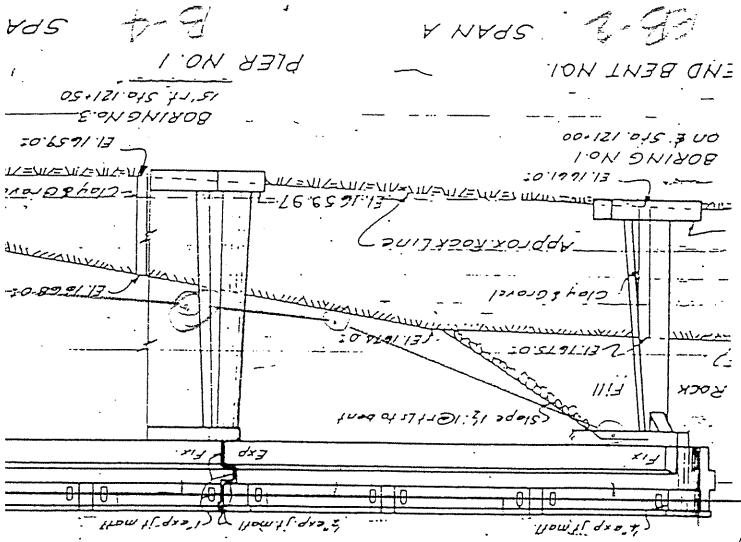
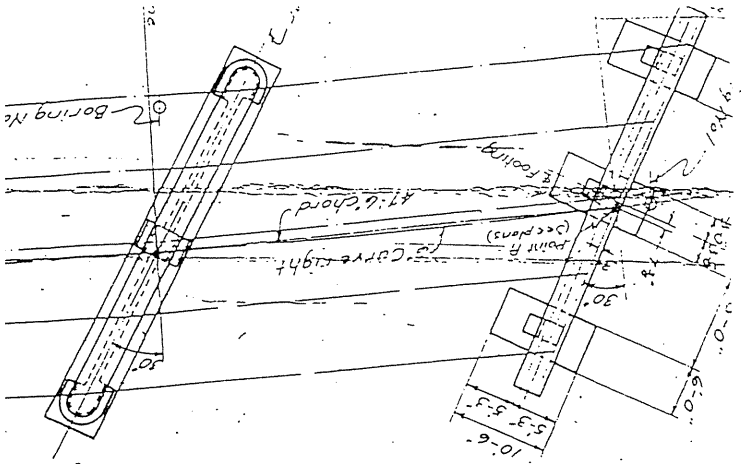
MADISON CG.

6-26-96
RWSTYPICAL SECTION DECK

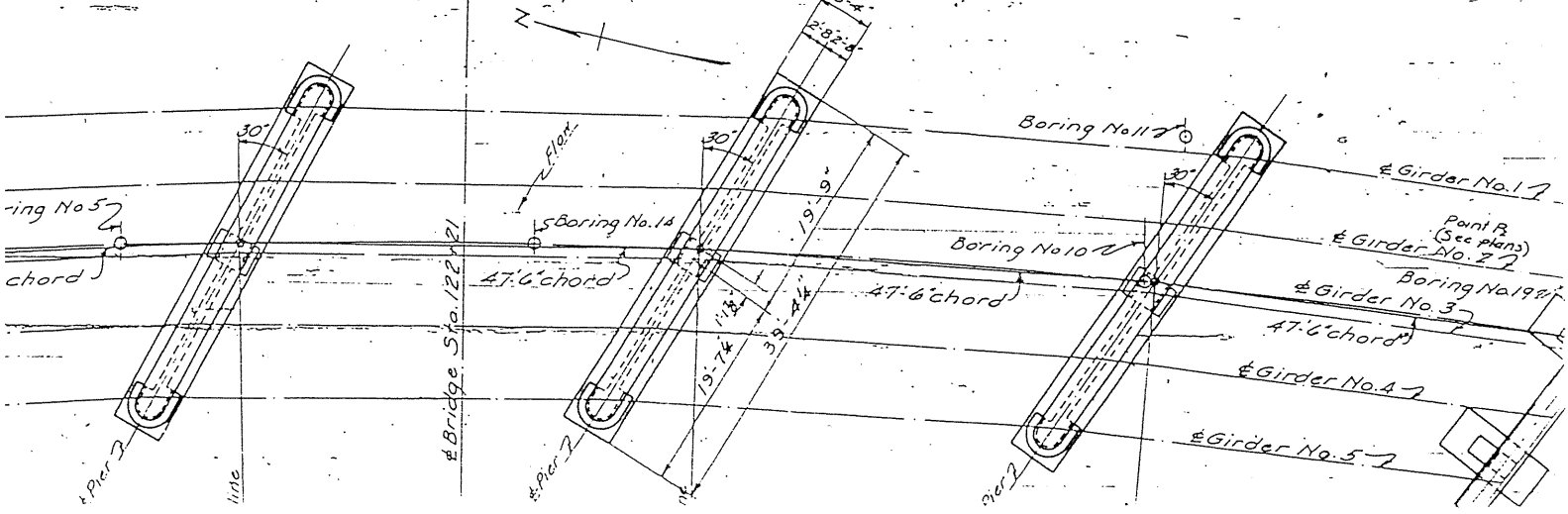
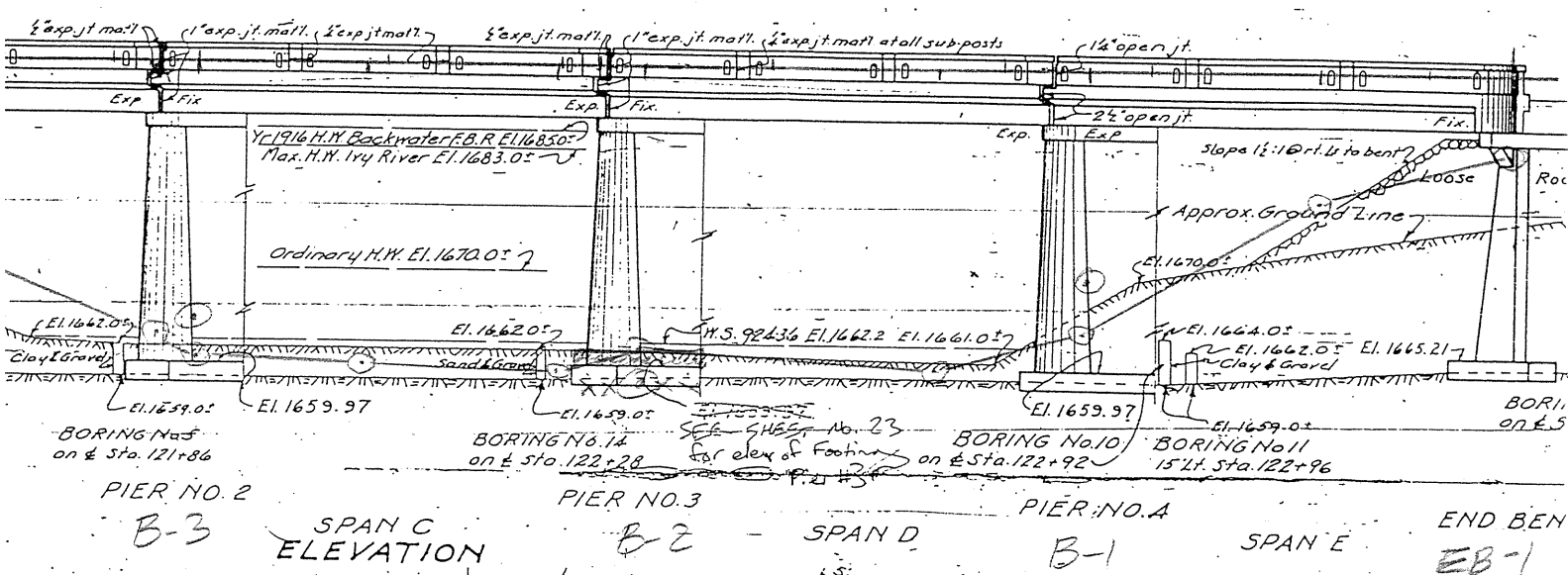
E # 251074



Note: All fills adjacent to and around End Bents below Elevation 1686.0± to be made of loose rock.

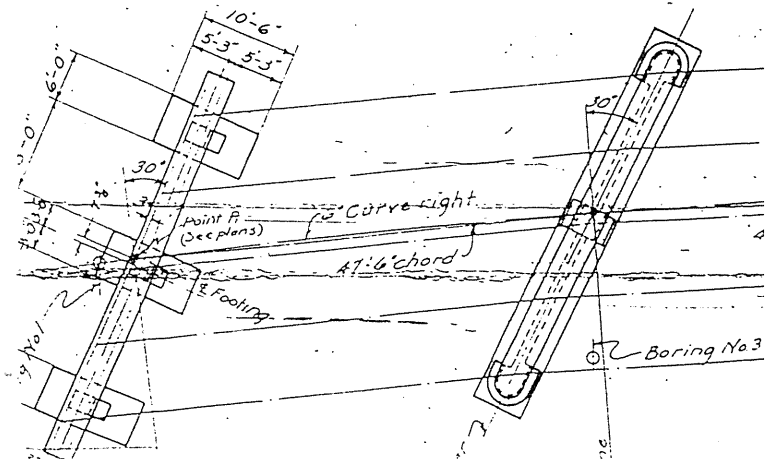
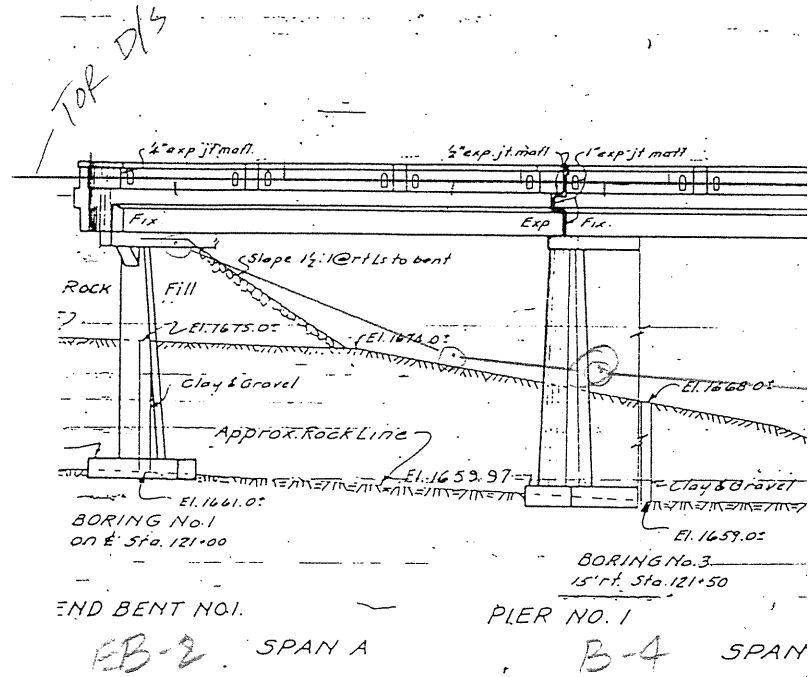


Note: All fills adjacent to and around End Bents below Elevation 1686.05 to be made of loose rock.



MADISON # 8

(2 of 2)

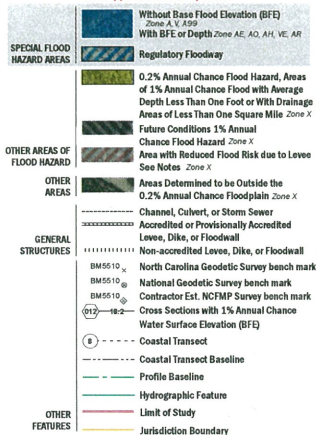




This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long-term approach to floodplain management to decrease the risk associated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

FLOOD HAZARD INFORMATION

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



NOTES TO USERS

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

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

For accuracy and consistency map data refers to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6020.

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

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

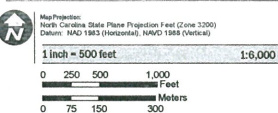
PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent annual-chance level) and Emergency Action Plan, on the levee system) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodplain management measures. For more information on flood insurance, interested parties should visit the FEMA Website at <http://www.fema.gov/floodinsurance>.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LIMWA). The LIMWA represents the approximate landward limit of the 1-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE zones are not identified) will be similar to, but less severe than those in the VE Zone.

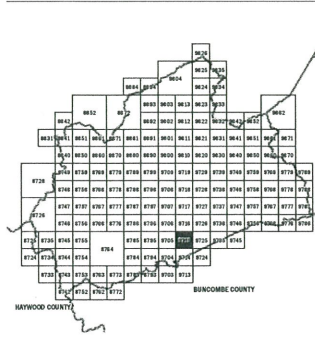
COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE
This map may include approximate boundaries of a CBRS for informational purposes only. Flood insurance is not indicated on the map. For more information see <http://www.fema.gov/floodinsurance> (Technical Support Data Notebook), or call 1-800-638-6020. The FEMA Map Service Center at 1-800-544-6020.

CBRS Area **Otherwise Protected Area**

SCALE



PANEL LOCATOR



FEDERAL EMERGENCY MANAGEMENT AGENCY

National Flood Insurance Program

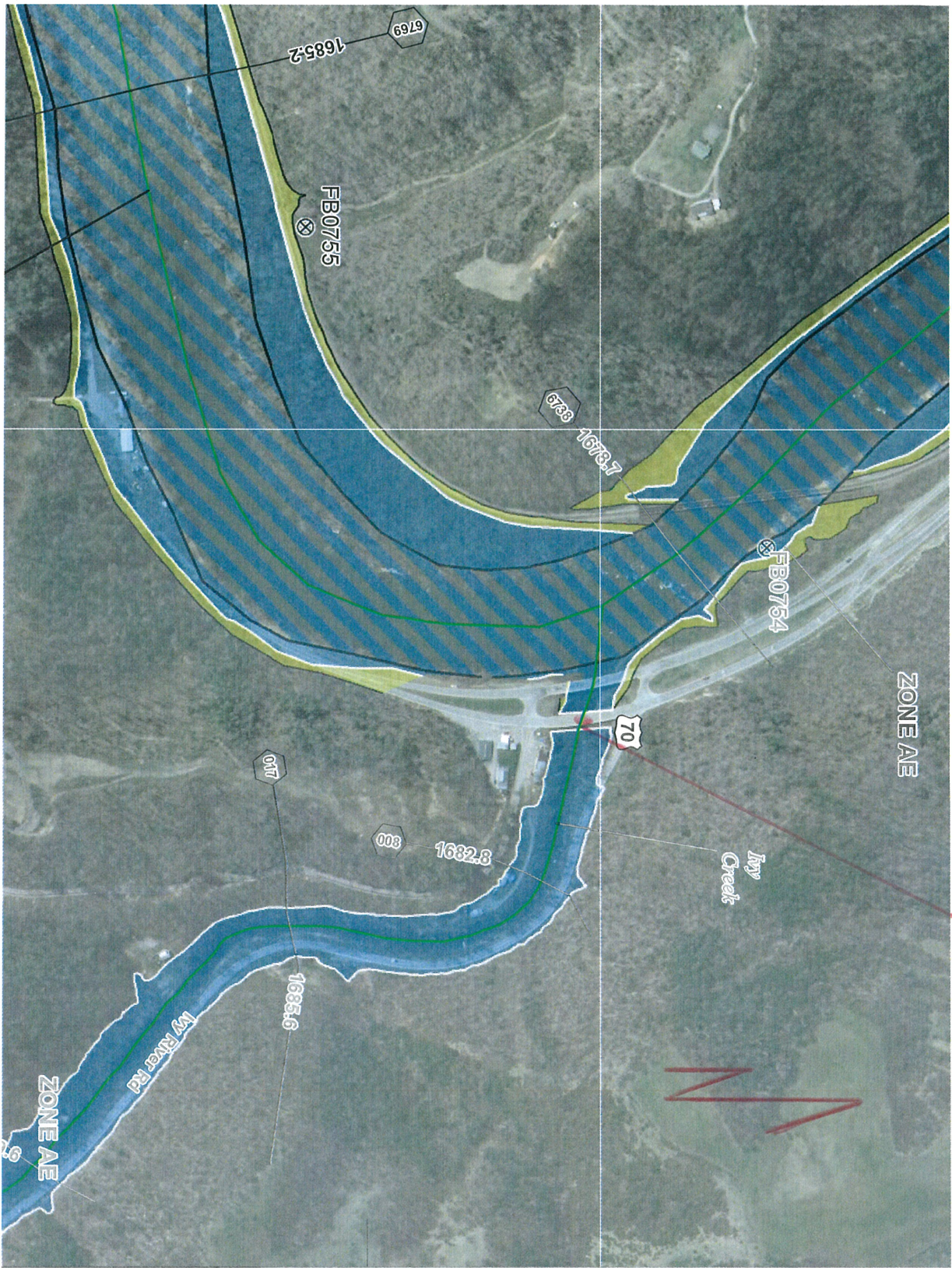
NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
NORTH CAROLINA
PANEL 9715

Panel Contains:
COMMUNITY
MADISON COUNTY
MARSHALL TOWN OF

CID PANEL SUFFIX
370152 9715
370154 9715

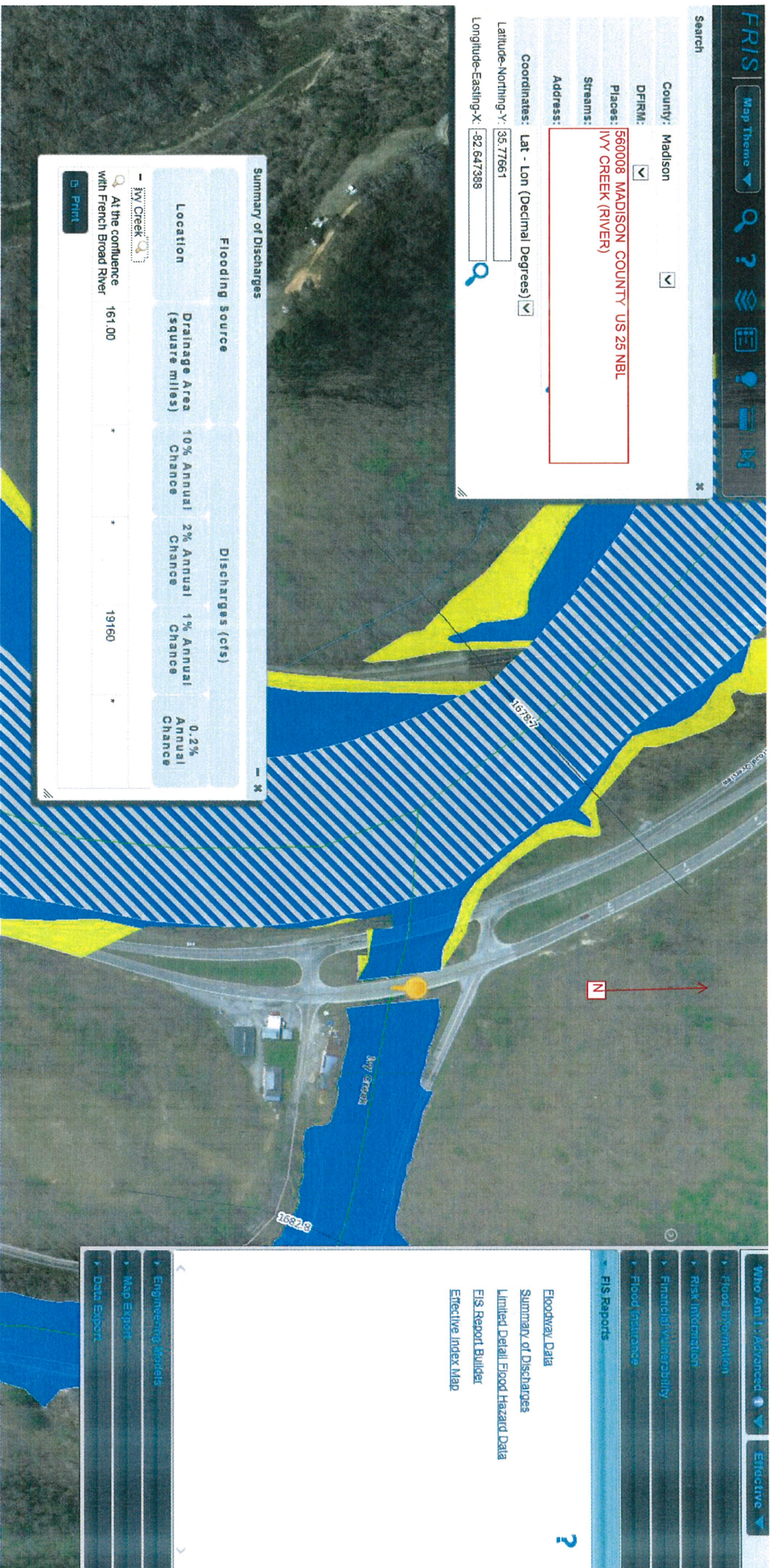
6/2/09

MAP NUMBER
37009715001
MAP REVISED
6/2/2009



35°46'30"N

560008



Ivy Creek Limited Detail Study Plan: Floodway Run 9/21/2007
RS = 354 BR Ids_ivy_crk87.0Structure ID: Bridge BApproximate Survey Struct

