

Memo to file

February 11, 2015

From: Casey Pecoraro  
Inventory Registrar

Re: WO-491

SHA Bridge No. 2300502, carrying U.S. 13 Southbound over Wagram Creek in Worcester County, was originally entered into the Maryland Inventory of Historic Properties as Bridge No. 23005. Older generations of forms on file list the bridge number as 23005. The Addendum prepared in 2013 and the DOE form prepared in 2014 list the bridge number as 2300502, which is the unabbreviated bridge number, per Tim Tamburrino.

**MARYLAND HISTORICAL TRUST  
DETERMINATION OF ELIGIBILITY FORM**

NR Eligible: yes \_\_\_\_\_  
no

Property Name: SHA Bridge No. 2300502, US 13 Southbound over Wagr Inventory Number: WO-491

Address: US 13 Southbound over Wagram Creek, south of Pocomoke City Historic district: \_\_\_\_\_ yes  no

City: Pocomoke City, MD Zip Code: \_\_\_\_\_ County: Worcester

USGS Quadrangle(s): \_\_\_\_\_

Property Owner: MD SHA Tax Account ID Number: \_\_\_\_\_

Tax Map Parcel Number(s): \_\_\_\_\_ Tax Map Number: \_\_\_\_\_

Project: Replacment of Bents on SHA Bridge No. 2300502 Agency: FHWA/SHA

Agency Prepared By: MD SHA

Preparer's Name: Anne E. Bruder Architectural Historian Date Prepared: 09/19/2013

Documentation is presented in: Project Review and Compliance Files

Preparer's Eligibility Recommendation: \_\_\_\_\_ Eligibility recommended  Eligibility not recommended

Criteria:  A  B  C  D Considerations:  A  B  C  D  E  F  G

*Complete if the property is a contributing or non-contributing resource to a NR district/property:*

Name of the District/Property: \_\_\_\_\_

Inventory Number: \_\_\_\_\_ Eligible: \_\_\_\_\_ yes Listed: \_\_\_\_\_ yes

Site visit by MHT Staff  yes  no Name: \_\_\_\_\_ Date: \_\_\_\_\_

Description of Property and Justification: *(Please attach map and photo)*

SHA Bridge No. 2300502, US 13 Southbound over Wagram Creek near Pocomoke City, Maryland was determined eligible for inclusion in the National Register of Historic Places (NRHP) by SHA in February 2001, and MHT concurred with that determination on April 3, 2001 since the bridge is an example of a composite timber and concrete bridge with a concrete superstructure and wood substructure. The Maryland State Roads Commission constructed such bridges for about ten years between 1937 and 1947, and there are other local examples included in the Historic Highway Bridge Inventory. Most of SHA's composite concrete and timber bridges have been replaced or are not eligible due to loss of historic fabric, most typically the wooden pier bents which are subject to rotting and insect infestation.

In 2009 the substructure of SHA Bridge No. 2300502 was in need of repairs due to rotting and insect infestation. However, while making repairs SHA determined that the substructure was structurally unsound and recommended that the wooden bents be replaced with steel. In Spring 2013, SHA replaced a number of the wood pier bents with steel bents and left steel jackets covering all of the piers.

As a result of this work, Bridge No. 2300502 has lost integrity of design, materials, and workmanship, and no longer meets the requirements for NRHP Criterion C, Engineering and Design. Additional investigations did not identify events or persons of local,

**MARYLAND HISTORICAL TRUST REVIEW**

Eligibility recommended \_\_\_\_\_ Eligibility not recommended

Criteria:  A  B  C  D Considerations:  A  B  C  D  E  F  G

MHT Comments:

*Jim [Signature]*  
Reviewer, Office of Preservation Services

12/10/2014  
Date

*[Signature]*  
Reviewer, National Register Program

12/12/14  
Date

State or national significance and SHA Bridge No. 2300502 is not eligible for the NRHP under Criteria A or B. NRHP Criterion D was not included as part of this study.

The boundary for the bridge is confined to SHA's right-of-way for US 13 southbound over Wagram Creek and includes the footprint of the bridge.

SHA consulted with MHT regarding the project and both agencies concurred with the Adverse Effect Determination. An Addendum with new photographs and a revised DOE indicating the project's history and impact on the historic bridge have been prepared as part of the mitigation.

**MARYLAND HISTORICAL TRUST REVIEW**

Eligibility recommended

Eligibility not recommended

Criteria:    A    B    C    D    Considerations:    A    B    C    D    E    F    G

MHT Comments:

\_\_\_\_\_  
Reviewer, Office of Preservation Services

\_\_\_\_\_  
Date

\_\_\_\_\_  
Reviewer, National Register Program

\_\_\_\_\_  
Date





WD-491

SNA BRIDGE 220050Z, US 13 OVER  
WAGRAM CREEK

WORCESTER, MD

JENNIFER GOULD.

DECEMBER 27, 2010

VND SHED  
LOOKING SOUTHWEST FROM NORTH  
AT EAST FACET (INTROWG)

VS



W0-491

SHA BEVE No. 2300507

EPSON

Worcester, MD

JENNIFER GOULD

12/27/10 MD SHAPO

LOOKING EAST FROM NORTH SHORE

AT WEST PARKET & FILINGS

IN 2010

2/5

Epson Professional Paper

E



W0-491

SNA BRIDGE, No. 2500502

WORCESTER Co, MA

JANIFER GOLD,

12/22/10 MID SAFO

LOOKING FROM SOUTH WEST TO  
NORTHEAST - CURVA RECTA END  
OF PARAPET

3/5



W0-491

Epson  
Professional Paper

SAN BRIDGE No. 2300502

WORCESTER Co MD.

JENNIFER GOULD

12/27/13

IND SAFO

LOOKING NORTHWEST FROM  
SOUTHWEST

4/5

EPSON

Epson  
Professional Paper



WO-491

SANABRIDGE 230550Z

WORCESTER Co, MD.

JENNIFER GOULD.

12/27/2010

MD S/WFO

LOOKING SOUTHWEST FROM NORTH  
AT ENTIRE BRIDGE, WOODS &  
WAGRAM CREEK

5/5

Epson  
Professional Paper

EPSON





NO-491

SHA BRIDGE NO. 230050Z, US 13 SB  
OVER WARRAM CREEK

WORCESTER COUNTY, MD  
BRIDGE.

7-2-2013 MD SHA

BRIDGE 230050Z LOOKING

NORTHEAST AT DECK & EAST  
FACE.

1/3



WB-497

SNA BRIDGE No. 230030Z, US 13  
SP OVER WAG DAM CREEK

WORCESTER COUNTY, MD

BRIDGE

2-2-13

MID SHPO

WEST FACE OF SUBSTRUCTURE  
LOOKING NORTHEAST.

2/3



W0-4911

SAN BRIDGE No. 2800302, US 13 CR  
OVER WAGGON CREEK

WORCESTER COUNTY, MD  
BRIDGE

7-2-13

IND SAPO.

EAST PARAPET LOOKING SOUTHWEST  
AT SUBSTRUCTURE

3/3

# Addendum to Maryland Historical Trust Maryland Inventory of Historic Properties Form

Inventory No. WO-491

Page 1 of 2

**Name of Property:** SHA Bridge No. 2300502

**Location:** US 13 Southbound over Wagram Creek, Worcester County

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SHA Bridge No. 2300502, US 13 Southbound over Wagram Creek in Worcester County was included in the Maryland Inventory of Historic Properties (MIHP) in 2001 as part of SHA's Historic Highway Bridge Inventory. It was determined eligible for the National Register of Historic Places (NRHP) by SHA in February 2001 based on the information contained in the MIHP Form and the recommendation of the Interagency Historic Highway Bridge Committee, and MHT concurred with that eligibility determination on April 3, 2001. The bridge has two-lanes, with narrow shoulders and a raised safety curb on the west side of the bridge at the bottom of the west parapet. The superstructure is of concrete and the parapets and bridge deck remain as described in the 1998 MIHP form – with an open concrete parapet made up of upright posts joined by two horizontal concrete bars on either side of the two lanes of the deck. The substructure originally consisted of three sets of timber pier bents, made up of 7 timber piles. Steel jackets were installed on the piles in 2009 address rotting and insect damage. Some wood piles were removed and steel piles were installed beneath the bridge in 2013 and this resulted in an adverse impact to the historic bridge. Other wood bents that have not been replaced retain their steel jackets.

The MIHP form states that Bridge No. 2300502 was constructed in response to the need for a more efficient transportation network. However, the Maryland State Roads Commission (SRC) deferred highway improvements during World War II because of the restrictions of materials and manpower. In 1944, the SRC applied to the War Production Board and the Public Roads Administration for assistance with funding and materials to construct twelve projects in the State. US 13 between Pocomoke City and the Virginia State line south of the city was among those projects in need of immediate repairs. This included constructing a new bridge which the 1943/1944 SRC report also indicated was necessary because of the rapid deterioration of the structure. The as-built plans for both the highway and the bridge do not show the location of the original bridge, although Wagram Creek was relocated to a single channel passing beneath the new bridge.<sup>1</sup> Given the material and manpower shortages, the composite timber and concrete bridge was a satisfactory choice for this location. The bridge was completed in 1945, and was the last of the timber-and-concrete-composite bridges built on State highways between 1937 and 1945.

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<sup>1</sup> Maryland State Roads Commission, *Report of the State Roads Commission, Operating Report for the Fiscal Years 1943-1944*, Baltimore, MD: State Roads Commission, 1945, p. 4, 49; *Report of the State Roads Commission, Operating Report for the Fiscal Years 1945-1946*, Baltimore, MD: State Roads Commission, 1947, p. 59-60

**Addendum to  
Maryland Historical Trust  
Maryland Inventory of  
Historic Properties Form**

Inventory No. WO-491

Page 2 of 2

**Name of Property: SHA Bridge No. 2300502**

**Location: US 13 Southbound over Wagram Creek, Worcester County**

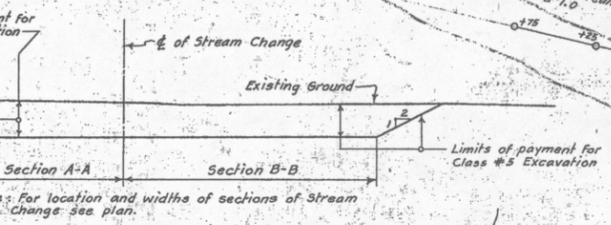
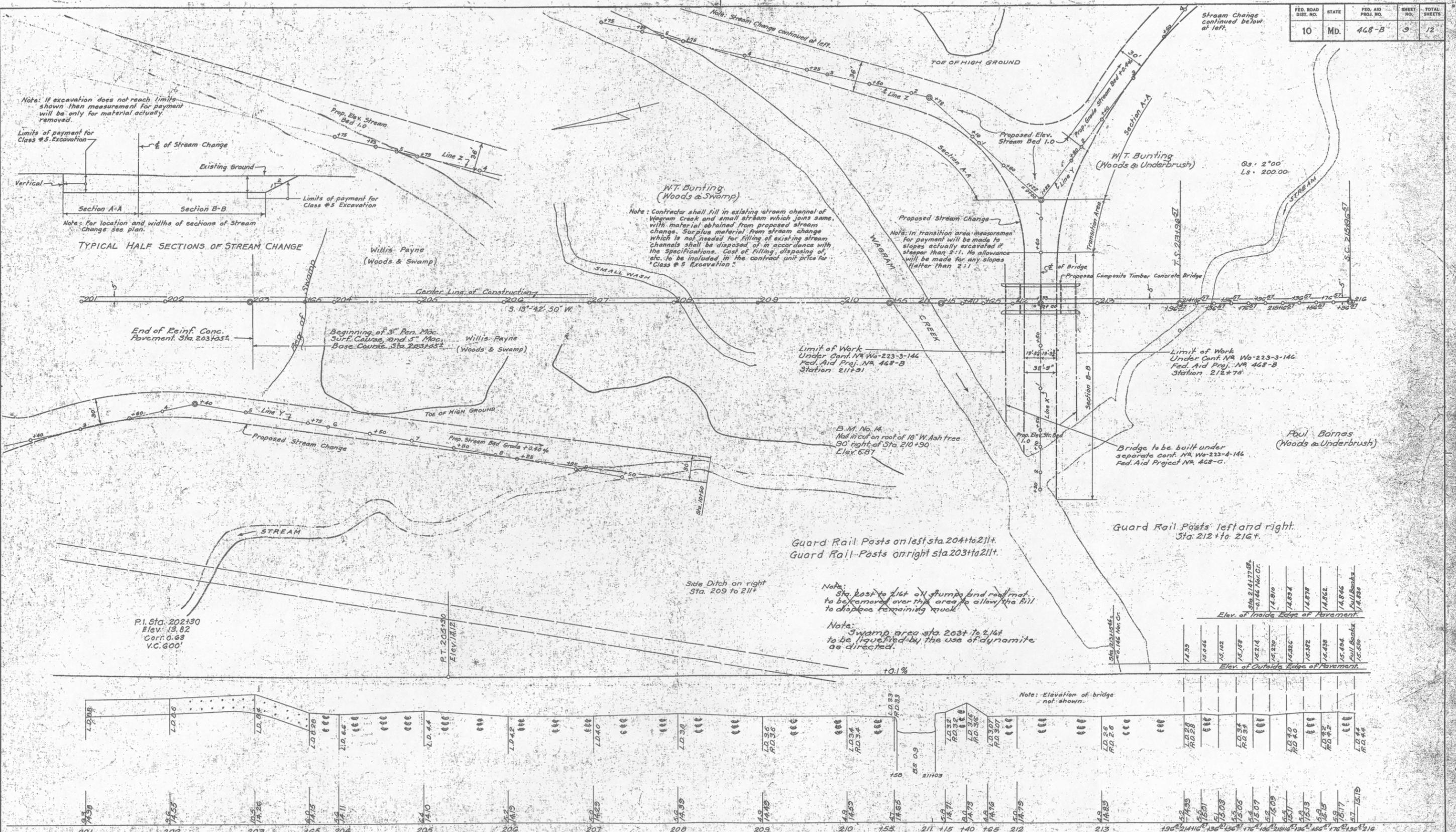
Sources Consulted:

Maryland State Roads Commission, *Report of the State Roads Commission, Operating Report for the Fiscal Years 1943-1944*, Baltimore, MD: State Roads Commission, 1945, p. 4, 49;

\_\_\_\_\_, *Report of the State Roads Commission, Operating Report for the Fiscal Years 1945-1946*, Baltimore, MD: State Roads Commission, 1947, p. 59-60

Williams, Carroll E., "Deferred Public Works May Be Post-War Boon," *The Baltimore Sun*, June 30, 1943, P. 17

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10	MD.	468-B	9	12



TYPICAL HALF SECTIONS OF STREAM CHANGE

End of Rein. Conc. Pavement Sta. 203+35+

Beginning of 3" Rein. Mac. Surf Course, 4" Mac. Base Course Sta. 203+35+

Limit of Work Under Cont. No. W0-223-3-146 Fed. Aid Proj. No. 468-B Station 211+91

Limit of Work Under Cont. No. W0-223-3-146 Fed. Aid Proj. No. 468-B Station 212+75

Guard Rail Posts on left sta. 204+ to 211+.

Guard Rail Posts on right sta. 203+ to 211+.

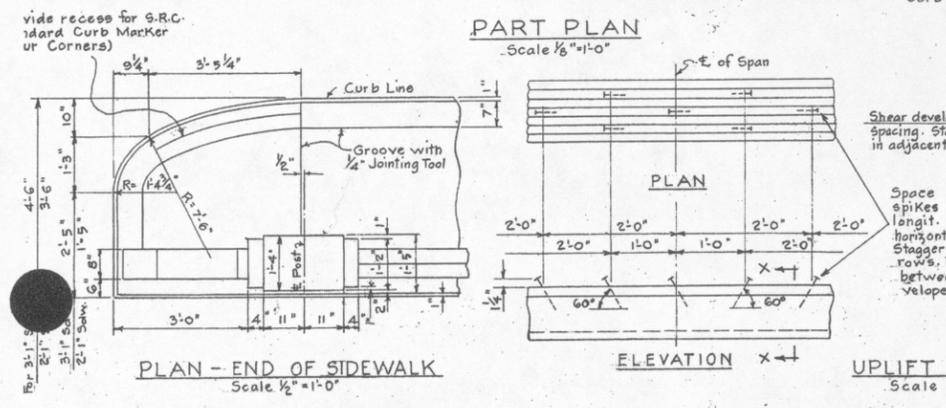
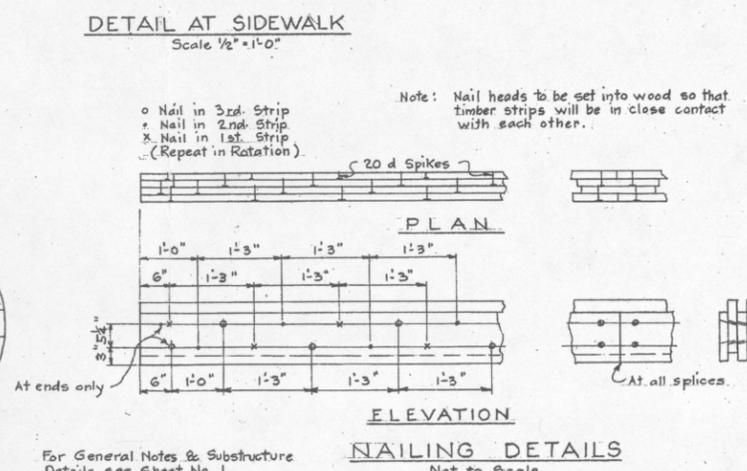
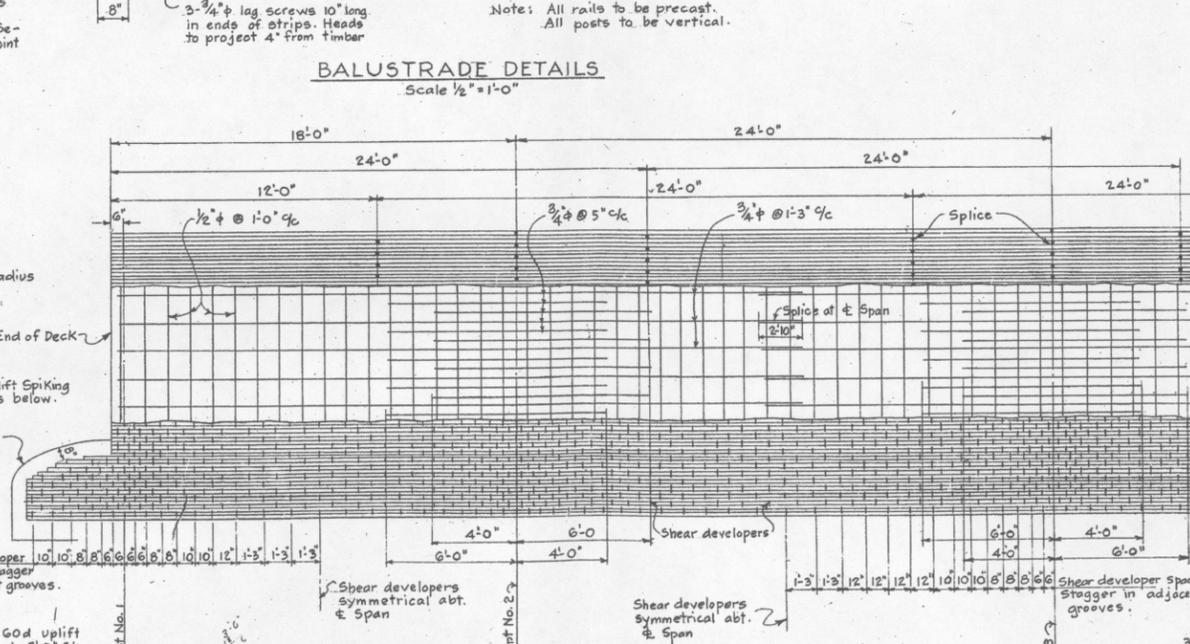
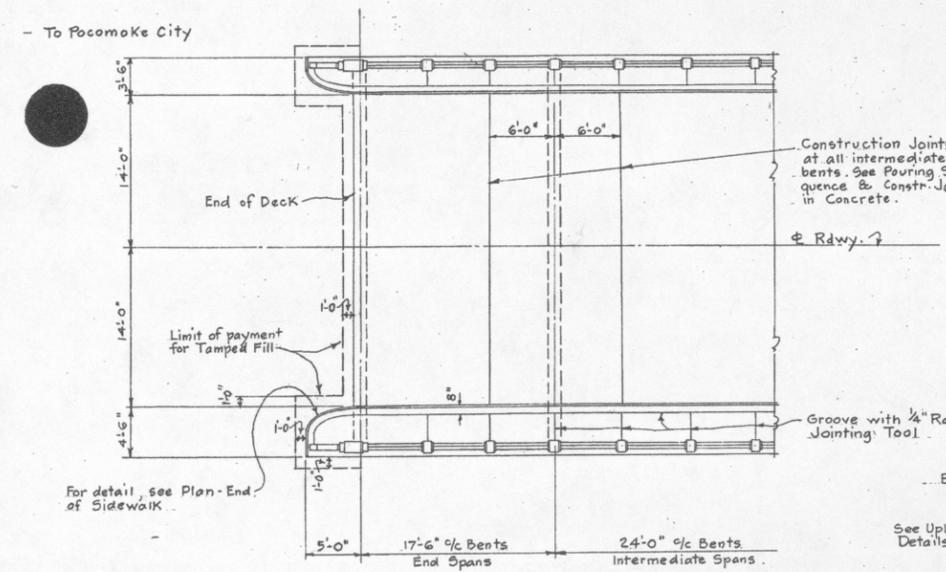
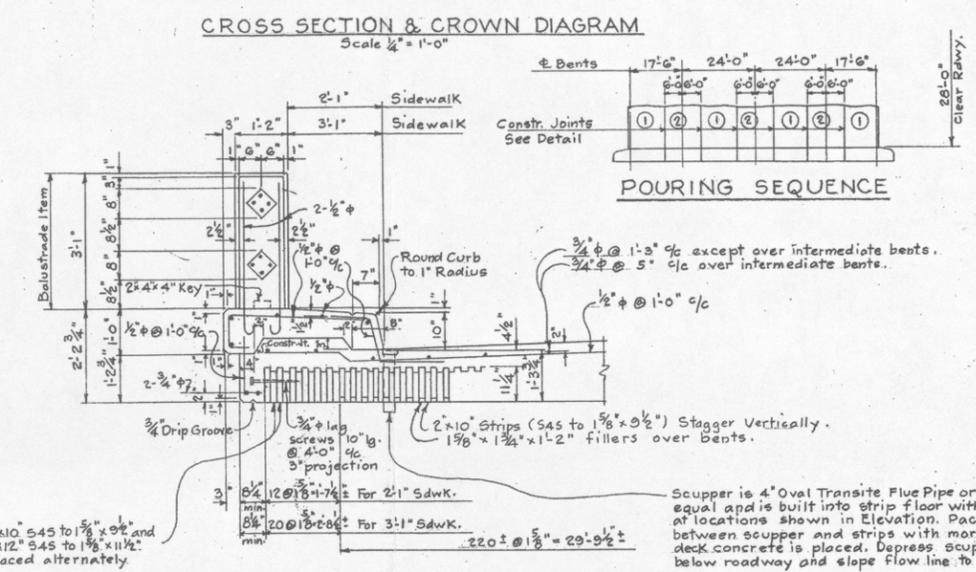
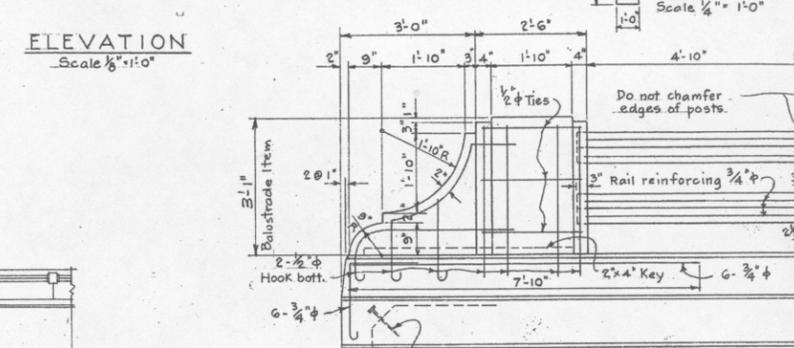
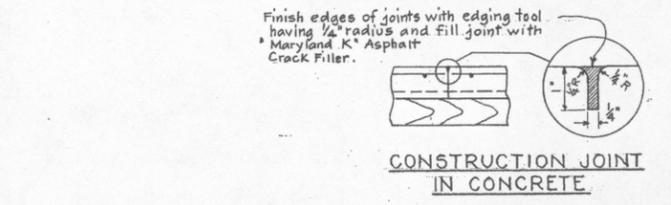
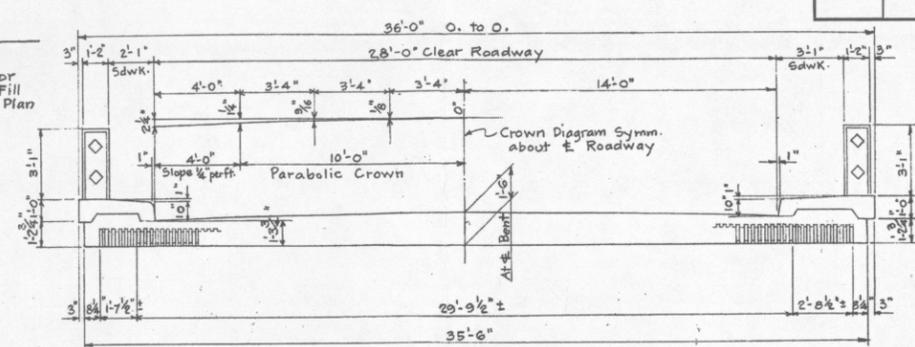
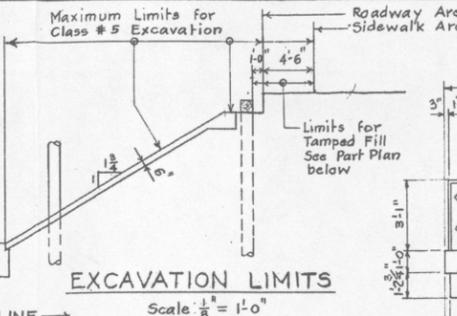
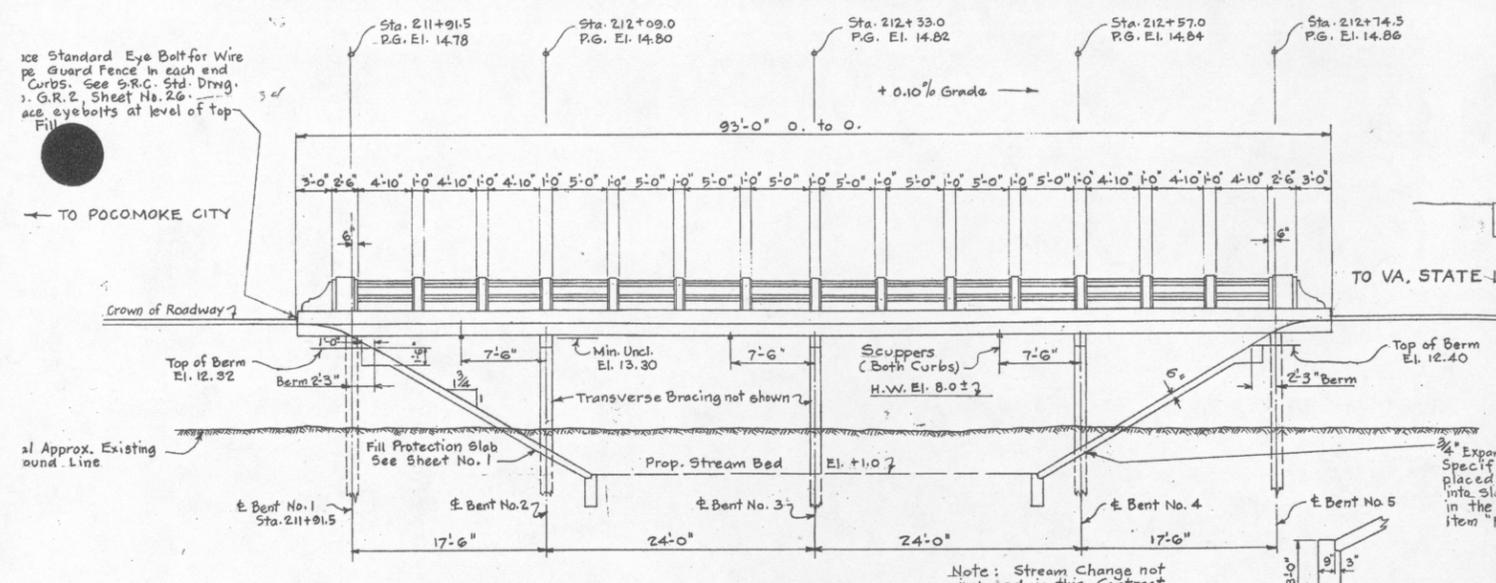
Side Ditch on right Sta. 209 to 211+

Bridge to be built under separate cont. No. W0-223-4-146 Fed. Aid Project No. 468-C.

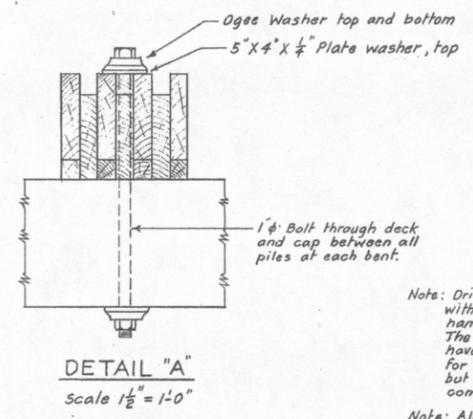
P.I. Sta. 202+30 Elev. 13.82 Corro. 63 V.C. 600'

P.T. 205+30 Elev. 14.12

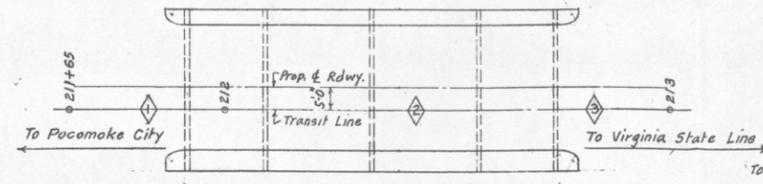
Station	Elev. of Inside Edge of Pavement	Elev. of Outside Edge of Pavement
201	14.99	14.99
202	15.04	15.04
203	15.10	15.10
204	15.18	15.18
205	15.24	15.24
206	15.32	15.32
207	15.40	15.40
208	15.48	15.48
209	15.56	15.56
210	15.64	15.64
211	15.72	15.72
212	15.80	15.80
213	15.88	15.88
214	15.96	15.96
215	16.04	16.04
216	16.12	16.12
217	16.20	16.20
218	16.28	16.28
219	16.36	16.36
220	16.44	16.44
221	16.52	16.52
222	16.60	16.60
223	16.68	16.68
224	16.76	16.76
225	16.84	16.84
226	16.92	16.92
227	17.00	17.00
228	17.08	17.08
229	17.16	17.16
230	17.24	17.24
231	17.32	17.32
232	17.40	17.40
233	17.48	17.48
234	17.56	17.56
235	17.64	17.64
236	17.72	17.72
237	17.80	17.80
238	17.88	17.88
239	17.96	17.96
240	18.04	18.04
241	18.12	18.12
242	18.20	18.20
243	18.28	18.28
244	18.36	18.36
245	18.44	18.44
246	18.52	18.52
247	18.60	18.60
248	18.68	18.68
249	18.76	18.76
250	18.84	18.84
251	18.92	18.92
252	19.00	19.00
253	19.08	19.08
254	19.16	19.16
255	19.24	19.24
256	19.32	19.32
257	19.40	19.40
258	19.48	19.48
259	19.56	19.56
260	19.64	19.64
261	19.72	19.72
262	19.80	19.80
263	19.88	19.88
264	19.96	19.96
265	20.04	20.04
266	20.12	20.12
267	20.20	20.20
268	20.28	20.28
269	20.36	20.36
270	20.44	20.44
271	20.52	20.52
272	20.60	20.60
273	20.68	20.68
274	20.76	20.76
275	20.84	20.84
276	20.92	20.92
277	21.00	21.00
278	21.08	21.08
279	21.16	21.16
280	21.24	21.24
281	21.32	21.32
282	21.40	21.40
283	21.48	21.48
284	21.56	21.56
285	21.64	21.64
286	21.72	21.72
287	21.80	21.80
288	21.88	21.88
289	21.96	21.96
290	22.04	22.04
291	22.12	22.12
292	22.20	22.20
293	22.28	22.28
294	22.36	22.36
295	22.44	22.44
296	22.52	22.52
297	22.60	22.60
298	22.68	22.68
299	22.76	22.76
300	22.84	22.84
301	22.92	22.92
302	23.00	23.00
303	23.08	23.08
304	23.16	23.16
305	23.24	23.24
306	23.32	23.32
307	23.40	23.40
308	23.48	23.48
309	23.56	23.56
310	23.64	23.64
311	23.72	23.72
312	23.80	23.80
313	23.88	23.88
314	23.96	23.96
315	24.04	24.04
316	24.12	24.12
317	24.20	24.20
318	24.28	24.28
319	24.36	24.36
320	24.44	24.44
321	24.52	24.52
322	24.60	24.60
323	24.68	24.68
324	24.76	24.76
325	24.84	24.84
326	24.92	24.92
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328	25.08	25.08
329	25.16	25.16
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334	25.56	25.56
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337	25.80	25.80
338	25.88	25.88
339	25.96	25.96
340	26.04	26.04
341	26.12	26.12
342	26.20	26.20
343	26.28	26.28
344	26.36	26.36
345	26.44	26.44
346	26.52	26.52
347	26.60	26.60
348	26.68	26.68
349	26.76	26.76
350	26.84	26.84
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352	27.00	27.00
353	27.08	27.08
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355	27.24	27.24
356	27.32	27.32
357	27.40	27.40
358	27.48	27.48
359	27.56	27.56
360	27.64	27.64
361	27.72	27.72
362	27.80	27.80
363	27.88	27.88
364	27.96	27.96
365	28.04	28.04
366	28.12	28.12
367	28.20	28.20
368	28.28	28.28
369	28.36	28.36
370	28.44	28.44
371	28.52	28.52
372	28.60	28.60
373	28.68	28.68
374	28.76	28.76
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389	29.96	29.96
390	30.04	30.04
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400	30.84	30.84
401	30.92	30.92
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403	31.08	31.08
404	31.16	31.16
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413	31.88	31.88
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422	32.60	32.60
423	32.68	32.68
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437	33.80	33.80
438	33.88	33.88
439	33.96	33.96
440	34.04	34.04
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444	34.36	34.36
445	34.44	34.44
446	34.52	34.52
447	34.60	34.60
448	34.68	34.68
449	34.76	34.76
450	34.84	34.84
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453	35.08	35.08
454	35.16	35.16
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465	36.04	36.04
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469	36.36	36.36
470	36.44	36.44
471	36.52	36.52
472	36.60	36.60
473	36.68	36.68
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484	37.56	37.56
485	37.64	37.64
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489	37.96	37.96
490	38.04	38.04
491	38.12	38.12
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494	38.36	38.36
495	38.44	38.44
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497	38.60	38.60
498	38.68	38.68
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501	38.92	38.92
502	39.00	39.00
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504	39.16	39.16
505	39.24	39.24
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527	41.00	41.00
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532	41.40	41.40
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534	41.56	41.56
535	41.64	41.64
536	41.72	41.72
537	41.80	41.



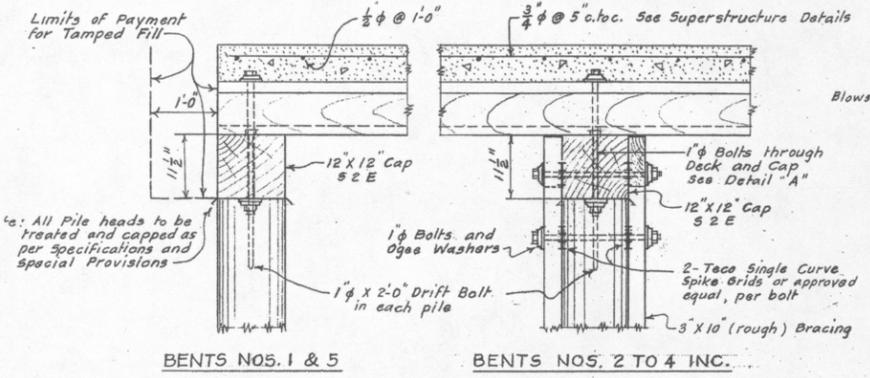
REVISIONS		STATE OF MARYLAND STATE ROADS COMMISSION BALTIMORE, MD.	
		COMPOSITE TIMBER CONCRETE BRIDGE OVER WAGRAM CR. POCOMOKE CITY-VA. STATE LINE	
		SUPERSTRUCTURE DETAILS	
SCALE AS NOTED		DATE MAY 1944	CONTRACT NO. 223-4-111
MADE BY	L.B.K.	APPROVED	W. L. B. ...
TRACED BY		CHECKED BY	L.W.O.
APPROVED	9/18/44	BRIDGE ENGINEER	
9/19/44			
		SHEET NO. 2 OF 2	



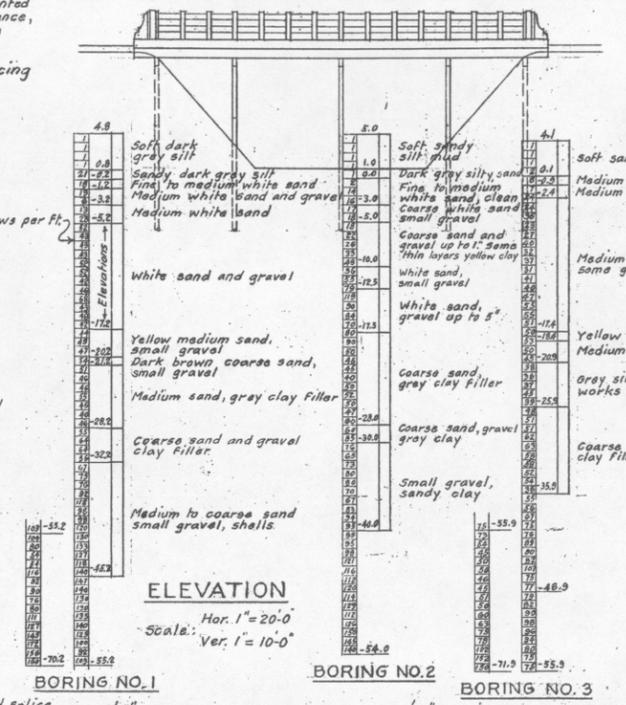
Note: Drive test uses 1" double extra strong pipe with hardened steel point tip and a 155 # hammer falling 22 inches. The several struts indicated by the borings have been carefully located and are presented for the contractor's guidance and assistance, but no responsibility is assumed by this commission for their accuracy.  
 Note: All borings were made prior to placing of roadway fill



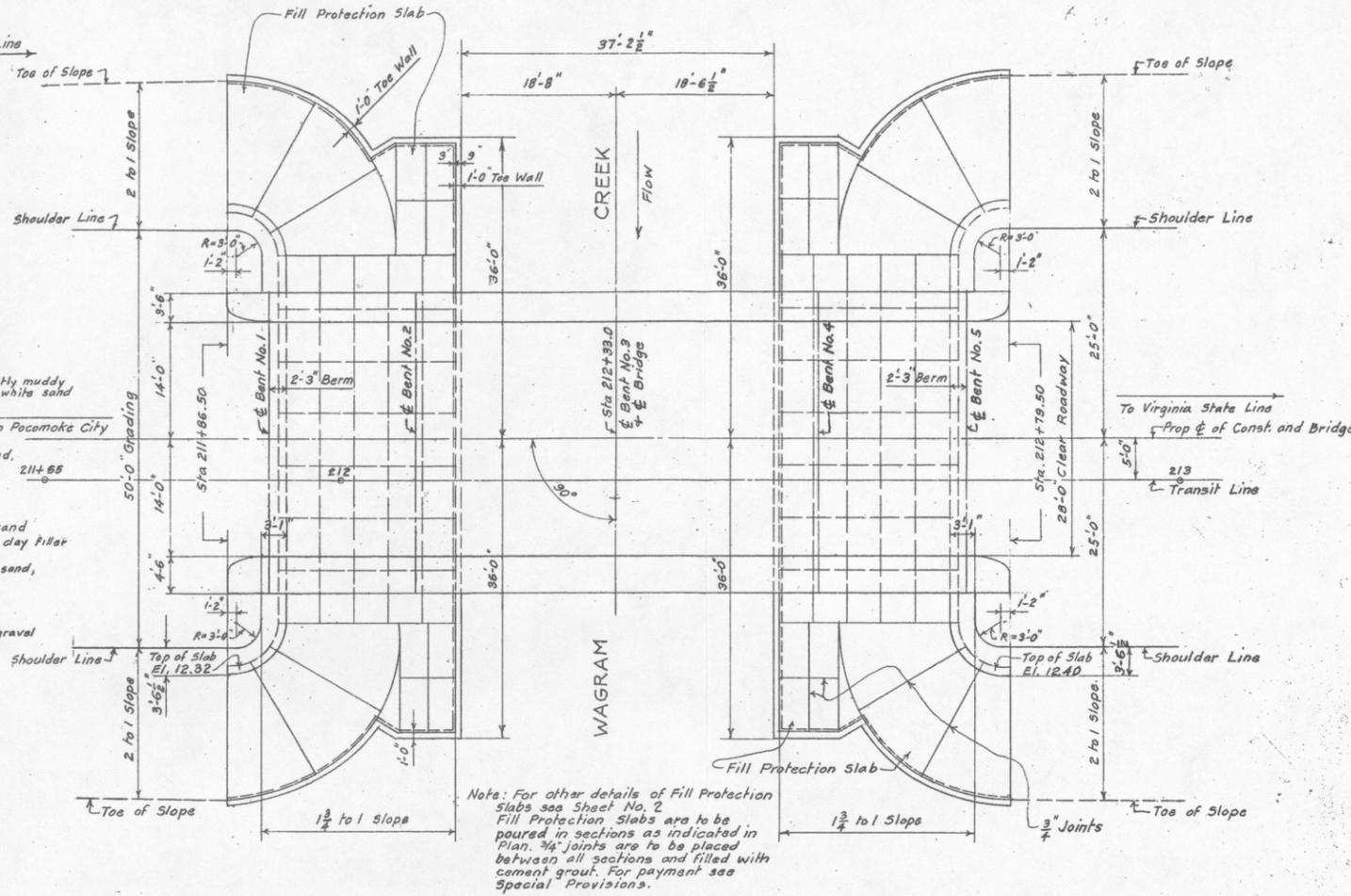
PLAN SHOWING LOCATION OF BORINGS  
 Scale 1" = 20'-0"



SECTIONS THROUGH BENT CAPS  
 Scale 3/4" = 1'-0"



ELEVATION  
 Scale: Hor. 1" = 20'-0"  
 Ver. 1" = 10'-0"



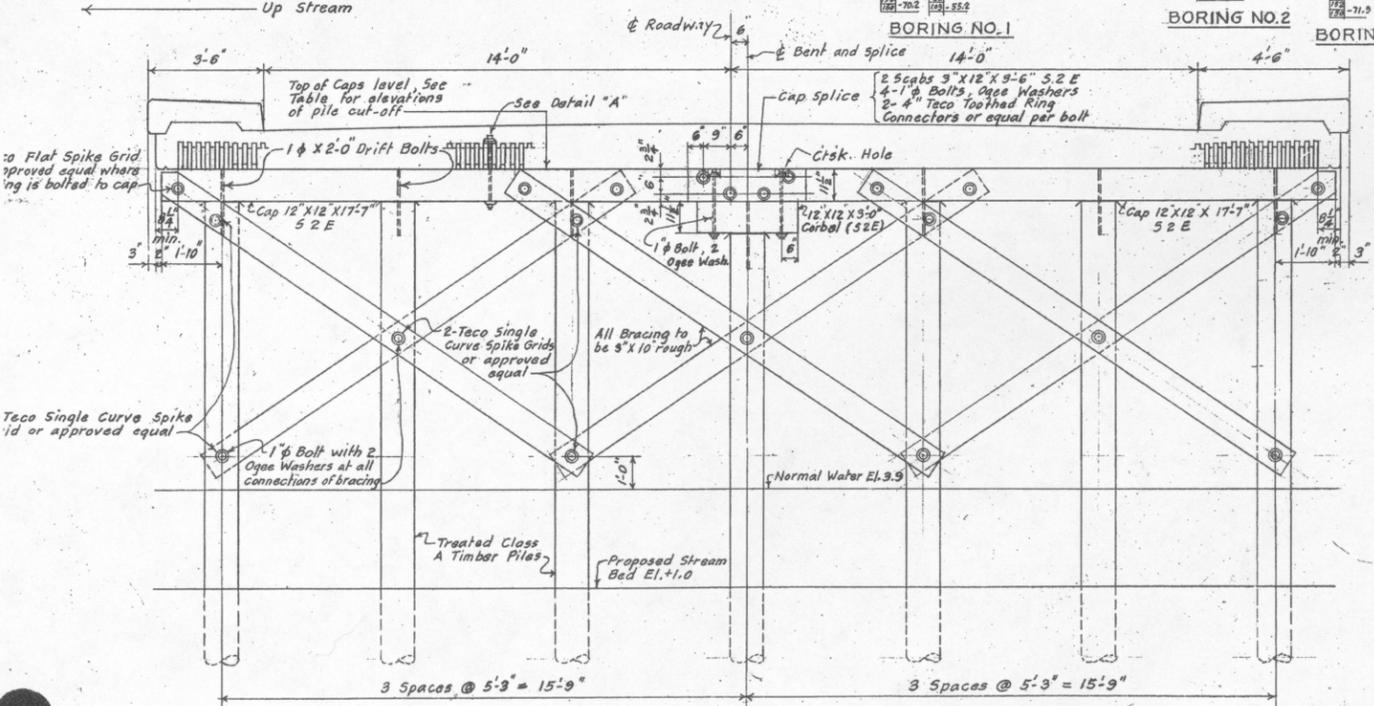
PLAN OF FILL PROTECTION SLAB  
 Scale 1" = 10'-0"

Note: For other details of Fill Protection Slabs see Sheet No. 2. Fill Protection Slabs are to be poured in sections as indicated in Plan. 3/4" joints are to be placed between all sections and filled with cement grout. For payment see Special Provisions.

PILE CUT OFF ELEVATIONS		
BENT NO.	PILE ON $\phi$ BENT	OTHER PILES
1	11.36	12.32
2	11.38	12.34
3	11.40	12.36
4	11.42	12.38
5	11.44	12.40

**DRAINAGE DATA**  
 Drainage Area = 13.15 Sq. miles = 8416 Acres  
 Opening Required by Talbot C = 1/6 C = 1/5 C = 1/4 C = 1/3  
 147' 175' 218' 293'  
 Opening Furnished by Proposed Bridge to El. 5.0 = 175'  $\pm$   
 " El. 8.0 (High Water) = 344'  $\pm$

**GENERAL NOTES**  
 Specifications: S.R.C. Specifications dated March 1942 for materials and construction, and A.A.S.H.O. Standard Specifications for Highway Bridges dated 1941 for design.  
 Loading: 1120  
 Concrete: All Concrete to be Class "A"  
 Reinforcing steel: Dimensions to steel are to  $\phi$  of bars.  
 Treated Timber: All Timber shall be "Treated Timber". See Specifications and Special Provisions.  
 Treated Timber Piles: All piles to be "Treated Class A Timber Piles". See Specifications and Special Provisions. Test Piles to be untreated.  
 Chamfer: All exposed edges of concrete to be chamfered as shown or as directed.  
 Eye-bolts: Cost of furnishing and placing eye-bolts at ends of bridge to be included in the contract unit price for Class A Concrete.  
 Expansion Joints: Cost of furnishing and placing 1/2" bituminous felt between posts and ends of railing, to be included in the contract unit price for "Class A Concrete Balustrade".  
 Crack Filler: Cost of furnishing and placing "Maryland K Asphalt Crack Filler" in construction joints in concrete to be included in the contract unit price for "Class A Concrete".  
 Fill Protection Slab: See Special Provisions.  
 Datum: B.M. # 14 Nail in cut on roof of 18" W. Ash. Tree. 30' right of Sta. 210+90 El. 6.87 Survey Book 05905



TYPICAL ELEVATION OF BENTS  
 Scale 3/8" = 1'-0"

Note: Bracing on Bents Nos. 2, 3, & 4 only

ESTIMATED QUANTITIES		
AMOUNT	UNIT	ITEM
100	Cu.Yd.	Class # 5 Excavation
10	Cu.Yd.	Tamped Fill
90	Cu.Yd.	Class A Concrete
8	Cu.Yd.	Class A Concrete Balustrade
12800	Lbs.	Reinforcing Steel Bars
40	M.B.M.	Treated Timber
1350	L.F.	Treated Class A Timber Piles
40	L.F.	Test Piles
500	S.Y.	Fill Protection Slab
2500	Lbs.	Shear Developers
100	Cu.Yd.	Borrow
85	Cu.Yd.	Removal of Existing Masonry

STATE OF MARYLAND  
 STATE ROADS COMMISSION  
 BALTIMORE, MD.  
**COMPOSITE TIMBER CONCRETE BRIDGE**  
 OVER WAGRAM CR., POCOMOKE CITY-VA. STATE LINE  
 SUBSTRUCTURE DETAILS

SCALE AS SHOWN DATE MAY 1944 CONTRACT No 223-A-111

MADE BY: L.W.O. APPROVED: [Signature]  
 TRACED BY: L.W.O. [Signature]  
 CHECKED BY: [Signature] 9/18/44  
 BRIDGE ENGINEER

9/19/44

SHEET NO. 1 OF 2

Maryland Historical Trust

Maryland Inventory of Historic Properties number: WD-491

Name: WS13 SOUTHBOWND OVER-WAGBAM C&K

The bridge referenced herein was inventoried by the Maryland State Highway Administration as part of the Historic Bridge Inventory, and SHA provided the Trust with eligibility determinations in February 2001. The Trust accepted the Historic Bridge Inventory on April 3, 2001. The bridge received the following determination of eligibility.

MARYLAND HISTORICAL TRUST	
Eligibility Recommended <u>  X  </u>	Eligibility Not Recommended <u>      </u>
Criteria: <u>  </u> A <u>  </u> B <u>  X  </u> C <u>  </u> D	Considerations: <u>  </u> A <u>  </u> B <u>  </u> C <u>  </u> D <u>  </u> E <u>  </u> F <u>  </u> G <u>  </u> None
Comments: _____ _____	
Reviewer, OPS: <u>  Anne E. Bruder  </u>	Date: <u>  3 April 2001  </u>
Reviewer, NR Program: <u>  Peter E. Kurtze  </u>	Date: <u>  3 April 2001  </u>

MARYLAND INVENTORY OF HISTORIC BRIDGES  
HISTORIC BRIDGE INVENTORY  
MARYLAND STATE HIGHWAY ADMINISTRATION/  
MARYLAND HISTORICAL TRUST

MHT No. WO-491

SHA Bridge No. 23005 Bridge name U.S. 13 Southbound over Wagram Creek

**LOCATION:**

Street/Road name and number [facility carried] U.S. 13 Southbound

City/town Pocomoke City Vicinity X

County Worcester

This bridge projects over: Road      Railway      Water X Land     

Ownership: State X County      Municipal      Other     

**HISTORIC STATUS:**

Is the bridge located within a designated historic district? Yes      No X

National Register-listed district      National Register-determined-eligible district     

Locally-designated district      Other     

Name of district     

**BRIDGE TYPE:**

Timber Bridge X:

Beam Bridge      Truss -Covered      Trestle      Timber-And-Concrete X

Stone Arch Bridge     

Metal Truss Bridge     

Movable Bridge     :

Swing      Bascule Single Leaf      Bascule Multiple Leaf     

Vertical Lift      Retractable      Pontoon     

Metal Girder     :

Rolled Girder      Rolled Girder Concrete Encased     

Plate Girder      Plate Girder Concrete Encased     

Metal Suspension     

Metal Arch     

Metal Cantilever     

Concrete     :

Concrete Arch      Concrete Slab      Concrete Beam      Rigid Frame     

Other      Type Name

**DESCRIPTION:**

**Setting:** Urban \_\_\_\_\_ Small town \_\_\_\_\_ Rural  X

**Describe Setting:**

Bridge No. 23005 carries U.S. 13 Southbound over Wagram Creek in Worcester County. U.S. 13 Southbound runs north-south and Wagram Creek flows east-west. The bridge is located south of Pocomoke City, approximately .8 kilometers (.5 miles) north of the Virginia State line and is surrounded by wooded wetlands.

**Describe Superstructure and Substructure:**

Bridge No. 23005 is a 4-span, 2-lane, composite timber and concrete bridge. The bridge was built in 1945 and is currently used to carry vehicular traffic southbound on U.S. 13. A separate bridge structure was constructed in 1954 to carry northbound vehicular traffic. The structure is 25.6 meters (84 feet) long and has a clear roadway width of 8.5 meters (28 feet); there are two sidewalks; the sidewalk on the west is .9 meters (3 feet) wide and the sidewalk on the east is .6 meters (2 feet) wide. The out-to-out width is 10.9 meters (36 feet). The superstructure consists of the timber slab, timber stringers with bituminous concrete deck overlay. The structure has concrete railings with decorative concrete end blocks and the roadway approaches have w-beam guardrails. The substructure consists of two timber abutments and three timber bents at mid-length. There are no wing walls. The bridge is posted for maximum legal loads and has a sufficiency rating of 73.4.

According to the 1996 inspection report, this structure was in good condition with minor splitting and checking at knots. Stringers are soft on the surface to a depth of 1.3 centimeters (.5 inches) ±, then become solid. The asphalt wearing surface has no pot holes or patches. The timber substructure and concrete railings are in good condition.

**Discuss Major Alterations:**

There have been no major alterations to this structure.

**HISTORY:**

**WHEN was the bridge built:**  1945

**This date is:** Actual  X  Estimated \_\_\_\_\_

**Source of date:** Plaque \_\_\_\_\_ Design plans \_\_\_\_\_ SHA bridge files/inspection form  X

**Other (specify):**

**WHY was the bridge built?**

The bridge was constructed in response to the need for more efficient transportation network and increased load capacity.

**WHO was the designer?**

State Roads Commission

**WHO was the builder?**

Unknown

**WHY was the bridge altered?**

N/A

**Was this bridge built as part of an organized bridge-building campaign?**

There is no evidence that the bridge was built as part of an organized bridge building campaign.

**SURVEYOR/HISTORIAN ANALYSIS:**

**This bridge may have National Register significance for its association with:**

- A - Events \_\_\_\_\_
- B- Person \_\_\_\_\_
- C- Engineering/architectural character     X

The bridge is eligible for the National Register of Historic Places under Criterion C, as a significant example of composite timber and concrete construction. The structure has a high degree of integrity and retains such character-defining elements of the type as the composite timber slab, timber piers, timber bents and concrete railing.

**Was the bridge constructed in response to significant events in Maryland or local history?**

The earliest bridges built in North America were timber bridges. According to one account, European settlers at first utilized the bridges constructed by the Native American populations, which consisted of tied timbers laid across up-turned forked tree trunks (American Association of State Highway Officials 1953: 19). This design was adopted by the settlers, who then modified the design by hewing the upper portions of the timbers to provide a flat surface and by adding a handrail to one side (American Society of Civil Engineers 1976: 143). Where crossings exceeded the length of the available timber, short spans were joined and supported on wood piles or on timber cribs filled with earth or stone. In fact, the earliest recorded bridge built by European settlers in America was most likely this type of design. Constructed in 1611 on James Towne Island, Virginia, this timber bridge extended approximately 200 feet into the water and provided docking facilities in the 12 foot deep channel (American Association of State Highway Officials 1953: 19).

The combination of timber with other materials began with the invention of the Howe truss in 1840. William Howe patented a truss which utilized iron verticals as tension members and wood diagonals as compression members. The Howe truss became a standard of railroad bridge design. By the 1860s, the problem of wood deterioration was under better control with the invention of pressure creosote treatments, which extended the life of the wood members. Timber pile bent structures remained popular, in particular in tidal areas, into the twentieth century. These were most often used in combination with concrete.

Timber bridges continued to be constructed in the United States during the twentieth century. A significant technological development of the 1930s permitted construction of timber-concrete composite structures, featuring decks utilizing both timber and reinforced concrete. The 1975 American Society of Civil Engineers Design Guide and Commentary on Wood Structures offered the following description of composite decks of timber and concrete:

Composite timber-concrete decks are commonly used in bridge construction. Construction is such that timber carries most of the tension forces. Composite construction is of two basic types, T-beams and slab decks.... Composite T-beam sections consist of timber stringers, which form the stem, and concrete slab for the flange area. Notches are cut into the top edge

of the stringers to resist horizontal shear and mechanical fasteners are driven into the top to prevent vertical separation so that the two components perform integrally. Stresses due to temperature changes must be considered in the concrete section.

Composite slabs consist of nominal 2-inch lumber, usually nailed-laminated with the wide faces vertical, and a concrete section cast monolithically in place. Grooves are formed by using alternate laminations that differ in width by 2 inches or by fabricating panels with a 2-inch offset between laminations. Horizontal shear is resisted by grooves cut into the projecting laminations or by metal shear plates. Transverse joints in the timber portion are made by dapping or cutting alternate laminations to a different length to provide finger joints. The concrete slab should be reinforced for temperature stress and for negative bending stresses when the deck is continuous over a support. No falsework or extensive forming is necessary with this construction (American Society of Civil Engineers 1975:372-73).

The timber-concrete composite slab type of bridge construction was pioneered in the United States by James F. Seiler and the American Wood-Preservers Association between 1932 and 1935. The latter organization's 1935 patent for "composite wood and concrete construction" became the basis for such technology.

Such timber-and-concrete composite structures were evidently introduced in Maryland by the State Roads Commission engineers, who kept abreast of early twentieth century trends in composite bridge design. In the 1937-1938 *Report of the State Roads Commission*, Bridge Division Chief Engineer Walter C. Hopkins acknowledged professional interest in such structures:

The bridges constructed have been varied, with miscellaneous types and of different materials. Bridges have been built of concrete, steel, timber, or stone, or combinations thereof. Careful study is given the employment of those materials most satisfactorily adapted to the structure in question. Balance, proportion and treatment that will result in simplicity, gracefulness and pleasing appearance are always considered and sought by the designer (State of Maryland, State Roads Commission 1938:71).

The Bridge Division's earliest timber-and-concrete composite bridges were built in 1937-1938 in Tidewater Maryland. Pictured in the 1937-1938 State Roads Commission report, the longest such bridge was "a timber and concrete composite bridge of twelve 20-foot spans, providing a clear roadway of 26 feet, and two 3-foot, 1-inch sidewalks, over Tony Tank Pond, on the road from Salisbury to Princess Anne near Salisbury, Wicomico County" (State of Maryland, State Roads Commission 1938:83).

Subsequent State Roads Commission reports refer to additional timber-concrete composite bridges constructed under state authority between 1939 and 1960, primarily at Tidewater (Coastal Plain) sites on the Eastern Shore and in Southern Maryland (State of Maryland, State Roads Commission 1939:71; 1943:45). In 1947, Bridge Division engineers observed that "the development of the composite use of timber and concrete has permitted the design of economical structures with the general appearance from the roadway of a much more costly bridge" (State of Maryland, State Roads Commission 1947:53).

**When the bridge was built and/or given a major alteration, did it have a significant impact on the growth and development of the area?**

There is no evidence that the construction of this bridge had a significant impact on the growth and development of this area.

**Is the bridge located in an area which may be eligible for historic designation and would the bridge add to or detract from the historic/visual character of the potential district?**

The bridge is located in an area which does not appear to be eligible for historic designation.

**Is the bridge a significant example of its type?**

The bridge is a potentially significant example of a composite timber and concrete bridge, possessing a high degree of integrity.

**Does the bridge retain integrity of important elements described in Context Addendum?**

The bridge retains the character-defining elements of its type, as defined by the Statewide Historic Bridge Context, including the composite timber slab, timber piers, bents and concrete railing.

**Is the bridge a significant example of the work of a manufacturer, designer, and/or engineer?**

This bridge is not a significant example of the work of a manufacturer, designer, and/or engineer.

**Should the bridge be given further study before an evaluation of its significance is made?**

No further study of this bridge is required to evaluate its significance.

**BIBLIOGRAPHY:**

County inspection/bridge files \_\_\_\_\_ SHA inspection/bridge files   X    
Other (list):

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1912 Concrete Bridges. *American Concrete Institute Proceedings* 8:631-640.

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Maryland State Roads Commission

1930a *Report of the State Roads Commission for the Years 1927, 1928, 1929 and 1930.* State of Maryland, State Roads Commission, Baltimore.

1930b *Standard Plans.* State of Maryland, State Roads Commission, Baltimore.

Taylor, Frederick W., Sanford E. Thompson, and Edward Smulski

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Tyrrell, H. Grattan

1909 *Concrete Bridges and Culverts for Both Railroads and Highways.* The Myron C. Clark Publishing Company, Chicago and New York.

**SURVEYOR:**

**Date bridge recorded** February 1998

**Name of surveyor** Caroline Hall/Marris German

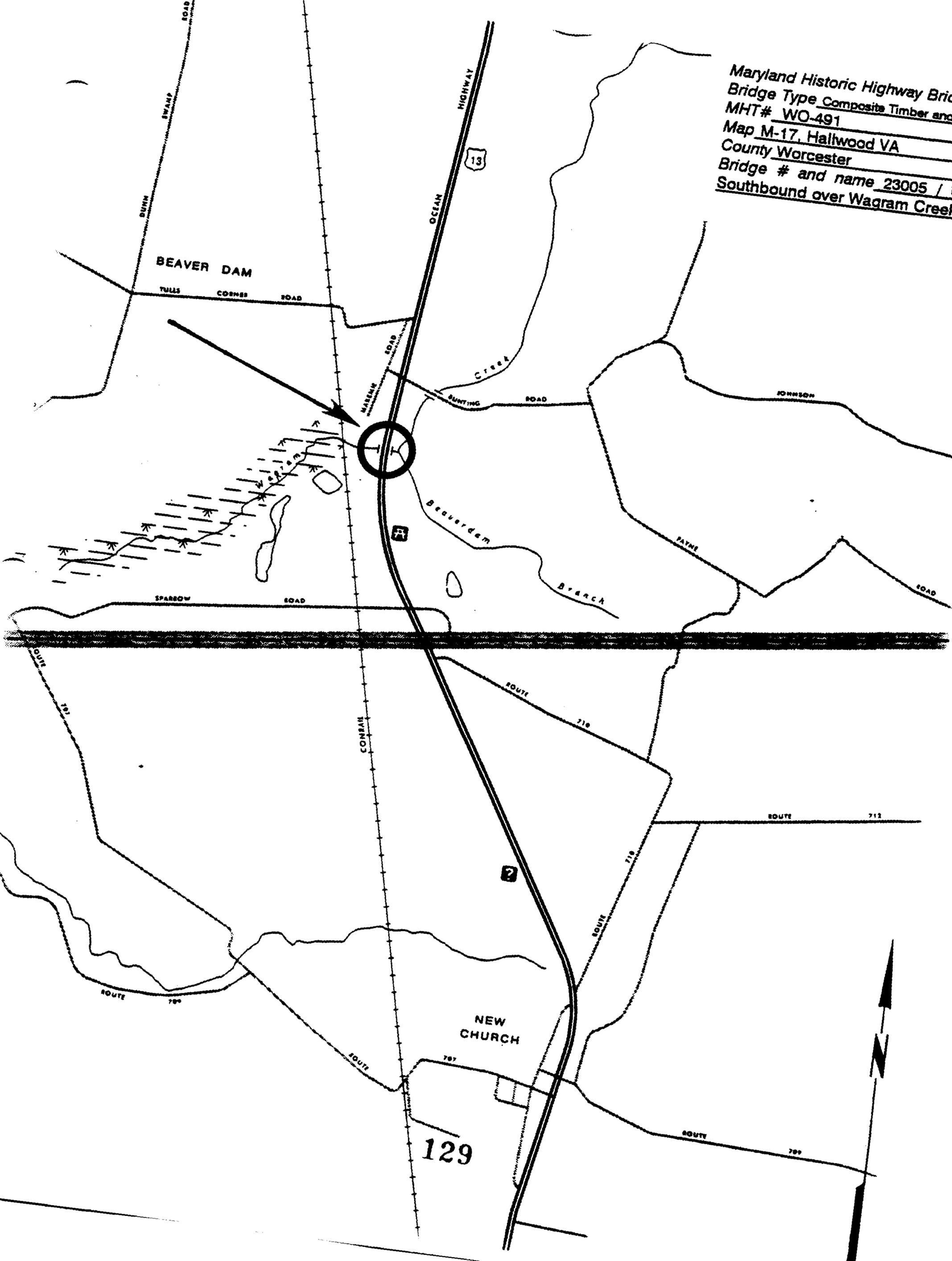
**Organization/Address** P.A.C. Spero & Co., 40 W. Chesapeake Avenue, Baltimore, MD 21204/  
Wallace Montgomery and Associates, 110 West Road, Towson, MD 21204

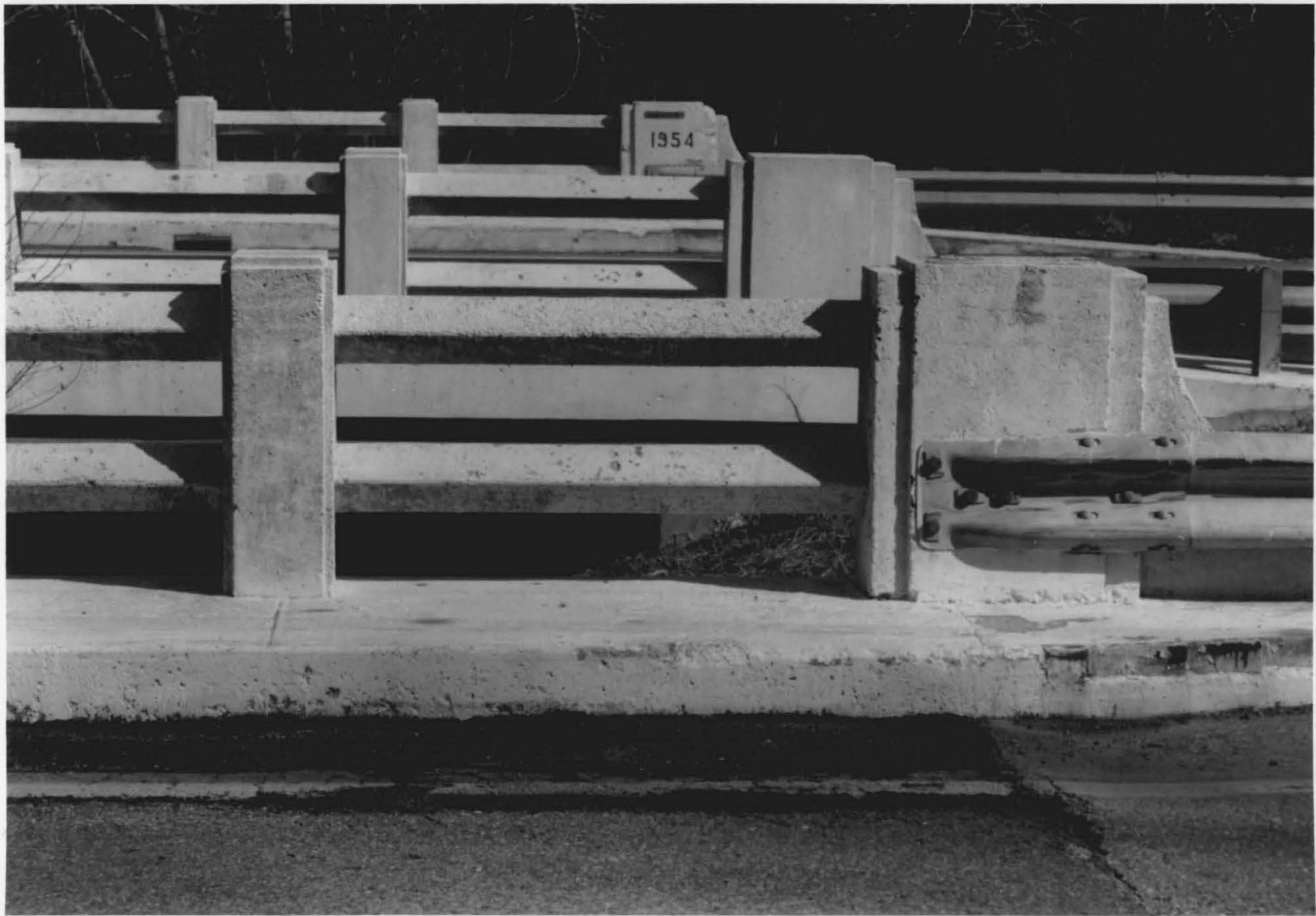
**Phone number** (410) 296-1635

**FAX number** (410) 296-1670

Revised by P.A.C. Spero & Company, July 1998.

Maryland Historic Highway Bridge  
Bridge Type Composite Timber and  
MHT# WO-491  
Map M-17, Hallwood VA  
County Worcester  
Bridge # and name 23005 /  
Southbound over Wagram Creek





- 1 WO-491
- 2 U.S. 13 SB over Wagram Creek
- 3 Worcester Co. MD
- 4 3/98
- 5 Marris German, WMA
- 6 MD SHPO
- 7 Concrete Railing East Side
- 8 1 of 5



- 1 WO-491
- 2 US 13 SB over Wagram Creek
- 3 Worcester Co., MD
- 4 3/98
- 5 Marris German, WMA
- 6 MD SHPO
- 7 Elevation Looking East
- 8 2 of 5



- 1 WO-491
- 2 U.S. 13, SB over Wagram Creek
- 3 Worcester Co, MD
- 4 3/98
- 5 Morris German, WMA
- 6 MD SHPO
- 7 Elevation Looking West
- 8 3 of 5



1 WO-491

2 US 13, SB over Wagram Creek

3 Worcester Co, MD

4 3198

5 Marris German

6 MD SHPO

7 Cooking South

8 4 of 5



- 1 WO-491
- 2 US 13, SB over Wagram Creek
- 3 Worcester Co., MD
- 4 3/98
- 5 Marris German, WMA
- 6 MD STPO
- 7 Looking North
- 8 5 of 5