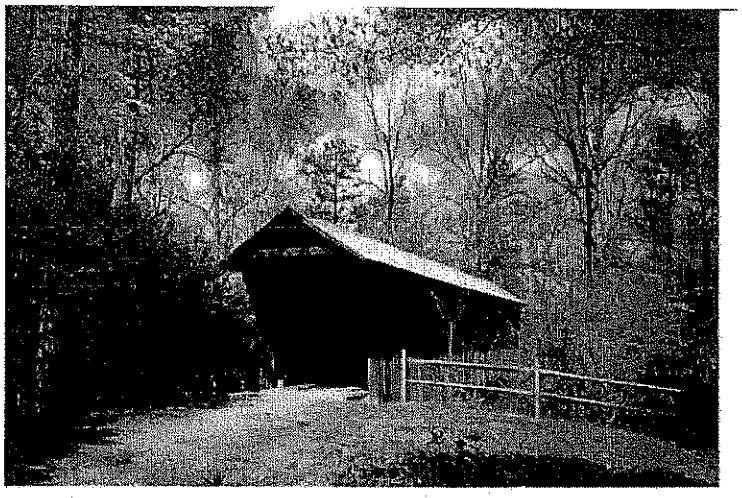
National Historic Covered Bridge Preservation Program

Fiscal Year 2011 Application for the Bunker Hill Covered Bridge Claremont, Catawba County, North Carolina



- Bridge and Abutment Restoration
- Tele-metered Security System with Video Cameras
- Outdoor Site Lighting
- Dry Pipe Sprinkler System
- Fire Retardant Coating
- Graffiti Removal and Application of Protective Coating

North Carolina Department of Transportation
June 3, 2011

Use this Report for background information only - Not all scope of work referenced is in current RFQ

North Carolina State's Priority Ranking: 1

NBI Structure Number:
No Number Bridge Closed to Vehicular Traffic

Bridge Name:
Bunker Hill Covered Bridge

Description of Location:
Located in Catawba County one and one-half miles east of the City of Claremont, North Carolina between US Highway 70 and Interstate Highway 40. Parcel ID 377213242220 situated on 1.1 acres, Latitude: N35 43' 17.44" Longitude: W081 6' 54.9" measured at the center of the bridge span. See **Appendix A** for Location/Site Map

Figure 1: The yellow box indicates the location of the Bunker Hill Covered Bridge spanning Lyle Creek just south of Interstate 40 and north of State highway 70 near the town of Claremont, NC.

The History of the Site:
The covered bridge spans the Lyle Creek on the Old Island Ford Road. This road was built upon a well documented Catawban and Cherokee Indian trade and hunting route leading from South Carolina via Ramsour's Mill, the town of Maiden, the Island Ford of the Catawba River, the Holman's Ford of the Yadkin and crosses the Blue Ridge at Cook's Gap Kentucky. The narrow footpath would grow into the second most important

colonial road in the Piedmont Region (the first being the Old State Road), and was known to exist prior to 1780. General Daniel Morgan used this road to elude Cornwallis' troops and to transport captured British prisoners, horses and supply wagons seized at the Battle of Cowpens in 1781.

By the 1850s the Island Ford Road was an important agricultural route for market goods. The James family built a race off the Lyle Creek and constructed a grist mill and established a rural post office on the roadway just west of the bridge site before the outbreak of the Civil War.

The high banks of the Lyle Creek undoubtedly required the building of many bridges prior to the construction of the present span built in 1894, however no documentation of their construction can be found. The present covered bridge was named after the Bunker Hill Farm which surrounded it. The owner of the farm, a former resident of Massachusetts and a proud patriot, had named the farm in honor of the famous Revolutionary battleground.

In the 1800s, Catawba County law required the land owner to maintain public roadways and bridges existing within their property and in 1894 the court order the owners of the farm to either repair the existing bridge or replace it. The farmer hired Andrew L Ramseur to construct the present bridge with the help of neighbors Eli Kale, George Motler, Cain Bost, and Electious Conner. Originally built as an open span it was covered five years after initial construction to protect the timbers from further water damage. The bridge was operated by the Shufford and Lowrance families for many decades and in 1921 they replaced the original wood shingles with a tin roof.

The bridge was damaged by a tornado in 1992 and as part of the repair and restoration effort the structure was returned to its 1921 appearance by Arnold M. Graton Associates, of New Hampshire under the direction of David C. Fischetti, DCF Engineering, Inc. of Cary, North Carolina on behalf of the Catawba County Historical Association.

Congressional District and Representative:
District 10, Patrick McHenry

Year Built:
1894

National Register Listing:
Listed in both the National Register of Historic Places (2/26/1970 – Rank -State Significance) and the American Society of Civil Engineers National Historic Landmarks (2001-Rank-National Significance) See attached letter from Chair of the ASCE History and Heritage Committee. See **Appendix B**

Structure Description:
The bridge was built in 1894 in general accordance with Herman Haupt's (1817-1905) improved lattice design patented of 1839. General Herman Haupt was a noted bridge

designer from Pennsylvania, graduated from West Point, was an instructor of engineering at West Point and was appointed by President Lincoln as the Chief of Military Railroads during the Civil War.

The bridge is a single span structure, 80 feet 2 inches long (out-to-out) and 10 feet wide built out of red oak. The floor consists of two layers of 2x8 deck board and 2x10 boards supported by 3x10 floor beams spaced approximately 34 inches on center.

The trusses consist of 3x12 rough cut posts (vertical web members) and double 2x12 braces (diagonal compression web members) in a lattice design where the braces cross two panels. The top chord consists of two 2x12's on each side of the braces, which contain the posts at the centerline of the truss. The bottom chord consists of four 3x12 members. The end post is a 6x12. The first brace is a notched 12x6 with a second post passing through a rectangular hole in the brace.

Connections between members are wood trunnels (pegs), usually three per joint. Two of the four members which form the chords are cut at the same splice locations resulting in a net cross sectional area in tension members equal to one-half of the gross cross sectional area. The sides of the bridge are covered in vertical siding and the roof is covered in a v-grooved metal roofing. The entire structure is unpainted.

General plan and elevation:
See attached HABS drawings Appendix Letter C

Description of previous repair work:

1900 - Covered open truss work with vertical wooden siding and a shingle roof to protect the exposed red oak timbers.

1921 - Replace shingle roof with metal roof – work completed by landowner

1992 - Bridge was damaged by fallen trees due to a micro-burst or tornado.

1994 - The 1994 repairs were initiated by the impact against the west portal by a tree that fell during the 1992 storm, however, examination revealed the need for additional restoration. The bottom chord, end post, and floor deterioration at all four corners was caused by the previous placement of concrete in contact with wood and poor drainage. This was corrected by reworking the ends of the bridge, by separating wood from earth or concrete, and supporting the bridge on pressure treated bolster beams. New bottom chord material was placed in the bridge using Southern Pine of a similar appearance, density and finish, respecting the original end joint locations between sticks. Minimal original material was removed from the bridge.**(See further notes prepared by Arnold M. Graton Associates, New Hampshire, Restoration and Conservationist team. Appendix D)**
2011 – At the time of the preparation of this grant we are awaiting news of the status of the 2010 FHWA Historic Covered Bridge Preservation Awards for the installation of a security monitoring system and the installation of a fire suppression system. If awarded

this work would begin immediately and precede the graffiti removal proposed within this grant application.

Description of proposed work including wood preservative system, fire protection, vandalism and arson prevention systems to be used –Phase I:
The proposed wood preservation system consists of ongoing efforts to improved drainage by adding wingwalls to the abutments as required and ensuring drainage away from the portals of the bridge.

The proposed fire protection system includes a dry pipe sprinkler system with a well, pump house and 5,000 gallon storage tank, a linear heat detection system, and a fire retardant coating applied to the inside and underside of the bridge.

For vandalism and arson protection, a system consisting of lighting and security cameras linked to local govt./county dispatch is proposed.

All plans and specifications for the work to be performed on the project will be reviewed and approved by the North Carolina State Historic Preservation Office and will be in compliance the Department of Interior Standards for Rehabilitation 36 CFR Part 67, Historic Preservation Certifications. **(See Appendix E)**

Description of proposed removal/reduction of graffiti on the Bunker Hill Covered Bridge and the proposed methods to be used – Phase II:
The surfaces to be treated are rough hewn, unsealed or unpainted wood. Also present are the occasional, stenciled, historic label or inscription relating to the original period of construction of the bridge. These surfaces have been heavily vandalized with graffiti over many years. Graffiti occurs as carved and scratched inscriptions, as well as applied materials (including, but not limited to spray and other forms of paint, permanent marker pen, crayon, ballpoint pen, pencil and what appears to be possibly chalk).

The aim of the treatment is to wherever possible remove the graffiti (or at least reduce its visible appearance so as not to be obvious to visitors), while at the same time causing no further damage to the historic wood surfaces or the historic stenciled inscriptions.

There are several difficult challenges posed by this project.
• Its location without ease of access and lack of power and water limits the choice of treatments that can be used – for example, pressure washing – while a generator would provide power, there is no water supply on hand.
• All materials, equipment and supplies have to be transported by hand from the nearest parking area to the site.
• The rough and unfinished or unsealed surface of the wood presents a particularly difficult surface from which to remove applied graffiti materials.
• The material to be cleaned (wood) is difficult to treat as many of the common paint removing systems call for the use of chemicals that may raise the grain, or otherwise compromise the integrity of the wood to an unacceptable degree for a historic structure.
• The presence under some graffiti of historic, stenciled inscriptions calls for particularly

careful treatment of these areas in order to remove the graffiti while retaining the underlying inscription.

• The absorbent nature of the substrate means that many of the applied graffiti materials (especially aerosol delivered substances like spray paint and ink-based materials, such as permanent marker pen) will have penetrated the surface of the wood coloring not only the surface, but also the area immediately below. This is a situation that is very difficult to fully reverse and tends to leave some shadowing or staining.

• The absorbency of the wood also makes choosing an appropriate treatment method difficult.

• Much of the applied graffiti is of considerable age and aged paints, etc. are harder to remove than fresh ones due to changes in the chemistry and physical structure of the materials brought on by exposure to oxygen and light over time.

• The graffiti problem is on-going at the site. This means that estimates as to time and materials, and therefore costs to treat the graffiti, are something of a moving target as there is likely to be more damage to treat by the time work on at the bridge can commence.

• The area to be treated is very large and therefore will be time and cost intensive.

• To date it has not been possible to carry out cleaning tests on the wide variety of graffiti materials to be removed, therefore the treatment proposal that follows includes the use of several possible treatment regimes, the final choice(s) of which will be made once on-site tests have been carried out in the first week of work.

In preparation for the execution of the work the consultant and the project manager will have phone conversations to review the approach listed below and plan for a site meeting with the representative with the North Carolina State Historic Preservation Office to finalize the plan and outline future SHPO review processes required before the treatment steps outlined below are begun.

The following treatment steps are proposed for this project. Field time is anticipated to be 8 working weeks.

1. The areas of graffiti will be photographed systematically to document all areas before any treatment tests or treatments are carried out.
2. During the first week cleaning tests on the various graffiti materials will be carried out to fine tune the choice(s) of treatment. Treatments to be assessed for possible use includes (but are not limited to) the use of mild detergent and water; custom mixed, solvent based cleaning gels (solvents most likely being acetone and ethanol); the use of a "peel-away", proprietary paste paint remover (such as "Safety Peel 1", by PROSOCO™ - a neutral pH, non-methylene chloride based paste system); a gelled, methylene chloride based paint remover (such as "Fast Acting Stripper", by PROSOCO™); mechanical cleaning with brushes and other hand tools. Methods of application may also include the use of repeated poulticing, most likely using paper pulp as the poulticing agent. Testing will also concentrate on finding materials and methods that will not damage the historic, stenciled inscriptions when used in those locations.
3. Deeply carved graffiti will be tested for the possibility of filling them with proprietary wood fillers.

4. On completion of testing, a treatment program for the following seven weeks will be drawn up and implemented.
5. Any remaining, deeply seated paint stains may be bleached to try to lessen them. Failing that, these areas may be pigmented using water based pigments, to lessen their visual appearance.
6. Scratched graffiti may be visually reintegrated by precise in-painting of scratch lines using water based pigments.
7. All surfaces will be coated with a sacrificial coating (such as "Sacrificial Coating SC-1", by PROSOCO™ - a water-based, low VOC, LEED certified, propylene glycol based coating) that serves as a protective barrier between the wood and any future graffiti, making clean up of future graffiti easier.
8. On conclusion of treatment all previously documented areas (step 1, above) will be re-photographed to record their appearance on completion of treatment.

9. A final, detailed treatment record will be produced and provided along with all photographic documentation.
NOTE: All brands of materials listed here are suggestions and examples only and are not final recommendations. Further research into specific brands will take place prior to field work and during the first week of testing.
ANTICIPATED RESULTS: It is anticipated that the bulk of the graffiti will be either totally removed, or its appearance drastically reduced to that of a minor stain or shadow. It is not realistic to expect the treated surfaces to look untouched, as if they had never been vandalized – although we will certainly strive to achieve such an appearance.
It is hoped that the treated, cleaned up appearance of the bridge will discourage others from vandalizing it again, and will certainly give the accurate suggestion that the structure is cared for and valued.

Conservators: The request for proposals (RFP) will call for a formally trained paint conservator with prior experience in the removal of paint from rough cut unpainted wood surfaces. RFPs will be announced for three weeks and a list of possible conservators will be compiled including recommendations from the Smithsonian Conservation Institute, Harpers Ferry Center - National Park Service, The Ohio Conservation Center, and American Institute for Conservation of Historic and Artistic Works to contact eligible conservators.

All plans and specifications for the work to be performed on the project will be reviewed and approved by the North Carolina State Historic Preservation Office and will be in compliance the Department of Interior Standards for Rehabilitation 36 CFR Part 67, Historic Preservation Certifications.

Indication of whether the State has a historic bridge inventory/management plan accepted by the State Historic Preservation Officer (SHPO). A programmatic agreement for historic bridges with the SHPO, FHWA and the Advisory Council on Historic Preservation (ACHP) may substitute:

NC DOT carried out a comprehensive statewide historic bridge truss bridge inventory in 1978, in partnership with the North Carolina SHPO. A second comprehensive bridge survey was completed by NC DOT in 1996, and was subsequently reviewed and accepted by the State Historic Preservation Officer. There is not currently a historic bridge management plan in place, nor is there a programmatic agreement in place. NCDOT has a long record of consulting with the SHPO in each case when a historic bridge is to be repaired, modified or replaced.

The SHPO has reviewed and certified that this project is warranted in accordance with *The North Carolina Statewide Historic Preservation Plan: 2006-2012.* The goals of this application are in full agreement with the goals of that plan: http://www.hpo.ncdcr.gov/NorthCarolina_2006-2012_HistoricPreservationPlan.pdf

Description of whether the SHPO has reviewed and certified this project as warranted in accordance with the SHPO's statewide historic preservation plan; how it benefits statewide preservation efforts; how it enhances cultural tourism or enhances the history/economic development of the community; and other benefits upon successful completion of this project (See Appendix F):

The Bunker Hill Covered Bridge is the oldest of two remaining historic covered bridges in North Carolina and its preservation benefits the state of North Carolina's historic preservation efforts. It enhances the state and region's cultural tourism by helping to preserve the only remaining example of Gen. Herman Haupt's 1839 patented "Improved Lattice" covered bridge in America.

In addition to being listed on the National Register of Historic Places, the structure was awarded by the American Society of Civil Engineers "*National Landmark Status*" in 2001. The designation recognized the importance of Haupt's engineering work in the United States and the innovative method he developed in calculating load stresses which he employed in creating this design. Furthermore, Bunker Hill is the last remaining example of Haupt's "Improved Lattice Truss" design. Dr. Henry Petroski the Aleksander S. Vesic Professor of Civil Engineering and Professor of History at Duke University and Chair of the History and Heritage Committee of the American Society of Civil Engineers wrote in a letter of support for this application **(See Appendix B)"***The continued existence and maintenance of the Bunker Hill Covered Bridge as a National Historic Civil Engineering Landmark provides a basis for educational programs that provide an important link in the chain of continuity between past and the future."* He further stated that the ASCE designation is conferred only on civil engineering structures and projects that have "*broad historical significance, such as technical achievement at the time of their construction or lasting historical value because of their uniqueness in preserving a disappearing aspect of our nation's civil engineering history."* Bunker Hill covered bridge represents both reasons for landmark status.

The Bunker Hill Covered Bridge site plays a critical part in the development of both regional and local recreational/transportation/tourism plans. In December 17, 2007 the Catawba County Government approved its first Comprehensive Parks Master Plan for the

county which listed Bunker Hill Covered Bridge a significant historic landmark in the county and made it part of the eastern gateway to the development of their greenway park, biking, and trail system plan which will link seven municipalities located throughout the county. The bridge was also selected in three different public forums as the most important site in the county to be featured in the plans for a fifteen county network of recreational hiking and biking trails and parks straddling both North and South Carolina known as the Carolina Thread Trail. The Catawba County Planning office is also exploring means to link the site's American Revolutionary War connections to the *North Carolina Overmountain Victory Trail* and the development of a new Revolutionary War Trail linking the Battles of Cowpens, Ramseur's Mill, and Guilford Courthouse that turned the tide for the American victory at Yorktown, Virginia.

Amount of State or local government matching funds or other resources to support the Phase I Security and Fire Suppression Systems (donated materials or labor may qualify):

Catawba County Government	$ 8,000	National Register Funds
Catawba County Historical Association	$ 5,626	In-Kind Project Management
Catawba County Historical Association	$ 24,000	Cash Contribution
Duke Energy	$ 6,500	In-Kind
Phase I 20% Match Total	**$ 44,126**	

Amount of State or local government matching funds or other resources to support the Phase II Graffiti Removal (donated materials or labor may qualify):

Catawba County Historical Association	$ 4,735	In-Kind
Two Conservation Interns	$ 7,680	In-Kind
Catawba County Historical Association	$ 14,035	Cash
Phase II 20% Match Total	**$ 26,450**	

When the project is complete, will the bridge meet the current State or AASHTO standards for the roadway classification that it carries; Will it meet Pedestrian Classifications?

The Bunker Hill Covered Bridge previously was a one lane vehicular bridge. It is now closed to traffic. Only a fragment of the original farm roadway remains near the bridge. Access to the bridge is limited to a foot path and bollards were recently installed to restrict access of off-road vehicular traffic. The bridge is rated for pedestrian use with a uniform floor live load capability in excess of 100 psf and after the proposed restoration work the bridge will remain restricted to pedestrian usage only.

Plan for documentation of the bridge and the work performed:

Documentation of Prior Work:
The 1994 Storm Damage Repairs and Structural Rehabilitation was based on preliminary drawings dated May 5, 1993. This documentation of the bridge was supplemented by more detailed HAER (Historic American Engineering Record) drawings. **(Appendix D)**

Documentation of the Phase I Security and Fires Suppression Systems:
Documentation of this restoration effort and the installation of fire prevention and suppression systems will be based on field measurement and verification of these drawings conducted by the project engineer and photo documentation. Melinda Herzog, Executive Director of the Catawba County Historical Association and project coordinator will be responsible for the preparation of the final report on the work performed for submittal to FHWA.

Documentation of Phase II Graffiti Removal:
Documentation of this paint removal effort will be prepared by Project Conservators and Project Manager upon the completion of the scope of work will present:

- Photographic documentation of all areas before treatment tests or treatments are carried out.
- On conclusion of treatment all previously documented areas will be re-photograph to record their appearance on the completion of treatment.
- A detailed treatment record will record will be produced and provided along with the photographic documentation.
- And these verification of these drawings and photo documentation will be conducted by Melinda Herzog, Executive Director of the Catawba County Historical Association, submitted to the SHPO before the submittal of the final report to FHWA.

Scheduled start and completion date for the Phase I projects: (month and year)
January 2011 – Request for proposals will be released for the engineering work for the final plans for the design and construction of the security and fire suppression systems.
Late January 2011- the Engineering firm will be selected and the final plans prepared.
Late February 2011 – request for proposals will be released for the installation of the fire suppression and security systems for the Bunker Hill Covered Bridge
March-April 2011- Construction on the installation of the Fire Suppression system
May 2011 – Installation of security camera, tele-communicators, and security lighting systems.

Scheduled start and completion date for the project (month and year):
The schedule of the project:
June 2012- prepare scope of work to be preformed and have it reviewed by SHPO and release request for proposals for paint conservators familiar with paint removal on rough cut timber
Mid -July 2012- The proposals will be reviewed and the finalist will be reviewed by the State Historic Preservation Office and approved. The winning proposal will be awarded.
August 2011- The Conservator, Project Manager and SHPO will meet prior to the beginning of the work to review scope of work and related schedule.
August 2011– Structure will be photographically documented prior to conservation and tests will be conducted on the graffiti to determine the best treatments.
August – September 2011 – 8 weeks of conservation work will be conducted, the SHPO will be invited to examine the work as it progresses and upon completion.

October 2011– SHPO will review work for compliance and photographic documentation of the completed conservation work will be compiled and all final conservation reports will be submitted.

National Historic Covered Bridge Project
FY 2011 Application for
Bunker Hill Covered Bridge, Claremont, North Carolina

List of Appendices

A. Location and site map for Bunker Hill Covered Bridge

B. Letters of support for the project

1. The American Society of Civil Engineers Chair of the ASCE History and Heritage Committee Dr. Petrowski

C. Set of Historic American Engineering Record drawings of the Bunker Hill Covered Bridge by Richard K. Anderson, Jr., dated 2004, 6 pages

D. Notes prepared by Arnold M. Graton Associates, New Hampshire, Restoration and Conservationist team

E. Set of Preliminary Project Plans, 4 pages

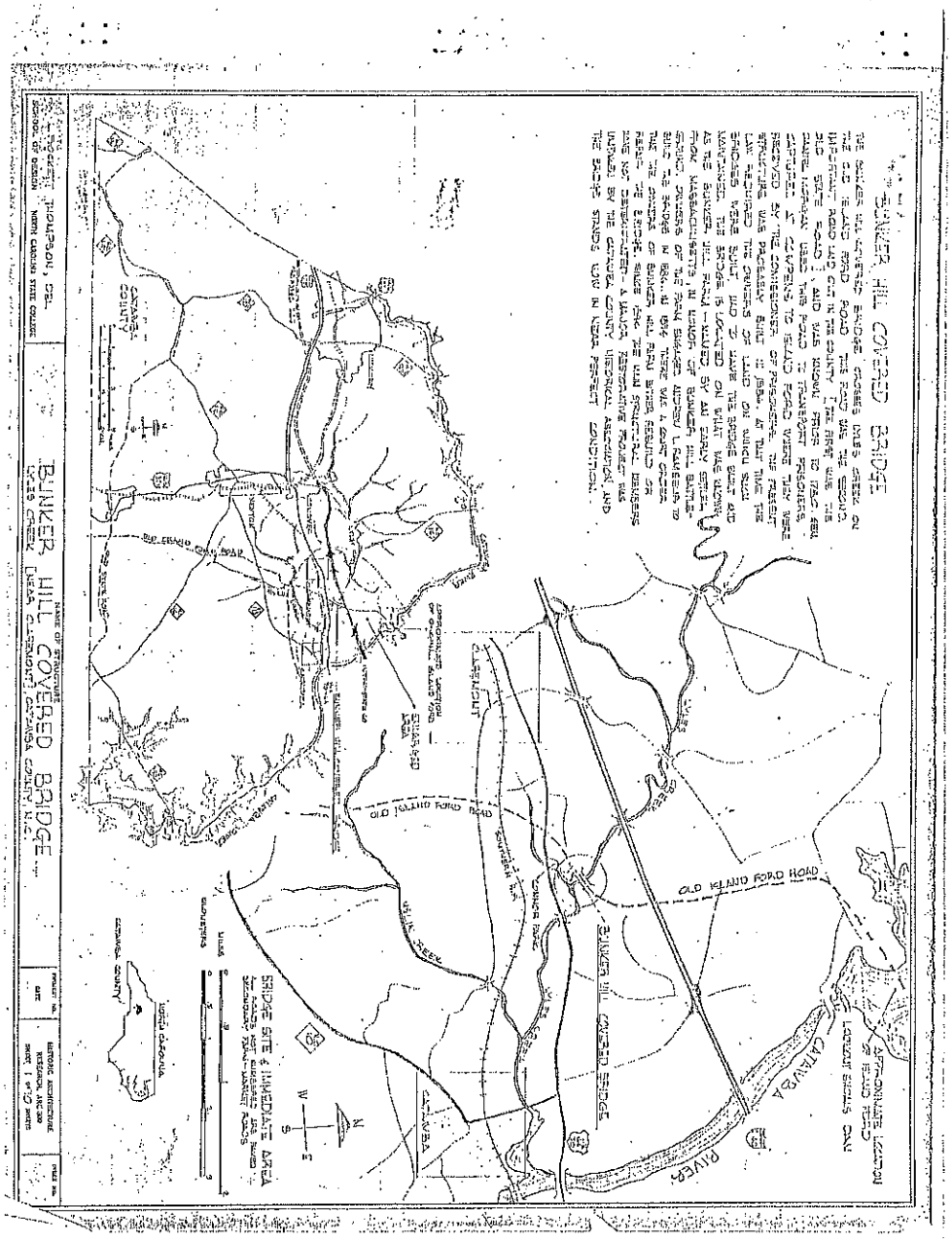
F. State Historic Preservation Office Letter

G. Set of photographs documenting the existing condition

Appendix A: Location and Site Map

Bunker Hill Covered Bridge, Claremont, North Carolina

Historic Architecture Research Archive, by L. Rockett Thompson, Page 1



Appendix B: Letters of Support
Letter 1: American Society of Civil Engineers

Duke University
Pratt School of Engineering
DURHAM, NORTH CAROLINA 27708-0287

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
BOX 90287

TELEPHONE (919) 660-5200
FAX (919) 660-5219
http://www-cee.pr.duke.edu

May 23, 2010

Mr. Peter Sandbeck
Administrator, State Historic Preservation Office
Deputy State Historic Preservation Officer
4617 Mail Service Center
Raleigh, NC 27699-4617

Dear Mr. Sandbeck:

The Bunker Hill Covered Bridge, located in Catawba County, North Carolina, has been designated by the American Society of Civil Engineers (ASCE) as a National Historic Civil Engineering Landmark. This designation is conferred only on civil engineering structures and projects that have broad historical significance, such as technical achievement at the time of their construction or lasting historical value because of their uniqueness in preserving a disappearing aspect of our nation's civil engineering history. The uniqueness of the Bunker Hill Covered Bridge in North Carolina makes it a special structure that should be preserved as a lasting monument to past achievement that can motivate future enterprise.

Since the profession and practice of civil engineering has been instrumental in designing and constructing our country's infrastructure—including roads and bridges—preserving significant structures like the Bunker Hill Covered Bridge is a means of preserving the sociotechnical memory of how our country's essential transportation system was developed. The continued existence and maintenance of the Bunker Hill Covered Bridge as a National Historic Civil Engineering Landmark provides a basis for educational programs that provide an important link in the chain of continuity between the past and the future. This is especially valuable these days in helping to communicate to the public the necessity of engineering for maintaining our country's global competitiveness.

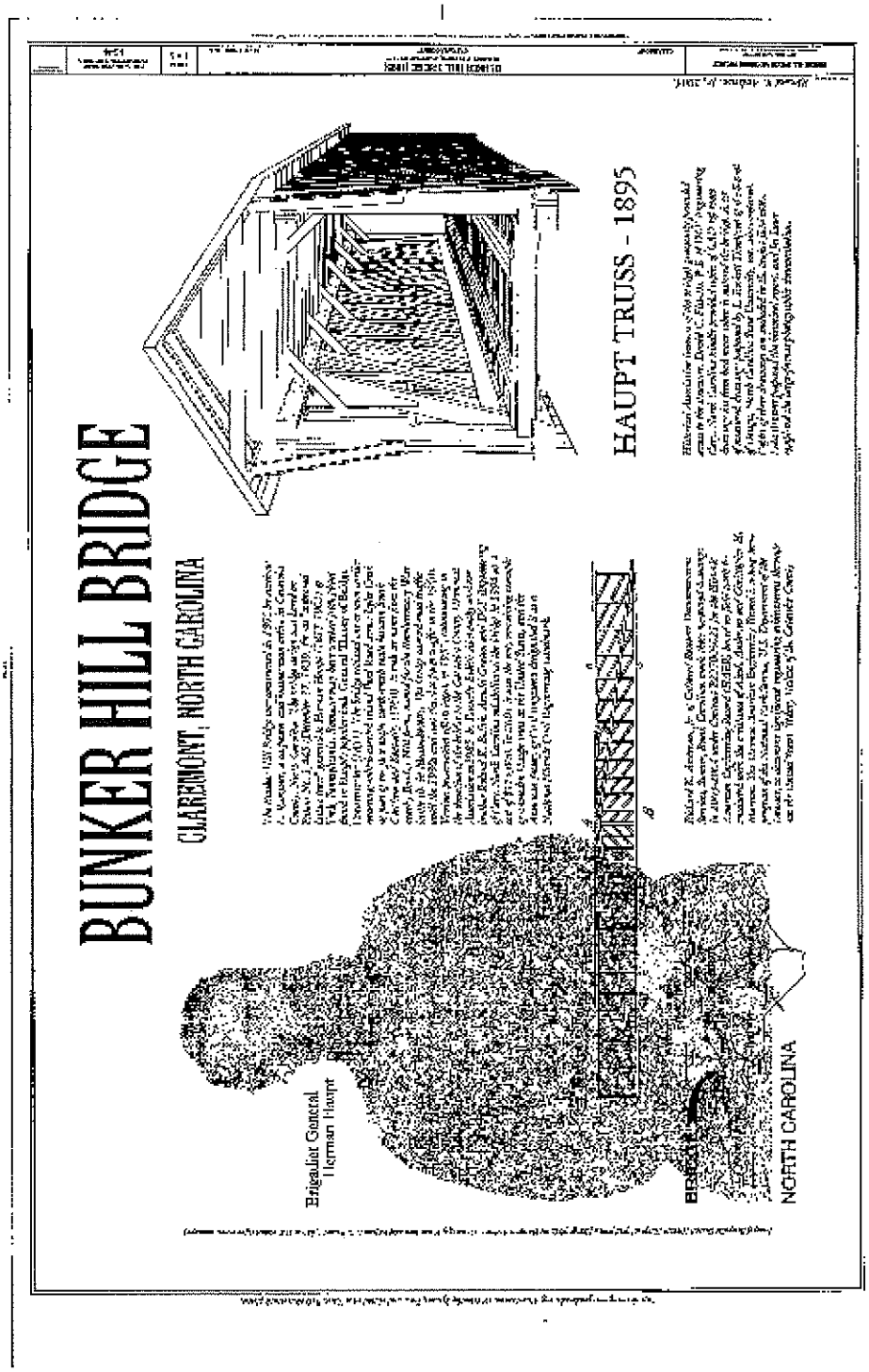
I fully endorse the grant application being prepared for submission to the U.S. Department of Transportation's National Historic Covered Bridge Preservation Project, which I thank for considering the proposal.

Sincerely,

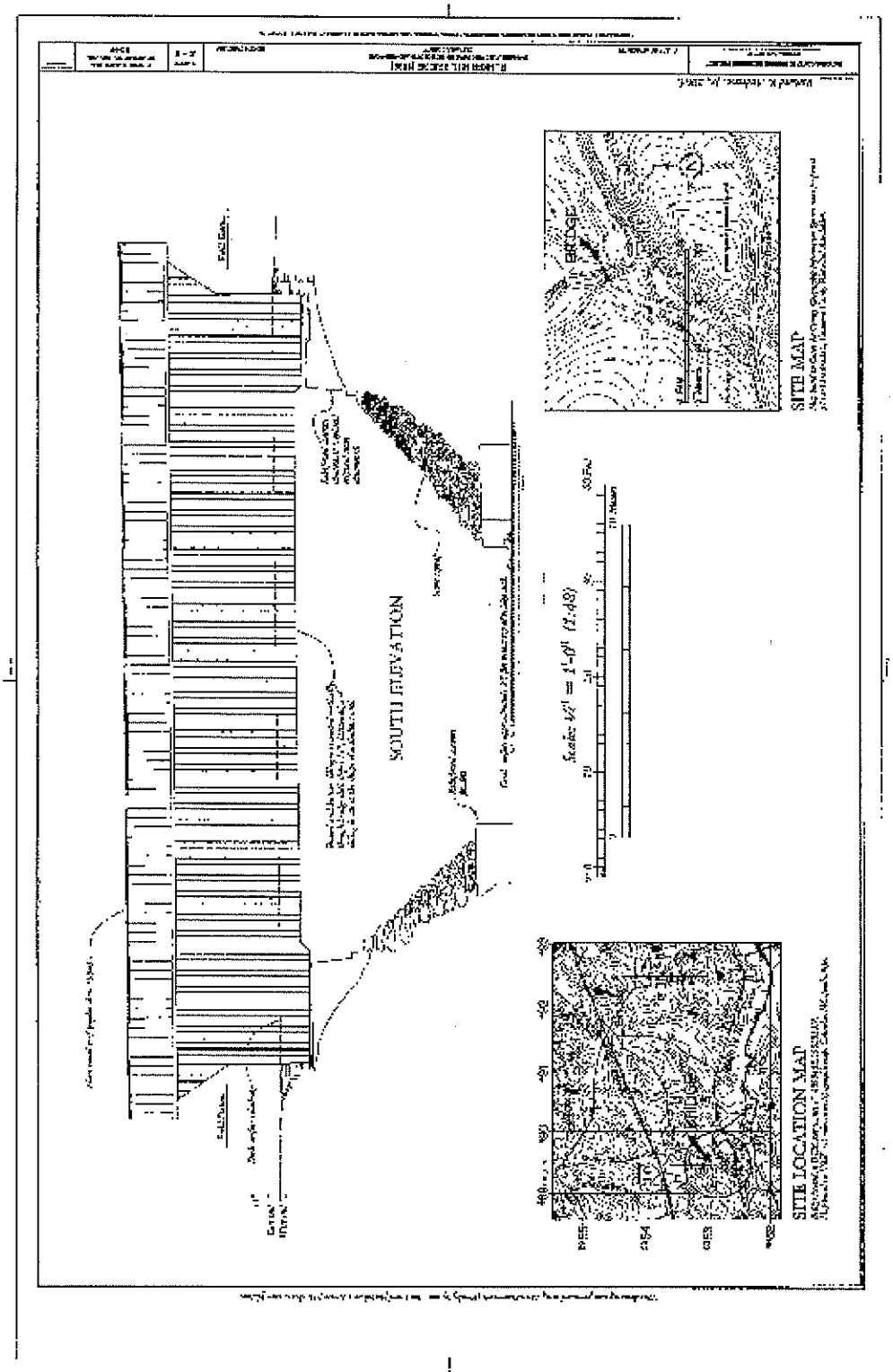
Henry Petroski
Aleksandar S. Vesic Professor of Civil Engineering
and Professor of History
Chair, ASCE History and Heritage Committee

Appendix C: Historic American Engineering Record Drawing
Bunker Hill Covered Bridge Set of 6 Images

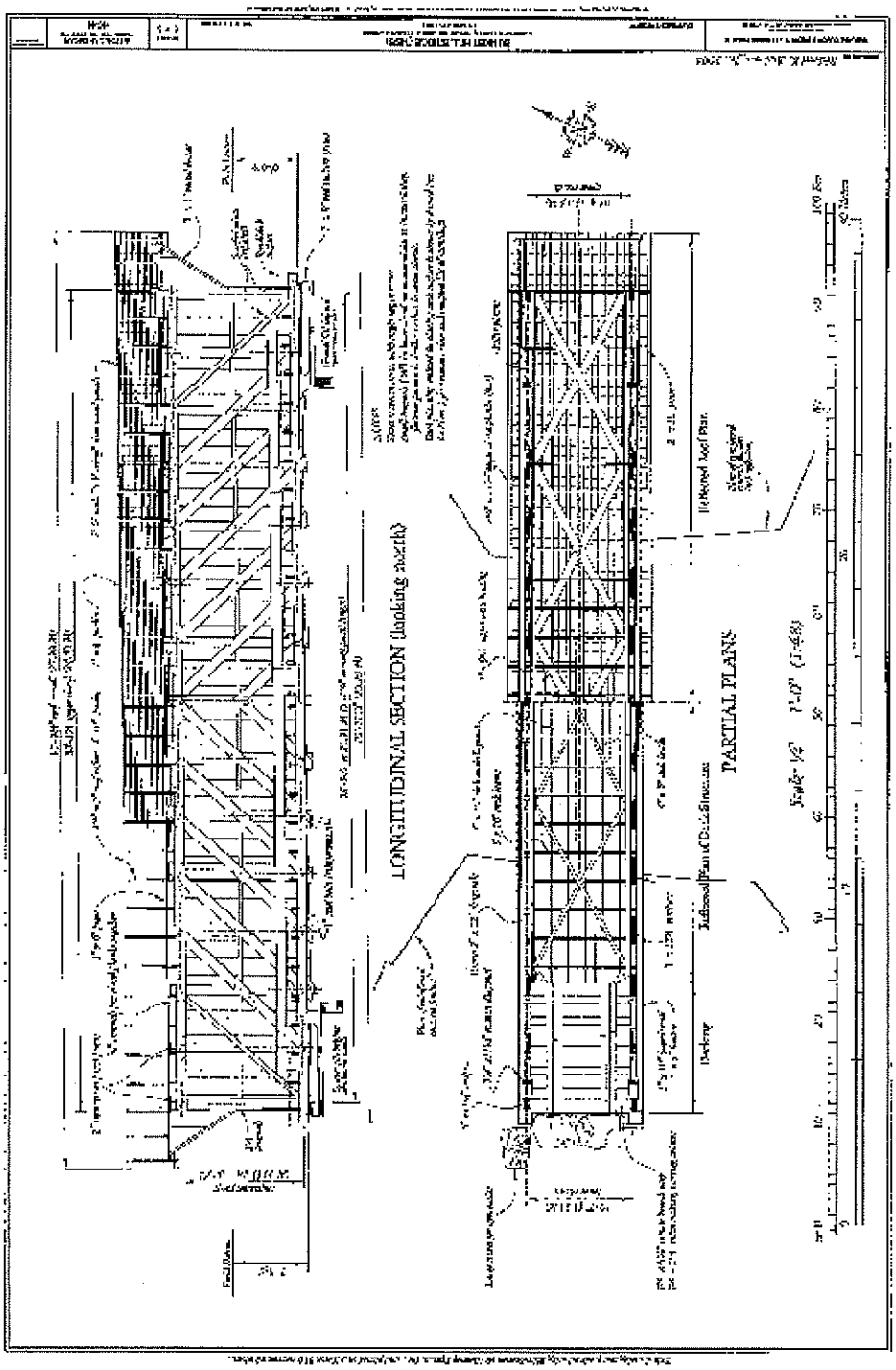
Prepared by Richard K. Anderson, Jr.
2004



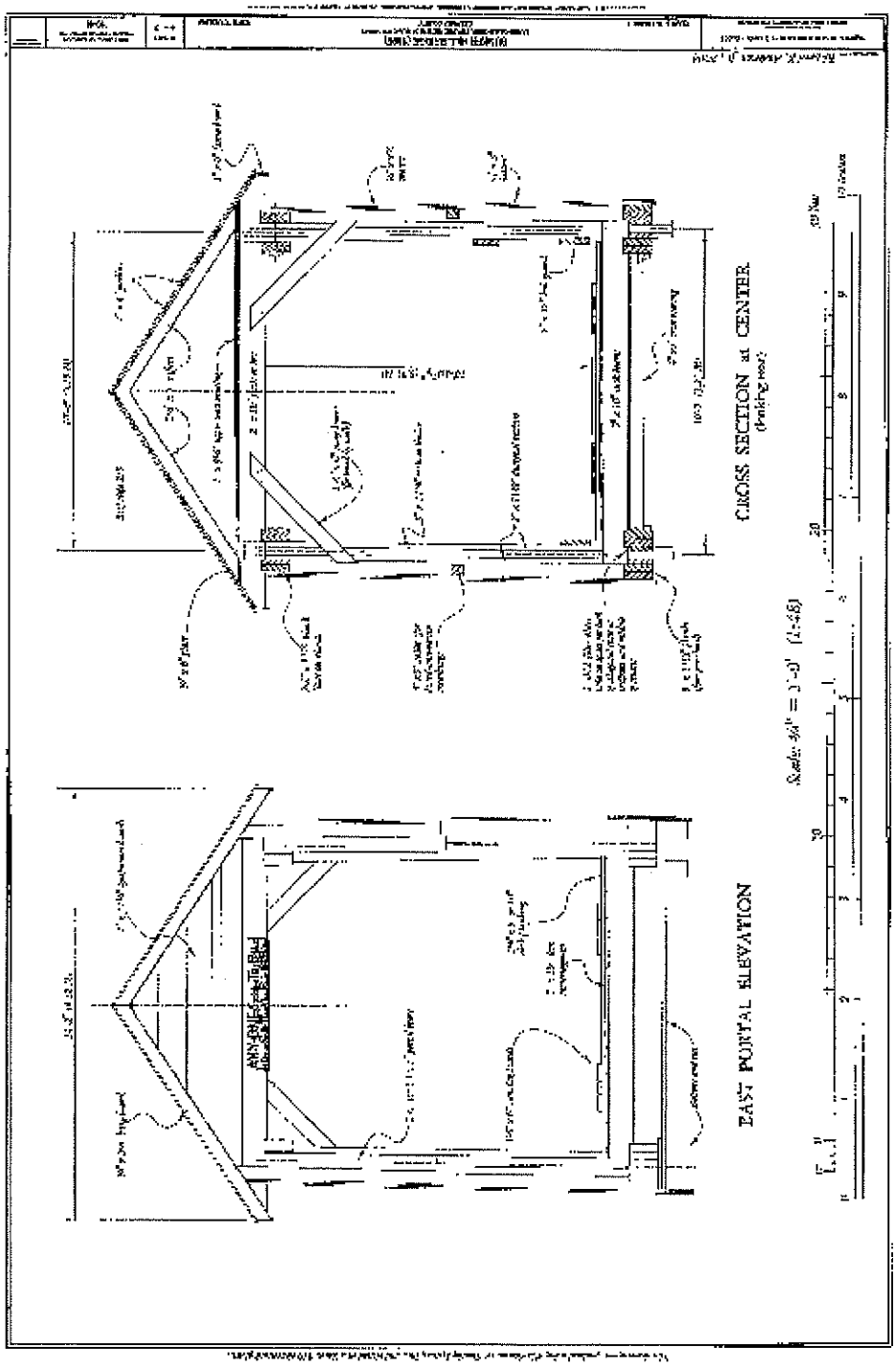
HAER Drawings, Bunker Hill Covered Bridge, Claremont, North Carolina



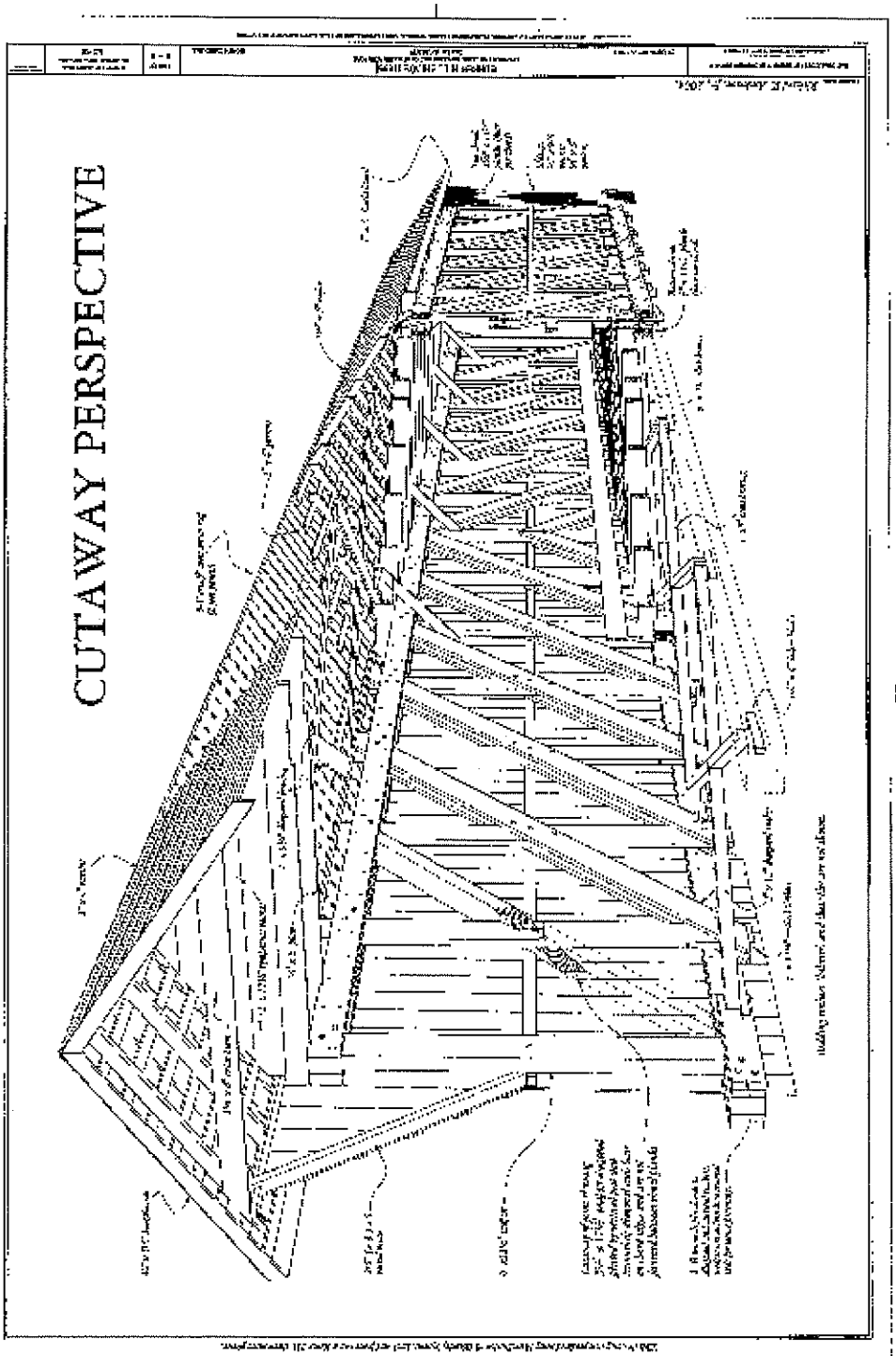
HAER Drawings, Bunker Hill Covered Bridge, Claremont, North Carolina



HAER Drawings, Bunker Hill Covered Bridge, Claremont, North Carolina



HAER Drawings, Bunker Hill Covered Bridge, Claremont, North Carolina



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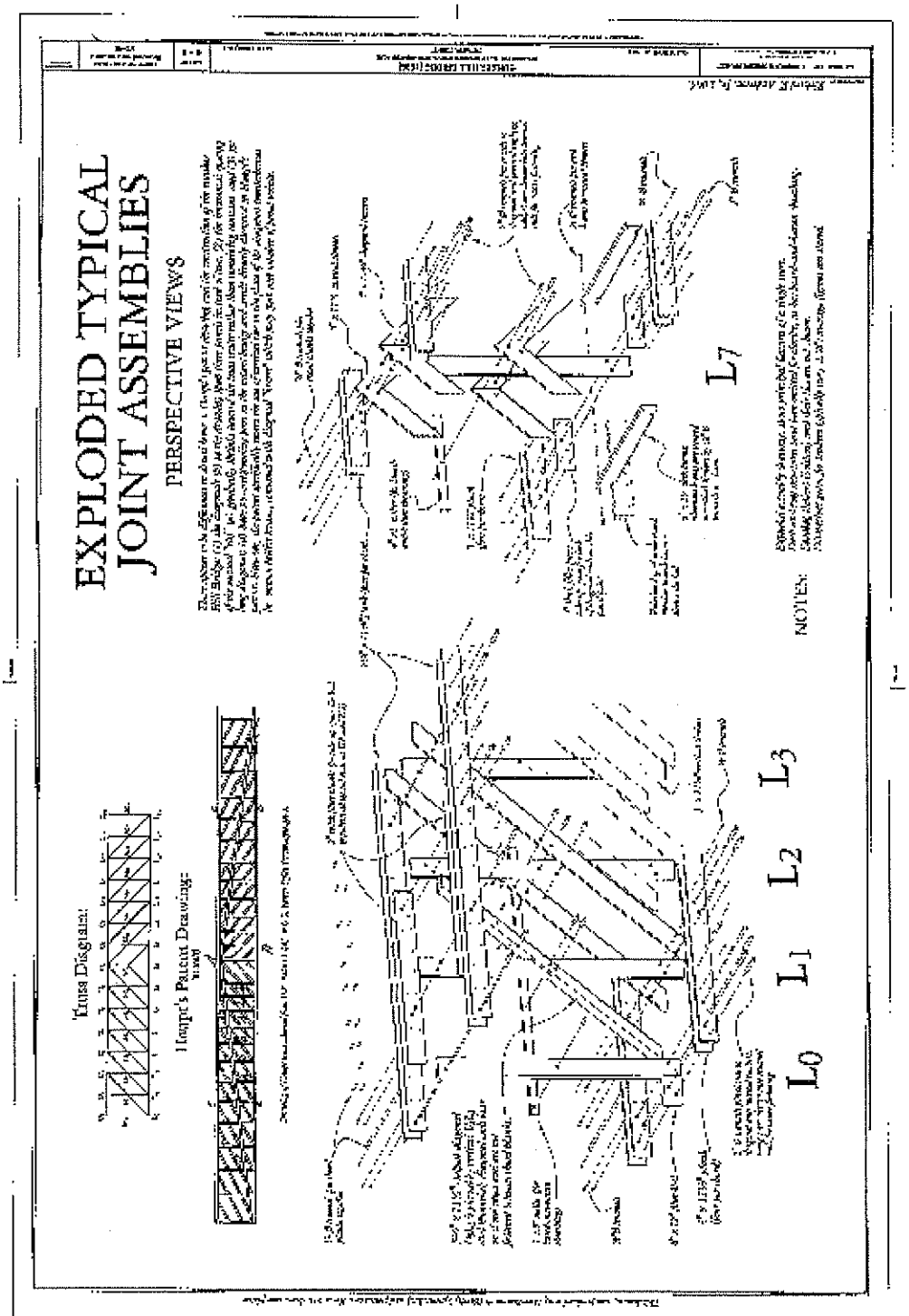
HAER Drawings, Bunker Hill Covered Bridge, Claremont, North Carolina



HAER Drawings, Bunker Hill Covered Bridge, Claremont, North Carolina

Appendix D: Restoration Notes by Arnold M. Graton Assoc., Inc.

RESTORATION CONSERVATIONIST

Arnold M. GRATON Associates, Inc.

US Rte. 3
PO Box 174
Holderness, NH 03245
cell 603-448-9592
603-968-9574 • 603-968-3621

ARNOLD M. GRATON
Master Bridge Wright
amgraton20@aol.com

Arnoldmgraton.com

Bunker Hill Covered Bridge

After shoring and restoring camber to the bridge the following work was completed:

West End Upstream

- Spliced in four members of the lower chord in lengths from 10' to 34' using recycled yellow pine from timber I had in my shed.
- Other remaining corners had to be spliced with lengths from 10' to 22'.
- All four corner posts were spliced with white oak to match original as closely as practical.
- All bed timbers were replaced and set on stone after the concrete which had been cast around them and the lower chord was removed.
- Some of the first braces on the end were spliced.

West End Downstream

- Spliced and repaired upper chord and lateral bracing which was broken by a tree falling during a storm.
- After all shoring and cribbing was removed, I relaid the approach walls and approach stones.
- I also placed some of our crib bearing stones at the base of the concrete abutment to help the erosion problem.
- During this work, all side boarding and part of the roof had to be removed and reinstalled along with a good portion of the floor and joists.

Appendix G: Photographic Documentation
Bunker Hill Covered Bridge, Claremont, North Carolina

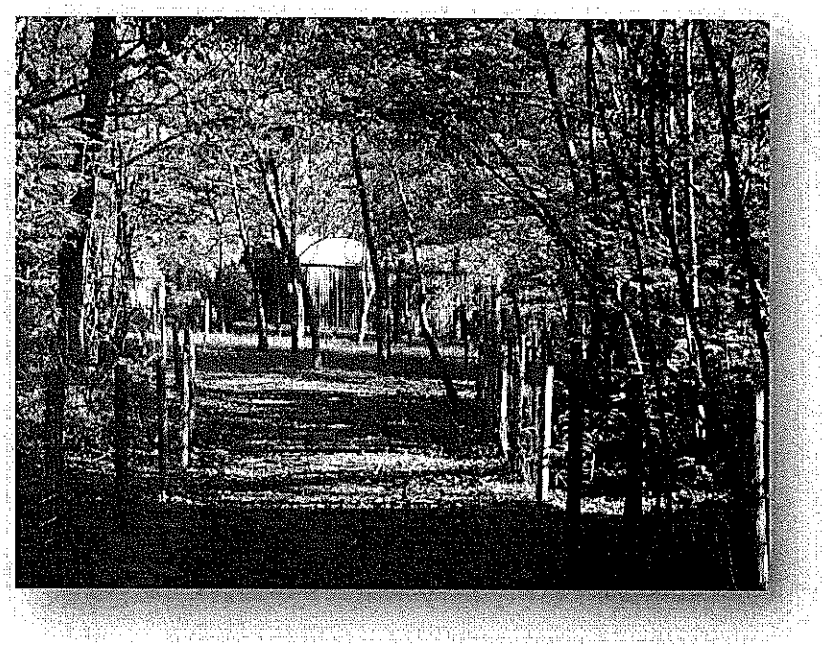


Figure 1: View of Bunker Hill Covered Bridge taken from the footpath leading from the picnic park off NC Highway 70 to the 1.1 acre bridge site. Photo taken March 8, 2010 looking northwest.

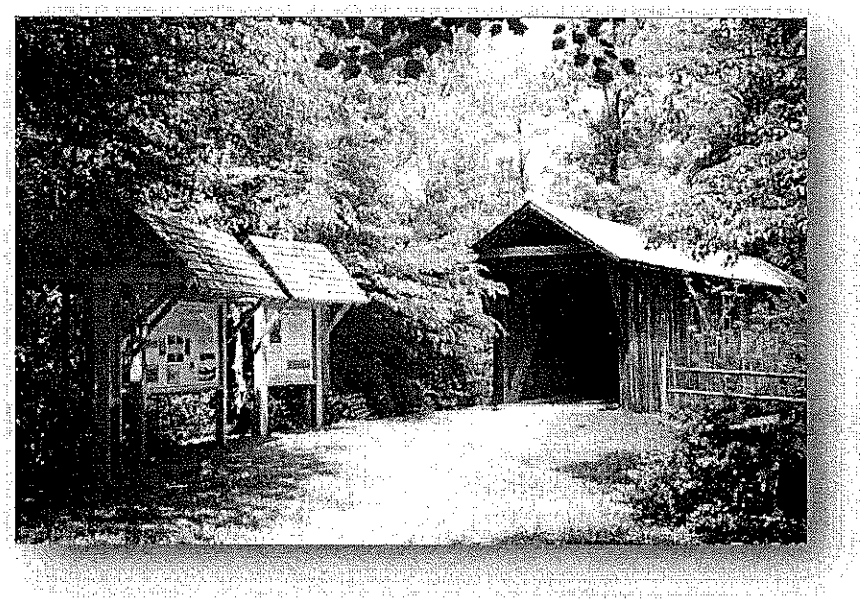


Figure 2: Interpretive kiosks, section of the Old Island Ford Road, and the eastern portal of the Bunker Hill Covered Bridge spanning the Lyle Creek near Claremont, North Carolina. Image taken May 9, 2001 looking northwest.

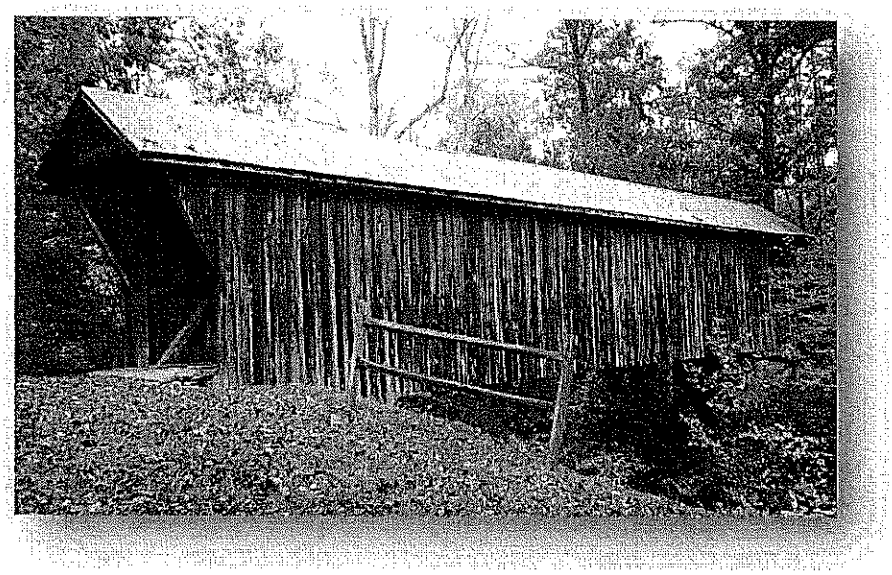


Figure 3: Board and Batten Exterior of the Bunker Hill Covered Bridge. Taken from the eastern bank of Lyle Creek on March 8, 2010 looking north west at the southern face of the covered bridge.

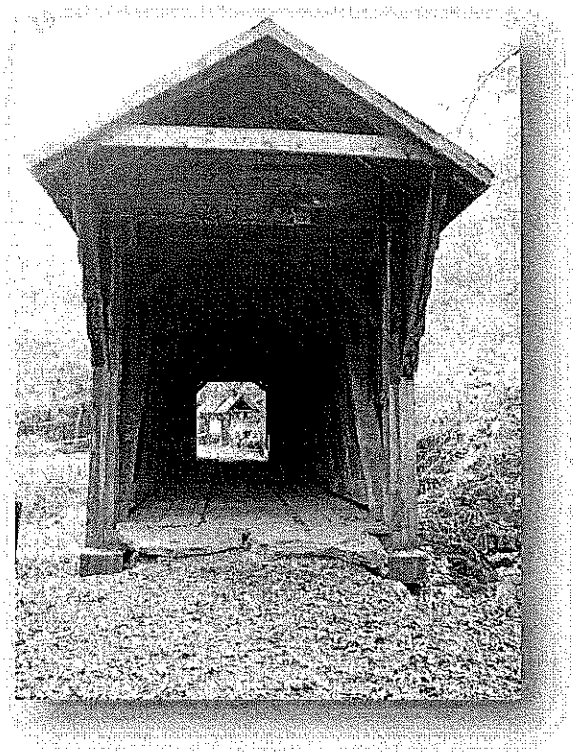


Figure 4: Western Portal to the Bunker Hill Covered Bridge showing the "improved lattice" truss work and running boards. Photo taken March 8, 2010 from the west bank of Lyle Creek looking east.

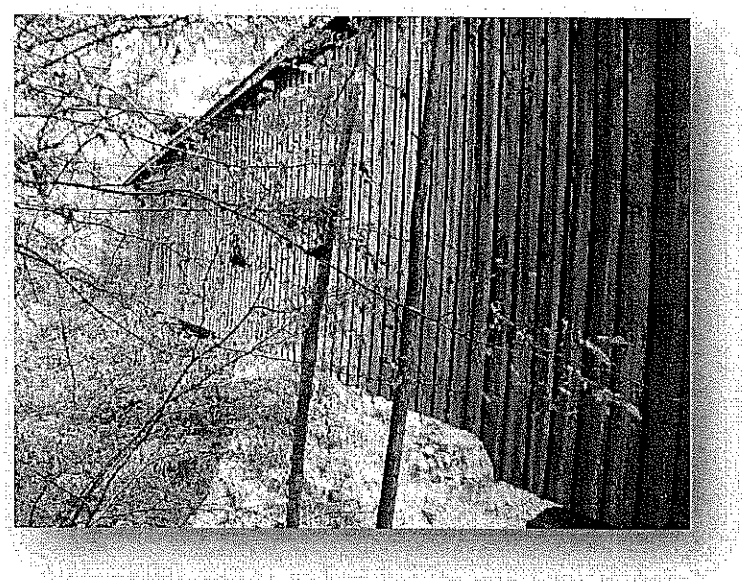


Image 5: View of board and batten exterior siding of the north face of Bunker Hill Bridge. Taken from the east bank of Lyle Creek looking southwest.

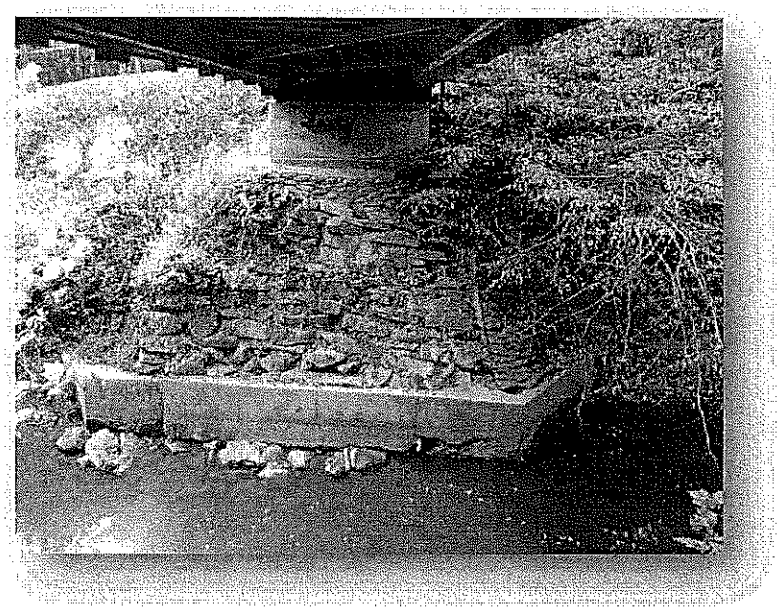


Image 6: Eastern abutment as viewed from underneath the bridge on the western shore. The abutment earlier repair with sandbags to reapair lost stone. Taken March 8, 2010.

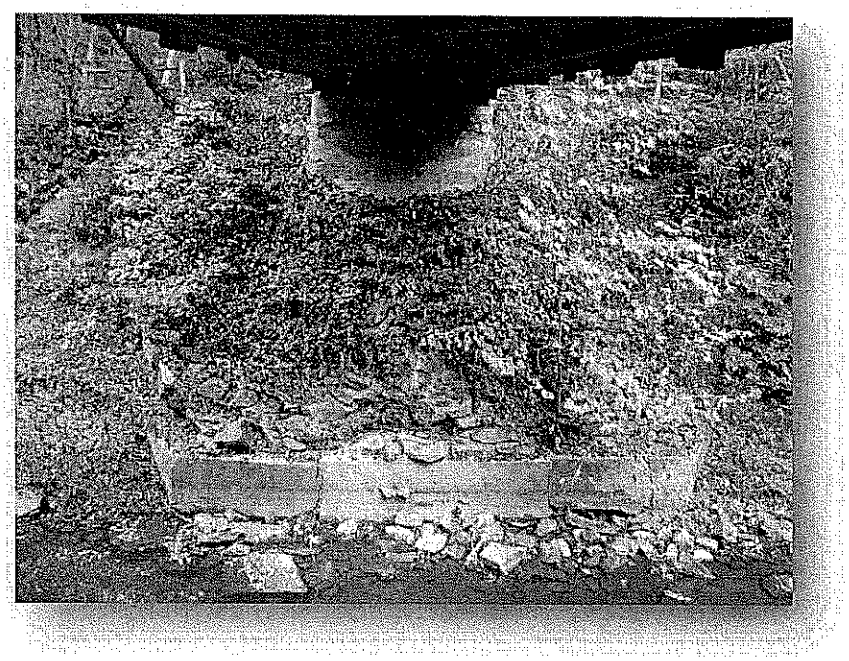


Image 7: Western abutment as viewed from underneath the bridge on the eastern shore. The abutment shows signs of scouring and vandalism. Taken March 8, 2010.

Image 8: View from west bank looking east at the underside of the Bunker Hill Covered Bridge showing lower chords, cross braces, deck joists, and underlayment flooring. Taken March 8, 2010.

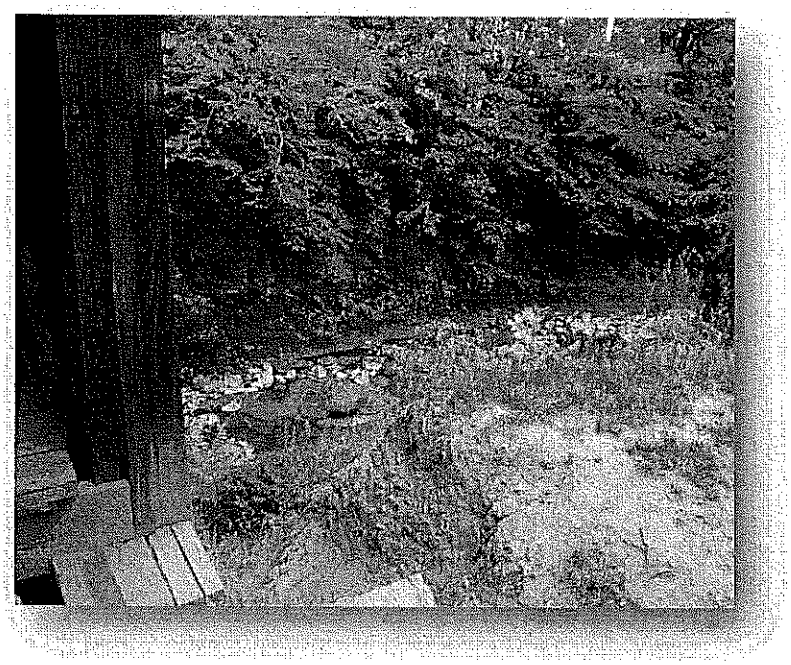


Image 9: View of the erosion near the eastern portal along the bank which is channeling runoff damaging the lower chord, and undermining the eastern abutment. Taken March 8, 2010.

Image 10: Graffiti over early 20th century advertising stencils on the interior of Bunker Hill Covered Bridge. Graffiti, smoking and drinking under the bridge is on the rise due the lack of a security system and an isolated setting both to be addressed with the award of grant funding.