North Carolina Department of Cultural Resources

State Historic Preservation Office

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Office of Archives and History
Division of Historical Resources
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May 21, 2010

Lynn Hicks
National Forests in North Carolina
160 Zillicoa Street
Suite A
Asheville, NC 28801

Re: Cultural Resource Survey, Bullpen Bridge, Nantahala National Forest, Macon and Jackson Counties, ER 10-0895

Dear Mr. Hicks:

Thank you for your letter of May 12, 2010, concerning the Cultural Resource Assessment of Bullpen Bridge in the Nantahala National Forest.

MA 0563 / JK 0556

We concur with the findings and recommendations in the report that the Bullpen Bridge is eligible for the National Register of Historic Places under Criterion A within the historic contexts of transportation in North Carolina, history of the National Forest Service and the development of its transportation systems, and the history of the Civilian Conservation Corps; and under Criterion C in the area of bridge engineering.

The bridge should be preserved, maintained, and interpreted by the US Forest Service. Any maintenance or alteration to the bridge should meet the *Secretary of the Interior's Standards for Rehabilitation* and should comply with Section 106 review procedures. We agree with the recommendations for treatment on page 45 of the report.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning this comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above tracking number.

Sincerely,

Renee Gledhill-Earley

for Peter Sandbeck

cc: Rodney Snedeker, National Forests in North Carolina

CULTURAL RESOURCE SURVEY

Recording and National Register of Historic Places Evaluation of the

BULLPEN BRIDGE

Nantahala National Forest
Macon and Jackson Counties, North Carolina

Prepared for
National Forests in North Carolina
160A Zillicoa Street
Asheville, North Carolina 28801

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May 7, 2010

CULTURAL RESOURCE SURVEY

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Ellen Pratt Harris AIA

May 7, 2010

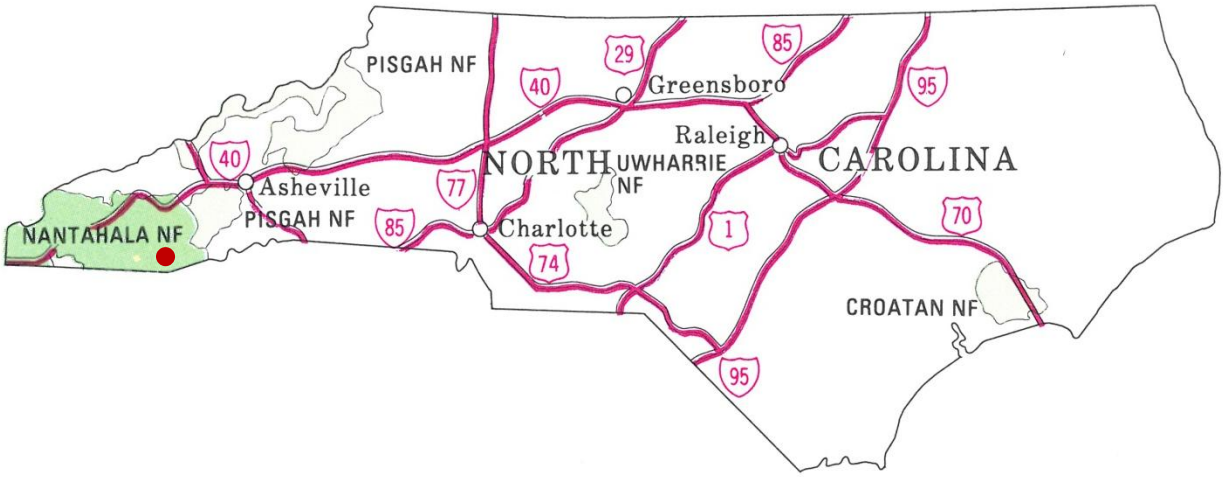
MANAGEMENT SUMMARY

This report is submitted under contract with the National Forests in North Carolina, Solicitation Number AG-4419-S-10-0120, funded in whole by the American Recovery and Reinvestment Act of 2009. The purpose is to conduct a cultural resource survey and structure assessment to record, document, and evaluate the Bulllpen Bridge, located in the Nantahala National Forest in Macon and Jackson Counties, North Carolina. This work shall include National Register of Historic Places (NRHP) evaluation of the site and record and evaluate the bridge, which would be affected by proposed maintenance and repairs. The data in this report will be used for National Environmental Policy Act analysis and for compliance with Section 106 of the National Historic Preservation Act, as amended.

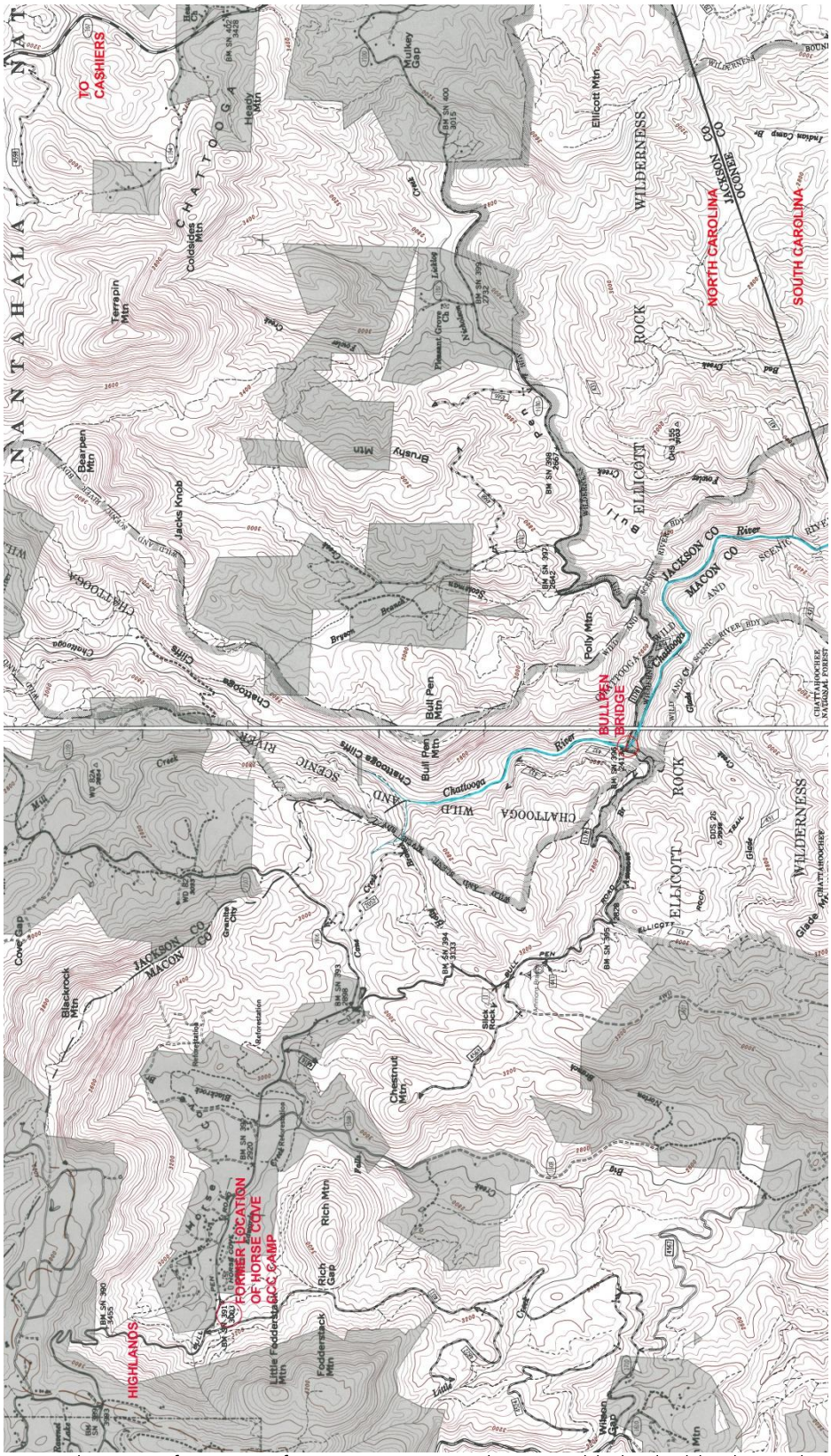
INTRODUCTION

Located in the Nantahala National Forest in Western North Carolina, the Bullpen Bridge spans the Chattooga River on Bullpen Road (Forest Service Road 1178). As the river is the dividing line between counties, the eastern end is in Macon County and the western end is in Jackson County. Both the bridge and the road were constructed in 1934 as part of a lasting legacy of construction within Federal Forests by the Civilian Conservation Corps. Bullpen Road is located in the southeastern section of the forest and runs roughly east-west from the town of Highlands to the west and to Route 107 to the east, which leads north to the town of Cashiers and south to Walhalla, South Carolina. Bullpen Road is an improved gravel road in the vicinity of the bridge.

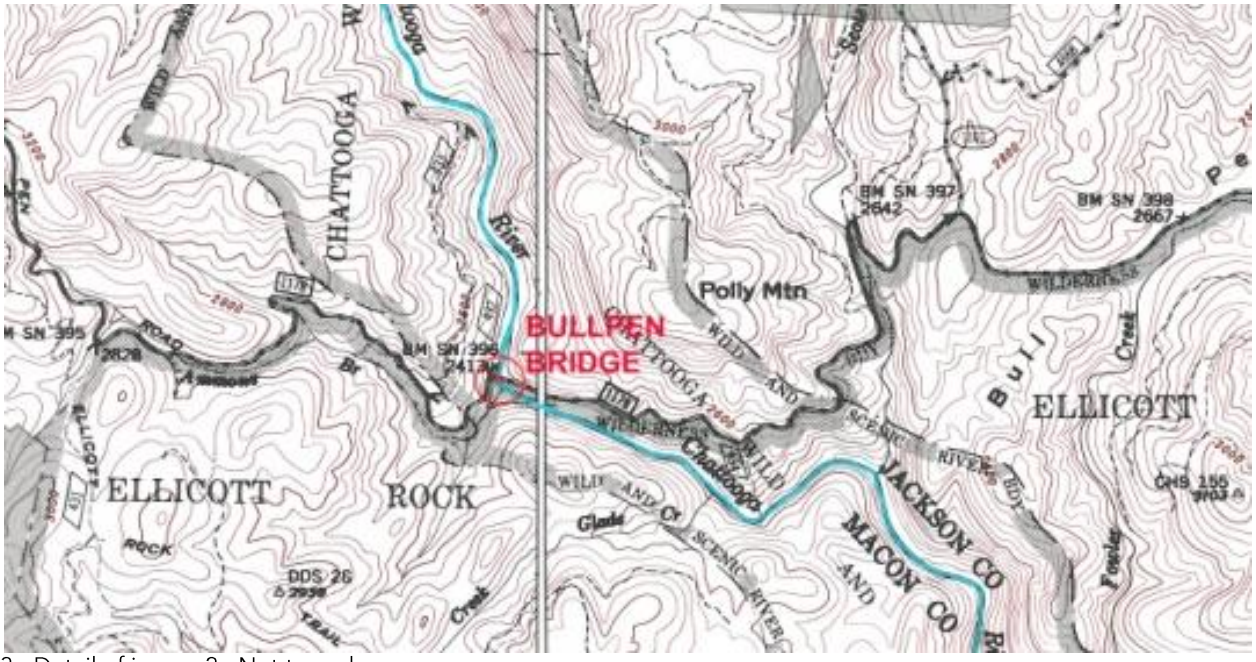
The historic significance of the bridge is based upon four related histories including the development of transportation in North Carolina; the history of bridge engineering; the history of the U. S. Forest Service and the development of its transportation systems; and the Civilian Conservation Corps. All of these historic contexts are discussed at length in this report.



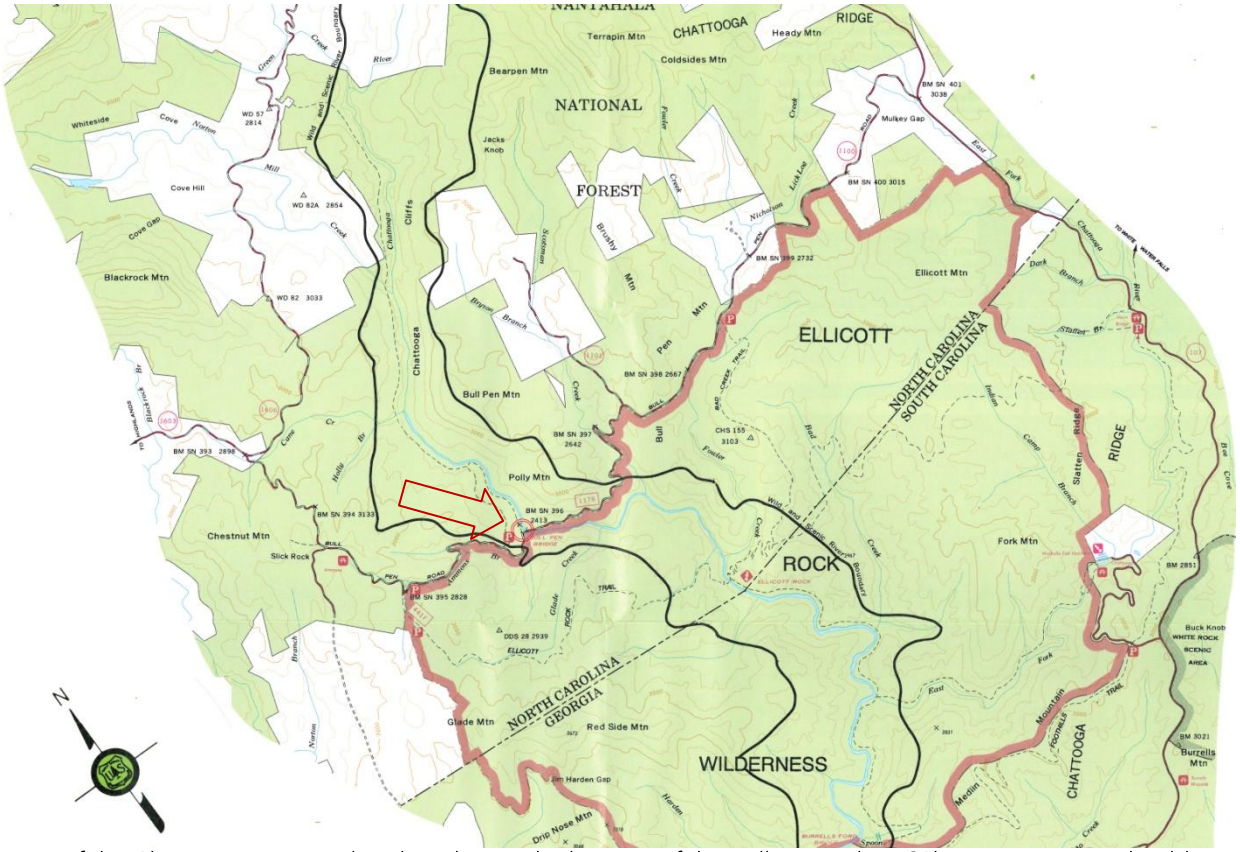
1. Vicinity Map, showing location of the Nantahala National Forest in North Carolina. Red dot indicates approximate location of the Bullpen Bridge. [Nantahala National Forest (map), North Carolina, United States Department of Agriculture, Forest Service, Southern Region, May 2001.



2. Combination of portions of two USGS maps, with notes added. The blue line is the Chattooga River, which runs roughly north – south. (Highlands, NC –GA, 1946 and Cashiers, NC-SC-GA, 1946) Not to scale.



3. Detail of image 2. Not to scale.



4. Map of the Chattooga River, red circle indicates the location of the Bullpen Bridge. [Chattooga, National Wild and Scenic River (map), United States Department of Agriculture, Forest Service, Southern Region, December 1994.] Not to scale.

HISTORIC CONTEXT

The historic context for the Bullpen Bridge requires the consideration of four related histories:

- Transportation in North Carolina
- Bridge Engineering
- History of the National Forest Service and the development of its transportation systems
- Civilian Conservation Corps

Much of the historic information presented in this report comes directly from other documented research, which is listed in the Resources section and annotated in the text. Some of the information presented is based upon research compiled by Forest Service staff that was in turn based upon work by others, which explains the need for "double" annotations. Clarifications and additions to this previous work is included in brackets [. . .] while annotations are in parentheses (. . .).

A transportation context for North Carolina was developed in 1995 (Griffith and Bevin) to evaluate and determine National Register eligibility of historic bridges. The North Carolina transportation history that follows is drawn entirely from that document. The function of Forest Service transportation networks contrasts somewhat from the North Carolina public roads works. Although many roads were designed for public vehicle use, most [Forest Service] roads were designed or maintained for access to manage and extract natural resources. In addition, the historic (prior to government acquisition of the land for National Forests) pursuit of resources in the mountains of Western North Carolina produced a very unique transportation system for the removal of timber and minerals.

Given the nature of Forest Service land use and transportation needs, additional context for these lands has been generated to describe the whole of North Carolina's transportation past. Eriksson, McLeod, and Gard (2000) developed a U.S. Forest Service lands historic context for bridges and transportation as a guide for identifying and preserving historic bridges. Portions of the National Forests in North Carolina (NFsNC) transportation context were drawn entirely from the Eriksson, McLeod, and Gard document.

Transportation in North Carolina
(Ashcraft and Snedeker, Curtis Creek CCC Camp and Improvements Project, 2006)
(Griffith and Bevin, 1995)
The natural transportation systems of North Carolina handicapped the state's early economic development and served to influence the prevalent modes of transportation and the physical development of the state's major routes and facilities. The importance of the "Good Roads movement" in North Carolina in the 1920's results in part from the insufficient and inadequate transportation systems of the previous two centuries.

Despite the state's extensive coast line, North Carolina suffered economically in the eighteenth and early-nineteenth centuries due to the dangerous coastal waters and lack of good harbors. Only one of North Carolina's principle rivers flows directly into the Atlantic Ocean, while the others empty into the shallow Albemarle and Pamlico Sounds or waterways outside the state. The barrier islands and sounds along the coast complicated navigation and provided "few good outlets for ocean commerce." (Lefler and Newsome 1954) An adequate natural system of inland waterways in the coastal plain, however, provided the primary routes of trade and travel throughout the colony. These navigable waterways and the area's rich soil attracted the earliest settlers to northeastern North Carolina. As the coastal areas became more densely populated and settlers had to move further away from navigable watercourses, particularly into the Piedmont, pleas for road development began in earnest.

The earliest colonial roads were little more than Indian trails or trading paths where tree branches had been cut away to allow a rider on horseback to pass without being struck, but these trails evolved into

the primary routes of travel in the eighteenth century. The act of 1764, one of many eighteenth century road laws, authorized the county courts to order "the laying out of roads," establish ferries, designate the location of bridges, and clear navigable rivers and creeks. The courts could delegate "Overseers of the Highways and Roads" to enlist "all male taxables, ages sixteen to thirty, to work the roads a certain number of days each year." Under this system public roads were laid out and cleared of trees and obstructions to a width of twenty feet. (Lefler and Newsome 1954) If the road laws had been enforced, the state might have developed a satisfactory network of good roads in its infancy.

In the eighteenth century, bridges were uncommon in areas of North Carolina where water travel was prevalent, but as settlement extended gradually inland, ferries and bridges were needed to cross the deeper and swifter creeks and rivers. In their absence, travelers risked either fording the waterway or taking a circuitous route. As a crossing became more heavily traveled, a ferry might have been established to reduce the risk of fording the creek or river and to make a profit for some enterprising individual. Many ferries were eventually replaced with bridges built by the county to allow for the unrestricted movement of traffic at the crossing. The Act of 1764 stipulated that bridges over small streams were to be constructed of wood "at least fourteen feet long, laid across the road, well secured, and covered with earth." Bridges over larger creeks and streams were to be "at least twelve feet wide, made of sawed plank at least two inches thick, with strong posts, rails, and beams, all well fastened together." (Lefler and Newsome 1954)

Archibald D. Murphy and the Reverend Joseph Caldwell were early proponents of an improved transportation network within the state to establish economic independence from North Carolina's neighboring states and help curtail the statewide problem of emigration. Murphy introduced a proposal to the General Assembly in 1815 that called for the improvement of existing waterways, clearing of river channels, connecting principal waterways by canals, building good roads and turnpikes, and developing strategic centers of trade and distribution. Although Murphy's plan initially met with statewide support, emphasis on regional projects and sectionalism led to ineffective appropriation of the internal improvement funds. (Ashe 1906)

The introduction of the locomotive engine and the operation of two "experimental railroads" in North Carolina aroused interest among the state's leaders and citizens concerning this new mode of transportation. In November 1833, the General Assembly chartered ten railroad companies to be constructed with private funds including the Wilmington and Weldon (originally chartered as the Wilmington and Raleigh) and the Raleigh and Gaston, both completed in 1840. The most important of the early railroad companies, however, proved to be the state-operated North Carolina Railroad (NCRR) chartered in 1849 and completed in 1856, because it not only linked the growing industrial cities of the state along its route but also demonstrated the willingness of the state's leaders to consider public funds for transportation projects. In the decade preceding the Civil War, North Carolina's railroads showed their potential to spur economic growth, but the war effort left the state's railroads in poor condition. By the mid-1870's, construction and consolidation of rail lines in North Carolina began a new era of prosperity.

In addition to railroads, North Carolina's leaders pursued the construction of plank roads as an antidote to the state's poor transportation systems. The General Assembly chartered numerous private companies to build plank roads with many radiating from Fayetteville, with the state subscribing up to three-fifths of the stock. Within ten years, however, most of the plank roads were in need of extensive repairs, and consequently abandoned, since the roads had not been profitable.

Although the railroads improved North Carolina's economic condition significantly, agitation for good roads resumed in the last quarter of the nineteenth century. The Mecklenburg Road Law, passed in 1879, provided for roads funded through taxation and implemented by the old labor system. This legislation was enacted as a general law but, in reality, only applied to a few counties. Most progressive counties, however, had adopted similar tax-based road building programs by the end of the century.

Rural Free Delivery mail service, instituted by the federal government in 1896, generated additional interest in good roads. Ultimately, North Carolina's desire for an extensive and dependable highway system achieved broad-based acceptance in the early twentieth century with the introduction and widespread availability of automobiles. The number of registered automobiles in North Carolina rose sharply from 2,400 in 1910 to 150,000 in 1921. By 1929, nearly 500,000 vehicles were registered in the state. (Lefler and Newsome 1954)

The "Good Roads" era of highway building in North Carolina can be said to have begun under Governor Locke Craig (1913-1917). In 1915, the Legislature created the State Highway Commission (SHC) and appropriated $10,000 for the construction of highways, in anticipation of the Federal Aid Road Act passed in 1916. The work of the SHC was carried out by four departments - bridges, testing, plans and estimates, and construction - under the supervision of the State Highway Engineer. State lawmakers passed new legislation in 1917 allowing the SHC to receive funds from automobile registration with the stipulation that 70 percent of the revenues were to be expended on the county from which they were collected.

A far-reaching, but ultimately flawed, piece of legislation enacted in 1919 "symbolized the beginning of real highway work" in North Carolina. (Waynick 1952) The SHC was charged with constructing all roads on the state highway system, assisting the counties with highway work, and allocating Federal Aid funds. The 1919 act created the State Highway Fund and gave priority for highway projects to counties that provided one-fourth of the construction costs, to the disadvantage of poorer counties. The main fault of the legislation was that the responsibility of maintenance was left to the counties.

Acknowledgment of the inadequate system of maintenance and the need for even more and better roads led to the beginning of the Good Roads campaign. In 1921, the Doughton-Connor-Bowie Act was passed, empowering the state to assume control of a network of approximately 5,500 miles of hard surfaced roads in North Carolina. The proposal called for linking the state's 100 county seats, principal towns, state parks, principal state institutions, and the highways of adjoining states. (N.C. Highway Bulletin, vol. 2, no. 2, 1921) To pay for this new responsibility, the state imposed a fuel tax of one cent per gallon, established a series of vehicle license and registration fees, and, most significantly, approved a $50 million bond issue. In the years of Governor Cameron Morrison's term (1921-1925) additional highway bonds were approved, bringing the total to $115 million for the period from 1921 to 1927. During this period of highway building, North Carolina became known as "the Good Roads State." (Harrington 1989)

The Bridge Department of the SHC was responsible for the design and construction of bridges on the State Highway System and for providing assistance to the counties. William L. Craven headed the Bridge Department from the late-1910s until 1949. Craven brought nearly 15 years of experience working with bridge companies in Pennsylvania, Virginia, and North Carolina when he began with the SHC. Mr. O. F. Yount, Superintendent of Bridge Construction in the early 1920s, spent a number of years with the Virginia Bridge and Iron Company of Roanoke, Virginia, prior to beginning work with the SHC. Both men not only possessed considerable knowledge in the design of metal truss bridges, but also played important roles as reinforced concrete came to be the preferred material for bridges on the state highway system beginning in the early 1920's. (Craven 1922, Yount 1920- North Carolina Highway Bulletin)

By the time the 1930's arrived and the Depression took hold, the counties clearly could not maintain the network of secondary roads, much less improve them. The legislature voted in 1931 to assume responsibility for county roads, which placed the state in charge of the entire secondary road system. On this single action, the state took over 40,000 miles of roads and 15,000 bridges [and the NC State Highway Department was created]. (Hardin 1966) The highway fund was diverted to other state programs during the Depression, but by 1935, highway building resumed in earnest as revenues began

to rise. Since World War II, North Carolina has continued to extend and improve its highway system to serve all citizens of the state.

The history of Western North Carolina and its transportation systems varied from the remainder of the state due to topography. The area is part of the larger Appalachian social and economic region characterized by rough mountains. The mountains have acted as a physical barrier that affected cultural, social, and economic development and interaction with surrounding areas. The first Euro American settlers entered the relatively remote area in the late eighteenth century. Land grants to Revolutionary War veterans provided an additional incentive for settlement, as did the Cherokee removal treaty of 1835. Most of these early settlers were small-scale farmers, with settlement density generally low, and restricted to river and major creek floodplains. (Harmon and Snedeker 1987) Travel was always difficult in the Western North Carolina mountains prior to the coming of the railroads in the late nineteenth century, travel was either by foot, horse, or boat.

The heart of the transportation and communication system in the mountains was a network of trails and dirt roads connecting each community with the larger villages and towns, and in turn with the nearest marketing centers of the low country. The earliest white settlers found the mountain landscape already interlaced by big-game and Indian trails, and they quickly turned these ancient paths into minor roads. Continued use gradually widened the narrow roadways, which usually ran along the banks of creeks and rivers, and frequently crossed the watercourse as they wound toward the headwaters of another stream. Such roads were usually steep and often muddy and impassable in the winter and spring, but they served the limited needs of early settlers. (Eller 1979)

The area was sparsely populated until the years following the Civil War, when Western North Carolina was linked to the east by improved roads and completion of the railroad. (Harmon and Snedeker 1987) The improvements in transportation, however, did not affect most mountain rural areas until the twentieth century. Thus, while technological change and industrial growth expanded transportation facilities in other areas of the nation, there matured in Appalachia a traditional transportation network which primarily met local needs. (Eller 1979) It was the large-scale pursuit of the vast virgin forests that initiated major changes within western North Carolina's transportation system.

Early lumbering in the area began around 1880 and was relatively selective with what was cut. Railroads were not yet in use for logging in remote areas. Logging was initially limited to areas along rivers and creeks, but when these areas were clearcut and depleted, operations moved into the higher, more remote sections of the forest. (Harmon and Snedeker 1987) To get these giant trees out of the interior forests before railroads, tram roads of thick hardwood planks were laid across heavy stringers.

This provided footing for draft animals to pull wagons. Later, wooden rails were added, and logs were loaded on trucks with iron wheels, still pulled by animals. (Bolgiano 1998) Oxen were the primary beasts of burden and they often were led down the path of least resistance, thus creating a temporary "skid road".

The introduction of industrial scale logging into western North Carolina brought the funding for widespread use of the railroad. The Western Carolina Railroad reached Old Fort in 1869. (Haney 2002), and between the 1870s and 1920, the "lumber barons" purchased and cut over huge tracts of mountain timberland, devastating the region's forests in one of the most frenzied timber booms in American history. This boom was facilitated primarily with the use of locomotives for large-scale removal of logs. The Western North Carolina Railroad arrived in Asheville, North Carolina on October 3, 1880. (Eller 1979) The line was soon extended west of

Asheville and connected with other regional railroads, and Western North Carolina was opened up for railway logging.

Many lumber companies entered into western North Carolina, and many new companies were created during the logging boom period. Thousands of miles of railroads were cut into the mountainsides of western North Carolina, extending up the highest peaks of the Appalachians.

Transportation in Macon and Jackson Counties

After the Cherokee Removal Treaty of 1832, which required the Cherokee Indians to abandon their native lands, the area was opened up to settlement. Large land grants were extended to settlers who scraped out a living through subsistence farming and timbering. The region remained somewhat isolated to the outside world until after the Civil War due to topography and the lack of good transportation routes. Access was only possible from the south, which required a two-day trip by horse back from Walhalla, South Carolina, on a thirty-two mile dirt turnpike with a ford across the Chattooga River. Routes east, west, and north were not developed until the early twentieth century.

President Woodrow Wilson traveled to Highlands in 1879 and found the road "simply terrible." Both construction and maintenance of roads and bridges were the responsibility of the counties until 1921. A Board of Supervisors was established in Highlands in 1879 for this work, and all able-bodied men under the age of 45 were required to donate their labor each year. In 1905 a revision to the law allowed taxes to be paid in lieu of labor, but the need for labor was always far greater than the work to be done. The combination of terrain, this lack of labor, and funding left many roads in poor condition and often extremely muddy.

Railroad service to Walhalla, Franklin to the west and Brevard to the east was in place by the 1890s, but railroad service was never extended into Highlands or Cashiers. So poor dirt roads in poor repair limited access into and out of the area until after the creation of the State Highway Department in 1931, when the Works Progress Administration (WPA) work to improve roads leading out of Highlands, although many remained dirt until the 1940s. (Shaffner)

A lack of bridges over the Chattooga River, which also serves as the county line between modern day Macon and Jackson Counties, also hindered travel. The river is characterized by deep ravines and rapids so crossing it was only possible at natural fords, such as along the modern day Whiteside Cove Road (north of the Bullpen Bridge site) and at a place close to the historic Russell House (to the south in SC, now lost).

The full history of bridges across this section of the river has not been fully researched, but it is very likely that the Bullpen Bridge was one of the first, if not the only bridge, to be built at a location that was not a natural ford. It was not, however, the first "iron" bridge to cross the Chattooga in this region. In 1891 an iron bridge was erected and it is thought that it was located close to the Russell House which served as a half-way house for travelers making the two-day journey between Walhalla and Highlands. Now located in Georgia, this spot is thought to have been in North Carolina at the time. (State boundaries have shifted over the years and have been contested at various times.) (Shaffner)

Bridge Engineering

(Ashcraft and Snedeker, NR Determination for Avery Creek and English Chapel Bridges, 1999)
(Griffith and Bevin, 1995)
The most common bridge type constructed in the late-nineteenth and early twentieth century in North Carolina was the metal truss. It was the successor to the covered wooden truss bridge, of which only two survive in the entire state. – Pisgah Community Bridge in Randolph County and Bunker Hill Bridge in Catawba County. By contrast, 100 metal truss bridges are still in service on the road system. North

Carolina's remaining metal truss bridges exemplify more than fifty years of rapid refinement in the fields of bridge engineering and design.

A truss is a rigid framework of interconnecting members designed to resist compression (a force that presses together), and tension (a force that stretches apart). In a truss, long top and bottom beams, called chords, are connected by panels of shorter structural members, often arranged in triangles. Paired trusses that are joined by a deck and rest on abutments at each end form a truss bridge. The trusses distribute stresses and transfer loads to the abutments, enabling the bridge to support its own weight, as well as live loads generated by vehicular traffic.

Simple wooden trusses have been used since ancient times to span bodies of water or other obstacles to travel. The earliest truss bridges were constructed of heavy wooden timbers and were covered to provide protection from the weather. Wood was ultimately an impractical material for truss bridges, however, while it acts well in compression, wood is less flexible in tension and is susceptible to weather and fire. Iron, first and then wrought, began to replace some of the wooden members in truss bridges beginning in the 1840s. Iron was mass-produced, inexpensive, strong, and fire-resistant. Most importantly, iron's elastic properties allowed it to function equally well in compression and tension. Once the Bessemer process for converting iron to steel made structural steel widely available in the 1880s, steel in turn superseded iron as the preferred material for truss bridges.

A truss is identified by its configuration of tension and compression members. Throughout the nineteenth century, engineers, architects, and builders designed and patented a series of truss configurations to be used for bridges. J. A. L. Waddell, in this 1916 textbook on bridge engineering, likened the evolution of truss design to "survival of the fittest," with only the simplest and most efficient configurations enduring into the twentieth century and gaining widespread use. (Waddell 1916)

The earliest of the truss patents was awarded in 1806 to carpenter Theodore Burr, who combined a wooden arch for strength with a wooden truss for rigidity. Architect Ithiel Town followed in 1920 with a wooden lattice truss composed of closely spaced diagonal timbers. In 1840, designer William Howe was the first of many to specify the use of iron members in combination with heavy wooden timbers. Complicated geometric configurations designed by railroad bridge engineers Wendel Bollman and Albert Fink specified all metal parts, but these were expensive to construct and lacked the rigidity that was essential to good truss design.

Surviving metal truss bridges in North Carolina date from 1891 to the 1930s and are representative of the last stage of truss design evolution, in which a few patented configurations and standard variants were widely used. All of the state's surviving metal truss bridges are variants of either Pratt or Warren trusses. These two trusses were versatile, durable, and inexpensive to fabricate and erect. Though designed for a combination of wood and iron members they were easily adapted to all-steel construction. Caleb and Thomas Pratt, father and son, patented a simple truss design in 1844 that used vertical wooden compression members and diagonal iron tension rods. Variants of the Pratt truss found in North Carolina include the Pratt half-hip, the Parker, the Camelback, and the Petit. Patented in 1848 by British engineers James Warren and Willoughby Monzani, the basic Warren truss consists of diagonals alternately acting in tension and compression. All of the surviving Warren truss bridges in North Carolina conform to the basic Warren design, and many incorporate vertical members as stiffeners. Several variants of the basic Warren configuration such as the Warren Polygonal Chord and the Warren Lattice truss were once found in the state but these bridges have been demolished.

Truss bridges are further characterized by the relationship of the roadway to the trusses that support it. Through and pony truss bridges carry the roadway level with the bottom chords of the truss while deck truss bridges carry the roadway level with the top chords. Through truss bridges are differentiated from pony truss bridges by their use of lateral bracing between the top chords. Because pony trusses are generally lower, they do not require overhead bracing and are suited for spanning relatively short

distances. Through and deck trusses are capable of longer spans, while multiple trusses were used to span the greatest distances.

One final distinguishing feature of metal truss bridges is the method used to connect the members. In most nineteenth-century truss bridges, structural members were joined by placing a large pin through a hole at the joint. Pin-connected trusses could be easily and quickly assembled on-site using unskilled labor. Pinned joints could loosen with use, however, causing increased vibration. An alternative method of construction called for riveting the members to a gusset plate at each joint which provided greater strength and rigidity and were favored for heavier-duty bridges.

Truss members and gusset plates were carefully fabricated in factories, as the pieces needed to be accurately made with the rivet holes in alignment. Once transported to the site, the members and plates were erected in the field with solid steel rivets. These chubby rivets where fabricated from rod with one domed end. These were then heated in a forge on-site, placed in the rivet hole and clamped into place by one worker, while another worker on the other side pressed into place with a rivet gun, forming a dome on the opposite end.

Prior to the establishment of the state highway system in 1921, counties owned public roads and were responsible for erecting and maintaining bridges. County officials could order standard bridges directly from mail order catalogs or traveling salesmen representing one of the numerous regional bridge manufacturers. After the creation of the state Highway Commission (SHC) in 1915, sate engineers were available to advise counties on bridge design. An item in the *North Carolina Highway Bulletin* from 1920 counseled county officials to "employ a competent engineer to determine the size of waterway required and the type of structure best suited to the location and, after a careful survey is made, have him draw up plans for the bridge. These plans should be submitted to the Bridge Department of the State Highway Commission for checking and approval by engineers thoroughly familiar with this work." (*NC Highway Bulletin* vol. 1, no. 3, 1920)

A state road system was established for primary routes in 1921 and was expanded to include all secondary roads in 1931. The SHC's Bridge Department took over responsibility for bridge design and construction on state-owned roads. An example of a bridge constructed during this period is the Neuse River Bridge in Goldsboro (no longer extant), which carried the Goldsboro-Wilmington Highway, "an artery of the State Highway System." The bridge was designed "in its entirety by Mr. Wm L. Craven, Bridge Engineer of the State highway Commission, and plans drawn up in the Bridge Department under his direction." (*NC Highway Bulletin*, vol. 2, no. 10, 1921) Documentary plaques credit the SHC with bridge design on a few of the surviving bridges, but many of those after 1921 and all bridges after 1931 can be assumed to represent the work of the Bridge Department engineers.

Whether designed by a professional engineer or ordered from a catalog, all metal truss bridges were fabricated by companies specializing in iron and steel work. In the nineteenth century, these companies often combined a foundry for producing the iron components with a contractor specializing in bridge construction. Once steel became the preferred truss material, most bridge companies focused on fabrication relying on large steel mills to produce the increasingly standardized parts.

Prolific bridge companies in Roanoke, Virginia, and other urban industrial centers fabricated many of the state's surviving metal truss bridges. Roanoke firms that built bridges in North Carolina include the Roanoke Iron & Bridge Works, Virginia Bridge & Iron Company, Camden Iron Works, and American Bridge Company. A handful of North Carolina's metal truss bridges were fabricated in-state by branch offices of firms based elsewhere, like the Atlantic Bridge Company of Roanoke, which has a branch office in Charlotte, and the Owego Bridge Company of Owego, New York, which operated a regional office in Greensboro. Of the surviving bridges, only Surry #164 was fabricated by a NC based firm – Greensboro's Carolina Steel and Iron Company. A few North Carolina bridges were fabricated outside

of the southeast, including Haywood #79; the state's oldest surviving metal truss bridge, which was fabricated by the internationally-known Phoenix Bridge Company of Phoenixville, Pennsylvania.

Although the SHC continued to design metal truss bridges into the 1930s, reinforced concrete increasingly became the material of choice for new bridges, especially on heavily-traveled roads. An item in the *North Carolina Highway Bulletin* from 1921 advocated the use of reinforced concrete bridges because "structures of this type require no painting, have no wood floors to replace, and as they grow older the strength increases." (*NC Highway Bulletin*, vol. 2, no. 5 1921) In some cases when metal truss bridges were replaced with reinforced concrete structures, the truss bridges were relocated to less heavily-traveled crossings for continued service. Truss bridges were well-suited to relocation because of their easy disassembly and transport. For example, several Parker truss spans from the Roanoke Rapids Bridge in Halifax and Northampton Counties were moved in 1965 to replace two bridges in Polk County over the Green River and one bridge in Jackson County over the Tuchasegee River. The exact number, however, of truss bridges that have been relocated is not known for certain, but it is likely that many of North Carolina's truss bridges have served transportation purposes at more than one location. Relocating metal truss bridges remains one option for preserving these resources into the next century.

National Forests in North Carolina and Transportation in National Forests

About 65 percent of North Carolina was once covered by trees and until the 1870s the state was the world's leading producer of lumber for naval stores, although overcutting reduced the available first growth lumber by the 1920s. This significant industry lead to the state's nickname of the "Tar Heel State"

National Forests in the state came early under the Weeks Act of 1911, which allowed the federal government to purchase lands that had once been forested. Within a few years, many acres of land were purchased from willing owners and were then converted into national forests by Congress. Pisgah National Forest was the first in North Carolina to be established in 1916 with the Nantahala National Forest following in 1920. (Williams, 2003)

(Ashcraft and Snedeker, 2006) The acquisition of private land by the Forest Service resulted in a substantial redirection of transportation scope within Western North Carolina. The early 20th century conservation, forestry, and watershed restoration movement in the U.S. was partly inspired by the destructive land use history in the once majestic North Carolina forests. The mountainous terrain was substantially damaged by a combination of natural and cultural factors prior to Forest Service ownership. Since acquisition, Forest Service management has produced a relatively stable physical environment.

<u>Transportation after Forest Service Ownership</u>

(Eriksson, McLeod and Gard 2000)

As the Forest Service began to amass lands in Western North Carolina, the antiquated transportation systems that were inherited were in need of attention. Providing access to forest resources required a system of roads and bridges capable of taking man and machine to the peripheries of the forests and beyond. In addition, forest rangers needed trails to reach the interior depths of forests. In the early 1900s, the Washington Office established a section called Reserve Engineering and charged it with "general supervision of all engineering work on reserves done by private interests or by the Forest Service." (USDA Forest Service 1990)

Throughout the period between 1905 and 1933, the total acreage of lands under management by the Forest Service continued to grow. As larger amounts of timber acres were placed under Forest Service management, funding for the transportation systems necessary became a critical issue. Subsequently, a Federal law was created to help provide funding for road and trail construction within the boundaries of the national forests. Enacted on March 4, 1913, the law (16 U.S.C 501) mandated that 10 percent of all moneys received from the national forest in each fiscal year be allocated for the construction and

maintenance of roads and trails. As a result, road and trail mileage within the national forests increased substantially. (USDA Forest Service 1993)

With the onset of the Great Depression, the Forest Service shared in the Nation's fate and was slowed by the downward spiral of the lumber market. As the depression set in following the stock market crash of October 1929, the agency felt the pain of a crippled economy. (Steen 1976) With the arrival of the CCC in 1933, work soon began and as the project list for the CCC expanded, engineers stepped in to make maps, design buildings, bridges, and various other structures, as well as supervise construction of roads, trails, communication systems, campgrounds, and watershed improvements. By the hundreds, engineers found Forest Service employment between the years 1932 and 1933, primarily to assist with CCC projects. (USDA Forest Service 1990)

Roadwork took on greater importance as transportation needs increased. Just prior to the advent of the CCC, the Forest Service began developing a system for locating, designing, and constructing "truck trails," which were simple roads used primarily for fire protection. Truck trails became important CCC projects and once completed, helped give greater access to the forests. (USDA Forest Service 1990)

Bridge construction proved to be another important role for the CCC. Bridge teams generally consisted of an engineer and assistant engineer, chief foreman, carpenter foreman, steel and concrete foremen, and a labor foreman who directed the CCC crews. They helped build a variety of roadway bridges, using styles that included continuous beam, steel beam suspension, and continuous truss. Many of these bridges are still standing, with some continuing to be used.

Throughout the country, CCC crews carried out much needed conservation projects that greatly benefited the Forest Service and, ultimately, the American public. The work of the CCC came to a close as World War II drew more and more men from its ranks. Many felt that with so much of the Nation's resources being poured into the war effort, having an active CCC working on the home front took on even greater importance. Attempts to make the CCC a permanent organization failed, and on June 12, 1942, all active operations ceased. More than 60,000 enrollees were discharged and 1,650 camps were closed down as one of Roosevelt's most successful New Deal programs came to an end. (Otis et al. 1986; Salmond 1967)

With the increased demand for natural resources during World War II came the need for upgraded roads and bridges to reach the raw materials. Forest Service engineers worked at a harried pace to design, complete, and in some cases, rehabilitate logging and mining roads. In an example of wartime cooperation, Forest Service engineers helped build a road for the massive copper giant, Anaconda Mining, after war restrictions made it impossible for the company to utilize their own equipment. (Steen 1976).

The technological advances that came out of WWII, such as the development of the chain saw and crawler tractor, greatly increased the efficiency of the wood products industry. Likewise, the returning veterans with the GI Home Loan now had the ability to purchase their own homes. The Forest Service responded to this demand by constructing new roads throughout the forests for timber harvest. Additionally, the peace and prosperity of the postwar years led to an increase in recreational activities within the national forests.

People now had more time and money to enjoy the beauty and tranquility found within America's public lands. Towards this end, a bill enacted in 1960 helped set the stage for a wider ranging use of national forest lands. The Multiple-Use Sustained Yield Act spelled out specific ways in which national forests would be managed for a host of purposes, including outdoor recreation, range, timber, watershed, and wildlife and fish habitat. No longer was economic return to be used as a primary focus in forest planning. (Steen 1976; Bergoffen 1976)

Civilian Conservation Corps (CCC)
(Ashcraft and Snedeker, 2006)
The New Deal era Civilian Conservation Corps and its accomplishments had a considerable and lasting effect on Western North Carolina. The area still reaps the aesthetic, social, and economic benefits of their work that included construction of the Blue Ridge Parkway, planting of forests, and the construction of numerous recreational areas. The U.S. Forest Service specifically benefited from the massive road and bridge construction, forest planting and maintenance, and watershed restoration and recreation projects. Impoverished, local families and individuals were able to find relief through employment with the CCC and provided the labor behind the projects. In 1933, 27 out of 100 people were on relief in North Carolina, with the hardest hit in the mountain areas. (Bassett 2000) Of the 131 CCC camps established in North Carolina, 25 were operated from Forest Service lands. . (Ashcraft and Snedeker,2006)

The Civilian Conservation Corps (CCC) was authorized by the Emergency Conservation Work Act, ratified on March 31, 1933. (Throop 1981) First established as the Emergency Conservation Works on April 5, 1933, the CCC was one of many programs implemented to alleviate the plight of the poor and unemployed. The idea behind the programs was "to relieve the acute condition of widespread distress and unemployment existing in the United States, provide for the restoration of the country's depleted natural resources, and advance an orderly program of useful public works."

From the industrial Revolution of the late 1880s until the stock market crash of 1929, there had been little government intervention with the "common man", business, or industry. With President Franklin Delano Roosevelt's election in 1932, the New Deal Era began that implemented programs that provided citizen protection, employment, and training from 1933 to 1942. The idea behind the CCC dated at least from 1915 when conservationist George Maxwell proposed that a national corps of young men be formed for reforestation, conservation, flood, and fire control. Not only did it put young men to work, it also provided training as well. This work was undertaken through a coordinated effort that included recruitment of men by the Department of Labor; supplies and direction of the camps from the U. S. Army and the War Department; educational programs from the Office of Education; and project supervision from the Department of the Interior and the Department of Agriculture. (Wise 1994).

Nearly three million men, most between the ages of eighteen and twenty-five, did much to improve and preserve America's forests, parks, and agricultural lands. (Rawick 1957; Salmond 1976) The average "enrollee" had an eighth-grade education and had been unemployed for at least nine months, as had his father. (Steen 1976) In addition to removing a hungry soul from the household, the CCC also assured that income was sent home. Each enrollee was paid $30.00 per month and was required to send at least $25.00 per month home to their families. (Merrill 1981) Young men were provided clothing, boots, room, board, and training. Initially, enrollees could serve for six months, with the possibility of a six month extension. In the later years of the program, enrollees could serve as long as two years. (Mastran and Lowerre 1983)

CCC camps were supervised by Army or Army reserve officers. Each camp typically contained 200 enrollees. Although some camps were located on military bases, most were in rural locations in national forests, national parks, or state parks. The following describes the typical establishment and structure of a camp. (Smith 2004) and (Espenshade 2005):

> *The first task performed by the enrollees was to clear a camp site under the direction of regular Army officers. Tents were used as living quarters until it was possible to construct more permanent buildings . . . Site plans differed for each camp and depended largely on the available supplies and terrain. However, some elements of the camp site were always consistent. A flagpole and administration office was usually the first visual indications of the camp. Officers' barracks were in straight rows in front of enrollees' (quarters)… Other buildings found in a typical 200 man camp included*

latrines, hospital and infirmary, showers and washroom, kitchen and mess unit, administrative unit, garage and shop.

Like the program name implies, the CCC projects were most commonly conservation oriented. (Merrill 1981) lists the 10 types of approved projects:

1. Structural Improvements- bridges, fire towers, service buildings.
2. Transportation – truck trails, minor roads, foot trails, and airport landing fields.
3. Erosion Control – check dams, terracing, and vegetative covering.
4. Flood Control- irrigation and drainage, dams, ditching, channel work, riprapping.
5. Forest Culture – planting trees and shrubs, stand improvement, seed collection and nursery work.
6. Forest Protection – fire fighting, fire prevention, and fire pre-suppression, insect and disease control.
7. Landscape and Recreation – public camp and picnic ground development, lake and pond site clearing.
8. Range – stock driveways, elimination of predators.
9. Wildlife – stream improvement, stocking fish, food and cover planting.
10. Miscellaneous – emergency work, surveys, mosquito control.

Landscape designs developed for recreation sites constructed by the CCC have their roots in the works of Andrew Jackson Downing, Frederick Law Olmstead, Frank Waugh, and many others. The sites represent an exploration of design in harmony with the natural environment. Period buildings represent a hybrid of influences from vernacular architecture to the Shingle and Arts and Crafts styles, most commonly referred to as Rustic style. The materials used in the construction of the sites and buildings were indigenous stone, timber, and earth. These materials, true to the design intent of the architects and landscape architects, allow the man-made forms to blend with the natural environment.

The craftsmanship of the resources is distinctive to Civilian Conservation Corps work and federal public projects of the 1930's. The works of the CCC are of simple, primitive methods of construction. The materials, rough laid stone, heavy timber and log construction are those of vernacular American architecture, but their use is more varied. In CCC construction, log and timber joinery is exaggerated; stonework has playful insets or is massive. Timelessness, serenity and complete integration with their surroundings, give Civilian Conservation Corps projects a presence not commonly found in the United States. (Wise 1994)

(Mastran and Lowerre 1983) summarize the impact of the CCC on Southern forests:

> *One of the biggest jobs undertaken by the CCC in the Southern Appalachian forests was road and trail construction. The enrollees built high-quality roads in some areas to open up the forest for timber harvesting or recreation. In addition, the CCC altered the landscape of the Southern Appalachian forests and parks. The fire towers, trails, roads, and campgrounds it built and the trees it planted, thinned and protected were improvements that controlled fire, enhanced the forests' beauty, and made the mountains more accessible.*

The United States Department of Agriculture had the vast majority of the CCC camps under its jurisdiction from the beginning of the Emergency Conservation Work. As of June 30, 1935, the department had 1,231 camps, 517 of which were on National Forests. Of the 131 CCC camps established in North Carolina, 25 were operated from Forest Service lands. (Ashcraft and Snedeker) The average number of camps operated in North Carolina was 45, 17 of which were on National Forests.

In 1933 there were 14 CCC camps on the National Forests in North Carolina. One of these camps, F-11, was actually in Tellico Plains, Tennessee, but administered by the National Forests in North Carolina

(Table II) Of the 13 camps in North Carolina (1933), 9 were on the Pisgah National Forest and 3 were on the Nantahala National Forest (National Archives; NF'sNC Heritage Resource Library):

CCC camps on the NFsNC in 1933

Camp No.	Company No.	Camp Name	Location (Post Office)	Date Occupied
Pisgah National Forest				
NC F-1	402	John Rock	Pisgah Forest, Transylvania	May 19, 1933
NC F-2	404	Mills River/Yellow Gap	Hendersonville, Henderson	May 19, 1933
NC F-3	406	Jim Staton	Old Fort, McDowell	May 25, 1933
NC F-4	401	McCloskey	Marion, McDowell	May 20, 1933
NC F-5	403 JW*	Mortimer	Mortimer, Caldwell	May 20, 1933
NC F-6	412	Globe	Lenoir, Caldwell	May 30, 1933
NC F-7	407 JW*	Alex Jones	Hot Springs, Madison	May 27, 1933
NC F-8	409	Big Ivy	Barnardsville, Buncombe	May 30, 1933
NC F-14	428	Gloucester/Balsam Grove	Balsam Grove, Transylvania	June 22, 1933
Nantahala National Forest				
NC F-9	405	Nawokada	Franklin, Macon	June 7, 1933
NC F-10	408 JW*	Winnfield Scott	Aquone, Macon	May 28, 1933
NC F-12	425 C*	Nathaniel Greene	Rainbow Springs, Clay	June 28, 1933
NC F-13	435	Bob Reynolds	Topton, Cherokee	June 27, 1933

* JW denotes "Junior White" camp, C denotes "Colored camp

As work progressed and successes mounted, new CCC camps were established and camps were often reoccupied to complete new projects. Side-camps, moveable buildings, and tent camps as well as permanent camps were utilized to be closer to job locations. Companies were also often relocated to different locations throughout the state as well as the region, with administration by different agencies.

A total of 25 CCC camps were established on the National Forests in North Carolina. In addition to those camps established in 1933 the following camps were later located on the Forests, including Horse Cove, camp NC F-19 in Macon County near Highlands, which was responsible for construction of Bullpen Road and the Bullpen Bridge in 1934.

Additional CCC camps on the NFsNC after 1933:

Camp No.	Company No.	Camp Name	Location (Post Office) (Town, County)	Date Occupied
NC F-3	413	Twin Oaks	Old Fort, McDowell	November 1937
NC F-15	296	Patterson	New Bern, Craven	Dec. 16, 1940
(reoccupied)	4471 JC*	Patterson	New Bern, Craven	June 10, 1941
NC F-17	2401 VW*	Albert R. Ives	Troy, Montgomery	Dec. 19, 1934
NC F-19	**455**	**Horse Cove**	**Highlands, Macon**	**Oct. 6, 1934**
NC F-20	3445 JW*	Cowee	Franklin, Macon	April 22, 1935
NC F-21	5424 C*	Gillette	Maysville, Jones	Sept. 3, 1935
NC F-22	3402	Bent Creek/Rocky Cove	Asheville, Buncombe	----1935----
NC F-23	3446 JW*	Coweeta	Otto, Macon	May 20, 1935
NC F-24	3447 JW*	Santeetlah	Robbinsville, Graham	July 7, 1938
NC F-25	3455 JW*	Sunburst	Canton, Haywood	----1935----
NC F-27	401 JW*	Joseph McDowell	Marion, McDowell	Dec. 17, 1937
NC F-28	428 JW*	John Rock	Brevard, Transylvania	May 22, 1938
NC F-29	2450 VW*	----------	Murphy, Cherokee	Sept. 29, 1939

Horse Cove Camp

Very little is known about the work accomplished by the Horse Cove camp as few records have survived. The camp was located to the west of the Bullpen Bridge site along Bullpen Road toward Highlands. (See image 2) Records entitled "Historic Record of CCC Camp Buildings" indicate that the camp was established on October 6, 1934. (see the following images) The camp was comprised of 13.81 acres located on a dirt road. The camp had 28 structures including 4 barracks with a total capacity of 200 men as well as officers quarters, and quarters for forest service personnel. The camp was abandoned on April 1, 1937, and turned over to the Forest Service two days later. The camp was then turned over to the Army, with the buildings salvaged as of February 24, 1938. The Wildwood Chapel in Highlands was constructed of some of the salvaged lumber. (Shaffner)

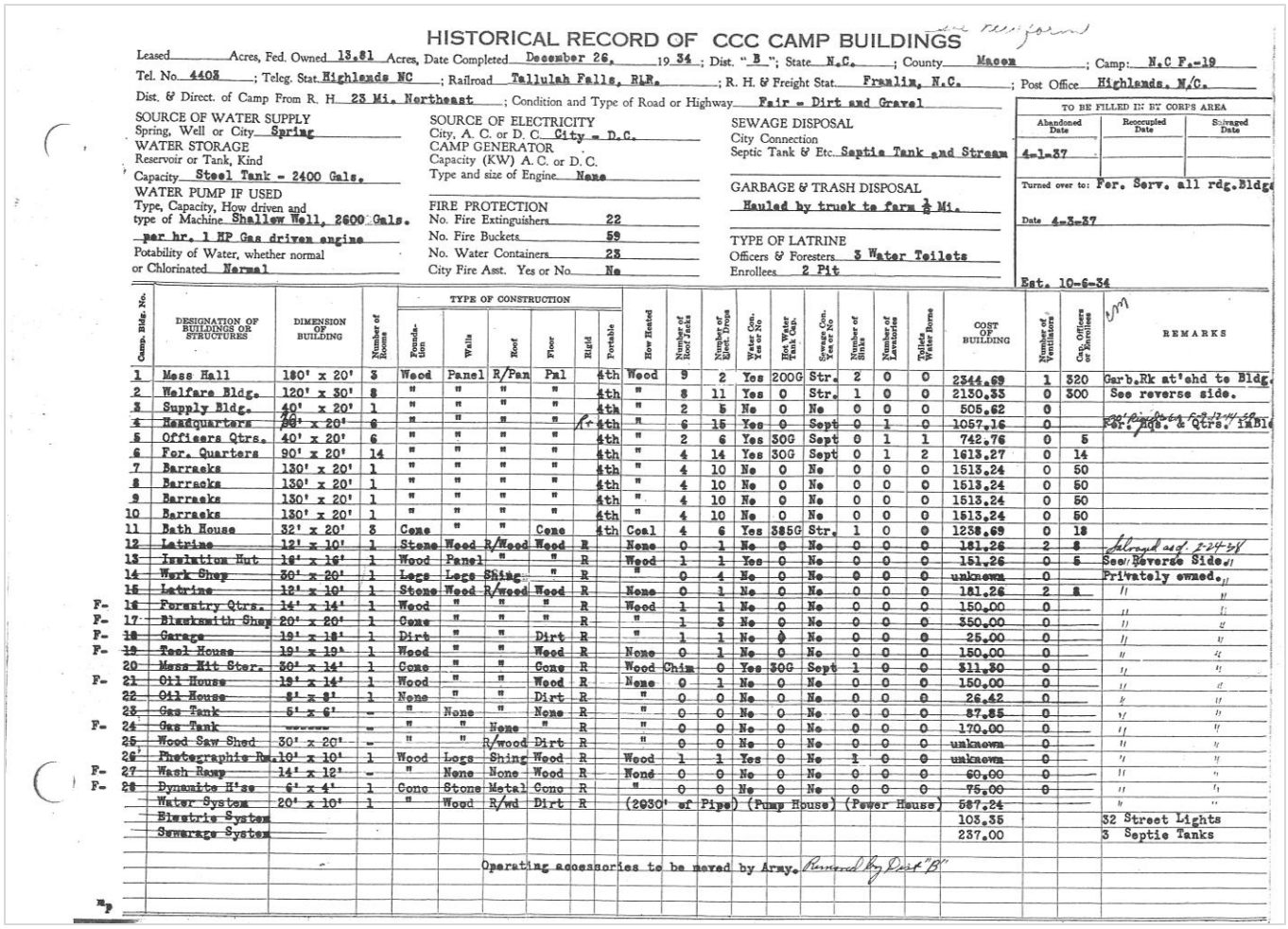
According to an archaeological survey form completed in 1990 by the NFs in NC, remnants of the Horse Cove Camp have been located and identified. The sloping side retains foundation remnants and large pit depressions and straddles publicly and privately owned land. There are three camp tent foundations (platforms), a spring box, seven refuse or privy depressions and the possible remnants of a chimney. (Snedeker 1990)

These archaeological findings are consistent with information provided about the camp by the son of the camp's second Commander, Farish C. Chandler, Sr. Chandler was a Captain in the Army and was assigned to take over the construction of the camp after its first Commander overspent the budget and had little to show for his efforts. His son, Farish C. Chandler, Jr. first visited the camp during Thanksgiving 1934 and remembers that the men were living in canvas tents. They hung their tin mirrors on trees to shave, got their water from a spring, and had some electric lights. (Chandler, interview)

The family rented a house in Highlands and the four Chandler children attended school. Farish was 14 years old at the time and remembers that the camp buildings were assembled from prefabricated lumber in 10 foot lengths that were shipped to Franklin by train. They were then off-loaded onto a truck for transport to the camp. Due to the condition of the road, this was not an easy task. At least seven buildings were constructed initially, including a Headquarters Building, Dining Hall, Recreation Hall and four barracks.

Apparently other projects were undertaken by the enrollees while the camp was completed. Chandler, Jr. remembers that Forest Service Supervising Engineers would take a group of men out to projects, including the construction of trails and roads as well as a bridge. They also fought forest fires and built firebreaks.

The bridge construction that he remembers must be the Bullpen Bridge as a plaque on the bridge dates it to 1934. (see Photo 19) This information and the wording on the plaque, "1934 – Department of Agriculture – Forest Service," indicates that the bridge was built by the CCC Camp under the direction of Forest Service Engineers. Considering that the camp was not occupied until October 1934, the bridge was probably not completed until sometime in 1935.



HISTORICAL RECORD OF CCC CAMP BUILDINGS

Leased ____ Acres, Fed. Owned 13.81 Acres, Date Completed December 26, 1934; Dist. "B"; State N.C.; County Macon; Camp: N.C F.-19

Tel. No. 4408; Teleg. Stat. Highlands NC; Railroad Tallulah Falls, RLR.; R. H. & Freight Stat. Franlin, N.C.; Post Office Highlands, N.C.

Dist. & Direct. of Camp From R. H. 23 Mi. Northeast; Condition and Type of Road or Highway Fair - Dirt and Gravel

SOURCE OF WATER SUPPLY
Spring, Well or City Spring
WATER STORAGE
Reservoir or Tank, Kind
Capacity Steel Tank - 2400 Gals.
WATER PUMP IF USED
Type, Capacity, How driven and type of Machine Shallow Well, 2600 Gals. per hr. 1 HP Gas driven engine
Potability of Water, whether normal or Chlorinated Normal

SOURCE OF ELECTRICITY
City, A. C. or D. C. City - D.C.
CAMP GENERATOR
Capacity (KW) A. C. or D. C.
Type and size of Engine None

FIRE PROTECTION
No. Fire Extinguishers 22
No. Fire Buckets 59
No. Water Containers 23
City Fire Asst. Yes or No. No

SEWAGE DISPOSAL
City Connection
Septic Tank & Etc. Saptic Tank and Stream

GARBAGE & TRASH DISPOSAL
Hauled by truck to farm ½ Mi.

TYPE OF LATRINE
Officers & Foresters 3 Water Toilets
Enrollees 2 Pit

TO BE FILLED IN BY CORPS AREA

Abandoned Date	Reoccupied Date	Salvaged Date
4-1-37		

Turned over to: For. Serv. all rdg. Bldgs
Date 4-3-37

Est. 10-6-34

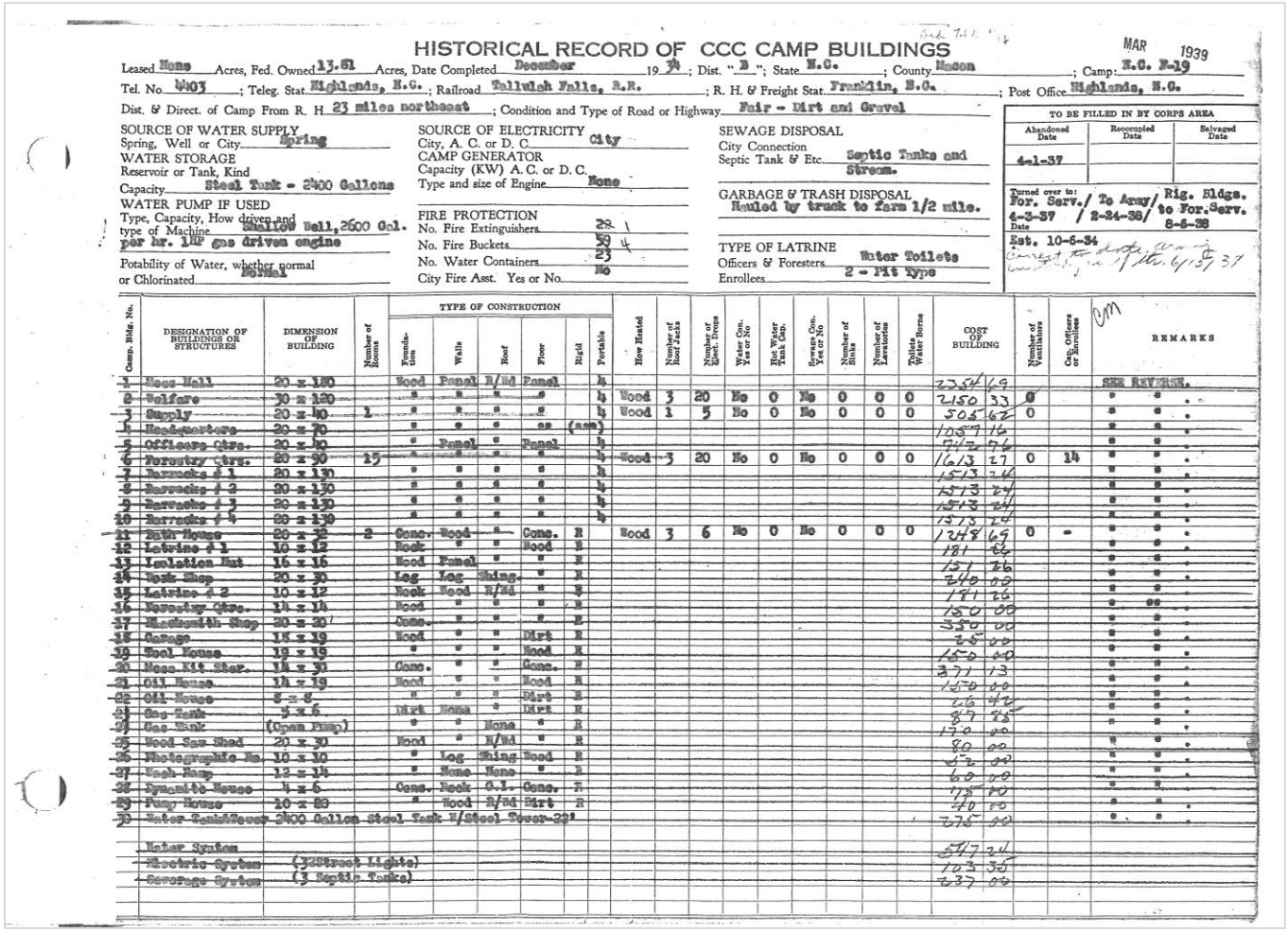
Camp. Bldg. No.	DESIGNATION OF BUILDINGS OR STRUCTURES	DIMENSION OF BUILDING	Number of Rooms	TYPE OF CONSTRUCTION: Foundation	Walls	Roof	Floor	Rigid	Portable	How Heated	Number of Roof Jacks	Number of Elect. Drops	Water Con. Yes or No	Hot Water Tank Cap.	Sewage Con. Yes or No	Number of Bunks	Number of Lavatories	Toilet Water Borne	COST OF BUILDING	Number of Ventilators	Cap. Officers or Enrollees	REMARKS
1	Mess Hall	180' x 20'	8	Wood	Panel	R/Pan	Pnl		4th	Wood	9	2	Yes	200G	Str.	2	0	0	2344.69	1	320	Garb. Rk at 'chd to Bldg.
2	Welfare Bldg.	120' x 30'	8	"	"	"	"		4th	"	8	11	Yes	0	Str.	1	0	0	2130.33	0	300	See reverse side.
3	Supply Bldg.	40' x 20'	1	"	"	"	"		4th	"	2	5	No	0	No	0	0	0	505.62	0		
4	Headquarters	20' x 20'	6	"	"	"	"	Fr	4th	"	6	15	Yes	0	Sept	0	1	0	1057.16	0		For. Hqs. & Qtrs. inBl
5	Officers Qtrs.	40' x 20'	6	"	"	"	"		4th	"	2	6	Yes	30G	Sept	0	1	1	742.76	0	5	
6	For. Quarters	90' x 20'	14	"	"	"	"		4th	"	4	14	Yes	30G	Sept	0	1	2	1613.27	0	14	
7	Barracks	130' x 20'	1	"	"	"	"		4th	"	4	10	No	0	No	0	0	0	1513.24	0	50	
8	Barracks	130' x 20'	1	"	"	"	"		4th	"	4	10	No	0	No	0	0	0	1513.24	0	50	
9	Barracks	130' x 20'	1	"	"	"	"		4th	"	4	10	No	0	No	0	0	0	1513.24	0	50	
10	Barracks	130' x 20'	1	"	"	"	"		4th	"	4	10	No	0	No	0	0	0	1513.24	0	50	
11	Bath House	32' x 20'	8	Cone	"	"	Cone		4th	Coal	4	6	Yes	585G	Str.	1	0	0	1238.69	0	18	
12	Latrine	12' x 10'	1	Stone	Wood	R/Wood	Wood	R		None	0	1	No	0	No	0	0	0	181.26	2	8	Salvaged 5-24-38
13	Inwintion Hut	16' x 16'	1	Wood	Panel	"	"	R		Wood	1	1	Yes	0	No	0	0	0	151.26	0	5	See Reverse Side.
14	Work Shop	30' x 20'	1	Logs	Logs	Shing.	"	R		"	0	4	No	0	No	0	0	0	unknown	0		Privately owned.
15	Latrine	12' x 10'	1	Stone	Wood	R/Wood	Wood	R		None	0	1	No	0	No	0	0	0	181.26	2	8	" "
F- 16	Forestry Qtrs.	14' x 14'	1	Wood	"	"	"	R		Wood	1	1	No	0	No	0	0	0	150.00	0		" "
F- 17	Blacksmith Shop	20' x 20'	1	Cone	"	"	"	R		"	1	3	No	0	No	0	0	0	350.00	0		" "
F- 18	Garage	19' x 18'	1	Dirt	"	"	Dirt	R		"	1	1	No	0	No	0	0	0	25.00	0		" "
F- 19	Tool House	19' x 19'	1	Wood	"	"	Wood	R		None	0	1	No	0	No	0	0	0	150.00	0		" "
20	Mess Hit Ster.	30' x 14'	1	Cone	"	"	Cone	R		Wood	Chim	0	Yes	30G	Sept	1	0	0	$11.30	0		" "
F- 21	Oil House	19' x 14'	1	Wood	"	"	Wood	R		None	0	1	No	0	No	0	0	0	150.00	0		" "
22	Oil House	8' x 8'	1	None	"	"	Dirt	R		"	0	0	No	0	No	0	0	0	26.42	0		" "
23	Gas Tank	6' x 6'	-	"	None	"	None	R		"	0	0	No	0	No	0	0	0	87.85	0		" "
F- 24	Gas Tank	-------	-	"	"	None	"	R		"	0	0	No	0	No	0	0	0	170.00	0		" "
25	Wood Saw Shed	30' x 20'	-	"	"	R/wood	Dirt	R		"	0	0	No	0	No	0	0	0	unknown	0		" "
26	Photographic Rm.	10' x 10'	1	Wood	Logs	Shing	Wood	R		Wood	1	1	Yes	0	No	1	0	0	unknown	0		" "
F- 27	Wash Ramp	14' x 12'	-	"	None	None	Wood	R		None	0	0	No	0	No	0	0	0	60.00	0		" "
F- 28	Dynamite H'se	6' x 4'	1	Cone	Stone	Metal	Cone	R		"	0	0	No	0	No	0	0	0	75.00	0		" "
	Water System	20' x 10'	1	"	Wood	R/wd	Dirt	R		(2930' of Pipe) (Pump House) (Power House)									587.24			" "
	Electric System																		103.35			32 Street Lights
	Sewerage System																		237.00			3 Septic Tanks

Operating accessories to be moved by Army. Removed by Dist "B"

5. Horse Cove CCC Camp Historical Record. (from National Archives, copy at NFs in NC).

Bldg. # 2 - C.X., Dispensary and School in Bldg.
Bldg. # 13 - Panel Walls in Bldg. are Panels left over from other Bldgs.

6. Horse Cove CCC Camp Historical Record, reserve side of form.



HISTORICAL RECORD OF CCC CAMP BUILDINGS

MAR 1939

Leased None Acres, Fed. Owned 13.61 Acres, Date Completed December 1934; Dist. "B"; State N.C.; County Macon; Camp: N.C. F-19

Tel. No. 9403; Teleg. Stat. Highlands, N.C.; Railroad Tallulah Falls, R.R.; R. H. & Freight Stat. Franklin, N.C.; Post Office Highlands, N.C.

Dist. & Direct. of Camp From R. H. 23 miles northeast; Condition and Type of Road or Highway Fair - Dirt and Gravel

SOURCE OF WATER SUPPLY
Spring, Well or City Spring
WATER STORAGE
Reservoir or Tank, Kind
Capacity Steel Tank - 2400 Gallons
WATER PUMP IF USED
Type, Capacity, How driven and type of Machine Shallow Well, 2600 Gal. per hr. 1HP gas driven engine
Potability of Water, whether normal or Chlorinated Normal

SOURCE OF ELECTRICITY
City, A. C. or D. C. City
CAMP GENERATOR
Capacity (KW) A. C. or D. C.
Type and size of Engine None

FIRE PROTECTION
No. Fire Extinguishers 28
No. Fire Buckets 59
No. Water Containers 23
City Fire Asst. Yes or No. No

SEWAGE DISPOSAL
City Connection
Septic Tank & Etc. Septic Tanks and Stream.

GARBAGE & TRASH DISPOSAL
Hauled by truck to farm 1/2 mile.

TYPE OF LATRINE
Officers & Foresters Water Toilets
Enrollees 2 - Pit Type

TO BE FILLED IN BY CORPS AREA

Abandoned Date	Reoccupied Date	Salvaged Date
4-1-37		

Turned over to: For. Serv. / To Army / Rig. Bldgs.
Date 4-3-37 / 2-24-38 / to For. Serv. 8-6-38
Est. 10-6-34

Camp. Bldg. No.	DESIGNATION OF BUILDINGS OR STRUCTURES	DIMENSION OF BUILDING	Number of Rooms	TYPE OF CONSTRUCTION: Foundation	Walls	Roof	Floor	Rigid	Portable	How Heated	Number of Heat Units	Number of Elect. Drops	Water Con. Yes or No	Fire Water Tank Cap.	Sewage Con. Yes or No	Number of Sinks	Number of Lavatories	Toilets Water Borne	COST OF BUILDING	Number of Ventilators	Camp Officers or Enrollees	REMARKS
1	Mess Hall	20 x 100		Wood	Panel	R/Rd	Panel		X										2354 69			SEE REVERSE.
2	Welfare	30 x 120		"	"	"	"		X	Wood	3	20	No	0	No	0	0	0	2150 33	8		" " "
3	Supply	20 x 40	1	"	"	"	"		X	Wood	1	5	No	0	No	0	0	0	505 62	0		" " "
4	Headquarters	20 x 70		"	"	"	"		X										1087 16			" " "
5	Officers Qtrs.	20 x 40		"	Panel	"	Panel		X										712 76			" " "
6	Forestry Qtrs.	20 x 30	15	"	"	"	"		X	Wood	3	20	No	0	No	0	0	0	1613 27	0	14	" " "
7	Barracks # 1	20 x 130		"	"	"	"		X										1513 24			" " "
8	Barracks # 2	20 x 130		"	"	"	"		X										1513 24			" " "
9	Barracks # 3	20 x 130		"	"	"	"		X										1513 24			" " "
10	Barracks # 4	20 x 130		"	"	"	"		X										1513 24			" " "
11	Bath House	20 x 32	2	Conc.	Wood	"	Conc.	X		Wood	3	6	No	0	No	0	0	0	1248 69	0	-	" " "
12	Latrine # 1	10 x 12		Rock	"	"	Wood	X											181 56			" " "
13	Isolation Hut	16 x 16		Wood	Panel	"	"	X											137 26			" " "
14	Tool Shop	20 x 30		Log	Log	Shing.	"	X											240 00			" " "
15	Latrine # 2	10 x 12		Rock	Wood	R/Rd	"	X											181 26			" " "
16	Recreation Qtrs.	14 x 14		Wood	"	"	"	X											150 00			" " "
17	Blacksmith Shop	20 x 30		Conc.	"	"	"	X											350 00			" " "
18	Garage	14 x 19		Wood	"	"	Dirt	X											25 00			" " "
19	Tool House	19 x 19		"	"	"	Wood	X											150 00			" " "
20	Mess Kit Shed	14 x 30		Conc.	"	"	Conc.	X											371 13			" " "
21	Oil House	14 x 19		Wood	"	"	Wood	X											150 00			" " "
22	Oil House	8 x 8		"	"	"	Dirt	X											76 42			" " "
23	Gas Tank	5 x 6		Dirt	Conc	"	Dirt	X											87 75			" " "
24	Gas Tank	(Open Frame)		"	"	None	"	X											170 00			" " "
25	Wood Saw Shed	20 x 30		Wood	"	R/Rd	"	X											80 00			" " "
26	Photographic Rm	10 x 10		"	Log	Shing	Wood	X											60 00			" " "
27	Wash Rack	12 x 14		"	None	None	"	X											60 00			" " "
28	Incenitor House	4 x 6		Conc.	Rock	C.I.	Conc.	X											178 80			" " "
29	Pump House	10 x 20		"	Wood	R/Rd	Dirt	X											140 00			" " "
30	Water Tank&Tower	2400 Gallon Steel Tank		R/Steel Tower-29'															276 00			
	Water System																		547 24			
	Electric System	(23Street Lights)																	103 35			
	Sewerage System	(3 Septic Tanks)																	237 00			

7. Horse Cove CCC Camp Historical Record, second copy with additional information.

DOCUMENTATION

The following documentation of the bridge has been gathered from several bridge inspection reports on file at the National Forests in North Carolina offices and from on-site observation. Labeling of the components that comprise the trusses has been transferred to the drawings from the inspection reports so they are consistent. Portions of the inspection reports are included in this documentation.

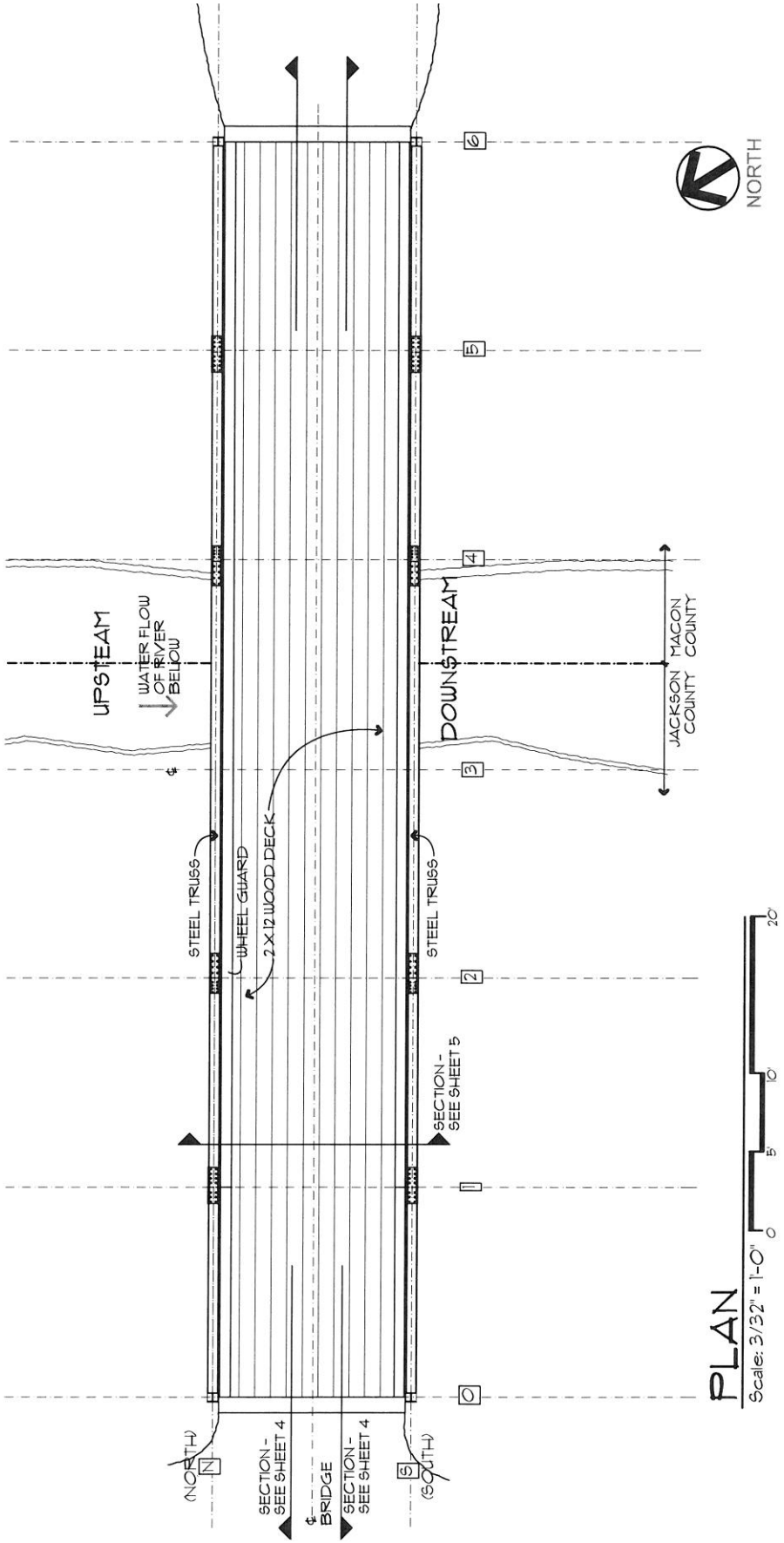
Bridge Inspection Report, US Forest Service, Thompson-Gordon-Shook Engineers, Inc, Raleigh, NC. Max Collins, Jr, Inspector. November 24, 1980.

Bridge Inspection Report, NC Department of Transportation, Division of Highways, Bridge Maintenance Unit, MDD, Inspector, November 13, 1996. (Includes portions of 1980 Inspection Report)

Bridge Inspection Report, US Forest Service Region 8, National Forests in North Carolina. D. Callahan, Inspection Team Leader. November 17, 1998.

2004 Bridge Inspection, United States Forest Service. Guillermo Mercado, PE, Mercado Consultants, Inc., Ashton, Maryland. July 28, 2004.

Contents of Documentation



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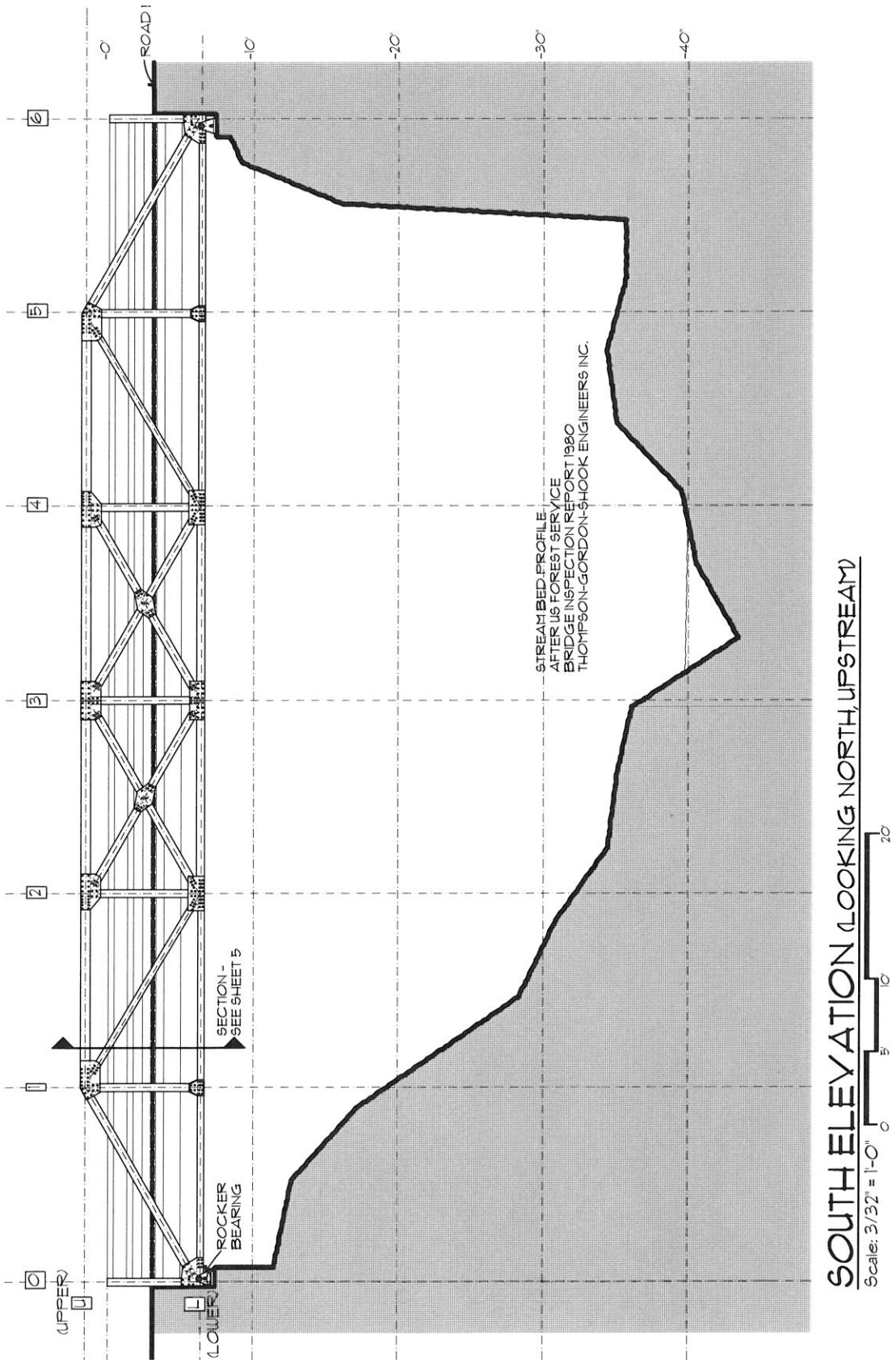

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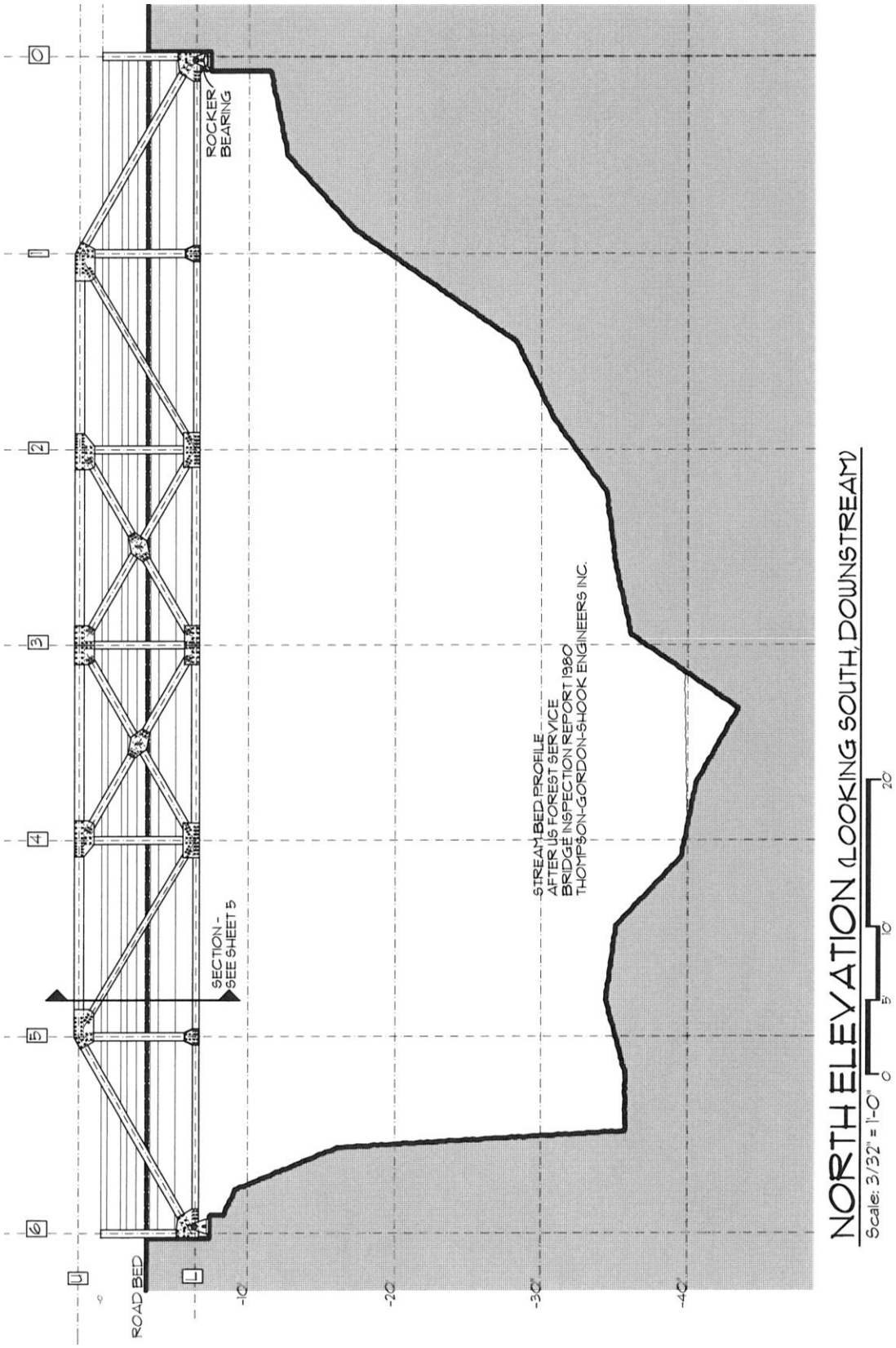

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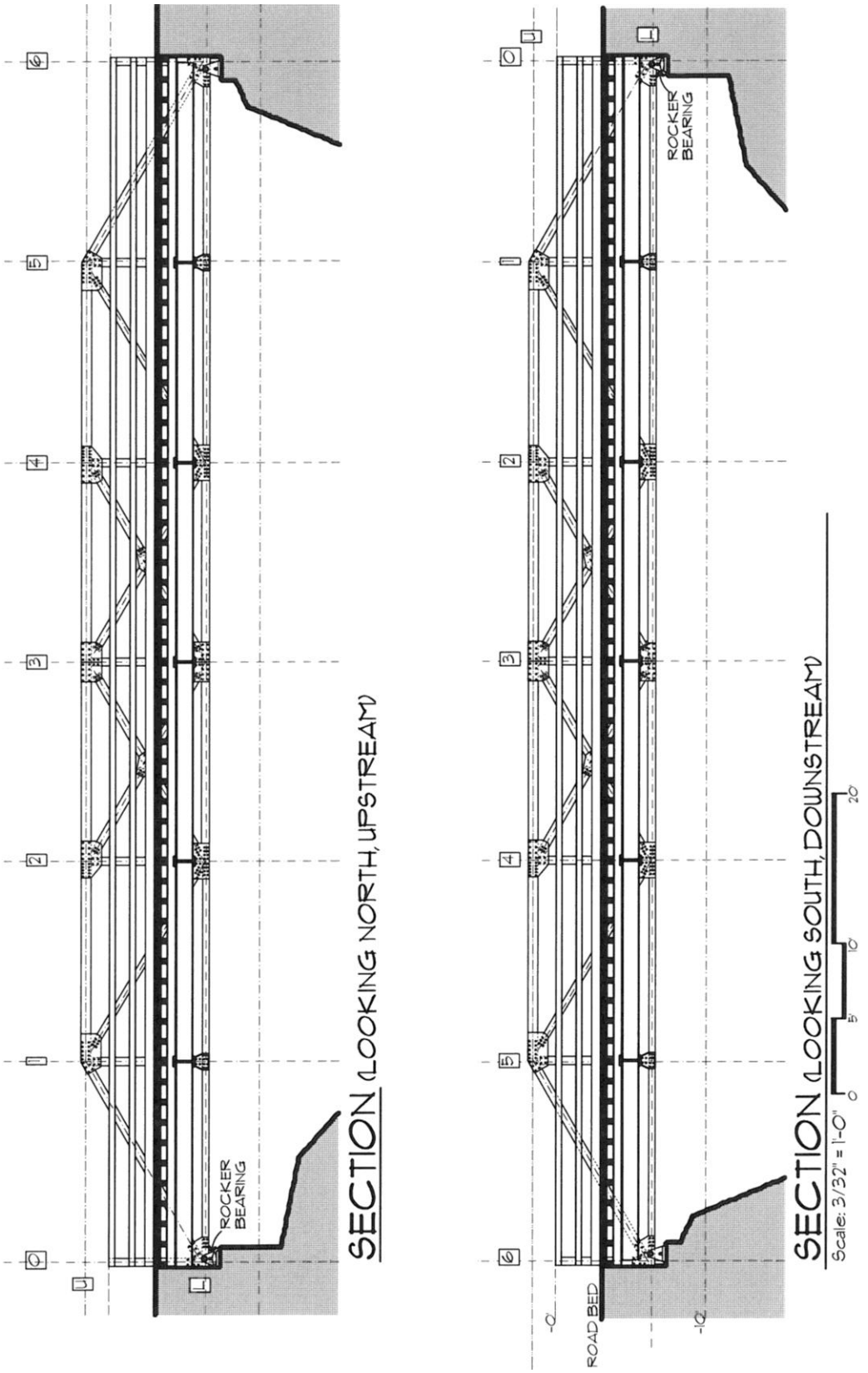

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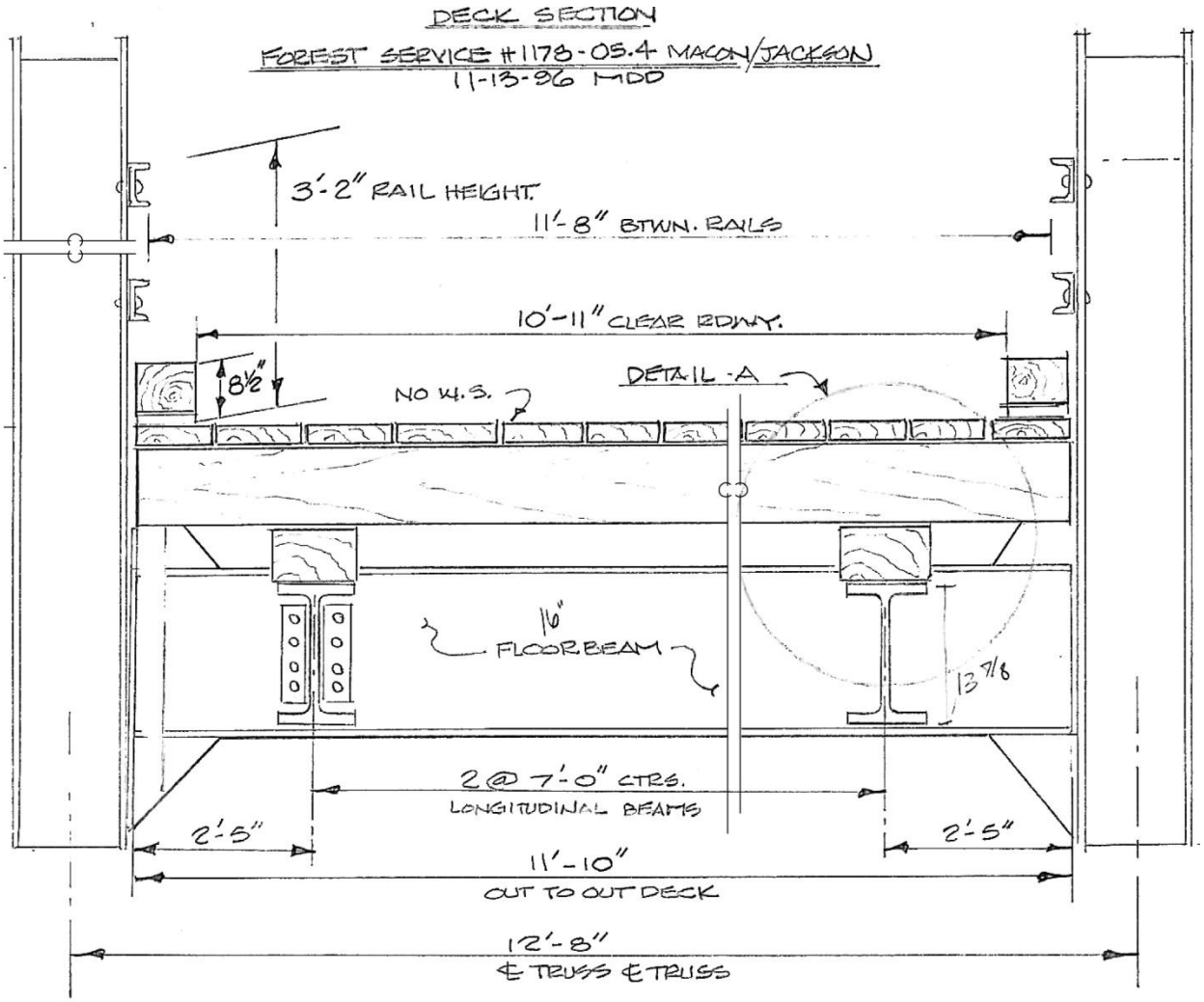
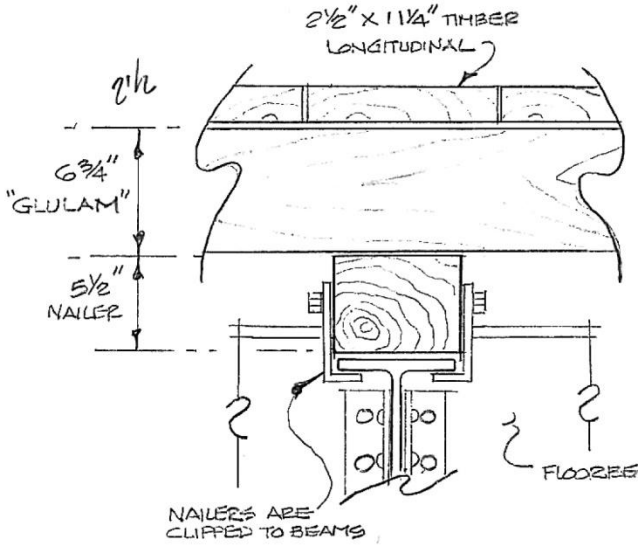


SECTION

- RAILS - TWO 3"X1½" CHANNELS
- EXPANSION ROCKER BRGS. APPROX. PLUMB @ 60° F
- SEE NEXT SHEET FOR TRUSS MEMBER SIZES

SOURCE:
BRIDGE INSPECTION REPORT
N.C. DEPARTMENT OF TRANSPORTATION
1996 M. DOTY & D.D. HONEYCUTT



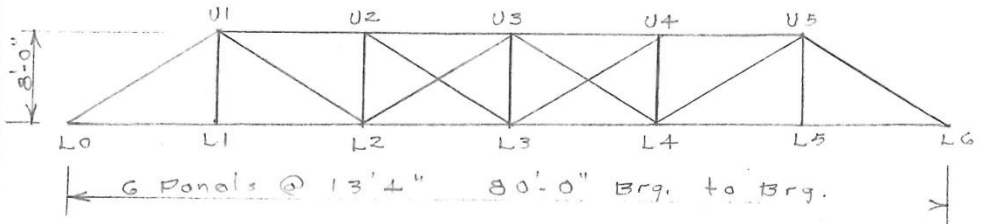
DETAIL-A

Thompson - Gordon - Shook
Engineers, Incorporated

JOB NO. #1 Highlands 1178-05.4
SHEET 1 OF 4
CALCULATED BY Max Collins DATE 9-23-80
CHECKED BY _____ DATE _____
FIELD MEASUREMENTS

Highlands #1

Truss Members

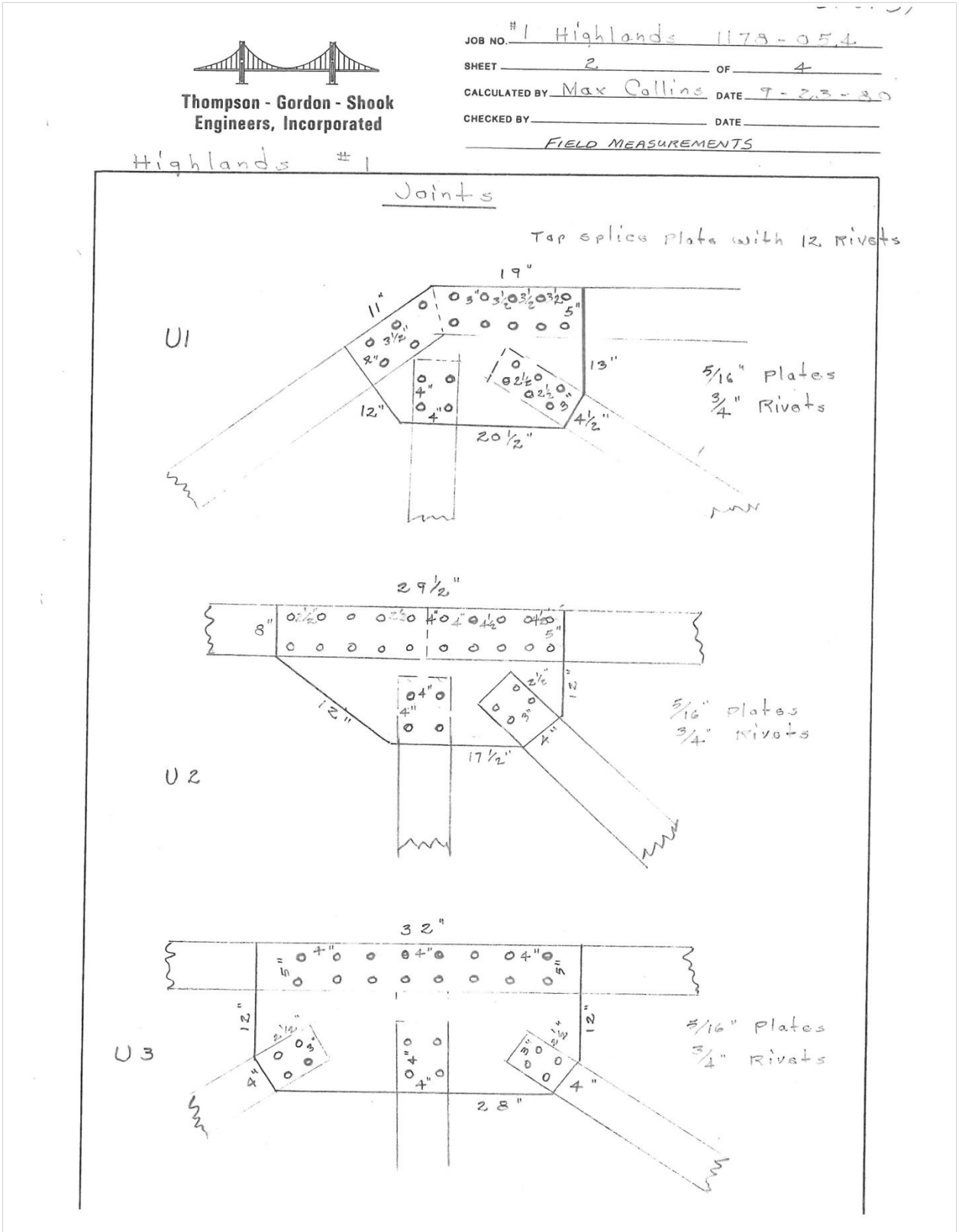


6 Panels @ 13'4" 80'-0" Brg. to Brg.

L0 - U1 8" x 6½" x ⅜"
U1 - L1 8" x 6½" x ⅜"
U1 - L2 8" x 5 3/16" x 3/16"
U1 - U2 8" x 8" x ⅜"
U2 - L2 8" x 6½" x ⅜"
U2 - U3 8" x 8" x ⅜"
U2 - L3 8" x 5¼" x 3/16"
U3 - L3 8" x 6½" x ⅜"
L2 - U3 8" x 5¼" x 3/16"
L0 - L1 8" x 5¼" x 3/16"
L1 - L2 8" x 5¼" x 3/16"
L2 - L3 8" x 6½" x ⅜"

diagonal braces are 3" x 2½" Ls
Floor beams are 16" x 7" x ⅜", 13'-4" o.c.
Longitudinal beams are 13⅜" x 6⅝" x ¼" @ 7'-0" ctrs.
stringers are 3½" x 9½" Creo. Tim., 19" o.c.
Rails are 2 @ 3" x 1½" channels.

Documentation Sheet 6



Documentation Sheet 7

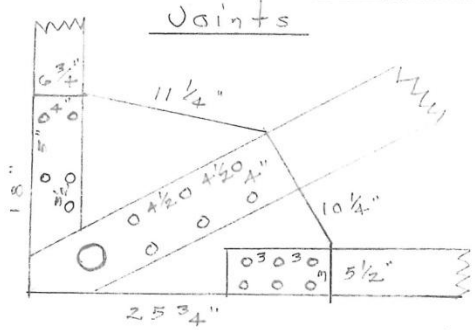
Thompson - Gordon - Shook
Engineers, Incorporated

JOB NO. #1 Highlands 1179-054
SHEET 3 OF 4
CALCULATED BY Max Collins DATE 9-23-80
CHECKED BY DATE
FIELD MEASUREMENTS

Highlands #1

Joints

L0

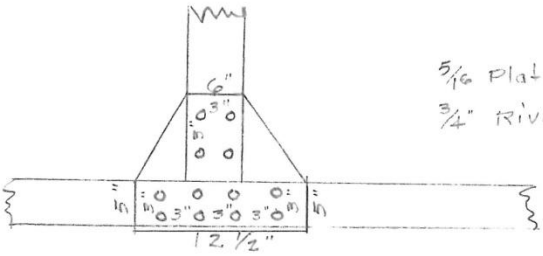


5/16" plates
3/4" rivets

12" high rocker
2" x 12" base plate

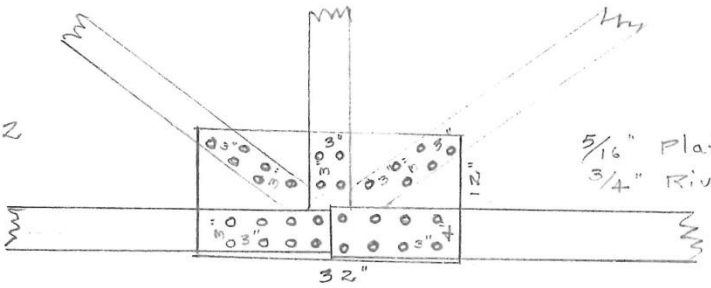
(see photos)

L1



5/16 Plates
3/4" Rivets

L2



5/16" Plates
3/4" Rivets

5/16" splice plate on bottom of web with 12 rivets. (on L2 Rt. side 3 rivets have been replaced with bolts - 2 nuts missing and one loose).

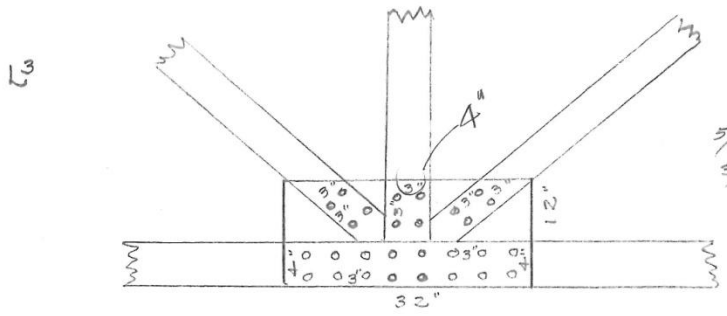
Documentation Sheet 8

Thompson - Gordon - Shook
Engineers, Incorporated

JOB NO. #1 Highlands 1178 - 05.4
SHEET 4 OF 4
CALCULATED BY Max Collins DATE 9-23-80
CHECKED BY _____ DATE _____
FIELD MEASUREMENTS

Highlands #1

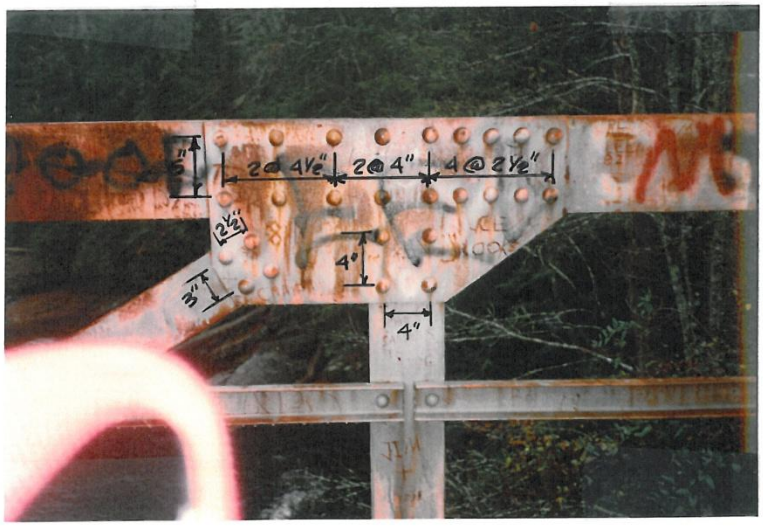
Joints



Documentation Sheet 9

U.S. FOREST SERVICE BR.
1178-05.4
MACON / JACKSON CO.
11-13-96

U1 & U5

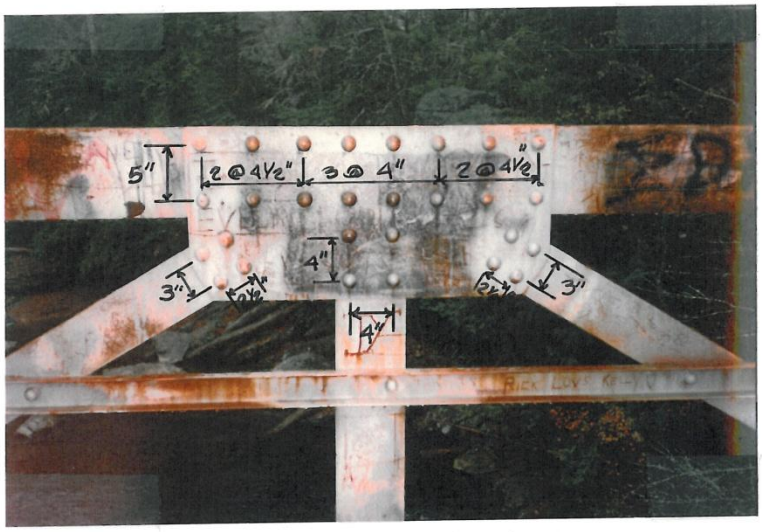


U2 & U4

NUMBER INDICATES SPACES BETWEEN RIVETS.

Documentation Sheet 10

U.S. FOREST SERVICE BR.
1178-05.4
MACON / JACKSON CO.
11-13-96

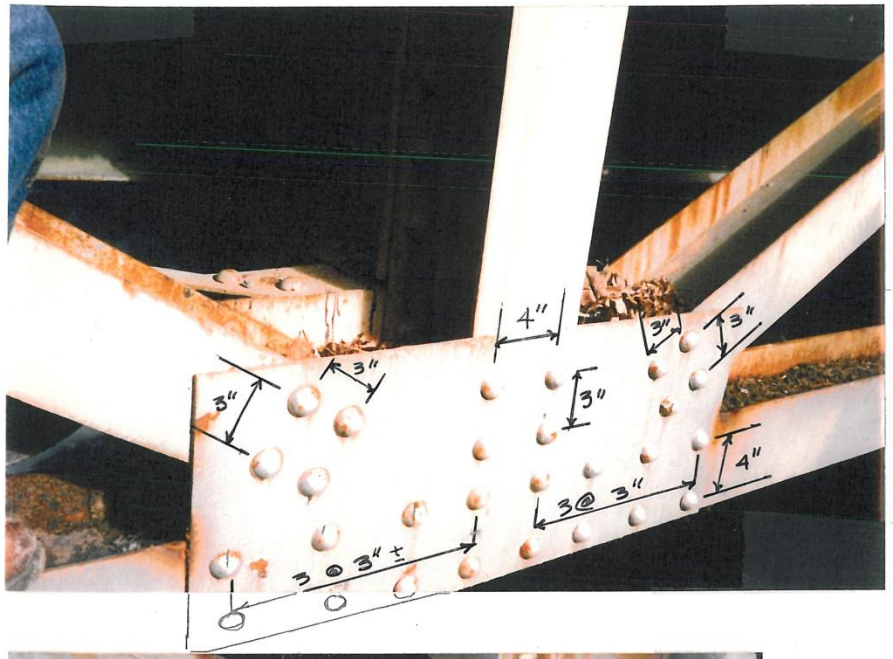


U3

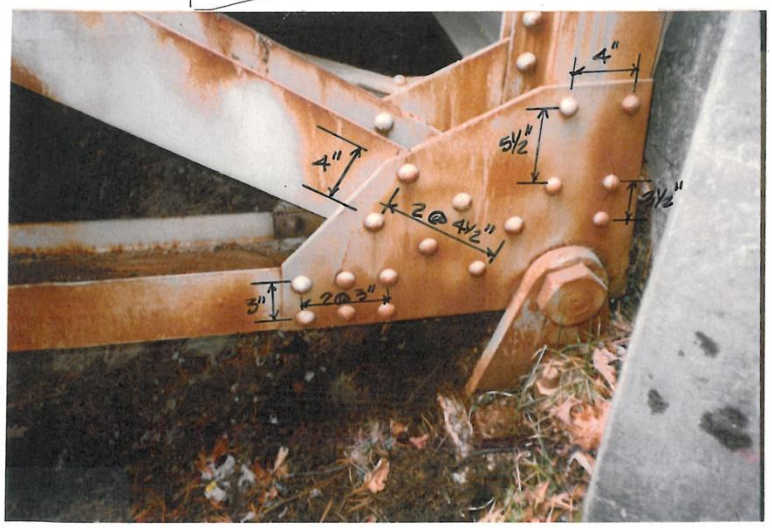
L0 L&R (EXPANSION)

Documentation Sheet 11

U.S. FOREST SERVICE BR.
1178-05.4
MACON / JACKSON CO.
11-13-96



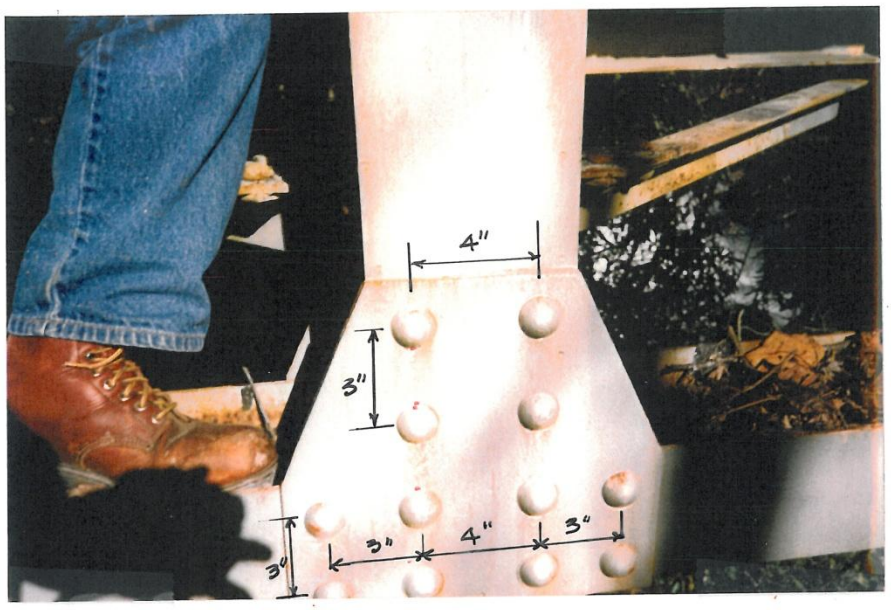
L3



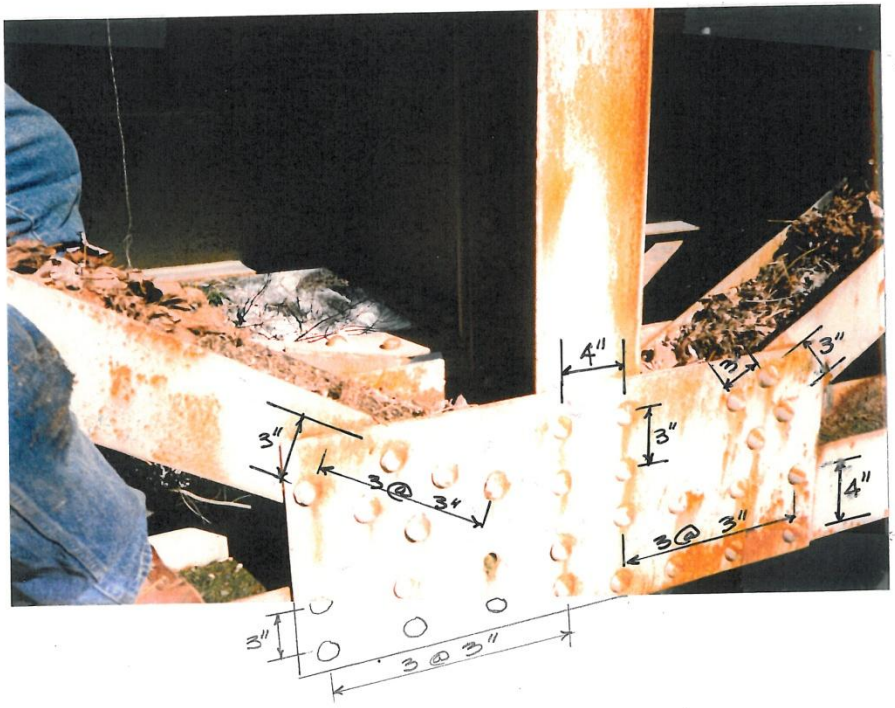
L6

Documentation Sheet 12

U.S. FOREST SERVICE BR.
1178-05.4
MACON / JACKSON CO.
11-13-96



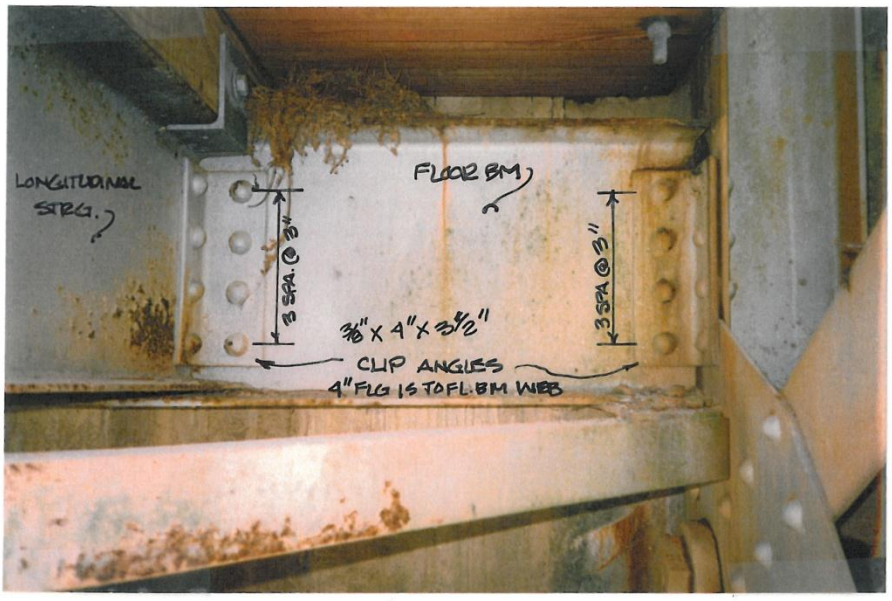
L1 & L5



L2 & L4

Documentation Sheet 13

U.S. FOREST SERVICE BR.
1178-05.4
MACON / JACKSON CO.
11-13-96



END FL. BM / LONGL. STRG. CONN.

INTERMEDIATE FL. BM
CONN. SIMILAR TO END FL. BM EXCEPT FOR KNEE BRACE!

Documentation Sheet 14

PHOTOGRAPHS

All photographs were taken in March 2010.

Photo 1. Bullpen Bridge, north side. (looing south downstream)

Photo 2. View looking west across the bridge.

Photo 3. View looking east across the bridge.


Photo 4. View looking east across the bridge.

Photo 5. Detail at top rail at connection NU1.

Photo 6. Detail at connection NU2.

Photo 7. Detail at top rail, connection SU3.


Photo 8. View looking northwest.

Photo 9. Eastern end looking north at the south side of the bridge.

Photo 10. East base connection at S6L showing a fixed connection to the concrete foundation.

Photo 11. Base connection at the eastern end, including the underside of the wood road bed.

Photo 12. View of south side, looking west at lower portion of truss and underside of the roadbed.

Photo 13. Looking down at the north side of the eastern end of the bridge (NL6) Note the heavy accumulation of debris on the lower cord of the truss and the heavy vegetation surrounding the foundation.

Photo 14. Western end of the bridge, looking south at the north side.

Photo 15. Western end of the bridge, looking south at the north side.


Photo 16. Rocker connection at base, NL1.

Photo 17. Base connection, NL1.

Photo 18. Base connection, SL1.

Photo 19. Plaque on lower cord, south side between connection SL1 and SL2.

bridge

Photo 20. Underside of bridge looking east.

Photo 21.
Detail of underside of bridge, looking east at north side.

NATIONAL REGISTER OF HISTORIC PLACES EVALUATION

The Bullpen Bridge is eligible for inclusion in the National Register of Historic Places (NRHP) under Criteria A and C (36CFR60. 4), as it is "(*a*) *associated with events that have made a significant contribution to the broad patterns of our history and* (*c*) *embodies the distinctive characteristics of a type, period* and *method of construction*. The bridge is a significant element of an historic transportation route, Bullpen Road, constructed by the Civilian Conservation Corps in the early development of the Nantahala National Forest. It is one of the few steel truss bridges constructed by the CCC that remain in the National Forests of North Carolina.

The CCC was the first nationally sponsored conservation movement in the United States, part of the New Deal Era following the Great Depression. The bridge was constructed under the direction of the US Forest Service using CCC camp labor, as consistent with other CCC projects in National Forests.

The Bullpen metal truss bridge is an historic "property that possesses integrity of location, design, setting, material, workmanship, feeling and association with events that have made a significant contribution to the broad patterns of our American conservation efforts and National Forest History. National movements or events that address Criterion A, include:

1. Industrial mass production of bridges after World War I.
2. New Deal Era, the Civilian Conservation Corps, a government sponsored response to mass unemployment during the Great Depression, who's contributions changed the Nation's perception of and relationship to the natural environment.
3. The creation of the Weeks Act of 1911 and the subsequent creation of the Nantahala National Forest in 1920.

The Bullpen Bridge is also among the "properties that possess integrity of location, design, setting, materials, workmanship, feeling and association and embody the distinctive characteristic of (Criterion C) New Deal Era Civilian Conservation Corps construction. The metal truss bridge was fabricated off-site and erected on-site on cast-in-place concrete foundations, using site installed rivets.

The Bullpen Bridge is a significant property on the local, state, and national level. Designed specifically for this location of steel beams, the bridge was designed to be fabricated off-site and assembled on-site using relatively unskilled labor. It is associated with a CCC camp and is part of the Nantahala National Forest.

CONCLUSIONS / RECOMMENDATIONS

The Bullpen Bridge is eligible for listing on the National Register of Historic Places and should remain in place and be maintained an interpreted by the US Forest Service. Any planned maintenance or alteration work should meet the Secretary of the Interior's Standards for Rehabilitation, which requires that all character defining elements to be maintained and repaired.

It is currently in fair to good condition and has been regularly inspected by Structural Engineers. Their assessment has been that the bridge is structurally sound, but that it has been in it is in need of general repairs and painting. Previous engineering inspections have noticed significant rust on some of the steel members and rivets. This deterioration is evident, as is the need for paint to prevent further erosion of the members. Each member and pin connection should be thoroughly inspected to determine the extent of deterioration. Significantly deteriorated members will require strengthening, repairs, and/or in-kind replacement depending upon these findings. The bridge also needs to be cleaned and painted. Coating of the steel is especially important as the configuration of the members allows water to accumulate and pond.

REFERENCES

Main sources

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North Carolina State Historic Preservation Office

HISTORIC PROPERTY FIELD DATA FORM

Circle your responses or write custom responses.

ER: _____

County Jackson/ Macon **Survey Site Number**:_____ **GIS:** N83º 0.958 W83 º 7.581

Property Name: Bullpen Bridge - Nantahala National Forest

Street Address / location description: Bullpen Road (Forest Service Road 1175); 5.4 miles west of Route

Town: Highlands *vicinity* **Ownership**: (*fed*) *state local private non-profit unknown*

District / Neighborhood Association: _____ *contrib non-contrib*

Surveyor: Ellen Pratt Harris AIA; Harris Architects PLLC **Date**: April 4, 2010

***For Survey Update**: No substantial change | change by alteration |change by deterioration | outbuilding loss | rehabilitated | removed or destroyed | not found | no access | file missing | newly identified | needs research*

Study List / DOE recommendation: *eligible | not eligible* **Criteria**: (*A*) *B* (*C*) *D*

Material Integrity: (*High*) | *Medium | Low | N/A Gone*

Condition: *Good |* (*Fair*) *| Deteriorated | Ruinous | N/A Gone* **Location**: *Original Moved (year if known_____) Uncertain*

Const. Date: *ca.* 1934 **Major Style Group**: *Georgian | Geo/Fed | Federal | Fed/GkRev Greek Revival | Italianate | Gothic Revival | Queen Anne | Victorian – Other | 19th-20th c. traditional-vernacular | Neoclassical Revival | Colonial Revival | Southern Colonial | Beaux Arts | Spanish Mission | Tudor Revival | Rustic Revival | Craftsman/Bungalow | Period Cottage | Minimal Traditional | International | Moderne | Art Deco | Misc. Modernist Standard Commercial/Industrial | Ranch | Split Level | Other* _____

Construction: *Timber frame | Balloon frame | Load bearing masonry | Masonry veneer | Log |* [*Steel frame*] *| Concrete | Unknown | Other*_____

Primary Original Ext. Material: *Weatherboard (plain beaded molded novelty type unk.) | Batten | Wood shingles | Exposed logs | Brick | Stone | Stucco | Pebbledash | Other* Steel truss/ wood deck

Covering: [*None*] *| Aluminum | Vinyl | Asbestos Shingle | Later brick veneer | Metal | Paper | Undetermined*

Height (stories): *1 | 1 ½ | 2 | 2 ½ | 3 | more than 3 (enter)* _____

Roof: *Side gable | Front gable | Triple A | Cross gable | Hip | Gambrel | Pyramidal | Mansard | Parapet | Flat Other* none

Plan: *Not Known | 1-room| Hall-parlor| 3 room| Side passage| Center passage | Saddlebag | Dogtrot | Irregular Shotgun | Other* single lane bridge

Core Form (domestic): *I-house | Single pile | Double pile | Foursquare | other* single lane bridge

Design Source:_____ *attributed | documented*

Special Associations / Themes: National Forest; Civilian Conservation Corps (CCC)

Outbuildings and landscape features *(continue on back if necessary)*

Use back of sheet for narrative description and field notes and sketches

Page 2. Use this side for written summary, notes, and sketches of floor plans and/or site plans. Use additional blank sheets if necessary. Address primary features like porches and chimneys when appropriate; make note of exceptional items such as high quality woodwork, masonry work, decorative painting, original storefronts, and special architectural materials.

Cultural Resource Survey, Recording and National Register of Historic Places Evaluation of the Bullpen Bridge, Nantahala National Forest
by Ellen Pratt Harris AIA, Harris Architects PLLC, May 7, 2010