

United States Department of the Interior
National Park Service

National Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Bissell Bridge

other names/site number _____

2. Location

street & number Heath Road (MA Route 8A) over Mill Brook n/a not for publication

city or town Charlemont n/a vicinity

state MASSACHUSETTS code MA county Franklin code 011 zip code 01339

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this ☒ nomination
☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of
Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property
☒ meets ☐ does not meet the National Register Criteria. I recommend that this property be considered significant
☐ nationally ☐ statewide ☒ locally. (☐ See continuation sheet for additional comments.)

Betsy Friedberg, National Register Director 1/12/04
Signature of certifying official/Title _____ Date _____
Massachusetts Historical Commission, State Historic Preservation Officer

State or Federal agency and bureau _____

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See continuation sheet for additional Comments.)

Signature of certifying official/Title _____

Date _____

State or Federal agency and bureau _____

4. National Park Service Certification

I, hereby certify that this property is:

- ☒ entered in the National Register
☐ See continuation sheet.
- ☐ determined eligible for the
National Register
☐ See continuation sheet.
- ☐ determined not eligible for the
National Register
- ☐ removed from the
National Register
- ☐ other (explain): _____

Signature of the Keeper Elsa H. Beall

Date of Action 2/26/04

Bissell Bridge
Name of Property

Franklin, MA
County and State

5. Classification

Ownership of Property

(Check as many boxes as apply)

- ☐ private
☒ public-local
☐ public-State
☐ public-Federal

(Check only one box)

- ☐ building(s)
☐ district
☐ site
☒ structure
☐ object

Number of Resources within Property

(Do not include previously listed resources in the count.)

Contributing

Noncontributing

_____ building

_____ sites

1 _____ structures

_____ objects

1 _____ Total

Name of related multiple property listing

(Enter "N/A" if property is not part of a multiple property listing.)

Number of contributing resources previously listed in the National Register

0 _____

6. Function or Use

Historic Functions

(Enter categories from instructions)

Transportation: Road-Related _____

Current Functions

(Enter categories from instructions)

Not in use _____

7. Description

Architectural Classification

(Enter categories from instructions)

Long Through Truss _____

Materials

(Enter categories from instructions)

foundation stone and reinforced concrete (abutments) _____

walls Western Spruce _____

roof Cedar Shingle _____

other Oregon Douglas Fir (large timbers) _____

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

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Bissell Bridge

Charlemont (Franklin), MA

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NARRATIVE DESCRIPTION

The Bissell Bridge is a two-lane, timber-framed, covered bridge crossing the Mill Brook on MA Route 8A (Heath Road) in the small, rural town of Charlemont, Massachusetts. Built in 1951, it is a TECO enhanced Long Through Truss bridge that replaced a similar bridge built on the site ca. 1881. The original bridge type – the Long Through Truss – was named for its designer, Stephen Harriman Long. TECO (Timber Engineering Company) in conjunction with the Massachusetts Department of Public Works designed the present bridge. The bridge spans a wooded, rocky gorge with an approximate depth of fifteen to twenty feet. **(photo #4)** On the north side of the bridge a waterfall cascades over the remains of a stone dam (active until 1987) before making its way beneath the bridge. **(photo #5)** The scenic setting also includes a mill pond, old stone retaining walls, and a carriage road along the west side of Mill Brook. **(photo #9)** The site is enhanced by its proximity to several historic houses including the Bissell House from which the bridge takes its name. Route 8A developed from an old stagecoach route leading to the Charlemont Village Historic District (NR 1988) and to the town's 1880s fairgrounds.¹

The bridge is situated on an S-curve alignment to the roadway, which continues at a relatively flat grade with a series of horizontal curves to the north. The south approach to the bridge has an uphill grade of approximately 2.5% with a view of the bridge unobstructed by buildings or residences. The Bissell family home stands approximately 200 feet beyond the north portal of the bridge. **(photo #1)**

The six-bay, 92' long bridge rests on ledge-supported abutments of reinforced concrete and stone facing. **(photo #5)** The load clearance is 14 feet, and the lane width is 24 feet.. Throughout the bridge, connections are made using timber connectors and shear plates designed by TECO. Interior trusses and secondary member connections utilize one-half inch bolts with two inch diameter split rings, while heavier wall trusses necessitate larger three-quarter inch bolts with four inch split rings. As was not uncommon of TECO engineered bridges, this structure incorporates elements of a metal bridge design with fabrication of top quality, dense Douglas Fir.

The Bissell Bridge follows the pattern of the Long Through Truss. The specifics of its construction are that each bay measures approximately fifteen feet, four inches in length. The walls are clad in 7/8 inch vertical boarding of Western Spruce connecting to four by six inch girders of the longitudinal truss at 22-inch spacing. **(photo #6-7)** The heavy timbers are eight large preservative-treated Oregon Douglas fir beams, each six inches thick by eighteen inches wide and forty feet long. The longitudinal truss spans twenty-eight feet on center, and members are connected using 3/4" diameter through bolts in combination with four inch diameter split rings. The truss verticals supporting the bottom chord connection of the transverse floor trusses extend two feet, six inches beyond the bottom chord.

The gabled roof of the Bissell Bridge slopes at a rise of five vertical inches to every twelve horizontal inches. **(photo #8)** Eighteen inch cedar shingles were laid 5-1/2 inches to weather, covering 7/8 inch matched boards and roofing paper to finish the roof, which overhangs the structure by approximately 14 inches on each side. The roof is supported by transverse trusses spaced every 15 feet, 4 inches. Longitudinal support between the transverse trusses

(continued)

¹ Adapted from a Letter from a letter to the Massachusetts Historical Commission from Norma Coli, Chair of the Charlemont Historical Commission. 1999. (On file with the CHC).

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is provided by two six by ten inch purlins. These purlins also provide mid-length support to the two by six inch roof rafters, which run parallel to the trusses at twenty-four inches on center along the top chords of the longitudinal truss. At each end post, on both sides of the portal openings, are sixteen-inch wide bands of vertical diagonal bracing, three by twelve inches in size.

The floor of the Bissell Bridge is Long Leaf Yellow Pine, cut to three by six-inch planks and embellished with, what were at the time of its building, high technology asphalt traction squares. The long leaf pine under-flooring is installed edgeways on a deck system consisting of three by six inch laminated wood decking, now overlaid with a bituminous concrete surface that spans four feet, six inches between longitudinal stringers. While the overall width of the bridge at its outside ends is approximately 34-1/2 feet, the actual roadway surface is only 24 feet wide. A timber deck, timber stringers, transverse timber floor trusses, and longitudinal timber through trusses support live loads. The deck timbers are oriented such that their strong axis is used to support traffic loads and are nail laminated as well as toe nailed to the stringers.

The stringers are pairs of six by sixteen inch members, spanning fifteen feet between transverse timber floor trusses, and spaced ten inches clear between the members in each pair. The pairs are spaced 4 feet 6 inches on center, and most are continuous over two spans. The stringers run over five feet deep supporting timber transverse trusses, spaced 15 feet 4 inches apart. They then frame into each panel point of the timber wall trusses. The transverse timber floor trusses are four feet deep, parallel-chord trusses spanning twenty-eight feet between longitudinal trusses. They are then attached to extended ends of the longitudinal truss's vertical member using 1/2 inch diameter through bolts in combination with 2-1/2 inch diameter split rings. Each truss has four interior bays four feet wide and two bays five feet wide.

Archaeological Description

While no ancient Native American sites are located in the immediate area of the bridge, sites may be present. One Native site is located in the general area (within one mile), reflecting generally low site densities for this portion of the Connecticut Valley. Although the bridge spans a waterfall of Mill Brook, a tributary of the Deerfield River, the presence of steep slopes and a rock gorge indicate locational criteria (slope, soil drainage, proximity to wetlands) that are generally unfavorable for ancient sites. Given the above information and impacts associated with construction of two bridges on the site, a low potential exists for locating ancient Native American resources in the area of the bridge.

A moderate potential exists for locating historic archaeological resources at the Bissell Bridge. Structural evidence may survive from the 1880 bridge abutments and retaining walls on both sides of the gorge. Stratigraphic evidence may also exist from builder's trenches used to build the abutments and walls and from the carriage road that led to the bridge.

(end)

Bissell Bridge

Name of Property

Franklin, MA

County and State

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- ☒ **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ☐ **B** Property is associated with the lives of persons significant in our past.
- ☒ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ☐ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

Property is:

- ☐ **A** owned by religious institution or used for religious purposes.
- ☐ **B** removed from its original location.
- ☐ **C** a birthplace or grave.
- ☐ **D** a cemetery.
- ☐ **E** a reconstructed building, object, or structure.
- ☐ **F** a commemorative property.
- ☐ **G** less than 50 years of age or achieved significance within the past 50 years.

Narrative Statement of Significance

(Explain the significance of the property on one or more continuation sheets.)

Areas of Significance

(Enter categories from instructions)

Engineering

Transportation

Period of Significance

1951-1954

Significant Dates

Significant Person

(Complete if Criterion B is marked above)

Cultural Affiliation

Architect/Builder

T.J. Harvey & Son (Builder)

Michael J. Mahiljan (Designer of record)

MA Dept. of Public Works

9. Major Bibliographical References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

- ☐ State Historic Preservation Office
- ☐ Other State agency
- ☐ Federal agency
- ☒ Local government
- ☐ University
- ☒ Other

Name of repository:

Heath Historical Documents (Charlemont H. C.)

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STATEMENT OF SIGNIFICANCE

The Bissell Bridge is significant in the historical and cultural development of the town of Charlemont both as a symbol of the small town's agrarian past and its present community pride and cohesiveness. In addition, the bridge is an important gateway from the north to the Charlemont Village Historic District, which is on the National Register of Historic Places. Local citizens constructed the first Bissell Bridge ca. 1881. The current bridge replaced the antiquated structure in 1951. Making use of the relatively new, innovative, and economical technique of timber connection developed by the Timber Engineering Company (TECO) of Washington, D.C., it was the first covered timber-frame bridge built in Massachusetts in the 20th century, and as recently as 1998, it was one of only four extant timber bridges built by the Commonwealth since 1950. These facts, coupled with the town's commitment to building a covered bridge that was as similar as possible to that of the first Bissell Bridge brought regional recognition to Charlemont.

An iconic covered bridge, the Bissell contributes significantly to the scenic beauty of its historic crossing over the Mill Brook. Described as "gorgeous" by the President of the National Society for the Preservation of Covered Bridges and "highly picturesque" by the Massachusetts Highway Department's bridge specialist, the Bissell Bridge retains integrity of design, location, setting, materials, feeling, workmanship, and association; and fulfills National Register criteria A and C at the local level.

Brief History of Charlemont

A 1736 survey of what is now the Town of Charlemont showed the area as Boston Township No. 1, extending north to the territory that now comprises of the towns of Rowe and Heath. Early use of the land appears to have been for hunting and fishing by the Pocumtuck Indians, whose tribal center was located on the Connecticut River in Deerfield. The first white inhabitant of Charlemont area was Moses Rice, who settled there in the early 1740s. The Charlemont name has been traced back to the village's original plantation, Charley's Mount.

Between 1740 and 1750, during the French and Indian War, a line of forts was constructed along the northern hills of Massachusetts and into New York. In 1746 Indians attacked and destroyed Fort Massachusetts, located in nearby North Adams, along with Moses Rice's home. Frightened settlers took refuge in Deerfield until the War passed, at which time Rice returned to Charlemont with the Taylor and Hawk families. By 1752 with eleven families making their homes in Charlemont, Moses Rice began to campaign for a tax to be levied upon absentee landowners to provide funds for construction of a meetinghouse, mills, roads, and bridges. As a result, Charlemont was formally organized as a plantation in 1753.

Captain Moses Rice and Phinneas Arms lost their lives in 1754 during an Indian attack known as the "Rice Massacre." Fear of further attacks held development at a standstill until 1762. For the next three years, however, Charlemont experienced a population explosion, growing to 665 residents by the end of 1765. The newly bustling plantation petitioned the state for incorporation as a township during that same year, coming under self-rule on June 21, 1765.

Settlers in Charlemont led an agrarian life based primarily upon crop growth and grazing of livestock in the

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Deerfield River floodplain. Industry and manufacture, however, quickly became an important part of the development of the small town, as the utility of the many brooks and streams and the area's abundant supply of wood began to be recognized. Aaron Rice had established the earliest mill, a gristmill, upon the west bank of the Mill Brook during the 1740s. Rice's operations expanded in 1753 and again in 1763, when the proprietors granted him additional money to establish both a corn mill and a sawmill. Rice's mills were destroyed in the floods of 1775. Sylvanus Rice, Aaron's brother, also became involved in the business of milling on the Mill Brook, establishing a saw mill on the east bank that remained active until 1822 when David Crittenden built a much larger operation. Another small saw mill, owned by A. P. Maxwell, operated at the upper reaches of the Brook.

Owing to the town's plentiful supplies of wood and water power, Charlemont's many mills provided the perfect opportunity for the manufacture of lumber products and other industrial endeavors which required a ready supply of energy. Thus, as early as 1800 Aaron Lyman joined a small building to Sylvanus Rice's saw mill on the Mill Brook for the purpose of a wool carding business. Lyman's son Josiah later established a similar arrangement at the gristmill. By 1836 another carding factory, owned by Eugene Field and later by Dexter Hawkes, operated further north on the Mill Brook until being destroyed by fire in 1852. Carding was not the only enterprise in which Mr. Field engaged, however. In two buildings on the Brook owned by Joseph White, Field ran a snath factory, and a company named Fuller and Rugg operated a trip hammer. Both of these were destroyed in an 1852 fire. A further product of the town's many saw mills was the proliferation of chair stock factories. Three operated on the Mill Brook during the mid 19th century, one owned by Dennis Baker, another by A. L. Cooley, and the other by Leonard Green.

Perhaps the largest and most successful business to operate upon the Mill Brook was that of the H. H. Frary and Sons manufacturing company, established in 1892. The company's primary product was spools, which it shipped to Belding Brothers, among others, in sacks of 120 each. As many as forty townspeople worked the plant's nine lathes turning 1000 cords of birch per year into spools, toys, tea sets, and puzzles.

Just north of Frary and Sons on the Mill Brook, John Gerry operated a blacksmithing shop at what was known as the Maxwell Flats. Gerry established his business in 1880 after purchasing the blacksmithing operation from W. S. Bemis. Bemis had rented one room in his shop to a Fred Smith, who repaired carriages. Gerry expanded the established operation to a full carriage manufacturing shop in the following years. At the southern end of the Mill Brook below the "lower bridge" Asa Taylor ran a tannery that passed through the hands of Alfred Olds and Charles Richards before becoming one of the largest and most noteworthy industries in Charlemont under the ownership of Barnard and Hammond, makers of shoes and boots.

In addition to the many industrial and manufacturing roles played by members of the Charlemont community, a number of citizens operated general stores for the purchase of daily necessities. Among them was H. W. Bissell, for whom the Bissell Bridge is named. Henry Bissell employed his young nephew, A. L. Tyler as a clerk for a short time before taking on a business partner in 1846. At that time Tyler made a trip to Boston for supplies and returned to establish his own store on the Mill Brook. Among Bissell's other investment ventures was the establishment of a stove store and tin shop with S. L. Chapman in the years following 1846.

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The First Bissell Bridge

Clearly the Mill Brook was an important waterway in the Charlemont community, providing the power for the gristmills, saw mills, and factories that operated on its banks. Town records have little to say about the building of the first Bissell Bridge, but they do indicate that the subject was initially discussed in 1879. In 1880, the citizens supported the appropriation of \$600 for construction. The next notation in the 1881 town report indicated that \$1000 would be raised to construct a bridge near the home of Adna Bissell. It has been assumed that the bridge was constructed shortly thereafter, hence the ca. 1881 date. It is believed that N.G. Warner, C.B. Mayhew, and A.L. Bernard oversaw construction of the bridge. While little is known about the events that led to the building of the first Bissell Bridge, a great deal is known about its design and engineering. The Long Through Truss was a product of the creative genius of Colonel Stephen Harriman Long of the U.S. Topographical Engineers. In 1829, Long was employed by the War Department to build bridges for the Baltimore and Ohio Railroad. During this time he built the first bridge to have a Long Through Truss superstructure -- the Jackson Bridge. A short description (see Edwards) of this first truss explains, "the trusses were of the parallel chord, counterbraced paneled web type." Further, "the improvements embodied in this bridge are conceded to be the second step toward simplicity and concentration of parts in wooden bridge truss types." A patent issued to Colonel Long on the 23rd of January 1836 indicated that the function of the counterbraces was to be a means by which "the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded." Though new to the United States, this system had been in operation in Europe for more than seventy years.

Throughout his career Colonel Long received five different patents for his bridge improvements. His widely distributed pamphlets advertised his designs. Long's bridge design became common in both highway and railroad construction, but not nearly so much as the Burr or Town trusses. Most often the Long Through Truss was used in conjunction with the wooden arch. Sources also suggest that it "... is worth noting that Colonel Long's first patent contemplated the use of both wooden and cast iron chord splices.... The cast iron gib plates were formed with lugs, or to use Colonel Long's nomenclature, 'trusscoms' for the transmittal of stresses."²

Stephen Long lists many other firsts of bridge engineering among his accolades. He is credited with having been the first American engineer to seriously contemplate mathematical theory in the design of bridges, as well as the first to give special consideration to load reaction problems. At the time during which Long's designs gained initial popularity, most bridges were designed in accordance with the then popular Town Truss, which neglected to include vertical columns intended to transfer superstructure loads to the substructure at abutments and piers. By contrast, Long's construction pamphlets provided specific directions based upon a principle he described as "the parallelogram of forces" to provide such vertical bracing. Ultimately the Long Through Truss bridge was very nearly a multiple kingpost design of the panel type with counterbraces, wooden posts, and single timbers in between. Most Long Through Truss bridges now in use differ slightly from the patented design because the patented design showed two single diagonals, whereas the bridges were consistently built with two braces and one counterbrace in each panel.

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² Edwards, L. N. p.61.

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Engineering Significance:

The significance of the Bissell Bridge of 1951 as demonstrative of a particular type, period, and method of construction is evidenced in its use of innovative TECO timber connectors and shear plates on a Timber Structures, Inc. prefabricated truss at a time when concrete and steel had reached the forefront of highway bridge construction. The timber connector was widely accepted as the preferable connection choice for heavy, prefabricated lumber structures because fewer connectors are required to serve the same purpose as bolts, thus requiring less boring and drilling, and consequently fewer opportunities for errors. It is for this reason that the TECO connection system was considered to be much more economical and efficient than other fastenings. Harry Parker, Professor of Civil Engineering at the University of Pennsylvania, noted in his 1953 textbook on design of roof trusses, that the TECO system was responsible for making possible the continued use of large timber trusses for efficient highway bridge construction in situations where it would otherwise have been impractical. Howard Hansen, Professor of Civil Engineering at the Agricultural and Mechanical College of Texas and author of Modern Timber Design, also praised the TECO connection stating: "no single factor was more responsible for revolutionizing timber design than the development of the modern timber connector."

Although TECO is responsible for bringing timber connectors to the United States, the technology originated in Europe at the close of World War I. Faced with depleted metal stores and the need to rebuild, European engineers required a joint connection for timbers of limited cross-section that could withstand heavy loads. The common system of connection necessitated excessively large lumber, unavailable at that time, so they designed what became known in the United States as the modern timber connector.

TECO, founded in 1933, is famous for its pioneering work in the design, manufacture, and patent of timber bridge construction elements in the United States, including joist hangers, wood fasteners, and the split ring connectors, which often, as in the case of Bissell Bridge, substituted for tree nails. TECO engaged in all manner of education, testing, and promotion of their product lines. As a subsidiary of the National Lumber Company, testing was also done for the U.S. Forest Products Association at TECO's state-of-the-art laboratory.

As a further service to the U.S.F.P.A., TECO published many small books and pamphlets encouraging the use of lumber for its many attributes: renewability, flexibility, and through the introduction of their product, increased strength. The primary focus of TECO's literature was newly developed clear span wooden trusses and the world of possibilities they presented for auditoriums, churches, airplane hangars, and bridges.

The TECO name gained prominence in the field of timber construction products in the years following 1952, as a result of aggressive advertising in twenty-eight separate architectural, engineering and building publications throughout the United States and Canada during that year, including American Builder, Engineering News-Record, and Building Standards Monthly. The Company garnered further recognition as a sponsor of the Timber Symposium held in Chicago that same year, as well as for its exhibits at a number of other conventions throughout the country. TECO literature became integral text for use in 306 engineering courses at 217 different schools nationwide.

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As a further service to the professional community, TECO designed literature specifically for the use of architects and engineers including diagrams and building plans. TECO developed more than 270 truss and structure designs, distributing 13,000 copies of the first edition of Typical Design of Timber Structures to students and professionals throughout the country. Four hundred job specific inquiries were made to the TECO by engineering departments as of 1952, and at the time of the second edition of the Typical Design book, 35,000 copies were requested.

The true success of TECO, however, was the introduction of its line of timber connectors including the split ring and shear plate used in the Bissell Bridge. The timber connector allowed for the development of clear-span, trussed-rafters to lengths previously unheard of, due to the fact that the connector allowed for the full distribution of the load stresses throughout the whole of a heavy timber. The TECO engineered trussed rafter enjoyed incredible success in applications where independent lumber fabrication services were unavailable or unaffordable, particularly in rural areas. The economy and efficiency of this advanced technology also made it particularly well adapted to the constraints of low cost housing development; thus, a full 30% of the houses built under the Housing Act of 1949 made use of the TECO truss. In this way TECO revolutionized the development of bridges as well as other trussed structures.

In contrast to the innovative timber connector, the first timber bridges used strong wooden pins that came to be known as "trunnels", short for tree nails, to bind members. Because of its durability, trunnels were typically made of oak, cut to approximately eight inches in length and two inches in diameter. Split rings operated in an entirely different manner from the trunnel and other binding strategies. The TECO split ring connector was manufactured from hot-rolled carbon steel formed to a closed, true circle save a single tongue and groove split at one point in its circumference. As described by TECO, this joint is important because: "A solid ring, in transmitting loads, may bear against only the wood outside the groove, or only the wood core within. The split ring bears against both and is therefore able to transmit higher loads." A special tool is used to pry apart the ring upon its insertion to the grooves. This assures that the ring is performing its dual bearing role at all times. The ring, created with beveled edges, is embedded in two adjacent pre-grooved timber faces to a point about three-eighths of an inch deep, becoming snug as the bevel ends just prior to its resting depth. For optimal performance the split "should be placed nearest the edge of the member stressed parallel with the grain." A bolt is then placed tightly at the circle's center.³

The functional superiority of the split ring system arises from the fact that the split "permits simultaneous ring bearing against the core wall and outer wall of the groove into which the ring is placed." Further, this system allows all the timbers to be held securely together rather than individually, as would be the case when using nuts and bolts. The split-ring connection system allows full transmission of loads to and from adjacent members, thereby decreasing joint stress by spreading it over a larger area. This system has been recognized by engineers as the most beneficial for minimizing a bridge's propensity to sway in strong winds, as well as being the strongest binding system in existence in 1951. Connector tests conducted at the TECO labs proving the reliability of the new system included long duration loading on individual joints of full scale twenty-six and forty-eight foot span heavy timber trusses. As a result of such tests, the split ring connector system was found to be five times stronger than the tradition nut and bolt connection.

TECO shear plates were also used in the construction of the Bissell Bridge. The shear plate is a circular element of

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³ Timber Engineering Company. Manual of Timber Connector Construction. 1935.

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malleable cast iron fixed with a solid perimeter of metal teeth, coupled with a cylindrical hub on the opposite face. The plate is designed to transmit tension loads from wood to steel in order to "eliminate crushing of the timber surface under the bolt, thereby developing the full shearing value of the bolt itself." The primary uses of the shear plate are to form a footing connection for timber columns at a foundation or to tie trusses to a building wall. The process of imbedding the plate in timbers may be accomplished either by hammering with a sledge, or drawing the connector into the wood by tightening surrounding bolts, after daps and grooves have been incised with a specially designed "dapping tool." The outside edge of the shear plate should be flush with wood surface when fully imbedded. The entire assembly is then secured by means of a bolt through the center portion of the circles.

TECO embraced its role as an innovator in timber highway bridge engineering with the publication of *Modern Highway Bridges*, a booklet devoted exclusively to timber bridge designs that utilized TECO connections. The booklet begins with an introduction to the benefits gained by and growing popularity of timber connector bridges. The text explains that compared to other types of bridge construction, the TECO system is economical to construct and maintain, simple to erect, requires less hardware and other material and has a high salvage value. In addition, since local labor and materials could be utilized, it keeps jobs and money in the community. The booklet lists thirty states, in addition to the District of Columbia and Canada, as having built timber bridges using the TECO connector system.

The New Bissell Bridge

The local significance of the present 1951 Bissell Bridge is exemplified by its having provoked one of the most heated political battles in the history of Charlemont. The Massachusetts Highway Department condemned the old Bissell bridge, and recommended replacing it with a modern concrete and steel structure. The Town of Charlemont vehemently opposed the plan, preferring to erect a copy of their beloved covered bridge. The controversy attracted the attention of avid covered bridge enthusiasts and internationally renowned Boston Pops concert pianist Leo Litwin, who wrote of the plight in the *Boston Globe*, as well as the National Society for the Preservation of Covered Bridge's "Covered Bridge Topics". In the early 1950s only twelve covered bridges remained in the state of Massachusetts, and the Bissell was the last of nine pre-1900 bridges in the Franklin County region. The passionate efforts of the Charlemont area residents to ensure that the new structure reflected the history, setting, and agricultural nature of the community resulted in a near replica of the previous Bissell Bridge, down to recreating streaks, stains, and other cosmetic signs of weathering. Constructed at a cost of approximately \$50,000, the new bridge is eight feet wider, four feet taller and about thirty feet longer than the first Bissell Bridge. Changes in dimensions were necessary to comply with modern safety standards and to accommodate modern vehicles. For example, the height of the bridge opening was increased from ten feet to fourteen feet in order to provide adequate clearance for trucks.

The designer of record for the new Bissell Bridge was Michael J. Mahiljan of the Massachusetts State Department of Public Works, the agency responsible for the overall project. The department's bridge division, under the direction of John C. Rundlett, bridge engineer, was the overall designer, and the engineer on the job was N. William Heino of Granville, MA. Constructed to the specifications of TECO, the bridge was built by the firm of T. J. Harvey and Son of Adams, Massachusetts. Drawing on twenty-three years of construction experience that included railroad, house, and road-building throughout New England, the Harvey firm put out a successful bid for the bridge

(continued)

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Bissell Bridge

Charlemont (Franklin), MA

Section number 8 Page 7

reconstruction project, estimating it would cost \$49,000. Paid for by a combination of municipal, county, and state funds, the actual cost of the town-owned bridge appears to have been between \$50,000 and \$55,000.

Thomas O. Harvey, son of the firm's founder, was a Rennsaelear Polytechnic Institute-trained engineer, who followed the footsteps of his Canadian-born father, T.J. Harvey. At the time of the Bissell bid, the firm had built roads and bridges from Adams and Williamstown, Massachusetts to Bennington, Manchester and Wilmington, Vermont. In 1940 the father and son pair began building runways at the United States Air Force Base in Dexter, Maine. Following World War II the company operated for 2½ years in Kylertown, Pennsylvania prior to returning to Adams, MA.

The Bissell Bridge was a new experience for the company, as it was the first timber bridge they had actually constructed, having torn down nearly fifteen such structures. The project proved to be a challenge due to the weight of the massive timbers. Assembly required that the various sections be constructed and then lifted into place.

On the State level the construction of the Bissell Bridge was of particular importance because it was the first timber-framed, covered bridge built in Massachusetts in the twentieth century.⁴ Further, the then Commissioner of Public Works for the Commonwealth of Massachusetts, William F. Callahan, publicly praised the decision to replace the Bissell Bridge with a similar timber covered bridge, stating:

The notion that a covered bridge can't do the work of new steel and concrete structure is all wrong. We can build a covered wooden bridge that will be an exact replica of an old-fashioned New England covered bridge and it will carry the load of steel, and last just as long.... The covered bridge is a New England symbol of romance, and a symbol too, of its rich, historic past. It represents the sweat and toil of New Englanders of over 100 years ago who risked their lives to bridge fast-running streams. Such bridges enabled them to live in closer community and relieved the hardships of self-dependence through the encouraging of commerce and trade.⁵

In another comment, Callahan said: "Unfortunately, these rare antiques cannot be preserved indefinitely for posterity, but they should be replaced whenever possible. Travelers can speed to their New England destinations on wide, modern highways of concrete, macadam and steel. But ...when they come to a covered bridge, they know they have seen New England."⁶

The factors that eventually won over Commissioner Callahan included the tourist potential of the bridge along with the sentimentality and romance associated with covered bridges. In addition, the economics were compelling, in that constructing a timber bridge is generally less expensive than a comparable concrete and steel structure.⁷ No doubt the Charlemont Board of Selectmen's final request for re-creation of the historic Bissell Bridge appealed to those monetary concerns. A poem sent to the Commissioner and published in the local newspapers indicated as much:

(continued)

⁴ Elon E. Ellis, "Reader Comment." Engineering News-Record, Feb. 17, 1954.

⁵ Ellis.

⁶ John B. Knox. "Ancient Covered Bridges Win Sentimental Reprieve." Springfield Republican. January 28, 1951.

⁷ Knox.

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Bissell Bridge

Charlemont (Franklin), MA

Section number 8 Page 8

Listen, Dear Voter, and you shall hear from a Board of Selectmen crazed by fear, That in the dead of night, with a mighty roar, the Bissell Bridge will be no more.

For one hundred years this bridge has stood, but for the last fifteen has been no good, And loving hands have patched its pants, till naught remains but food for ants.

By Grace of God it stands today, exactly why, no man can say. But in the breeze its sways and jerks should give the chills to Public Works.

On all the Board the hair is raised and daily we avert our gaze. At night to sleep we daren't start, for fear the bridge will fall apart.

So weak and feeble is the spanny that birds no longer park their fanny, For fear this structure old and hoary, will any minute go to glory.

And so Dear Voters, with pen in hand, we let you know how matters stand; how every time the planking flops, beneath, the river licks it chops.

The Bissell Bridge is falling down, right in the middle of our Town; Please view this matter with alarm, and do vote yes unto our plan.

More than 700 people in a town of less than 1,000 celebrated the opening of the new Bissell covered bridge in 1951. The town marked the day with a full schedule of activities; a parade, luncheon, and evening square dance held in the Bridge itself. The parade, recalling the early days of the original Bissell Bridge, featuring a covered wagon drawn by oxen, a hand fire pump, and large ore wagons drawn by teams of horses. The Shelburne Falls band even gave a celebration concert at the fairgrounds. Newspapers from all over the country covered both the recreation and re-opening of the Bissell covered bridge. The Heath Historical Documents alone contain more than thirty newspaper clippings of the events, including one from the *New England Homestead* in which a writer from New Jersey explained, "As one of the annual visitors and a lover of the unique attraction of the Covered Bridges in the New England landscape I believe it is possible to speak for a majority, and say the traveling public extends its gratitude..." for the replica of the Bissell Bridge.⁸

There is ample evidence to support this contention, not the least of which is the inclusion of the Bissell Bridge and the story of its re-creation in both Covered Bridges of The Northeast and World Guide To Covered Bridges. In fact, in the introduction to the second edition of Clara Wagemann's book on New England's covered bridges, the publishers cite the enormous interest and "hundreds of indignant letters from every state in the country" written to the Massachusetts Highway Department "when the Associated Press carried a feature story this year about the replacement of the old span at Charlemont, Massachusetts" as part of the reason for their bringing forth a second edition of the work. Further still, two entire pages of the book are devoted to the Bissell Bridge and a sketch of the original bridge.

Recent History

In the early 1990s, Charlemont's highway superintendent, Wallace McLean, called the selectmen's attention to the poor condition of the Bissell Bridge. Little or no maintenance had been performed since the bridge was built in 1951. The original cedar shingle roof and ridge cap had seriously deteriorated. Original drainage holes between the bridge and the abutments had filled, first with sand and gravel and later with asphalt. When Rt. 8A was repaved in

(continued)

⁸ Loekle, Lucy Gray. "The Bissell Bridge." The New England Homestead, May 10, 1952.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Bissell Bridge

Charlemont (Franklin), MA

Section number 8 Page 9

the late 1980s, the pavement was extended over the bridge deck. The town hired engineer, Jim Bianchi of JDB Associates, to assess the condition of the bridge. Bianchi concluded that the bridge's capacity should be reduced from the original unrestricted rating to 9 tons, then 7 tons, and eventually, 3 tons. Given these limitations, fire trucks, town plows, fuel delivery truck, and other essential vehicles could not use the bridge. In 1992, at the Town's request, the State stepped in to close the covered bridge, building a temporary Acrow Panel bridge adjacent to it on the upstream (north) side. Over the course of the past 10 years, the Bissell Bridge has stood vacant while discussions took place over whether or not to bring the 1951 Bissell Bridge back into service. Reminiscent of the controversy regarding the 1881 Bissell Bridge and its 1951 replacement, the decision has recently been made to restore the covered bridge.

The Bissell Bridge stands as a magnificent example of significant innovation in the design and erection of timber bridges in the United States, and particularly in the Commonwealth of Massachusetts. At a time when the art of timber bridge building had been all but abandoned in the name of cheaper and more efficient concrete and metal designs, the citizens of Charlemont, were able to save money and employ local laborers to maintain the historic image and association of their beloved covered bridge. It is in part its exemplification of engineering innovation and in part its representation of the enduring efforts of the Charlemont community to retain a connection with their past that centered on the Mill Brook that make the Bissell Bridge worthy of a place on the National Register of Historic Places.

Archaeological Significance

Structural evidence from 1880 bridge abutments and retaining walls may contribute information on materials and methods relating to 19th century bridge construction including their supporting structures. Archaeological research may also document the extent that the 1880 abutments were used in conjunction with later reinforced concrete for the 1951 bridge construction. Analysis of the stratigraphy associated with the carriage road and its approach to the bridge may contribute information relating to 19th century (or earlier) road construction and maintenance.

(end)

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National Park Service

National Register of Historic Places Continuation Sheet

Bissell Bridge

Charlemont (Franklin), MA

Section number 9 Page 1

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(continued)

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National Park Service

National Register of Historic Places Continuation Sheet

Bissell Bridge

Charlemont (Franklin), MA

Section number 9 Page 2

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(end)

Bissell Bridge
Name of Property

Franklin, MA
County and State

10. Geographical Data

Acreage of Property less than one acre

UTM References See continuation sheet.

(Place additional UTM references on a continuation sheet.)

1. 18 674700 4721980
Zone Easting Northing

2. Zone Easting Northing

3. Zone Easting Northing

4. Zone Easting Northing

See continuation sheet

Verbal Boundary Description

(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification

(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Cara T. Welch, with Nora Coli, Charlemont Historical Comm., and Betsy Friedberg, NR Director, MHC

organization Massachusetts Historical Commission date January, 2004

street & number 220 Morrissey Boulevard telephone 617-727-8470

city or town Boston state MA zip code 02125

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name Town of Charlemont, MA

street & number 157 Main Street telephone 413-339-4335

city or town Charlemont state MA zip code 01339

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reduction Project (1024-0018), Washington, DC 20503. NPS Form 10-900 OMB No.

1024-0018
(Rev. 10-90)

United States Department of the Interior
National Park Service

National Register of Historic Places

Continuation Sheet

Bissell Bridge

Charlemont (Franklin), MA

Section number 10 Page 1

Verbal Boundary Description

The boundary includes the span, retaining wall, supports, and structure as it crosses over Mill Brook. It does not include the adjacent temporary bridge currently used to cross the brook.

Boundary Justification

The boundary is that historically associated with the 1951 Bissell Bridge, which replaced an earlier bridge at the same site.

(end)

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Bissell Bridge

Charlemont (Franklin), MA

Section number photos Page 1

PHOTOGRAPHS

Taken by: Norma Coli, Charlemont Historical Commission

Date: November 2003

Negatives at: Charlemont Historical Commission

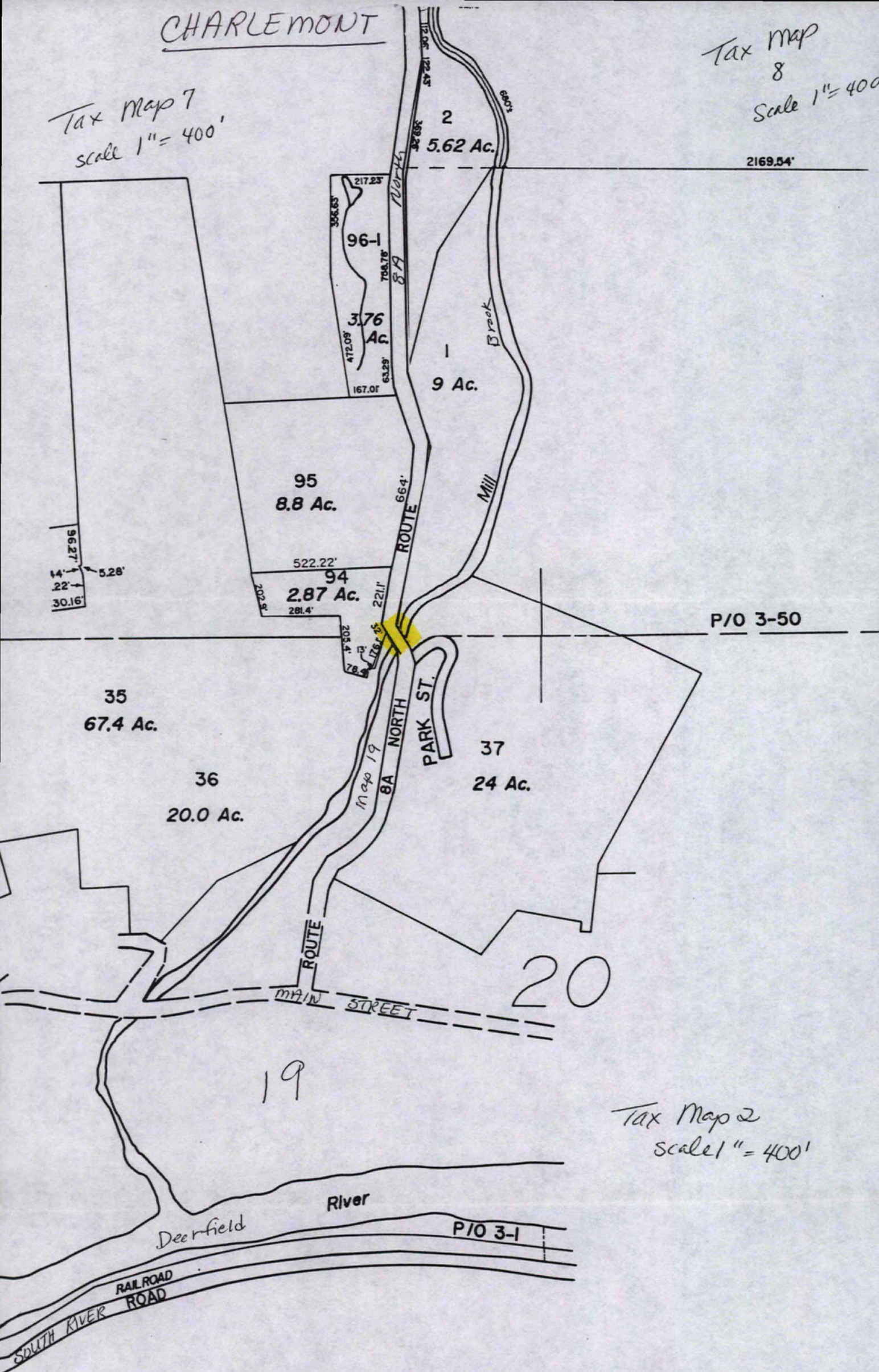
1. Approach to southern end of bridge along Rte. 8A, facing N
2. Southern entrance, facing NW
3. Northern entrance, view facing SE. Temporary bridge on left.
4. Mill Brook, span showing truss, looking NE
5. Underside of bridge, waterfall over stone dam, facing NE
6. Northern exterior façade, looking SE
7. Northern exterior façade, looking NW
8. Shingle roof, view facing SW
9. Retaining walls

(end)

CHARLEMONT

Tax Map 7
scale 1" = 400'

Tax Map 8
Scale 1" = 400'





BISSELL BRIDGE

CHARLEMONT (FRANKIN) MA

NORMA COU, PHOTOGRAPH

NOV. 2003

APPROACH FROM S

VIEW FACING N

photo 1



BISSELL BRIDGE
CHARLEMONT (FRANKLIN) MA

NORMA COLI PHOTO
NOV 2003

SOUTHERN ENTRANCE
VIEW FACING NW

photo 2



BISSELL BRIDGE
CHARLEMONT (FRANKLIN) MA

NORMA COLI PHOTO
NOV. 2003

NORTHERN ENTRANCE
VIEW FACING SE

TEMPORARY BRIDGE ON L

photo 3



BISSELL BRIDGE

CHARLEMONT (FRANKLIN) MA

NORMA COLI PHOTO

NOV. 2003

MILL BROOK SPAN SHOWING TRUSS

VIEW LOOKING NE

photo 4



BISSELL BRIDGE
CHARLEMONT (FRANKLIN) MA

NORMA COLI PHOTO
NOV. 2003

UNDERSIDE OF BRIDGE
WATERFALL OVER STONE DAM
VIEWING LOOKING NE

photo 5



BISSELL BRIDGE
CHARLEMONT (FRANKLIN) MA

NORMA COLI PHOTO

NOV. 2003

NORTHERN FACADE

VIEW LOOKING SE

photo 6



BISSELL BRIDGE

CHARLEMONT (FRANKLIN) MA

NORMA COLI PHOTO
NOV 2003

NORTHERN FACADE
VIEW LOOKING NW

photo 7



BISSELL BRIDGE

CHARLEMONT (FRANKLIN) MA

COLI PHOTO

NOV 2003

SHINGLE ROOF

VIEW FACING SW

photo 8

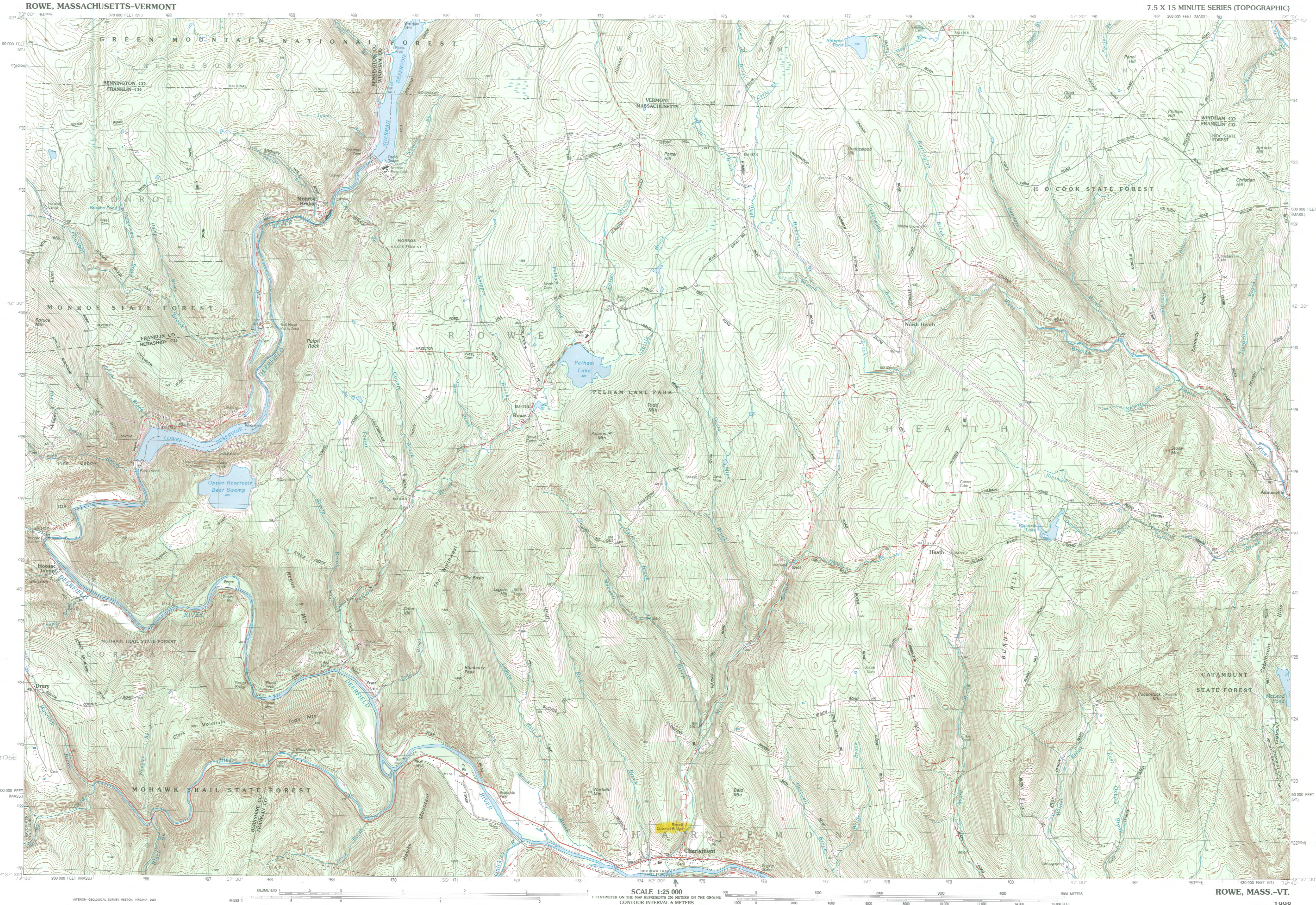


BISSELL BRIDGE
CHARLEMONT (FRANKLIN) MA

COLL PHOTO
NOV 2003

RETAINING WALLS

photo 9





Rowe
CHAMMONT
MASSACHUSETTS-VERMONT
(FRANKLIN) MA

**1:25 000-scale metric
topographic map**



**7.5 X 15 MINUTE QUADRANGLE
SHOWING**

- Contours and elevations in meters
- Highways, roads and other manmade structures
- Water features
- Woodland areas
- Geographic names

**U.S. Department of the Interior
U.S. Geological Survey**

1998

Produced by the United States Geological Survey
Derived from imagery taken 1981 and other sources. Photoresected using imagery taken 1998; no major culture or drainage changes observed. Survey control current as of 1984. Boundaries revised 2001.

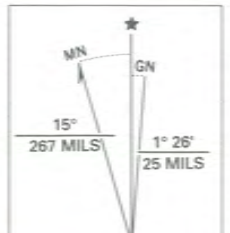
This area also covered by 7.5 minute, 1:24 000-scale maps: Rowe and Heath dated 1977, 1974. North American Datum of 1927 (NAD 27). Projection and 1000-meter grid. Universal Transverse Mercator, zone 18. 10 000-foot ticks. Massachusetts coordinate system, mainland zone and Vermont coordinate system.

North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software.

There may be private inholdings within the boundaries of the National or State reservations shown on this map.

CONTOUR INTERVAL 6 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
CONTROL ELEVATIONS SHOWN TO THE NEAREST 0.1 METER
OTHER ELEVATIONS SHOWN TO THE NEAREST METER

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

CONVERSION TABLE		DECLINATION DIAGRAM	ADJOINING MAPS
Meters	Feet		1 A 2 B 3
1	3.2808		4
2	6.5617		5
3	9.8425		6 7 8
4	13.1234		
5	16.4042		
6	19.6850		
7	22.9658		
8	26.2467		
9	29.5275		
10	32.8084		

To convert meters to feet multiply by 3.2808
To convert feet to meters multiply by 0.3048

UTM grid convergence (GN) and 2001 magnetic declination (MD) at center of map
Diagram is approximate

1 Standard (7.5)
2A Readboro (7.5)
3 Readboro (7.5)
4 North Adams
5 Readboro
6 Readboro
7 Ashfield
8 Readboro



Topographic Map Symbols

- Primary highway, hard surface

Secondary highway, hard surface

Light-duty road, hard or improved surface

Unimproved road, trail

Route marker: Interstate, U. S., State

Railroad: standard gage; narrow gage

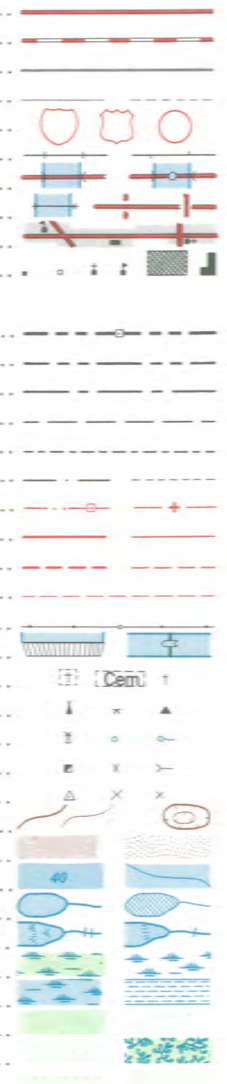
Bridge: drawbridge

Footbridge: overpass; underpass

Build-up area: only selected landmark buildings shown

House; barn; church; school; large structure

Boundary:

 - National, with monument
 - State
 - County, parish
 - Civil township, precinct, district
 - Incorporated city, village, town
 - National or State reservation; small park
 - Land grant with monument; land section corner
 - U. S. public lands survey: range, township, section
 - Range, township; section line: location approximate
 - Fence or field line
 - Power transmission line, located tower
 - Dam; dam with lock
 - Cemetery; grave
 - Campground; picnic area; U. S. location monument
 - Windmill; water well; spring
 - Mine shaft; prospect; adit or draw
 - Control: horizontal station; vertical station; spot elevation
 - Contours: index; intermediate; supplementary; depression
 - Distorted surface: strip mine, levee, sand
 - Bathymetric contours: index; intermediate
 - Perennial lake and stream; intermittent lake and stream
 - Rapids, large and small; falls, large and small
 - Swamp; marsh
 - Submerged marsh; land subject to controlled inundation
 - Woodland, scattered trees
 - Scrub; mangrove
 - Orchard; vineyard
- 

A pamphlet describing topographic maps is available on request

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The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

January 13, 2004

Ms. Carol Shull
National Register of Historic Places
Department of the Interior
National Park Service
1201 Eye Street, NW 8th floor
Washington, DC 20005

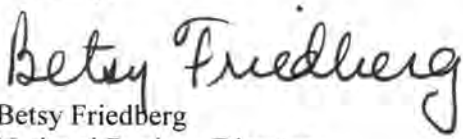
Dear Ms. Shull:

Enclosed please find the following nomination form:

Bissell Bridge, Charlemont (Franklin), MA

The nomination has been voted eligible by the State Review Board and has been signed by the State Historic Preservation Officer. The owners of the property were notified of pending State Review Board consideration 30 to 45 days before the meeting and were afforded the opportunity to comment.

Sincerely,


Betsy Friedberg
National Register Director
Massachusetts Historical Commission

enclosure

cc: Steve Roper, Massachusetts Highway Department
Charles Bellows, Board of Selectmen
Norma Coli, Charlemont Historical Commission
Charlotte Dewey, William Stephens, Charlemont Planning Board

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY Bissell Bridge
NAME:

MULTIPLE
NAME:

STATE & COUNTY: MASSACHUSETTS, Franklin

DATE RECEIVED: 1/14/04 DATE OF PENDING LIST: 2/11/04
DATE OF 16TH DAY: 2/26/04 DATE OF 45TH DAY: 2/27/04
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 04000083

REASONS FOR REVIEW:

APPEAL: N DATA PROBLEM: N LANDSCAPE: N LESS THAN 50 YEARS: N
OTHER: N PDIL: N PERIOD: N PROGRAM UNAPPROVED: N
REQUEST: N SAMPLE: N SLR DRAFT: N NATIONAL: N

COMMENT WAIVER: N

☒ ACCEPT ☐ RETURN ☐ REJECT 2/26/04 DATE

ABSTRACT/SUMMARY COMMENTS:

Entered in the
National Register

RECOM./CRITERIA _____

REVIEWER _____ DISCIPLINE _____

TELEPHONE _____ DATE _____

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.