

Appendix K

Intensive Historic Architectural Survey and Effects Assessment



Report
Aberjona River Flood Mitigation Program
Winchester, Massachusetts

*Intensive Historic Architectural Survey and
Effects Assessment*
PAL NO. 2404
January 6, 2010

Submitted to:
AECOM
2 Technology Park Drive
Westford, Massachusetts 01886-3140

Introduction

AECOM is assisting the Town of Winchester, Massachusetts in the preparation of a Final Environmental Impact Report (FEIR) for the Aberjona River Flood Mitigation Program (ARFMP). The ARFMP consists of several individual projects that together are designed to alleviate periodic flooding of low-lying areas along the course of the Aberjona River in the town. A Draft Environmental Impact Report (DEIR) for the ARFMP was submitted to the Executive Office of Environmental Affairs (EOEA), Massachusetts Environmental Policy Act (MEPA) Office in February 2006, and a Supplemental Draft Environmental Impact Report (SDEIR) in February 2007. The DEIR contained the results of a historic architectural survey conducted by PAL to identify historic properties within the ARFMP area of potential effects (APE). The SDEIR provided additional information regarding historic architectural resources in response to comments on the DEIR received from the Massachusetts Historical Commission (MHC), Winchester Historical Commission (WHC), and Winchester Town Historian Ellen Knight.

This report presents the results of an intensive historic architectural survey that was conducted to evaluate five properties within the Area of Potential Effect (APE) of the ARFRMP for their potential for listing in the National Register of Historic Places (National Register). The survey, which included the preparation of the attached (Appendix A) MHC Inventory of the Historic and Archaeological Assets of the Commonwealth Inventory Forms (MHC Inventory Forms) was conducted in response to comments from the MHC on a previous reconnaissance level survey conducted by PAL in association with the development of the DEIR and SDEIR. The report also provides an assessment of the AFRMP's potential to impact the qualities of significance of properties that are listed or evaluated as eligible for listing in the National Register and recommendations regarding ways to avoid, minimize, or mitigate adverse effects.

Project Description

As originally proposed, the ARFMP consisted of 17 project components that were developed by Camp, Dresser, and McKee (CDM 1999). CDM prepared an Environmental Notification Form (ENF) and submitted it to the EOEA, MEPA Office on May 15, 2003. Since that time a number of projects components have either been completed or dropped from consideration. Historic property investigations conducted in association with the preparation of the DEIR and SDEIR resulted in the identification five remaining project components that have the potential to impact aboveground historic properties. They include Project 2: Waterfield Road to Bacon Street; Project 4: Mount Vernon Street Bridge; Project 8: Swanton Street Bridge Improvement; Project 10: Railroad Bridge near Muraco School; and Cradock Bridge and Locks.

Project 2: Waterfield Road to Bacon Street - The preferred alternative for Project 2 Waterfield Road to Bacon Street has changed since the filing of the SDEIR and is no longer being undertaken by the United States Army Corps of Engineers as originally proposed. The current preferred design, which will be presented in the FEIR, proposes widening the Aberjona River beginning at the Waterfield Road Bridge and ending at a point approximately 1,200 feet (ft) downstream. The existing 15 to 20 ft wide channel will be widened to the east to achieve a minimum bottom width of 35 ft. The existing granite revetment along the east side of the river will be removed and replaced with a 1:1 engineered slope using a cellular confinement system. The granite revetment on the west bank will remain in place and granite blocks will be reset in areas where the revetment is failing. To the maximum extent practicable, the vegetation on the west bank will be preserved as long as the vegetation does not interfere with the stability of the existing granite revetment.

Downstream of the reach being widened it was determined that the channel from bank to bank had a sufficient width to achieve the desired 35 ft bottom width, but the channel bottom has an adverse slope. Therefore, project includes dredging along the entire project width to maintain a positive slope. Vegetation along both banks south of the reach being widened will be preserved. The channel widening will alter the curb line of a portion of the Mystic Valley Parkway, converting 8 feet of the current shoulder to a 5 ft-wide sidewalk and vegetated strip. The Mystic Valley Parkway is currently 42 ft curb-to-curb in this section. The project would alter the roadway to 34 ft curb-to-curb. In total, the project would alter the curb line for approximately 475 feet of parkway, of which 275 ft would be the full 8 ft reduction. The remaining 200 ft of altered curb line would be tapered zones where the total road width would expand from 34 ft back to the full 42 ft width. Dredging of the channel will require the removal of the concrete weir associated with the United States Geological Survey (USGS) Stream Gauging Station located west of Mystic Avenue. The Project has been redesigned, however, to retain the Gauge House at the station, thereby minimizing its effects on the historic structure.

Project 4: Mount Vernon Street Bridge – Project 4 proposes the installation of a fourth 8 ft wide opening in the Mount Vernon Street Bridge to augment the three existing 8 ft wide openings. The proposed work associated with this project has not changed since the SDEIR.

Project 8: Swanton Street Bridge Improvement – Project 8 proposes the enlargement of the existing Swanton Street Bridge opening from 10 ft by 16 ft to 10 ft by 25 ft. An alternative to this bridge reconstruction, described in the SDEIR is the construction of an additional 100 square ft opening under the existing road. The proposed work associated with this project has not changed since the SDEIR.

Project 10: Railroad Bridge near Muraco School – Project 10 proposes the installation of two 7 ft diameter conduits under the railroad bridge to supplement the two existing 6.5 by 7 ft bridge openings. The Town of Winchester also completed a feasibility study to construct a bikeway/greenway tunnel under the railroad in this area. A dual purpose tunnel for flood-flow conveyance and bikeway/greenway access may be possible. The proposed work associated with this project has not changed since the SDEIR.

Cradock Bridge and Locks – This project proposes to remove the remainder of the tide gate structure below the Cradock Bridge in order to increase the bridge's hydraulic opening. The proposed work associated with this project has not changed since the SDEIR.

Results

The five properties evaluated during the intensive survey consist of the Kellaway Landscape, Boston & Lowell Railroad Culvert, USGS Gauging Station, Bacon Street Bridge, and Cradock Bridge and Locks. PAL architectural historians conducted field investigations and archival research for the properties in October 2009. MHC Inventory Forms and National Register of Historic Places Criteria Statement Forms (where applicable) were completed for each property and are attached as Appendix A. Of the five properties inventoried, PAL evaluated three as eligible for National Register listing. The Kellaway Landscape appears to be eligible for the National Register as a district under National Register Criteria A and C, although some sections of the landscape have been altered over time. The Bacon Street Bridge appears to be eligible for the National Register both individually and as a contributing resource to the potential Kellaway Landscape District under Criteria A and C. The USGS Gauging Station appears to be eligible for individual listing in the National Register under Criteria A and C. The Cradock Bridge and Locks and Boston & Lowell Railroad Culvert (a/k/a Muraco School Culvert) were evaluated as not eligible for listing in the National Register due to loss of integrity.

Table 1 includes a summary of the historic aboveground properties that are within the APE for the ARFMP. It includes properties that were evaluated during this survey as eligible for listing and those previously listed National Register properties that were identified in the DEIR and SDEIR within the remaining ARFMP project components that have the potential to impact historic properties.

Table 1. Historic Architectural Properties within the ARFMP APE.

Property Name	National Register Status	Applicable ARFMP Project
Kellaway Landscape	Recommended eligible for National Register listing as a historic district (Waterfield Road Bridge and Bacon Street Bridge are contributing properties in this National Register eligible district)	Project 2
Winchester Center Historic District	National Register Historic District (Mt. Vernon Street Bridge and Waterfield Road Bridge are contributing properties in the Winchester Center Historic District)	Projects 2 and 4
Mystic Valley Parkway	National Register Historic District	Project 2
USGS Stream Gauging Station	Recommended individually eligible for National Register listing	Project 2
Bacon Street Bridge	Recommended eligible for National Register listing individually and as a contributing property to the Kellaway Landscape	Project 2

Effects Assessment

PAL conducted an assessment of effects for properties listed and potentially eligible for listing in the National Register within the ARFMP APE. The following presents the results of that assessment and is intended to update the information contained in the preliminary impacts assessment in Table 4.6.2.1 of the SDEIR.

Kellaway Landscape

Project 2 is located within a non-contributing section of the Kellaway Landscape that was altered in 1946 when a bend in the river was straightened and resulted in the relocation of the river channel from the east side of Manchester Field to the west side. The widening and deepening of the river channel will result in the alteration of the slope of the east bank of the river and will result in the removal of granite block that remains at its base (Figure 1). Vegetation along the east side of the river will be cleared and views to and from the river may change slightly (Figure 2). PAL recommends that Project 2 will have no adverse effect on the potential Kellaway Landscape Historic District because it will impact a non-contributing area of the district that was altered in 1946, outside the period of significance for the district, which extends from 1911 to 1940. Projects 4, 8, and 10 will not alter any of the historic characteristics that qualify the Kellaway Landscape eligible for the National Register and will therefore have no adverse effect on the Kellaway Landscape.



Figure 1. View of the Aberjona River channel within the Kellaway Landscape, looking south from Waterfield Road.



Figure 2. View of the Aberjona River channel within the Kellaway Landscape, looking north toward Waterfield Road.

Winchester Center Historic District

Project 2 may involve temporary construction activities at the south edge of the Winchester Center Historic District near the Waterfield Road Bridge. Views from the district toward the river are currently obstructed by dense vegetation along the river banks (Figures 3 and 4). Construction related to the river channel widening south of Waterfield Road is not anticipated to alter the historic characteristics that qualify the district for the National Register or qualify the Waterfield Road Bridge as a contributing property to the National Register district (Figure 5). Therefore Project 2 will have no adverse effect on the Winchester Center Historic District.

Project 4 will result in the physical alteration of the Mount Vernon Street Bridge, which is a contributing structure within the Winchester Center Historic District (Figure 6). The project will involve the construction of a fourth 8 foot wide opening. This additional opening will alter the structure's original design as a three-span bridge. Therefore, PAL recommends that Project 4 has the potential to impact the historic integrity of the bridge. This physical alteration of the bridge will not change viewsheds within the district or impact the qualities for which any other property within the district is significant.

Projects 8 and 10 are located outside the boundaries of and out of view from of the Winchester Center Historic District and will therefore have no effect on the district.



Figure 3. View looking southeast from Waterfield Road in the Winchester Historic District toward the Aberjona River.



Figure 4. View looking northwest from the Aberjona River (south of Waterfield Road) toward the Winchester Historic District.



Figure 5. View looking south at Waterfield Road Bridge.



Figure 6. View looking west from Mill Pond Park in the Winchester Center Historic District toward the Mount Vernon Street Bridge.

Mystic Valley Parkway

The Mystic Valley Parkway is a National Register Historic District that encompasses approximately 10 ft of land from the edge of the roadbed curb, including the sidewalk. The land immediately adjacent to the parkway, including the sidewalk and planted trees contributes to the character of the district (Figures 7 to 9). PAL recommends that Project 2 has the potential to directly and indirectly impact the Mystic Valley Parkway. Widening of the river channel toward its east bank would change views from the parkway roadbed by taking the abutting land, introducing a guard rail into the landscape, removing trees, and relocating the extant sidewalk.

Projects 4, 8, and 10 are located outside the boundaries of and out of view from of the Mystic Valley Parkway Historic District and will therefore have no effect on the district.

USGS Stream Gauging Station and Weir

Project 2 proposes the demolition of the USGS Stream Gauging Station and Weir. PAL recommends that the demolition of these historic structures would have a direct adverse effect on the qualities of significance and integrity of a potentially significant historic property (Figures 10 and 11).

Bacon Street Bridge

Project 2 would deepen the Aberjona River channel immediately upstream of the bridge but would preserve the vegetation along both stream banks. This work is not anticipated to alter the historic characteristics that qualify the bridge for the National Register. PAL therefore recommends that the ARFMP will have no effect on the structure (Figure 12 and 13).



Figure 7. View looking south at Mystic Valley Parkway and intersection with Waterfield Road, showing vegetation along Aberjona River to right.



Figure 8. View looking north toward Waterfield Road Bridge, showing land between the Mystic Valley Parkway and Aberjona River.



Figure 9. View looking southwest along Mystic Valley Parkway toward east bank of Aberjona River.



Figure 10. USGS Stream Gauging Station weir, looking northeast across Aberjona River.



Figure 11. USGS Stream Gauging Station, looking southwest.



Figure 12. Bacon Street Bridge, looking north.

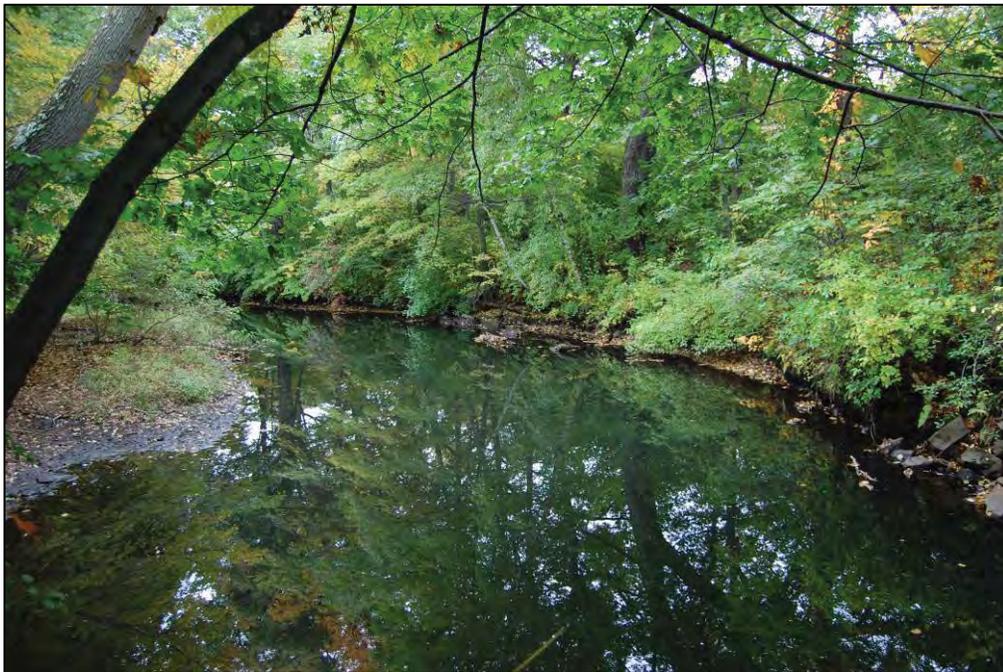


Figure 13. View looking north (upstream) at Aberjona River from Bacon Street Bridge.

Mitigation Recommendations

Projects determined to have an adverse effect on historic properties will require consultation to seek ways to avoid, minimize, or mitigate the effect in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800) and MGL Chapter 9, Sections 26-27C (950 CMR 71) and MEPA (301 CMR 11). Proposed measures for the mitigation of project impacts on properties recommended or determined eligible for the State/National Registers or listed in the State/National Registers are included below.

Winchester Center Historic District

PAL recommends that the Town and consulting parties explore ways to avoid or minimize effects to the Mt. Vernon Street Bridge by adhering to the Secretary of the Interior's *Standards for Rehabilitation* in designing the construction of a bypass culvert. Such work would use context-sensitive stone masonry compatible with, yet differentiated from, the structure's historic fabric. Recordation of the bridge according to Massachusetts state-level documentation standards would be another means to mitigate the impacts of the proposed work. Any construction activities involving the bridge could be undertaken sensitively to avoid disturbing the landscaping and viewsheds in the surrounding historic environment.

Mystic Valley Parkway

PAL recommends that the Town continue to work with a landscape architect and participate in the design of preferred alternative for Project 2, in conjunction with the WHC and MHC. The introduction of a wood guard rail into the landscape could incorporate a context sensitive design compatible with the surrounding natural environment that would retain open views between the parkway and river. The presence of pedestrian circulation and vegetation along the parkway are integral components of the parkway system. Replanting of grass and trees along the east bank of the river would help maintain the feeling of the Mystic Valley Parkway as a component of a planned park system. Consideration should be given to the design concepts of Herbert Kellaway's plans for the river corridor, such as the retention of public green space adjacent to the river, pedestrian recreational access, open views of the river, and plantings along the riverbanks.

USGS Stream Gauging Station and Weir

PAL recommends removal of the USGS Stream Gauging Station Weir may be mitigated through the recordation of the complex to Massachusetts state-level documentation standards.

Appendix A

**Massachusetts Historical Commission Inventory Forms and National Register of Historic
Places Eligibility Evaluations.**

FORM H – PARKS AND LANDSCAPES

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's Number USGS Quad Area(s) Form Number

	Boston North		
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Town Winchester

Place (*neighborhood or village*)

Address or Location Aberjona River, from Woburn town line to Upper Mystic Lake

Name Kellaway Landscape

Ownership *Public* *Private*

Type of Landscape (*check one*)

- | | |
|---|---|
| <input checked="" type="checkbox"/> park | <input type="checkbox"/> farm land |
| <input type="checkbox"/> green/common | <input type="checkbox"/> mine/quarry |
| <input type="checkbox"/> garden | <input type="checkbox"/> training field |
| <input type="checkbox"/> boulevard/parkway | |
| <input type="checkbox"/> other (<i>specify</i>) | |

Date or Period 1911-1936

Source Original plans, town files

Landscape Architect Herbert J. Kellaway

Location of Plans Town of Winchester, MA

Alterations/Intrusions (*with dates*)

Short section of river relocated 1946, 1968

Condition Good

Acreage Approximately 135 acres

Setting The Kellaway Landscape extends approximately 3.9 miles along the Aberjona River corridor from the Woburn town line, through the center of Winchester, to its terminus in the Upper Mystic Lake. The surrounding landscape is comprised of a generally flat, low-lying, urbanized area. The winding path of the river is adjacent to the MBTA Lowell Railroad Line (formerly the Boston and Lowell Railroad), which it crosses three times during its course through Winchester. The Kellaway Landscape, which encompasses the river and affiliated ponds and parkland, abuts a mixture of residential, commercial, institutional development. The Winchester Center National Register Historic District contains a portion of the landscape surrounding Mill Pond and the Mystic Valley Parkway National Register Historic District extends along the south third of the area.

Recorded by Jenny Fields Scofield

Organization PAL

Date (*month / year*) October 2009

Photograph



Topographic or Assessor's Map

See Continuation Sheet

PARKS AND LANDSCAPES FORM

VISUAL / DESIGN ASSESSMENT *see continuation sheet*

Describe topography and layout. Note structures such as bandstands, gazebos, sheds, stone walls, monuments, and fountains. Note landscaping features such as formal plantings, agricultural plantings, and bodies of water. If possible, compare current appearance with original.

The Kellaway Landscape is a continuous corridor of open space encompassing the ponds, bridges, dams, and adjacent parkland along the Aberjona River in Winchester, Massachusetts. The landscape, along with affiliated waterway improvements, is derived from plans developed by Herbert J. Kellaway in 1911 and 1928. It extends north to south through the town of Winchester, Massachusetts, located approximately 8 miles north of Boston. The landscape lies within the Mystic River Valley basin, at an elevation of approximately 25 feet above sea level. The topography of the area is generally flat, but has been altered through frequent filling, grading, and leveling. Most sections of the river flow through a stone-lined channel flanked with vegetation on both sides. The parks and ponds included in Kellaway's plans are extant, but incorporate informal improvements and alterations that were completed between the 1930s and the present, such as contemporary culverts, plantings, and paths. The following description of the Kellaway Landscape is organized from north to south. A table listing notable existing features of the landscape is provided at the end of the description.

The Kellaway Landscape originates at the Woburn town line and encompasses the Aberjona River corridor extending south along the east side of Washington Street. This section of the river channel maintains its 1932–1934 configuration as recommended by Kellaway, but is currently overgrown with brush. The surrounding land comprises the North Washington Street Park, created in 1934. The park is partially overgrown and the original footbridges over the river have been replaced. The original park rock garden and rose bed are not extant, but a grass lawn with a paved walkway is maintained along North Washington Street. The river crosses under the Washington Street Bridge, a single-span concrete structure erected in 1934, then continues southwest toward Davidson Park. The 900 foot (ft) section of river channel between Washington and Cross streets that extends through Davidson Park dates between 1928 and 1934. The river banks are flanked by natural vegetation and a mowed path along the south bank provides access into the park.

Davidson Park is organized around a man-made central pond formed by the damming of the Aberjona River. Open grass fields with periphery willow, birch, oak, and maple trees surround the pond and abut the railroad line to the west and house yards to the east. A contemporary footbridge located at the south end of the park crosses the river on the upstream side of a stone dam with a concrete spillway, constructed in 1932 and repaired in 1968. Notched abutments for a gate structure remain on either side of the dam. The river channel in this location incorporates dry-laid rubblestone walls that continue on the opposite side of the Cross Street Bridge, a single-span concrete structure erected in 1995 to replace an earlier 1914 bridge on the site. A contemporary paved access road that extends south from Cross Street along the east side of the river connects Davidson Park to Leonard's Pond, a similar recreation and flood control area conceptualized by Kellaway.

Leonard's Pond is an informal park created in 1932 that retains a swimming pond dammed off from the Aberjona River in 1938. The pond is surrounded by mowed grass and periphery vegetation, including maple trees planted in 1940 and pine trees planted along the river in 1974. The park is separated from the neighboring residential community by a chain-link fence installed in 1969. An opening in the fence located near the Tufts Road cul-de-sac provides access to a contemporary paved walkway along the east edge of the park. A one-story, rusticated concrete block pump house with a hip roof is sited near the northeast corner of the pond. Concrete steps descend into the water on the west side of the pond. An earth dike constructed in 1938 and concrete replacement dam built in 1974 maintain the water level in the pond.

HISTORICAL NARRATIVE *see continuation sheet*

Discuss history of use. Evaluate the historical associations of the landscape/park with the community.

BIBLIOGRAPHY and/or REFERENCES *see continuation sheet*

Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

INVENTORY FORM CONTINUATION SHEET

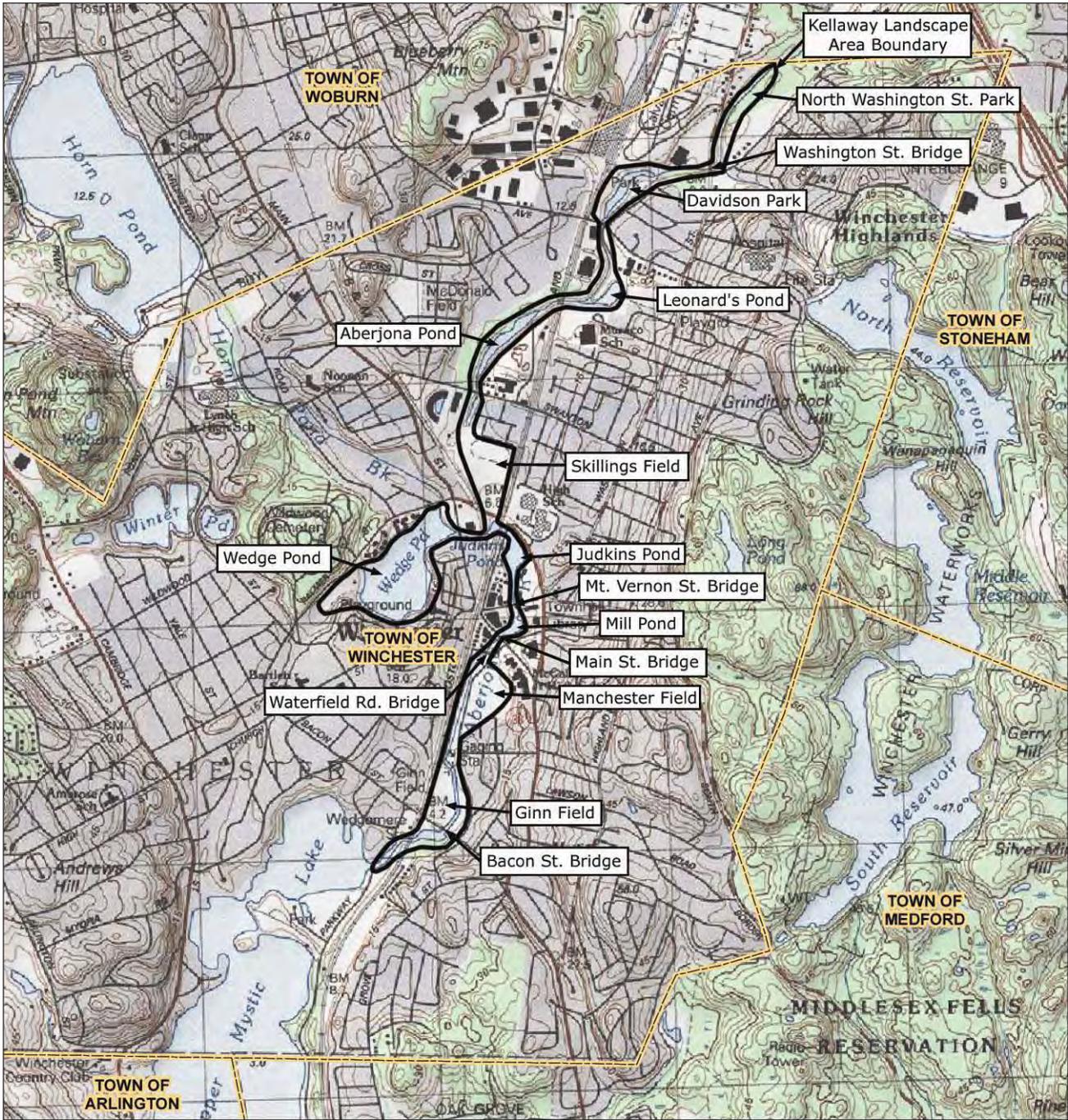
[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Location Map
 Kellaway Landscape, Winchester, MA

0 500 1,000 2,000 3,000 4,000 5,000 6,000 Feet

Scale: 1:24,000
 1 inch equals 2,000 feet

Image Source: USGS Topographic Quadrangles.
 Map Projection: MA State Plane Mainland, NAD 83, Meters.

Map Created by
 ENSR/AECOM
 2/2007

Altered by PAL
 10/2009

INVENTORY FORM CONTINUATION SHEET

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VISUAL / DESIGN ASSESSMENT Continued

The Aberjona River flows along the west side of Leonard's Pond park, then turns west and crosses under the MBTA Lowell Line Railroad Culvert (formerly Boston and Lowell Railroad) (refer to the Boston & Lowell Railroad/MBTA Aberjona River Culvert MHC Inventory Form). The remains of a concrete dam and short sections of stone channel walls are visible when the water level in this section of the river is low. The riverbanks in this location are unimproved and lined with thick brush. The river continues southwest into Aberjona Pond, a narrow water body created in 1931 for flood control. Aberjona Pond is currently situated in a densely forested area southeast of a condominium complex and remains unimproved.

The river continues its course from the south end of Aberjona Pond under a contemporary bridge at Swanton Street to Skillings Field. A paved path flanks the west side of the river between Swanton Street and Skillings Field, where the river is diverted into an underground channel. On the opposite bank, a grass path provides additional access to the field from the neighborhood to the north. Skillings Field dates to 1932 when swampland on the site was filled in with soil from the excavation of the present Aberjona Pond. The field is currently used by the adjacent high school and contains a contemporary track. A metal deck covers the river where it transitions underground.

The river emerges from the south end of the field and crosses under Skillings Road, where it converges with Horn Pond Brook. At this point, the Kellaway Landscape extends west to Wedge Pond and east to Judkins Pond. Horn Pond Brook flows southeast from Horn Pond in Woburn to Wedge Pond in Winchester. The brook is channelized with ashlar and rubblestone where it crosses Lake Street into the northwest corner of Wedge Pond. A single-span, concrete arch bridge erected in 1936 carries the street over the brook. Water exits the pond at its northeast corner and flows under a contemporary concrete bridge carrying Main Street. Although the periphery of the pond is generally unimproved, two public parks provide access to its waterfront. Elliot Park is a triangular parcel at the corner of Lake and Main streets retained after 1929. The park is developed with an open lawn, wood benches, a paved path, and a variety of mature trees, including maple, cherry, and pine. A recreational complex featuring a contemporary beach, tennis courts, and a playground is located on Palmer Street at the southwest corner of the pond.

East of Wedge Pond, the Aberjona River continues its course from Skillings Field, under Shore Road to Judkins Pond. Judkins Pond and Mill Pond to the south serve as the physical keystones of Kellaway's concept. Judkins Pond generally retains its shape as altered in the 1930s, although it was slightly reduced in size during the construction of Skillings Road between 1954 and 1957. The periphery of the pond is lined with natural vegetation and mature, informally planted or volunteer trees. The Aberjona River exits the south end of the pond and crosses under the Mt. Vernon Street Bridge, before entering the Mill Pond. The Mt. Vernon Street Bridge is a three-span granite block structure constructed in 1872 with a concrete parapet added in 1914. It is highly visible from the Mill Pond, which incorporates the most complete landscape completed based on Kellaway's recommendations. The Mill Pond landscape includes a landscaped island, and periphery parkland and paths, as well as a substantial dam and adjacent bridge at its south end. A concrete sidewalk leads from Mt. Vernon Street along the east side of the pond and provides access to a contemporary footbridge to Sandy's Island, constructed in 2001. The path continues around the south side of the pond as a dirt trail lined with rhododendrons, mountain laurel, and hemlocks. The island and east side of the pond are also planted with daffodils; azaleas; and cherry, willow, white birch, oak, and maple trees. The majority of the landscaping was completed or altered in the late twentieth century and the east bank of the pond was reconstructed in 1970. A low, metal safety fence surrounds the pond.

A semi-circular, 120-ft-long, stepped dam complements views of the adjacent single-span arched bridge that carries Main Street over the river at the south end of the pond. The dam and bridge were constructed between 1914 and 1915 and are part of Mill Pond Park, which is a contributing resource to the Winchester Center National Register Historic District. A short distance downstream is the Waterfield Road Bridge, another arched, concrete structure built contemporaneously with the Main Street Bridge (also known as the Converse Bridge). The Waterfield Road Bridge is also a contributing resource within the Winchester Center Historic District. Both bridges are adjacent to the Mystic Valley Parkway National Register Historic District located to the southeast.

INVENTORY FORM CONTINUATION SHEET

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[Aberjona River]

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The Aberjona River continues south from the Waterfield Road Bridge within a channel dug in 1946, located between the railroad and the Mystic Valley Parkway. This portion of the Kellaway Landscape is narrow because of its proximity to the previously established parkway landscape. The river channel near the bridge is graded and continually maintained, but becomes overgrown as it travels south. In addition to the parkway, the east side of the river is flanked by Manchester Field. Manchester Field had been included in Kellaway's improvement plans as an existing open space associated with the Mystic Valley Parkway before the river was relocated in 1946. The field currently serves as an athletic facility with a track and baseball diamond.

The river flows parallel to the railroad until it reaches the Ginn Field, where it continues in a curve along the east side of this second recreational facility. Ginn Field contains a contemporary playground at its north end and multiple baseball diamonds. The river crosses under the Bacon Street Bridge near the southeast corner of the field, before turning west under the railroad and emptying into the Upper Mystic Lake. The Bacon Street Bridge is a single-span concrete arch structure with stone facing erected in 1922 (refer to the Bacon Street Bridge MHC Inventory Form).

Integrity

The Kellaway Landscape retains the continuous string of open spaces and waterways created or improved as a result of Herbert J. Kellaway's early-twentieth-century design concepts, but some sections have been altered over time. Intact areas encompass several structures, such as dams or bridges, which retain their original materials and design. Some bridges have been replaced, but the key bridges in the design are extant. Minor alterations to the landscape consist of the replacement of footbridges, repair or replacement of some dams, installation of fences, creation or paving of footpaths, construction of new recreational facilities such as tracks or playground equipment, and continual planting and dredging at ponds. Portions of the Aberjona River retain stone channel walls and grading that was conducted in the 1930s. Some sections of the river are overgrown and appear reverted to a more natural state, such as the area between Leonard's Pond and Swanton Street. The most significant alterations that have occurred to the elements of the plan that were executed are the relocation of the stream in the section of the river between Waterfield Road and Bacon Street in 1946 and the diversion of the river via a conduit placed under Skillings Field in 1968. The setting and feeling of the landscape as a planned system of improved waterways and open spaces remains intact in other areas of the landscape.

INVENTORY FORM CONTINUATION SHEET

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Table of Features in Kellaway’s Plans

Information compiled from field survey, Kellaway 1911, Kellaway 1928, and Knight 2005

*Features are organized north to south

Location	Element	Kellaway Concept	As-Built Status	Alterations/Existing Conditions
Woburn town line to Washington St	Aberjona River Channel	Relocate river channel as straighter, wider course; build rapids at Washington St, 1938	New channel dug 1932-1934	Extant with natural vegetation on both sides; river channel cleaned 1964
Washington St over Aberjona River	Washington St Bridge	Build new bridge with greater flow capacity, 1928	Built 1934	Extant single-span concrete bridge
Washington St	North Washington St Park	Trees/plantings shown in plans flanking riverbed, 1928	Built 1934 with two footbridges, gravel river walks, rock garden, rose bed, and shrubs	Extant, but partially overgrown linear park; footbridges replaced, planted trees along Washington St, contemporary paved path as well as street sidewalk
Washington St	Dam	Rapids show in plan near Washington St Bridge, 1928	Built 1934	Unknown
Winchester Hospital to Cross St (Davidson Park)	Aberjona River Channel	Dig new channel, 1928	Swamp filled, 900 ft long new channel dug, old channel filled 1928-1932	Extant
Davidson Park	Parkland	Preserve space surrounding pond, 1928; no specific recommendations for layout of park	Built 1932	Extant open space
Davidson Park	Pathways	None shown in 1928 plan	Unknown	Unimproved grass path extends from Washington St to north end of park; contemporary paved path in park on west side of river; open grass spaces
Davidson Park	Landscaping	Plant trees in acquired space—shown on map as dense foliage; no recommendations for tree species	Unknown	Park contains open fields on either side of pond with trees at edges and randomly placed in field, including willow, birch, oak; willows and white birches planted 1971
Davidson Park	Pond	Acquire land, create new pond, “Pond 3” and fill surrounding area to eliminate swampland, 1928	Built 1932	Pond extant; separated from river 1938
Davidson Park	North Dam	Necessary to create pond, 1928	Built 1932	Repaired/Repointed 1968, stop logs removed (currently submerged)
Davidson Park	South Dam	Necessary to create pond, 1928	Built 1932	Repaired/Repointed 1968
Davidson Park	Footbridge	Not shown in 1928 plans	Two pedestrian bridges built 1932	Not extant; new footbridges built 1975
Cross St over Aberjona River	Cross Street Bridge	Build new bridge with greater flow capacity, 1928	Riprap added in channel near 1914 bridge in 1932	Replaced 1995-1996; bypass culvert installed 2005

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Location	Element	Kellaway Concept	As-Built Status	Alterations/Existing Conditions
Cross St to Railroad Bridge	Aberjona River Channel	Eliminate swampy areas, dig new channel, 1928	Swamp filled, channel straightened/ widened 1932; Resident Lewis Parkhurst bought land from Croos to Swanton streets 1931, created pond, and completed improvements including fill and clearing/grading of shoreline	Extant stone lined channel; contemporary paved pathway extends from Cross St to Leonard’s Pond
Leonard’s Pond	Parkland	Retain land surrounding pond	Land retained by town, banks of pond graded,1932; beach created 1933 but closed 1935	Extant, open space surrounds east, north and west sides of pond
Leonard’s Pond	Pathways	Build pedestrian path around east side of pond	Unknown	Contemporary paved path extends from Tufts Rd along east side of pond
Leonard’s Pond	Landscaping	Plant trees in acquired space—shown on map as dense foliage; no recommendations for tree species	Unknown	Natural vegetation at periphery of property; maple trees planted 1940; chain-link fence installed 1969; black pine trees planted along river, 1974
Leonard’s Pond	Pond	Acquire land, create new pond, “Pond 2” and fill surrounding area to eliminate swampland, 1928	Created from swamp in1932 with island; filled with well water 1938 for swimming	Extant with concrete steps into pond; used for swimming until 1993; dredged and cleaned 1963, 1986
Leonard’s Pond	Pumping Station	Not mentioned in plan	Rusticated concrete building, ca. 1950	Extant
Leonard’s Pond	Earth Dike	Not mentioned in plan	Built 1938	Extant
Leonard’s Pond	Dam(s)	Not mentioned in plan	Concrete dam built 1938	Replaced 1974
Roughly parallel to Washington St, from Irving St to Woburn Line	Proposed boulevard	Build street along east side of river extending from north end of improved Florence St to ponds 2 and 3 and across Washington St to Woburn line	Not Built	n/a
Leonard’s Pond	Railroad Bridge	n/a: built 1830s/1955-57	n/a	n/a
Florence St and Nelson St	Florence/Nelson St Parkway	Tree-lined, 60 ft boulevard linking town hall and Washington St, 1911, 1928	Not Built	n/a
Aberjona Pond	Parkland	Retain land surrounding pond	Land purchased by Lewis Parkhurst, cleared, filled, and graded, 1931	Extant as unimproved natural growth and brush
Aberjona Pond	Pathways	Open space/paths along east and west sides of pond	Unknown	Contemporary dirt path maintained on west side behind housing development separated from pond by thick vegetation
Aberjona Pond	Landscaping	Plant trees in acquired space—shown on map as allees along paths and random plantings; no recommendations for tree species	Not completed	Unimproved natural growth and brush

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Location	Element	Kellaway Concept	As-Built Status	Alterations/Existing Conditions
Aberjona Pond	Pond	Acquire land, create new pond, "Pond 1" and fill surrounding area to eliminate swampland, 1928	Land purchased by Lewis Parkhurst, swamp dredged and pond created 1931	Extant
Swanton St to Skillings Rd	Aberjona River Channel	Create open river channel to west of Skillings Field (site of original Aberjona Pond), 1928	700 ft of new channel built, old channel filled, 1932	River diverted in underground channel, 1968; Pathway and open channel extends from Swanton St to north end of Skillings field
Skillings Road	Skillings Field (also Ciarcia Field)	Fill swampland and portion of Judkins Pond, 1928	Completed ca. 1932, Shore Road Park created (now Skillings Field)	Extant park with track and athletic fields, became high school field in 1968
Swanton St	Swanton St Bridge	Build new bridge for greater flow and canoe use, 1928	Single box culvert built 1933	Reconstructed in 1996
Lake St at Wedge Pond	Lake St Bridge	Build new bridge with greater flow capacity, 1928	Built 1936	Extant
Wedge Pond	Pond	Retain and clean natural pond, 1911	Retained	Extant
Wedge Pond	Parkland	Acquire all land along periphery of Wedge Pond and Horn Pond Brook for public use, remove dump at Wedge Pond, 1911, 1928; Acquire land along Main St up to Lake St and demolish houses to create park and open views to water, 1911 and 1928; Create park along Lake St using land from Cemetery Commission, 1928	Some land surrounding Wedge Pond acquired; Elliot park created after 1929	Elliot Park extant at north end, playground and beach later constructed at southwest corner of pond
Wedge Pond	Pathways	Create pedestrian path around pond for recreation, convenience, and pond maintenance, 1911, 1928	Not Built	n/a
Wedge Pond	Landscaping	Care for existing trees, replant where needed; no recommendations for specific plantings	Unknown	Extant mature trees in Elliot Park and south of Lake Street near the Lake Street Bridge
Wedge Pond	Dam	Build dam to maintain water level in pond, 1911	Unknown	Unknown
Extending west along Horn Pond Brook from Lake St, south of Main St	Parkway	Create parkway linking Wedge and Horn ponds; acquire land for parkway, 1911, 1928	Not Built	n/a
Approximately Lake Street and Wedge Pond	Horn Pond Brook	Place brook in stone-lined channel as part of parkway work, 1911	Built at Lake Street (south) end	Extant dry-laid granite block and mortared rubblestone

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Location	Element	Kellaway Concept	As-Built Status	Alterations/Existing Conditions
Land south of Skillings Rd, west of Railroad	Black Ball Pond (also original site of Aberjona Pond)	Fill pond; use land for manufacturing or freight, 1911, 1928	Filling of pond completed	Extant as unimproved land
Main St to Judkins Pond and Shore Rd at Railroad Ave	Parkway	Extend Mystic Valley Parkway north to Judkins Pond, then west over railroad to Main St	Not Built	n/a
Skillings Rd to Waterfield Rd	Aberjona River Channel	Realign, clean, and grade river channel; remove raceway, 1911	Raceway filled, single channel dug exiting Mill Pond 1914	Extant; channel dredged 1962
Judkins Pond	Parkland	Acquire land on both sides of pond for public open space, remove dump, 1911, 1928	Completed	Banks of pond retained and covered with natural vegetation
Judkins Pond	Pathways	Build walkway around pond/meadow	Not Built	n/a
Judkins Pond	Landscaping	Plant and grade park area	Unknown	Daffodils and Jonquils planted, 1973 and 1975
Judkins Pond	Pond	Reshape natural pond; remove dam, fill rest of meadow that forms, cover with grass, 1911	Part of pond filled/pond reshaped, river channel redug, in 1910s and 1930s	Extant; High school on filled half of pond (built 1972); size of pond reduced 1954–1957 when Skillings Rd created
Mt. Vernon St	Mt. Vernon St Bridge	Replace existing 1872 bridge with single arch bridge, 1911	Not realized	n/a; repaired 1886, concrete parapet added 1916
Mill Pond	Parkland	Acquire land between Main and Mt. Vernon streets; clean rubbish and tree stumps	Completed	Extant; Underground watering system for plants installed 1966; East bank of pond reconstructed 1970
Mill Pond	Pathways	Build walks and driveway on west side of pond and walk on east side, 1911	Walkway built around east and south edges of pond	Extant as maintained concrete and dirt paths; contemporary pedestrian bridge to Sandy’s Island added 2001
Mill Pond	Landscaping (including Sandy’s Island)	Add trees, shrubs, plantings, and seedlings, 1911; Secure control of Elm trees on west side of pond, gravel shores; No recommendations for specific species of trees or plants	Completed; Sandy’s Island converted from peninsula formed from debris deposits to recreational island with plantings	Extant: mature willow trees on north and east sides of pond; rhododendron and hemlock along south path; birch, maple, oak, and various shrubs also extant; Willows and white birches planted (to replace trees removed earlier), brush cleared on south side, 1971; Dogwood trees, azaleas, mountain laurel, rhododendrons, and cherry trees planted, 1974; Daffodils planted 1975 Sandy’s Island renovated 1969, 1990, 2001

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Location	Element	Kellaway Concept	As-Built Status	Alterations/Existing Conditions
Mill Pond	Pond	Lower pond elevation (will decrease size); maintain picturesque character of pond with periphery foliage	Completed, pond dredged and graded, shore riprapped, 1932	Extant; pond dredged 1964
Mill Pond	Central Falls Dam	Rebuild existing dam with semi-circular structure, 1911	Built 1914–1915	Extant; Dam repaired 1974; contemporary railing installed at entrance to steps
Mill Pond/Thompson St	Post Office	Relocate post office to Thompson Street and relate to waterfront	Relocated 1928, but plans to relate to waterfront were not realized	Extant
Main Street at Mill Pond	Main Street Bridge (also known as Converse Bridge)	Relocate bridge and rebuild as larger, single arch structure	Built 1914–1915	Extant, Contributing to Winchester Center Historic District
Waterfield Road	Waterfield Road Bridge	Replace existing wood bridges in disrepair with arched bridge	Built 1914–1915	Extant, Contributing to Winchester Center Historic District
Main Street to Waterfield Rd	Buildings	“Public authority” should buy Whitney’s mill property and demo buildings, continue landscaped parkway, 1911, 1928	Parkway not built, but land purchased, buildings demolished and pond area retained for public use	Extant pond and town park
Waterfield Rd to Bacon St	Aberjona River Channel	Keep existing path of river around east side of Manchester field, make clean gravel shores, deepen channel at islands, fill Mystic Ave Extension roadbed; build footbridges, walks, grading, plantings, 1911	Completed with exception of walkways and footbridges; river channel cleaned 1915 from Mill Pond to Bacon St	Original concept altered in 1946 when river channel was relocated west of Manchester Field and Mystic Valley Parkway
Mystic Valley Parkway	Manchester Field	Extant in 1911 (created 1890s, completed 1902 by MPC, granted to town in 1905), Place plantings around semi-circular extant field with river to east	Land used as park/field with river on east side	Original concept altered in 1946. Location of field shifted and parkway and river relocated from east to west side of field. Field altered with track and athletic fields added.
Bacon Street	Ginn Field	Extant in 1911 (land preserved 1897), landscape and add path around perimeter; secure control of field by town, add playground, 1928	Playground and tennis courts built 1938-40 by WPA	Extant with athletic fields, contemporary playground at north end; low stone retaining wall along west side
Bacon Street	Bacon Street Bridge	Rebuild existing 1874 wood bridges with single arch bridge for recreational boat passage, 1911	Built 1922 as designed by Ralph S. Vinal	Extant

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION

Area(s) Form No.

220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

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Location	Element	Kellaway Concept	As-Built Status	Alterations/Existing Conditions
Bacon St to Aberjona Bridge	Aberjona River Channel	Drain to clean growth in channel; eliminate stagnant pools; Lower sewer pipe elevation to allow boat passage; grade and plant, 1911	Completed	Unimproved shoreline with natural vegetation and brush

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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HISTORICAL NARRATIVE Continued

The Kellaway Landscape was designed and implemented in the early twentieth century when the City Beautiful and municipal parks movements were spreading to cities and towns throughout the nation. Widespread epidemics in the mid-nineteenth century exacerbated by unsanitary conditions and overcrowding among the urban poor inspired national public health and welfare reforms. The threat of disease and poor quality of life necessitated the development of public water supply and sewage systems, and the rise of social ills in urban environments influenced the quest for social order reflected in architecture of the time. The City Beautiful Movement initiated on a national scale at the 1893 Chicago World's Fair employed Classically-inspired, monumental formal designs for master-planned cities with grand civic buildings and public spaces. The movement was based in the ideal that the designs represented civic order and beautification could influence social behavior, increase the quality of life and instill social harmony. Besides sanitation infrastructure, City Beautiful urban designs included public parks, boulevards, and plazas as essential amenities intended to provide for social interaction, fresh air, recreation, and pleasant views.

Nationally renown landscape architects Frederick Law Olmsted Sr.'s and Charles Eliot's work in greater Boston during the 1890s established the city as a lead in the American municipal park movement (Adams et al. 2002:E-4). By the 1890s, Olmsted was reaching the end of his long landscape design career and had established philosophies for parks. Olmsted intended his parks to be places where all social classes could mingle and find tranquility within enhanced natural environments that utilized existing natural features inherent in a place such as topography or waterways. Olmsted also introduced the practice of designing park systems with landscaped parkways or boulevards connecting multiple public parks, land reservations, and gardens. His principles are exhibited in Boston's Emerald Necklace, a ring of connected city parks extending from Boston Common to Franklin Park. After the City of Boston established a Metropolitan Sewerage Commission in 1889, Charles Eliot, who had apprenticed Olmsted Sr. in the 1880s, presented a paper in 1893 advocating for the creation of a Metropolitan Park System. Eliot joined the Olmsted firm as a partner the same year and the city established the Metropolitan Park Commission in June, enabled with a \$1 million fund and the power of eminent domain. Frederick Law Olmsted Sr. continued to work at his firm until his death in 1895, but the firm was renamed Olmsted, Olmsted, and Eliot in 1893 for his sons John Charles Olmsted and Frederick Law Olmsted Jr., and Charles Eliot. Upon creation of the Metropolitan Park Commission, the firm immediately began designing and constructing the Metropolitan Park System, which currently contains 20,000 acres of reservations, parks, and parkways, including the Winchester section of the Mystic Valley Parkway that opened in 1897 (Adams et al. 2002:E-1 to E-8).

The town of Winchester recognized the need to address the sanitation and functionality of its waterways and preserve parkland contemporaneously with the Boston region parks movement. During the nineteenth century, Winchester's winding rivers and natural swamps were developed with channels serving the railroad and emerging industrial concerns. Winchester grew as a prosperous late-nineteenth century commuter suburb of Boston with a concentration of leather and felt industries (MHC 1981:8). These factories contributed to the pollution of the Aberjona River, which additionally suffered from inadequate storm water and sewage systems, high mosquito populations, and the build-up of weeds and debris (Kellaway 1911:3-5; Khuen 1995). In the 1890s, the town, led by lawyer-resident Forrest C. Manchester advocated for the removal of factories and a freight yard south of Waterfield Road to create the land reservation that became Manchester Field. The city of Boston owned rights to the waterways in the Mystic River Valley, and its Metropolitan Park Commission contributed to the improvement and creation of Manchester and Ginn fields during the construction process of the Mystic Valley Parkway (Knight 2005:16-18). Control of the Aberjona River bed was transferred to the Metropolitan Water Board in 1898.

Although the construction of the Mystic Valley Parkway beautified a portion of the landscape along the river and provided a vital transportation link between there and Boston, sanitation and water control problems persisted along the Aberjona River. In 1909, the Winchester Committee on Waterways commissioned landscape architect, Herbert J. Kellaway to complete a study for improvements of the Aberjona River area between Swanton Street and the Mystic Lakes. Kellaway secured selection by the town with a recommendation from Frederick Law Olmsted Jr. (Khuen 1995).

Herbert J. Kellaway (1867-1947) and his family emigrated from Kent, England to Needham, Massachusetts in 1874 when he was seven years old. He began his career working as a lithographer's artist and joined the landscape design firm of Olmsted, Olmsted, and Eliot as a draftsman in 1892. Kellaway remained at the firm for 12 years and adopted the principals' ideals

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION

220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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regarding land conservation, the enhancement of natural landscape features such as waterways, and networks of open spaces linked by landscaped parkways. During his tenure at the firm, Kellaway saw the completion of the majority of the Metropolitan Park System and likely participated in the project. As he became a more experienced designer, Kellaway specialized in campus plans. He left Olmsted, Olmsted, and Eliot in 1906 to establish his own landscape design firm based in Boston. The following year, Kellaway published a book entitled *How to Lay Out Suburban Home Grounds* that contained formal, symmetrical designs for private residential properties. His work portfolio up to his retirement in 1944 included the designs for numerous housing development site plans, rose gardens, town parks and playgrounds, and parkways. One year before the Town of Winchester hired Kellaway, he completed a plan to connect the Charles River Reservation to Hammond's Pond Woods and the West Roxbury Parkway through Brookline and Newton that would connect existing open spaces with minimal impact to existing buildings. Only the Hammond Pond section of this parkway was actually constructed. Kellaway served as a trustee and Examining Board member of the American Society of Landscape Architects and became a Fellow of the organization in 1912 (Paraphrased from Khuen 1995).

Kellaway completed his *Report Upon Mystic Valley Improvement Along the Aberjona River, Winchester, Mass. From Upper Mystic Lake to Swanton Street* in 1911. It included a review of existing conditions along the town's waterways and conceptual recommendations for a connected park system. Kellaway noted that the plan was "designed to give a simple, dignified treatment [to the landscape], to provide needed connection with the several parts of the town, to preserve the existing scenery, and to create new park scenery to take the place of the existing unsightliness" (Kellaway 1911:20). The key recommendations in the plan involve cleaning the river channel, developing the waterways for recreational use, and attaining the land surrounding waterways to ensure scenic viewsheds and prevent future industrial development (Kellaway 1911; Khuen 1995).

In an effort to eliminate pollution, Kellaway suggested the removal of existing sewer overflows, and connection of surface drains with new settling basins. In addition to cleaning the overgrowth in the river channel, he described regulating water levels by deepening waterways in some locations and adding fill to make shallows in others. Kellaway intended these changes to be coupled with the regrading and planting of the riverbanks and pond shorelines. His proposed 1911 plans depict a continuous corridor of tree-covered public land flanking both sides of the river from Judkins and Wedge ponds, through Mill Pond to the Upper Mystic Lake. This corridor is drawn with winding pedestrian paths and footbridges and was intended to complement the existing Mystic Valley Parkway. Kellaway did not prepare any construction drawings, descriptions of specific park details, or planting diagrams, and the plans remained largely conceptual.

Kellaway envisioned the core of the design as the creation of a picturesque park and town civic center around Mill Pond. He recommended that the town purchase the Arthur Whitney mill property, which encompassed Mill and Judkins ponds, and the original site of the Aberjona Pond (now Skillings Field). The Whitney mill building, raceway, and dam were situated on Mill Pond. Judkins Pond existed as a shallow swamp created by flooding a meadow. Kellaway advocated for the return of Judkins Pond back into a meadow complete with walkways and public playing fields. He further recommended that the town demolish the Whitney mill and relocate the former Main Street dam on the site to create a park. Kellaway intended the new dam to regulate water levels in Mill and Wedge ponds, to retain the ponds as scenic landscape elements and facilitate water recreation. The plan proposed the reconstruction of extant Mt. Vernon Street, Main Street, Waterfield Road, Bacon Street bridges as single arched structures to facilitate canoe passage along the river (Kellaway 1911; Khuen 1995).

The town purchased the Whitney Mill property following Kellaway's 1911 recommendations and proceeded to create the Mill Pond park. Waterways Committee Chairman, Lewis Parkhurst enabled the town to begin the project by providing \$87,000 in personal funds, for which he was reimbursed by the town (Khuen 1995). A new dam and arched bridges carrying Main Street and Waterfield Road were completed between 1914 and 1915 according to Kellaway's designs. The town also completed the grading and cleaning of the riverbank between the bridges at this time. This work occurred contemporaneously with the formation of the town planning board (Khuen 1995). A third arched bridge was erected at Bacon Street in 1922 (Kellaway 1928).

Despite the completion of these projects in the 1910s and early 1920s, much of the town's waterways remained unimproved. The town continued their efforts by conducting a pollution survey in 1922 and mosquito survey in 1926 (Kellaway 1928). In

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

--	--

response to increasing demands for automobile roads, the town hired one of Kellaway's former Olmsted firm associates, Arthur Shurcliff, to prepare a plan for new roadways and parks in 1924 (Khuen 1995). Following the establishment of a new waterways committee in March 1927, the town employed Kellaway to expand upon his 1911 report and Schurcliff's parkway concepts. The committee specifically sought recommendations regarding "the causes and extent of pollution," the "improvement of flowage of streams and the improvement of the sanitary condition and appearance of waters and water-courses," and the "elimination of stagnant pools" (Kellaway 1928:3). Kellaway completed his *Report Upon the Improvement of Waterways in Winchester, Massachusetts and Related Matters* in January 1928.

Kellaway's 1928 plans reinforced his earlier recommendations and encompassed the full length of the Aberjona River from the Upper Mystic Lake to the Woburn town line at the north end of Washington Street. Kellaway enhanced his earlier plans through the proposal for two parkways and three overflow ponds north of Swanton Street. Kellaway strategically located the ponds along the course of the Aberjona River to eliminate stagnant natural swamps, while reducing flood risk. Consistent with his earlier plans, Kellaway envisioned a continuous, landscaped river corridor with an open stone-lined channel. The improved river would flow through the newly created Pond No. 3 (Davidson Park), Pond No. 2 (Leonard's Pond), and Pond No. 1 (Aberjona Pond). Kellaway recommended filling the existing Aberjona Pond to create the extant Skillings Field and intended for the open river channel to pass through the west side of the field before converging with a new stone-lined channel controlling the flow of Horn Pond Brook from Wedge Pond.

Kellaway's conceptual drawings show footpaths and dense tree plantings around each new pond; although no specific landscaping plans are mentioned in his reports. He further recommended that the south portion of Judkins Pond be retained and improved, and that the town acquire all land surrounding Wedge Pond for public use. He specifically suggested that the town demolish the houses along Main Street to create a park and open views to the water, and recommended the creation of a second park on the west side of the pond using excess land from the cemetery commission. Kellaway's proposed parkway system involved the conversion of Nelson and Florence streets into a 60 ft wide tree-lined boulevard between Leonard's Pond and Judkins Pond, in order to connect the northern neighborhoods to the town's civic center. Kellaway proposed a similar parkway along the route of Horn Pond Brook to connect Wedge Pond to Horn Pond. He envisioned that the town would form a maintenance patrol to care for the municipal parkland once the improvements were completed (Kellaway 1928:59).

The town completed elements of Kellaway's early-twentieth-century waterway improvement plans as funds became available, but Kellaway did not oversee any construction. Completed projects included the re-channeling of the river, shoreline cleaning and grading, bridge and dam construction, the creation and reshaping of ponds, construction of recreational fields, and land acquisition. Although a large number of open spaces and ponds remain in Winchester, Kellaway's connecting parkways and many of his proposed pedestrian paths were not realized. The town experienced funding issues related to the general economic downturn during the Great Depression, but still worked toward completing Kellaway's vision. Lewis Parkhurst, who aided the town in acquiring the Mill Pond property, purchased the land to create overflow Pond No. 1 (Aberjona Pond) for \$20,000 in 1931. Parkhurst hoped to encourage residents to privately invest in the town's planned improvements. Town-funded work, such as improvements at Mill Pond, provided opportunities to pair intended projects with unemployment relief (Khuen 1995).

The town successfully completed several of Kellaway's recommendations in the early 1930s, including the construction of Davidson Park, Leonard's Pond, Skillings Field, and a new river channel between Washington Street and Skillings Road. The Massachusetts Horticultural Society recognized the town's efforts with an award for park planning and beautification in 1940 (Khuen 1995).

In the mid- to late twentieth century, the Town of Winchester continued to maintain and improve its reserved waterway and open spaces. The parks contain contemporary plantings and walkways and the Aberjona River retains its 1930s course in most locations. One significant alteration of the river channel was undertaken in 1946 when the section south of the Waterfield Road Bridge was relocated from the eastern to the western side of Manchester Field and a new alignment of the Mystic Valley Parkway.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
 220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

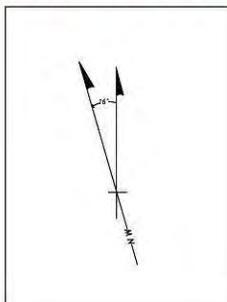
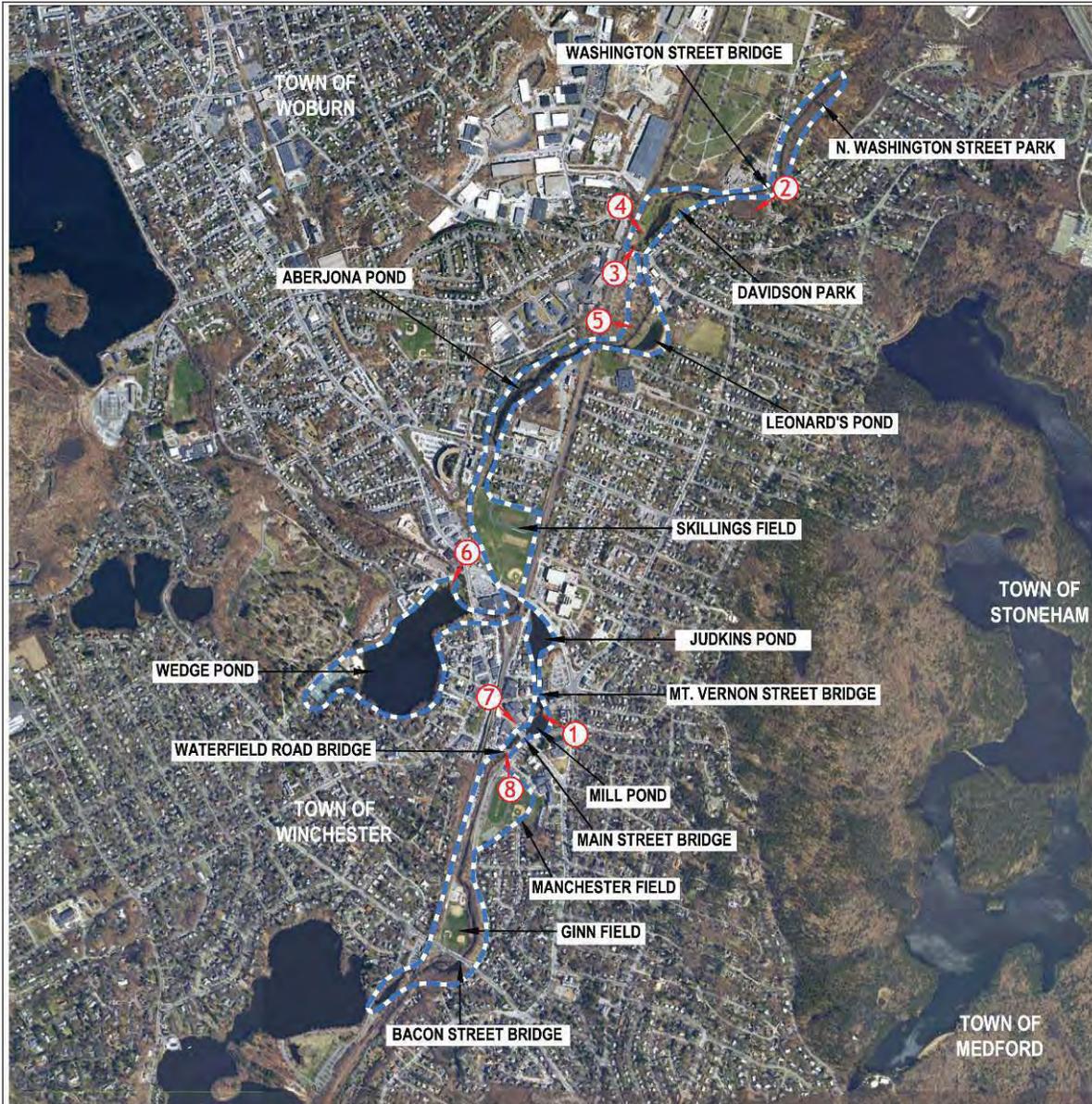
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220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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PHOTOGRAPHS

Photograph Key



KEY

--- Kellaway Landscape Area Boundary

① Photo number and view

Source/Revision/Issue	Date
PAL modified: Add resource information	11-19-09
Map source: MassGIS Aerial Imagery	2007

PAL makes no warranties, either expressed or implied, regarding the fitness or suitability of this map for any other purpose than to depict the location and/or results of cultural resource investigations conducted by PAL.

Project
Aberjona Flood Control Project
Date
November 19, 2009



INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Photograph 1:
Mill Pond, looking west from Mill Pond Park footpath (See Cover Sheet).



Photograph 2:
Aberjona River and adjacent path, looking west from Washington Street Bridge.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

--	--



Photograph 3:
Davidson Park,
looking northeast
from Cross Street
(pond and river
behind trees to right
side of photo).



Photograph 4:
Davidson Park south
dam and river channel
looking southeast.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

--	--



Photograph 5:
Leonard's Pond,
looking east.



Photograph 6:
Elliot Park and Wedge
Pond, looking
southwest.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

--	--



Photograph 7:
Mill Pond Park, Dam
and Main Street
Bridge (Converse
Bridge), looking
southeast.



Photograph 8:
Aberjona River
corridor, looking north
toward Waterfield
Road Bridge.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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BOSTON, MASSACHUSETTS 02125

Community **Property Address**
WINCHESTER ABERJONA RIVER CORRIDOR

Area(s) Form No.

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National Register of Historic Places Criteria Statement Form

Check all that apply:

- Individually eligible Eligible **only** in a historic district
 Contributing to a potential historic district Potential historic district

Criteria: A B C D

Criteria Considerations: A B C D E F G

Statement of Significance by Jenny Fields Scofield, PAL, Pawtucket, RI

The criteria that are checked in the above sections must be justified here.

The Kellaway Landscape in Winchester, Massachusetts derives its primary significance under Criterion A at the local level for its association with early-twentieth-century planning efforts to improve public welfare and quality of life through infrastructure development, sanitation, recreation and the acquisition of land for public use. The landscape remains as a 3.9-mile corridor of public open space encompassing the Aberjona River, ponds, bridges, dams, and adjacent parkland affiliated with plans for waterway improvements conceived by Herbert J. Kellaway in 1911 and 1928. It represents a local application of city beautiful-inspired social ideals and the related municipal parks movement that created the Metropolitan Park System in Boston. The period of significance for the district extends from 1911, when Kellaway’s first proposed the plan, to 1940, the date by which the elements of the original plan that were ultimately executed were completed.

Although the Kellaway Landscape is not a prime or innovative example of the municipal park system property type, it possesses significance under Criterion C as a local example of a plan conceptualized by landscape architect Herbert J. Kellaway. Kellaway absorbed the ideals of the nationally renowned Olmsted, Olmsted, and Eliot firm during his employment there from 1892–1906. Kellaway’s plans for the Town of Winchester’s waterways generally employ Frederick Law Olmsted’s and Charles Eliot’s principles regarding the use of natural features in design, and the concept of continuous public land reservations. The setting and feeling of the landscape as a planned system of improved waterways and open spaces remains intact. The Kellaway Landscape also retains the majority of its original location and design integrity, and the key structures in the district retain their historic materials.

A portion of the Kellaway Landscape, located between the south end of Judkins Pond and Waterfield Road is encompassed within the Winchester Center National Register Historic District. The Mill Pond Park including the dam and Main Street Bridge, and the Waterfield Road Bridge are identified in the National Register form as contributing resources to the district.

FORM F – STRUCTURE (BRIDGE)

Assessor's Number USGS Quad Area(s) Form Number

Not available	Boston North		
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Town Winchester

Place (*neighborhood or village*)
N/A

Photograph



Street/Route MBTA Lowell Commuter Rail Line at Milepost 8.80

Carried over Aberjona River
(Railroad, river, brook, canal or road)

Historic/Common name
Boston & Lowell Railroad/Massachusetts Bay Transportation Authority (MBTA) Aberjona River Culvert

Ownership Massachusetts Bay Transportation Authority
(Name of state agency or municipality)

Mass. Highway bridge no. N/A

Bridge type Stone slab culvert

Bridge typology code 1 7 1 2

Date of Construction Circa 1832

Source Waters 1836, visual assessment

Engineer/Designer Boston & Lowell Railroad

Bridge company/Contractor Boston & Lowell Railroad

Material (s) Granite, concrete

Alterations (*with dates*)
West extension (1889-1899); concrete roof slab repair and headwall addition (1934 or 1954)

Posted load limit (*if any*) N/A

Condition Fair

Moved X no ___ yes **Date**

Acreage <1.00

Setting Railroad corridor in wooded riverine area

Topographic or Assessor's Map

See attached Continuation Sheet

UTM Reference 19.0324567 E; 4703316 N

Recorded by John J. Daly

Organization: PAL, Inc., Pawtucket, RI

Date (*month / year*) November, 2009

STRUCTURE FORM (BRIDGE)

Superstructure

Overall length: Approx 18 ft Deck width: 95 ft Skew: N/A
Main unit: No. of spans: 2 Span length: 7 ft
Approaches: No. of spans: N/A Span length: N/A

Substructure *(structure below deck)*

Height above feature spanned: 6.5 ft Material of abutments or piers: Granite

ENGINEERING/DESIGN ASSESSMENT X *see continuation sheet*

Describe important design features and evaluate in terms of other bridges within the community or region.

The Boston & Lowell Railroad/Massachusetts Bay Transportation Authority (MBTA) Aberjona River Culvert (Aberjona River Culvert) in Winchester is a two-conduit (“double-barreled”) granite box culvert. The culvert carries the Aberjona River on a roughly east-west course beneath the Massachusetts Bay Transportation Authority’s Lowell commuter rail line (a/ka the New Hampshire Main Line, originally the Boston & Lowell Railroad). The structure is located near Milepost [MP] 8.80 on the rail line, about 1,200 feet (ft) south of Garfield Avenue and the same distance north of Swanton Street. This portion of the rail line passes through a wooded area in the Aberjona River floodplain. The line is constructed on an earthen embankment that rises to a maximum elevation of about 15 ft above the river channel, with about 10 ft of fill and ballast overburden atop the roof of the culvert. The roadbed currently holds two tracks, although it historically accommodated three or possibly four tracks.

The culvert structure has an overall length of between 90 and 100 ft. Each culvert barrel is 6.50 ft tall and 7 feet wide. The east (upstream) and west (downstream) halves of the culvert utilize differing masonry construction techniques that indicate different ages. The east half is probably from the line’s original period of construction ca. 1830-1835. The west half probably dates to ca. 1889-1899, as is discussed in the historical assessment below.

The east end of the culvert consists of the culvert’s paired openings divided by a pier about 4 ft wide and topped with a headwall about 7 ft in height. The culvert’s north and south sidewalls extend beyond the culvert mouth as sloping channel walls approximately 9 ft long. The masonry bond varies between different portions of the culvert, but uses split granite that is of consistent workmanship. The center pier and channel lintels and roof use massive, rough, 4 ft wide and 1 ft tall slabs. The headwall uses slabs and split-faced rubble arranged in uneven courses. The north and south culvert wall and channel wall extensions use random, split-faced rubblestone. The stone is dry-laid, except for the headwall and the top halves of the channel wall extensions, which were pointed at a later date with Portland Cement-based mortar. The headwall and channel walls have been topped with a poured concrete capstone or extension. The north channel’s lintel has been replaced with a plank-formed, poured concrete slab. *continued*

HISTORICAL NARRATIVE X *see continuation sheet*

Explain the history of bridge and how it relates to the development of the community.

BIBLIOGRAPHY and/or REFERENCES X *see continuation sheet*

 Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

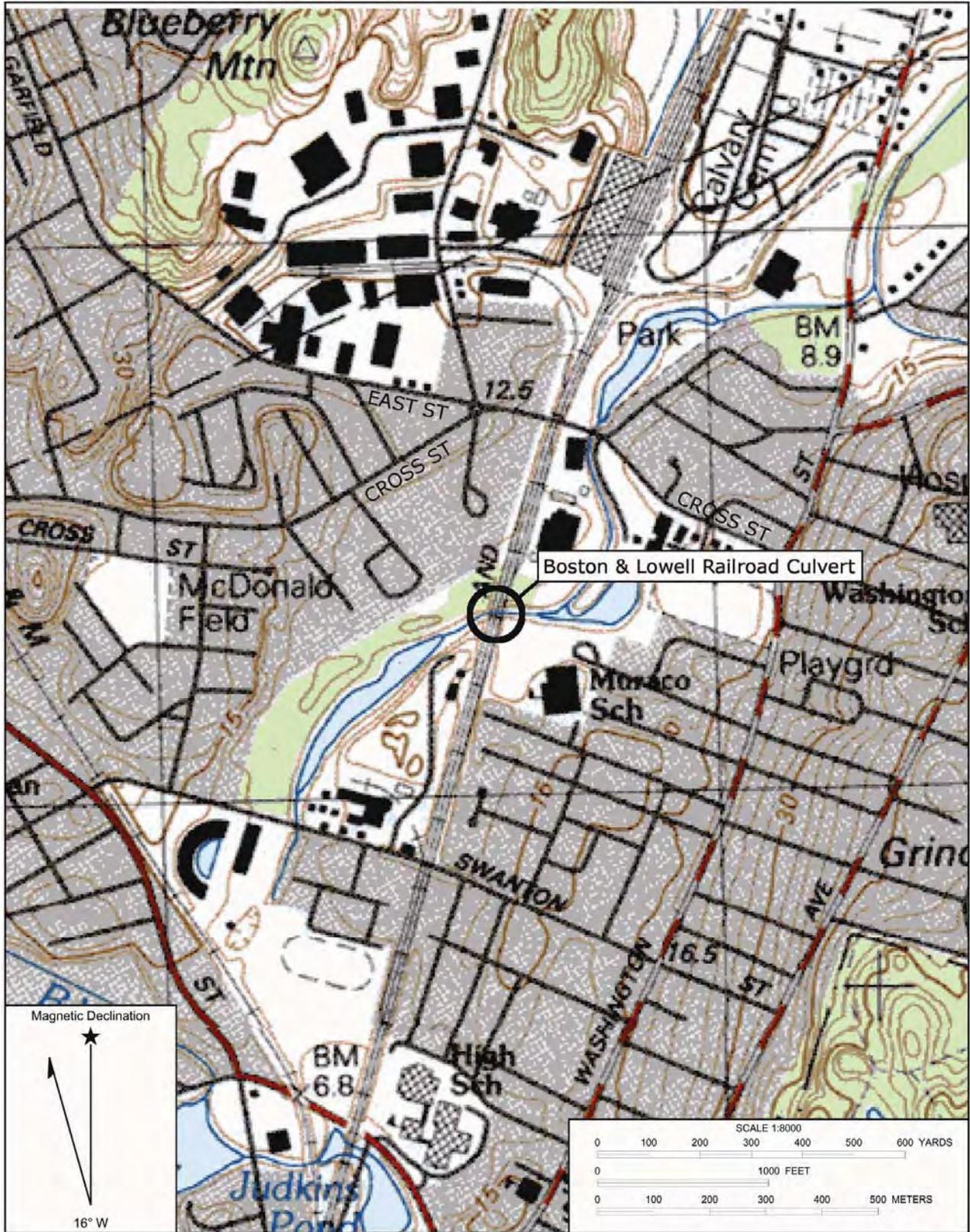
INVENTORY FORM CONTINUATION SHEET [WINCHESTER] [MBTA Lowell Commuter Line at MP 8.80]

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220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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LOCATION MAP



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220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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ENGINEERING/DESIGN ASSESSMENT *continued*

The west end of the culvert consists of the culvert's paired openings divided by a pier about 4 ft wide and topped with a headwall about 5 ft in height. The culvert's north and south side walls extend beyond the culvert mouth as stepped channel walls for a distance of approximately 10 ft. In contrast to the culvert's east end, the west end's culvert mouth and culvert sidewalls are constructed entirely of massive, evenly split granite slabs that are leveled with chink stones and pointed with mortar. The slabs vary in dimension, but average 2 ft in height and 6 ft in length. Regularly-spaced, 0.75 inch drill marks are visible on some of the slabs.

Integrity

The Aberjona River Culvert has been lengthened to approximately double its original length with additional stone masonry construction at the west end of the structure ca. 1889-1899. Concrete additions have been made to the masonry in the original ca. 1830-1835 east headwall of the culvert.

HISTORICAL NARRATIVE

The east half of the Aberjona River Culvert appears to date to ca. 1830-1835, the Boston & Lowell Railroad's original construction period. An 1836 map of the Boston & Lowell's route indicates a culvert over the Aberjona at the same approximate location as the surveyed structure and the masonry work is consistent with the period of construction (Adams et al. 2008; Waters 1836).

The Boston & Lowell Railroad was chartered in 1830, making it the first steam-powered railroad to be organized in New England and a significant pioneering regional transportation corporation. The organizers and charter members of the board of directors of the Boston & Lowell were investors who had recently established the textile city of Lowell. The railroad was expressly designed to carry heavy textile-related traffic between the two cities. The engineer chosen for the line was James F. Baldwin, son of the famous Loammi Baldwin who had designed the Middlesex Canal. Designed as a technological and engineering solution to one particular problem, rather than as a general speculative venture, Baldwin's course avoided established villages en route to obtain favorable gradients and a direct alignment between the railroad's namesake cities. Achieving these goals required the railroad to spend heavily on deep cuts and embankments, an unusual effort for early American railroads, which usually relied on rapid, but cheap construction. Provision was also made at the outset for a second track. The 26 mile-long railroad opened in 1835 to almost immediate success and was double tracked by 1841.

Historical maps indicate that the west half of the Aberjona River Culvert was constructed by the Boston & Maine Railroad (B&M) between 1889 and 1899. The B&M, one of the Boston & Lowell's chief competitor's, leased the Boston & Lowell in 1887 and incorporated the line into its New England railroad network as the Southern Division (Adams et al. 2008). The B&M was the dominant New England carrier in northern Massachusetts, New Hampshire, and southern Maine at the beginning of the twentieth century. In 1918 the Boston & Lowell was officially merged into the B&M Railroad Company. During this period, historical maps indicate that the portions of the B&M in Winchester were heavily industrialized. A tannery was located immediately to the northwest of the Aberjona Culvert and a spur track to Winchester's railroad freight yard diverged to the west of the main line just north of the culvert. The historical maps also indicate that the B&M increased the width of the railroad embankment to hold as many as four tracks in the culvert's immediate vicinity. The massive stonework is consistent with this period of construction, when rail-mounted steam derricks were widely available for such construction projects, but reinforced concrete construction was not yet established (J.B. Beers & Co. 1875; Sanborn Map Company 1904; Sanborn-Perris Map Co., Ltd. 1899; George H. Walker & Co. 1889). *continued*

INVENTORY FORM CONTINUATION SHEET [WINCHESTER] [MBTA Lowell Commuter Line at MP 8.80]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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HISTORICAL NARRATIVE *continued*

The exact date of the concrete work at the east end of the culvert could not be verified. These alterations could be the by-products of either of two B&M railroad projects in Winchester. According to Winchester historian Ellen Knight, the alterations date to ca. 1954-1957, when the B&M elevated its right-of-way in downtown Winchester. However, the track work in the culvert's vicinity was also altered significantly ca. 1934-1939, when the freight yard near the culvert was relocated and a second culvert over the Aberjona River was replaced with a new concrete arch bridge (Knight 2005:37; Parkhurst 1939:3).

The Boston & Maine declared insolvency in 1970, after severe competition from trucks and automobiles. The MBTA purchased the former Boston & Lowell ROW, along with other Boston & Maine routes in Massachusetts, in 1976 (Adams et al. 2008). No alterations to the culvert have been made under MBTA ownership.

National Register Assessment

The 1899-1899 and early/mid twentieth century additions and modifications to the Aberjona River Culvert have compromised the integrity of the structure by obscuring its original design, workmanship, feeling, and association. Therefore, the bridge is not recommended as eligible for the National Register.

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INVENTORY FORM CONTINUATION SHEET [WINCHESTER] [MBTA Lowell Commuter Line at MP 8.80]

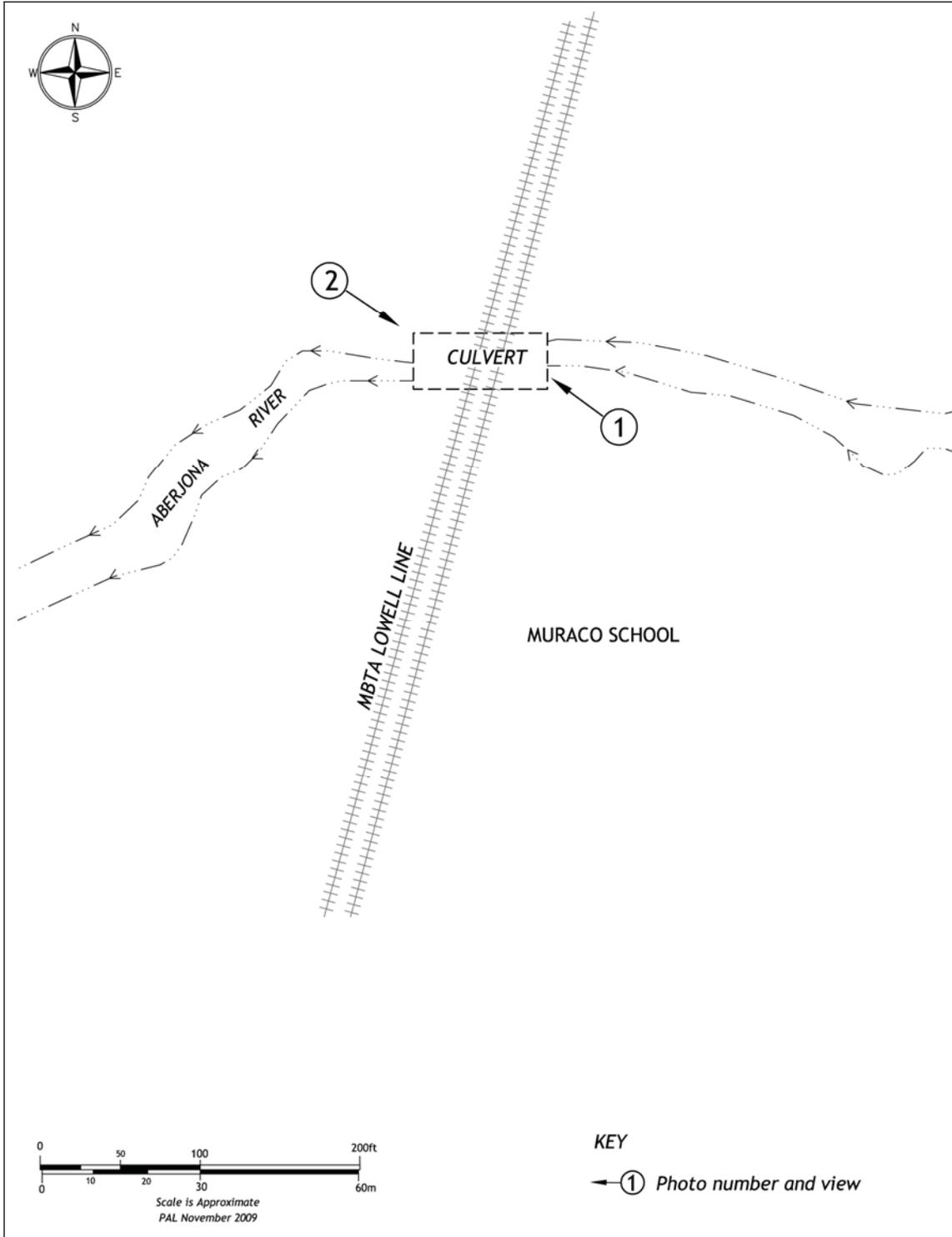
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Area(s) Form No.

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PHOTOGRAPHS

Photograph Key



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Area(s) Form No.

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Photograph 1. East end of Boston & Lowell Railroad/ Massachusetts Bay Transportation Authority (MBTA) Aberjona River Culvert, constructed ca. 1831-1835 with mid-twentieth century concrete work.



Photograph 2. West end of Aberjona River Culvert, constructed ca. 1889-1899.

FORM F – STRUCTURE

Assessor's Number USGS Quad Area(s) Form Number

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Not available	Boston North		
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Photograph



Town Winchester

Place (*neighborhood or village*)
Mystic River Valley Reservation

Address or Location Mystic River Parkway at Mystic Avenue

Name USGS Stream Gauging Station and Weir

Ownership *Public* *Private*

Type of Structure (*check one*)

- | | |
|--|--------------------------------------|
| <input type="checkbox"/> boat or ship | <input type="checkbox"/> pound |
| <input type="checkbox"/> canal | <input type="checkbox"/> powderhouse |
| <input type="checkbox"/> carousel | <input type="checkbox"/> street |
| <input type="checkbox"/> dam | <input type="checkbox"/> tower |
| <input type="checkbox"/> fort | <input type="checkbox"/> tunnel |
| <input type="checkbox"/> gate | <input type="checkbox"/> wall |
| <input type="checkbox"/> kiln | <input type="checkbox"/> windmill |
| <input type="checkbox"/> lighthouse | |
| <input checked="" type="checkbox"/> <i>other (specify)</i> Gauging Station | |

Date of Construction 1939

Source Flynn and Hartwell 1939

Architect, Engineer or Designer
United States Geological Survey

Materials Concrete

Alterations (*with dates*)

Analog gauge replaced with current digital equipment, fenced compound added, and outside gauge graduated timber replaced (date unknown)

Condition Fair

Moved *no* *yes* **Date**

Acreage <1.00

Setting Wooded riverine parkland

Topographic or Assessor's Map

See attached Continuation Sheet

Recorded by: John J. Daly

Organization: PAL, Inc., Pawtucket, RI

Date (*month / year*) November, 2009

STRUCTURE FORM

DESIGN ASSESSMENT X *see continuation sheet*

Describe important design features and evaluate in terms of other structures within the community.

The United States Geological Survey (USGS) Stream Gauging Station and Weir on the Aberjona River at Winchester, Massachusetts (No. 01102500; hereafter referred to as the Gauging Station) is a scientific complex used for the collection of hydrologic data. The facility is located on the east bank of the Aberjona River, about 2,000 feet (ft) below Main Street in Winchester Center, and 2,600 ft above the head of the Upper Mystic Lake. It is just west of the Mystic Valley Parkway, where that road intersects with Mystic Avenue. The Gauging Station is operated by the USGS and located on lands of the Mystic River Reservation, which are owned by the Commonwealth of Massachusetts Department of Conservation and Recreation (DCR).

The Gauging Station consists of four structures: the Low Water Control (Weir), the Gauge House and Stilling Well, and the Outside Gauge. The Gauging Station's primary purpose is the measurement of the stage of a river, or its elevation. The elevation data may be converted to a discharge figure (streamflow) using a mathematical formula that relates the water's elevation to discharge measurements for a particular weir type (the laboratory discharge rating), which are calculated in a laboratory under controlled conditions (USGS n.d.; Rantz 1982).

The Low Water Control, or Weir, is a reinforced concrete "Trenton-type" control immediately downstream of the Gauge House (Flynn and Hartwell 1939). The Weir is 44 ft long between the abutments and is approximately 2.5 ft wide at the crest. The crest has curved cross section and a shallow "vee" contour in profile. There is a spillway apron 3 ft wide at the base of the weir. Sloping rectangular abutments of concrete extend from the Weir to the tops of the stream banks. The sloping portions of the abutments are 6.50 ft wide and 16 ft long. The sloping elements intersect with vertical concrete walls at the top of each bank. These walls are 13 ft wide and raised 1.50 ft above the sloping abutments. The Weir serves two functions. Its standardized design allows discharge figures to be calculated because it has a known and tested discharge rating, as described above. It also stabilizes the low water level, which was historically variable because of alterations in the river stage due to the fluctuating level of the Upper Mystic Lake. According to USGS technical literature, Trenton-type weirs are a common type of broad-crested weir featuring a curved crest in cross section (as opposed to thin plate weirs, which have a chisel-edged crest). They are typically chosen because of their resistance to damage from water-borne debris. The vee profile provides increased sensitivity in low water conditions (Rantz 1982).

The Stilling Well is directly beneath the Gauge House, about 15 ft from water's edge. Two 3 inch diameter, 29.50 ft long galvanized wrought iron intake pipes convey the water level of the stream behind the Weir to the Stilling Well. The Well is constructed of reinforced concrete and is approximately 10 ft deep. Its primary purpose is to dampen momentary fluctuations in water level.

The Gauge House is a low, rectangular, rectangular reinforced concrete hut with a hipped roof and a concrete slab foundation. The structure measures 6 ft by 11 ft in plan. The roof and wall surfaces are concrete. The entry consists of a steel slab door set in steel jambs on the east elevation. The corners of the structure are ornamented with integrally-cast corner pilasters that have a restrained, stepped, Art Deco style motif in lieu of capitals. Historically, the interior was lined with galvanized steel, though this could not be confirmed in the field survey (Flynn and Hartwell 1939). A small chain link enclosure and concrete pad are set against the Gauge House's south elevation. The enclosure contains a plastic equipment cabinet and a solar array, which are presumably for supporting apparatus for the gauge recording instrumentation and communications equipment described below.
continued

HISTORICAL NARRATIVE X *see continuation sheet*

Explain the history of the structure and how it relates to the development of the community.

BIBLIOGRAPHY and/or REFERENCES X *see continuation sheet*

 X Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

INVENTORY FORM CONTINUATION SHEET

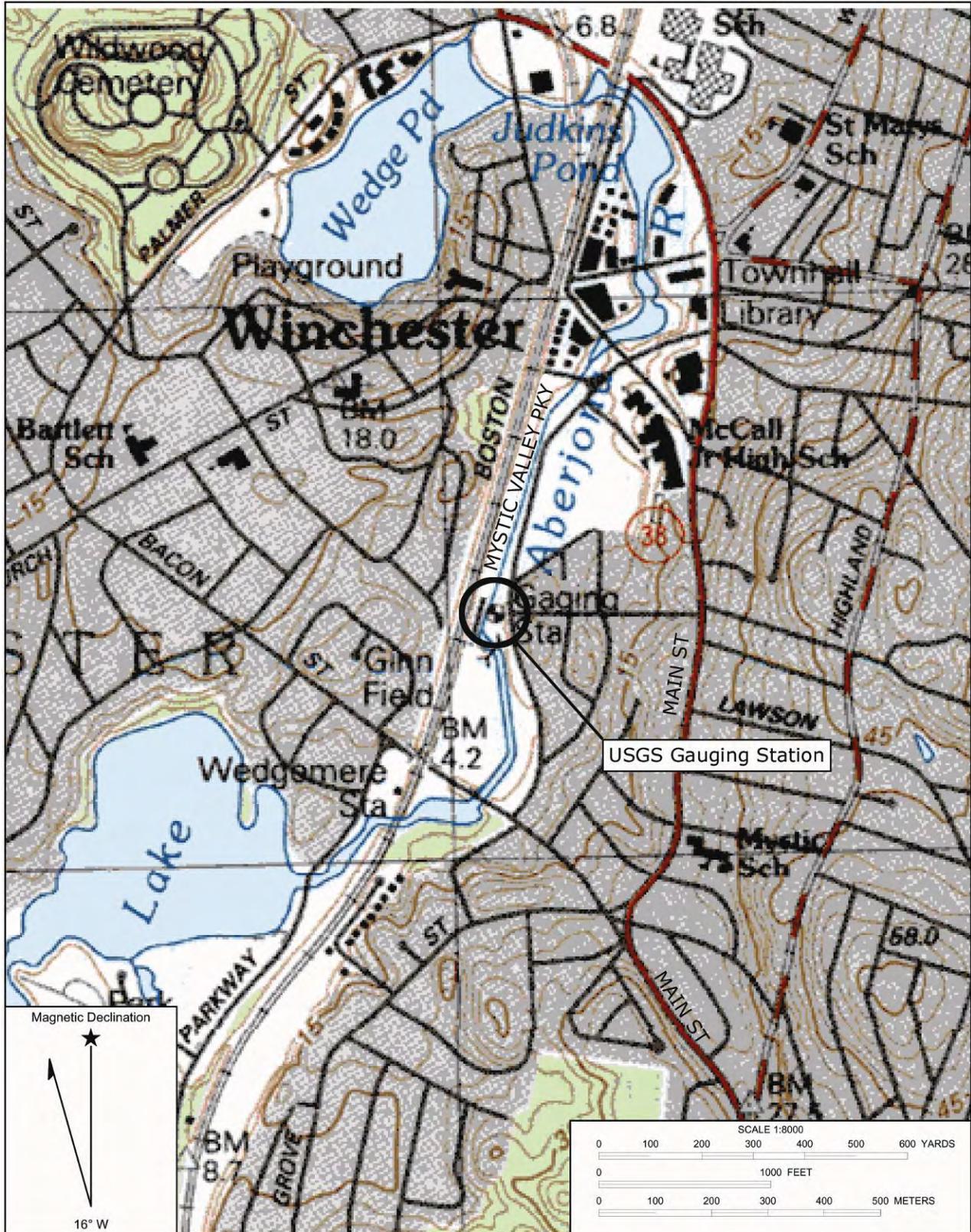
[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

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LOCATION MAP



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INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

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Area(s) Form No.

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DESIGN ASSESSMENT *continued*

The stream gauge or water gauge recording instrumentation is set inside the Gauge House and extends down into the Stilling Well. The stage is sensed by float and counterweight fitted with a shaft encoder to sense water level changes. The stage is recorded digitally and transmitted hourly to a satellite that relays to a down-link computing station at Wallops Island, Virginia. Data from Virginia is in turn related via a phone line to the USGS MA-RI Water Science Center in Northborough, Massachusetts and also displayed on a USGS website (Roy S. Socolow, MA-RI Water Science Center, personal communication, October 27, 2009).

The Outside Gauge is located on the sloping river bank immediately west of the Gauge House. This gauge consists of an angled pressure-treated timber graduated in 1 ft increments with stamped metal numerals. This timber replaces an original pre-cast gauge. The timber is set into three pairs of original rectangular concrete piers at the top, middle, and bottom of the gauge. Rough stone slab steps and a recently-installed, pressure-treated wood plank railing are installed next to the gauge.

Integrity

The Gauging Station retains its integrity. Minor alterations include the modification of the Outside Gauge, new digital gauging equipment, and the removal of glass block windows in the Gauge House. Otherwise, the materials and workmanship of the complex have been maintained. The Gauging Station is in fair condition. The roof of the Gauge House is heavily overgrown with moss. A piece of concrete from the bottom of the Weir's east abutment is broken and washed several feet downstream.

HISTORICAL NARRATIVE

Explain the history of the structure and how it relates to the development of the community.

The construction of the Gauging Station on the Aberjona River was one of a continuum of late-eighteenth and nineteenth century planning and engineering efforts to understand, regulate, and apportion water resources and run-off within the Aberjona and Mystic Rivers' watershed; an effort that continues at the time of this writing.

USGS Stream Gauging Program

The Gauging Station was historically part of the USGS stream-gauging program, which was established to provide hydrologic data in support of irrigation, water supply, flood control efforts. The USGS was created in 1879 and first authorized to measure stream flows in 1894. The first Cooperative Program was established with the Kansas Board of Irrigation Survey and Experiment in 1895. Throughout the twentieth century, the stream-gauging program has grown and shifted in emphasis in response to national and regional trends in water usage, such as hydroelectric power development, and episodic influences, such as extreme flood and drought events (Wahl et al 1995:). Systematic streamflow monitoring in Massachusetts began in 1904 on the Connecticut River. The number of stations increased slowly until the 1930s, when there were about 30 stations in the state. Severe flooding in 1936 and 1938 prompted a more rapid expansion of the state network. The monitoring network now includes 81 stream gauge stations, as well as additional ground water wells, in Massachusetts. The stream gauging program is cooperatively-funded by the federal government and state and local agencies, with the majority of gauging stations funded through the Federal-State Cooperative Program (Zarriello and Socolow 2008:1, 14).

USGS Gauging Station on the Aberjona River (No. 01102500)

Historically, the town of Winchester and the Commonwealth of Massachusetts have undertaken numerous urban planning and construction to regulate the Aberjona and Mystic rivers' waters. During the nineteenth century, Winchester's winding rivers and natural swamps were developed with channels serving the railroad and emerging industrial concerns. Winchester grew as a prosperous late-nineteenth century commuter suburb of Boston with a concentration of leather and felt industries.

Continued

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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HISTORICAL NARRATIVE *continued*

These factories contributed to the pollution of the Aberjona River, which additionally suffered from inadequate storm water and sewage systems, high mosquito populations, and the build-up of weeds and debris. In the 1890s, the town, led by lawyer-resident Forrest C. Manchester advocated for the removal of industrial concerns and a freight yard south of Waterfield Road to create the land reservation that became Manchester Field. The city of Boston owned rights to the waterways in the Mystic River Valley. The MPC contributed to the improvement and creation of Manchester and Ginn fields during the construction process of the Mystic Valley Parkway. Control of the Aberjona River bed was transferred to the Metropolitan Water Board in 1898. Later, in 1909, the Winchester Committee on Waterways commissioned Herbert J. Kellaway to complete a study for improvements of the Aberjona River area between Swanton Street and the Mystic Lakes. Kellaway secured selection by the town with a recommendation from Frederick Law Olmsted Jr. (Freeman 1904a and 1904b; Kellaway 1911 and 1928; Khuen 1995; Knight 2005:16-18; MHC 1981:8).

The USGS Water Resources Branch completed construction of the Aberjona Gauging Station on April 1, 1939 and began operation of the facility on April 16, 1939 (Flynn and Hartwell 1939). According to period newspaper accounts of the Gauging Station's construction, the initial funds for construction of the facility were provided by the USGS. The USGS, the Metropolitan District Commission (MDC, now part of the DCR), and the Massachusetts Department of Public Health shared operational costs (Weston 1939). The Gauging Station has recorded measurements continuously its opening beginning in 1939 until the present day (USGS 2008).

According to period newspaper accounts, data collected at the station was initially provided to the Winchester Department of Public Health to assist in determining how much water industrial and municipal users could safely remove from the river's watershed without causing a shortage, or drought. It was also provided to the Massachusetts Department of Public Works to assist in the construction of flood mitigation projects elsewhere in Massachusetts. Curiously, these newspaper accounts specifically state that the Gauging Station was not constructed for flood control efforts, even though flooding was a constant concern and had occurred as recently as 1936 on the Aberjona River in Winchester (Knight 2005; Sanderson 1939; Weston 1939).

The station is located on DCR land and is currently operated by the USGS Massachusetts Water Science Center, with cooperation from the Massachusetts DCR, Division of Planning and Engineering (USGS 2008). The data gathered at the station is currently of primary interest for flood protection at the local level and to support national water quality networks identified under the USGS' National Streamgauge Information Program (NSIP) (Zarriello and Socolow 2008:8-12). Although this cooperative agreement exists, there is direct historical association between the station and the establishment of the Metropolitan Parks Commission's (MPC, predecessor of the DCR) Mystic Valley Parkway or Mystic River Reservation (built 1896) could be determined in the current survey effort (Adams et al 2002). The Gauging Station's location within the Mystic Valley Reservation is likely an outcome of siting requirements relative to the course of the Aberjona River and its users and that fact that the facility could be accommodated conveniently on lands already in the public domain. However, there remains the possibility that there is an as yet unidentified connection between the Gauging Station and MDC management of the Mystic River watershed in the mid-twentieth century.

The instrumentation of the Gauging Station has been modernized from analog to digital in order to accommodate remote operation and more efficient data gathering. The still well of the Gauging Station was originally equipped with a float gauge consisting of graduated tape attached to a pulley and balanced with a counterweight. The pulley drove a graphic recording device, which included three pens for continuous recordation of stage, reversal, and time data. When installed, this instrumentation was capable of measuring a stage of 17.40 ft. A fenced-in equipment shed and solar array described above are probably associated with this modernization. The date of these minor alterations is unknown. The Outside Gauge has also been altered within the last ten years by the replacement of its graduated strip with a wood timber.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

MASSACHUSETTS HISTORICAL COMMISSION

220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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*Continued***BIBLIOGRAPHY and/or REFERENCES** *continued*

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INVENTORY FORM CONTINUATION SHEET

[WINCHESTER]

[Mystic Valley Parkway at Mystic Ave.]

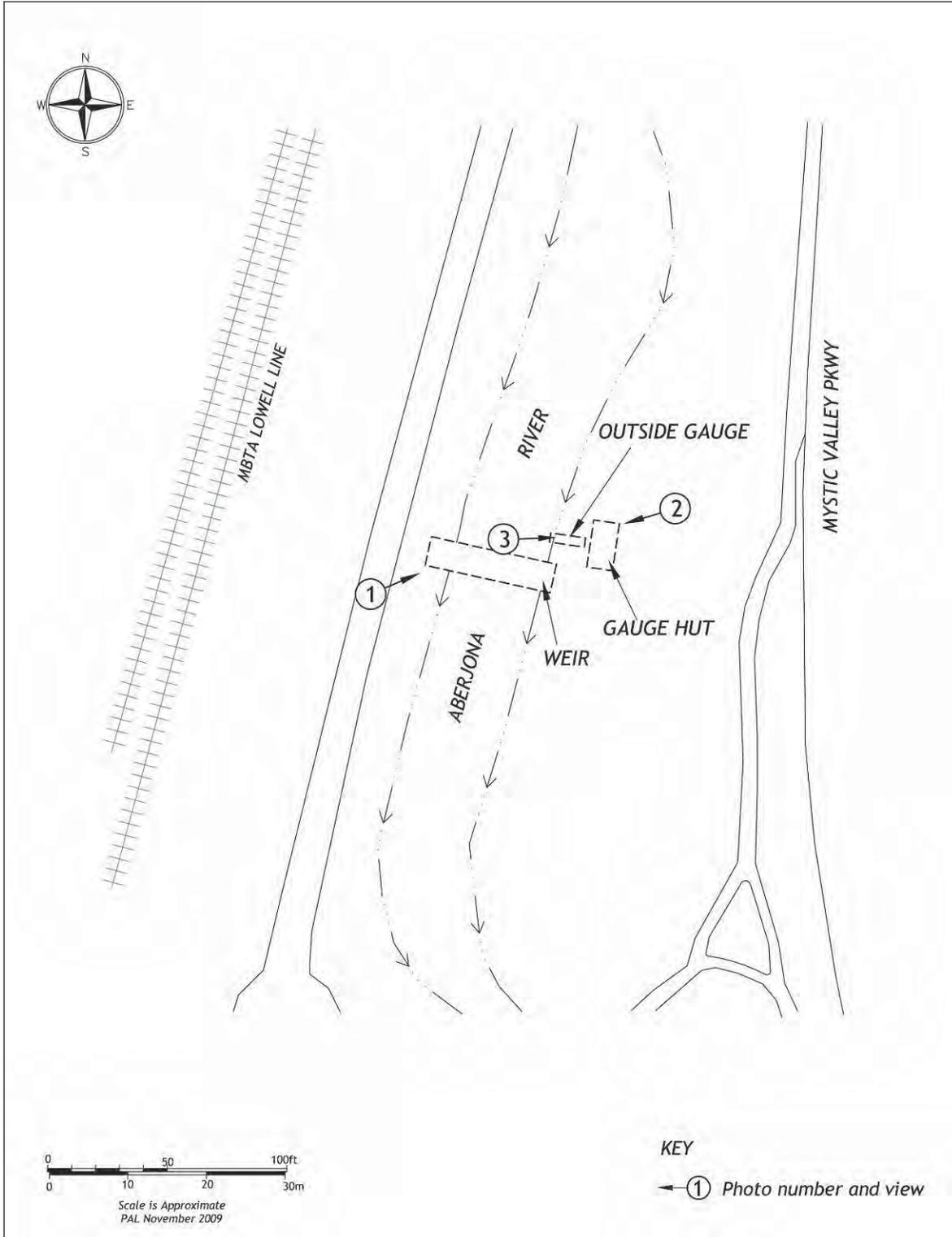
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PHOTOGRAPHS

Photograph Key



INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

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220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Photograph 1. United States Geological Survey (USGS) Gauging Station on the Aberjona River (No. 01102500), looking northeast. The Low Water Control (a/k/a Weir) crosses Aberjona River in foreground, with Outside Gauge and Gauge House on opposite bank.



Photograph 2. Gauge House, looking southwest.

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Mystic Valley Parkway at Mystic Ave.]

MASSACHUSETTS HISTORICAL COMMISSION
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Area(s) Form No.

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Photograph 3.
Outside Gauge,
looking northeast.



Photograph 4. Weir,
looking west.

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220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Community Property Address
WINCHESTER ABERJONA RIVER AT MYSTIC AVENUE

Area(s) Form No.

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National Register of Historic Places Criteria Statement Form

Check all that apply:

- Individually eligible Eligible **only** in a historic district
 Contributing to a potential historic district Potential historic district

Criteria: **A** **B** **C** **D**

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

Statement of Significance by John J. Daly, PAL, Inc., Pawtucket, RI
The criteria that are checked in the above sections must be justified here.

The United States Geological Survey (USGS) Gauging Station on the Aberjona River at Winchester, Massachusetts (No. 01102500) is a scientific complex constructed in 1939 for water gauge and stream flow measurement. It derives its significance under Criteria A and C at the local level in the areas of community planning and development, conservation, and engineering. Under Criterion A, the Gauging Station is significant as a component of the Town of Winchester's planning and construction efforts to understand, control, and improve the Aberjona River and its floodplain, an effort which began in the 1890s. It is also significant as a local example of the USGS' construction of gauging stations under the Federal-State Cooperative Program, which applied scientific principles to water resources management and conservation through a national program of gauging station construction. Under Criterion C, the Gauging Station is significant because it embodies the distinctive characteristics of a USGS gauging station, a complex engineered specifically for capturing scientific measurements under controlled conditions. The Gauging Station retains its location and setting in the Aberjona River valley and the design, materials, and workmanship that convey its scientific purpose. While the original instrumentation within the Gage [sic] House has been replaced, the complex is still in use for its intended purpose and is in fair condition.

The Gauging Station is located within the Commonwealth of Massachusetts Division of Conservation and Recreation's Mystic Valley Reservation, but is not included within the Mystic Valley Parkway National Register Historic District.

FORM F – STRUCTURE (BRIDGE)

Assessor's Number USGS Quad Area(s) Form Number

Not available

Boston
North

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Town Winchester

Place (*neighborhood or village*)
Mystic Valley Reservation

Street/Route Bacon Street

Carried over Aberjona River
(Railroad, river, brook, canal or road)

Historic/Common name
Bacon Street Bridge

Ownership Massachusetts Department of Transportation –
Highway Division
(Name of state agency or municipality)

Mass. Highway bridge no. W-40-1

Bridge type Concrete Elliptical Arch

Bridge typology code 1 4 1 27

Date of Construction 1922

Source J.R. Worcester and Co. and Ralph S. Vinal 1922

Engineer/Designer Robert S. Vinal, architect; J.R.
Worcester & Co., engineers.

Bridge company/Contractor Unknown

Material (s) Concrete, granite

Alterations (*with dates*)
Rehabilitated (1996)

Posted load limit (*if any*) N/A

Condition Good

Moved X no yes **Date**

Acreage <1.00

Setting Wooded parkland/river valley in Mystic River
Reservation.

Photograph



Topographic or Assessor's Map

See Continuation Sheet.

UTM Reference 19.0324020 E; 4701100 N

Recorded by: John J. Daly

Organization: PAL, Inc., Pawtucket, RI

Date (*month / year*) November, 2009

STRUCTURE FORM (BRIDGE)

Superstructure

Overall length: 74 ft Deck width: 60 ft Skew: N/A/
Main unit: No. of spans: 1 Span length: 30 ft
Approaches: No. of spans: N/A Span length: N/A

Substructure *(structure below deck)*

Height above feature spanned: 14 ft Material of abutments or piers: Reinforced concrete w/ stone cladding

ENGINEERING/DESIGN ASSESSMENT *see continuation sheet*

Describe important design features and evaluate in terms of other bridges within the community or region.

The Bacon Street Bridge carries Bacon Street on an east-west course over the Aberjona River in Winchester, Massachusetts. The bridge is situated about 1,200 ft north (upstream) of Upper Mystic Lake and 4,000 ft south (downstream) of Winchester Center in a suburban neighborhood. This portion of Bacon Street is a connecting route between two sections of the Mystic Valley Parkway, but is not included within the bounds of the Mystic Valley Parkway National Register Historic District.

The bridge is a single-span concrete elliptical arch structure with stone-faced closed spandrels to give the appearance of a true stone masonry structure. It measures 74 feet (ft) in length on the parapets and 60 ft in width to the outside parapets faces. The arch span is 30 ft and rises about 14 ft above the surface of the Aberjona River. The spandrel walls are constructed of seam-face granite (also called the sap or rind) chosen for its variegated iron-stained color. The rectangular and tabular stone blocks are laid in a random ashlar pattern. The arch ringstones are regular blocks of the same stone, with no prominent keystone. Shallow buttresses with sloping capstones flank the arch. The barrel of the arch is the exposed surface of the plank-formed concrete arch. A shallow stringcourse of stretcher blocks tops the spandrel wall and demarcates the bottom of the bridge parapets.

The 2 ft wide, 3 ft tall parapets are constructed with a granite ashlar material similar to the spandrel walls, but with less of the iron-stained material, giving them a lighter tone overall. The parapets are topped by hammered, rounded, granite block capstones. The bridge deck accommodates a 40 foot-wide, two-lane roadway paved with asphalt. Eight foot-wide concrete sidewalks with granite curbs flank either side of the roadway.

Filled spandrel arch bridges are the simplest of concrete arch bridge designs and representative of early applications of concrete engineering to arch bridges, which later evolved to open-spandrel designs. They are less common than simpler concrete slab and girder bridges and were often chosen in situations where it was desired to emulate the appearance of a stone masonry structure (Parsons Brinkerhoff and Engineering and Industrial Heritage 2005:3-65).

HISTORICAL NARRATIVE *see continuation sheet*

Explain the history of bridge and how it relates to the development of the community.

BIBLIOGRAPHY and/or REFERENCES *see continuation sheet*

Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Bacon Street over Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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LOCATION MAP



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INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Bacon Street over Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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HISTORICAL NARRATIVE

Bacon Street has been the location of a crossing over the Aberjona River since at least 1836, when it appears on a map associated with the construction of the Boston & Lowell Railroad. The street name is likely derived from its proximity to Bacon's Mill, which was demolished in the mid nineteenth century. Various wooden bridges served at the crossing until 1874, when the first stone bridge, three-span box culvert structure, was constructed. According to Winchester historian Ellen Knight, the stream channel was relocated slightly for the 1874 construction program (Knight 2005; Waters 1836).

The current bridge was constructed in 1922 as a replacement for the 1874 box culvert structure. Ralph S. Vinal was the bridge designer and J.R. Worcester & Co. was the engineering firm on the project (J.R. Worcester and Co. and Ralph S.Vinal 1922). Ralph Sumner Vinal was an MIT-trained architect who graduated in 1897 and in 1907 opened a Boston-based landscape architecture firm with Harvard graduate S.P. Negus. The J.R. Worcester & Co. firm was a noted Massachusetts engineering company founded by Joseph R. Worcester (1860-1943) of Waltham, Massachusetts. Worcester was one of the country's foremost engineers of steel and reinforced concrete foundations and structures. His firm contributed to the construction of significant Massachusetts buildings and structures including the Boston Transit Commission (BTC) subways, the Boston Elevated Railway (BERy) elevated structures, the Lechmere Viaduct, and Harvard Stadium. Worcester's direct involvement in the company he founded ceased in 1924, soon after construction of the Bacon Street Bridge (Closs 1988; Harvard Graduates Magazine Association:491; MIT 1915:508).

The conceptual design of the Bacon Street Bridge was an outgrowth of planning efforts by the Town of Winchester to improve the Aberjona River for recreation and sanitary purposes. The Town created a Waterways Committee and hired landscape architect Herbert J. Kellaway to provide recommendations for this purpose in 1911 and in a subsequent 1928 investigation (see associated Form H – Parks and Landscapes Form for the Kellaway Landscape). In his 1911 report, Kellaway recommended the replacement of various bridges with wider stone arch structures that would allow recreational boats to use the waterway. Following Kellaway's recommendations, but without any direct involvement on the part of the architect, the town built three new single arched bridges at Aberjona crossings: the Bacon Street Bridge, the Waterfield Road Bridge (1915, formerly the Walnut Street Bridge), and the Converse Bridge on Main Street (1915). The Waterfield Road and Main Street Bridges, both segmental arch concrete structures with concrete parapets, are contributing resources to the Winchester Center National Register Historic District (Kellaway 1911 and 1928).

Intrgrity

The Bacon Street Bridge was rehabilitated in ca. 1996. The original design of the bridge was maintained in this rehabilitation and the original materials and workmanship of the stone and concrete work was preserved. Cracked and spalled concrete in the arch barrel was repaired with grout and new mortar. The original "Granolithic" concrete sidewalks were replaced with new poured concrete slabs. The parapets were completely dismantled. The parapets were then replaced in-kind by reusing the salvaged stones and matching the original parapet in pattern, color, and material. The roadway on the bridge and approaches was regraded and resurfaced. (Knight 2005; Universal Engineering Corporation 1995).

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continued

INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Bacon Street over Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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BIBLIOGRAPHY and/or REFERENCES *continued*

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INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Bacon Street over Aberjona River]

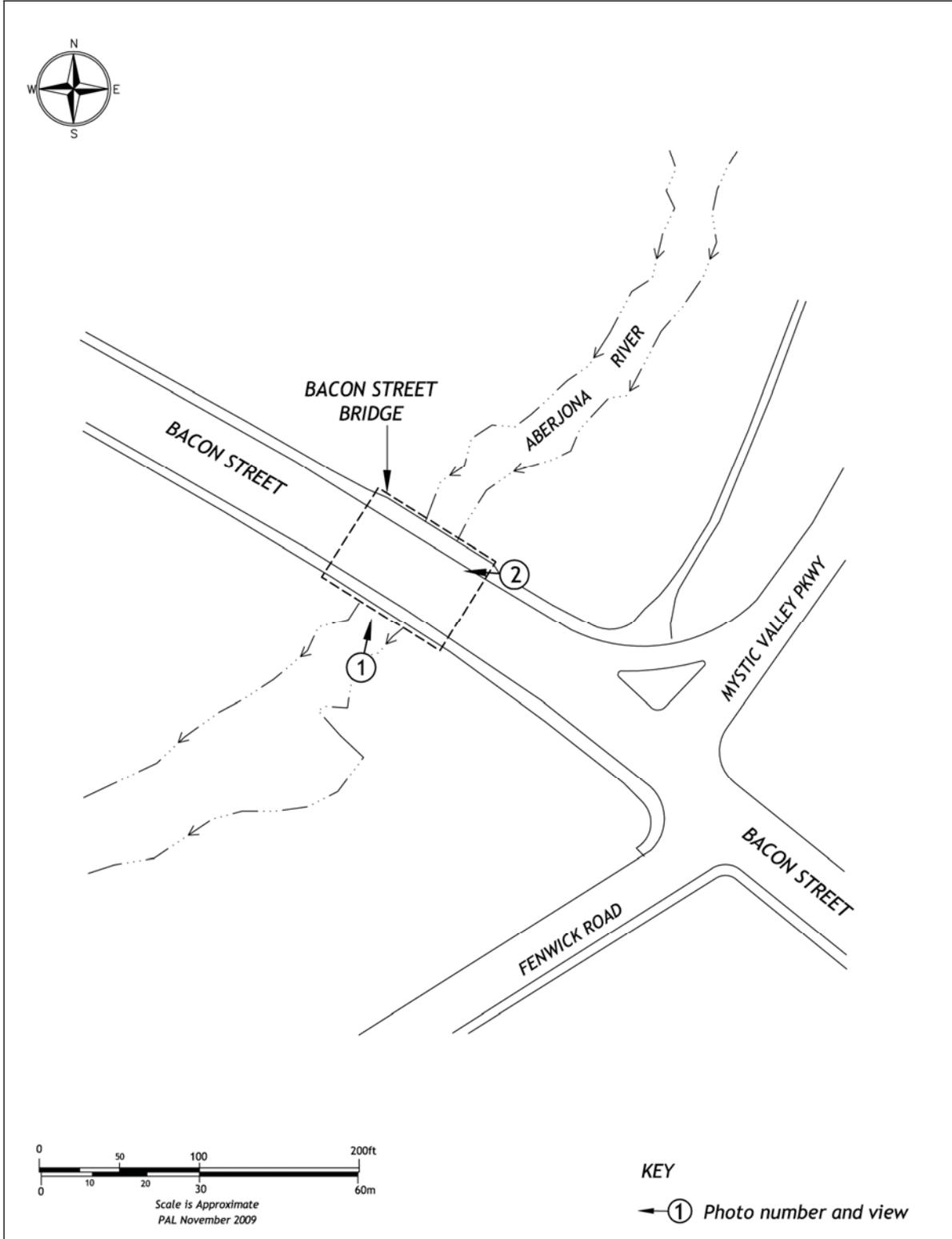
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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PHOTOGRAPHS

Photograph Key



INVENTORY FORM CONTINUATION SHEET

[WINCHESTER] [Bacon Street over Aberjona River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Photograph 1. South elevation of Bacon Street Bridge.



Photograph 2. Roadway deck of Bacon Street Bridge, looking west.

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Community Property Address
WINCHESTER BACON STREET AT ABERJONA RIVER

Area(s) Form No.

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National Register of Historic Places Criteria Statement Form

Check all that apply:

- Individually eligible Eligible **only** in a historic district
 Contributing to a potential historic district Potential historic district

Criteria: **A** **B** **C** **D**

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

Statement of Significance by John J. Daly, PAL, Inc., Pawtucket, RI
The criteria that are checked in the above sections must be justified here.

The Bacon Street Bridge is a single-span concrete arch bridge with stone cladding constructed in 1922. The structure is eligible for listing in the National Register under Criteria A and C at the local level in the areas of community planning and development and engineering. Under Criterion A, it is significant as component of the Town of Winchester's planning and efforts to understand, control, and improve the Aberjona River and its floodplain, an effort which began in the 1890s. The bridge is one of three concrete arch structures constructed over the Aberjona River in the first quarter of the twentieth century according to the recommendations of landscape architect Herbert J. Kellaway to improve the scenic and recreational aspects of the river. Under Criterion C, the bridge represents an early phase in the evolution of reinforced concrete engineering as applied to bridges.

The Bacon Street Bridge is also eligible for listing in the National Register as a potential contributing element to the Kellaway Landscape in Winchester, Massachusetts (see associated MHC Form H – Parks and Landscapes Form with attached National Register of Historic Places Criteria Statement Form). The Kellaway Landscape is a 3.9-mile corridor of public open space encompassing the Aberjona River, ponds, bridges, dams, and adjacent parkland affiliated with plans for waterway improvements established by Herbert J. Kellaway in 1911 and 1928. The Kellaway Landscape derives its primary significance under Criterion A at the local level for its association with early-twentieth-century planning efforts to improve public welfare and quality of life through infrastructure development, sanitation, recreation and the acquisition of land for public use. It represents a local application of city beautiful-inspired social ideals and the related municipal parks movement that created the Metropolitan Park System in Boston. Although the Kellaway Landscape is not a prime or innovative example of the municipal park system property type, it also possesses significance under Criterion C as a local example of a plan conceptualized by landscape architect Herbert J. Kellaway. Kellaway absorbed the ideals of the nationally renown Olmsted, Olmsted, and Eliot firm during his employment there from 1892–1906. Kellaway's plans for the Town of Winchester's waterways generally employ Frederick Law Olmsted's and Charles Eliot's principles regarding

the use of natural features in design, and the concept of continuous public land reservations. The setting and feeling of the landscape as a planned system of improved waterways and open spaces remains intact. The Kellaway Landscape also retains the majority of its original location and design integrity, and the key structures in the district retain their historic materials.

The bridge retains its setting in the Aberjona River valley, its association with the Kellaway-designed landscape, and the design and materials that convey its intended purpose as a visual and recreational amenity and illustrate its engineering significance. The 1996 reconstruction of the bridge did not alter any of the bridge's important characteristics and the bridge is in excellent condition.

The Bacon Street Bridge is located within the Commonwealth of Massachusetts Division of Conservation and Recreation's Mystic Valley Reservation, but is not included within the Mystic Valley Parkway National Register Historic District.

FORM F – STRUCTURE (BRIDGE)

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

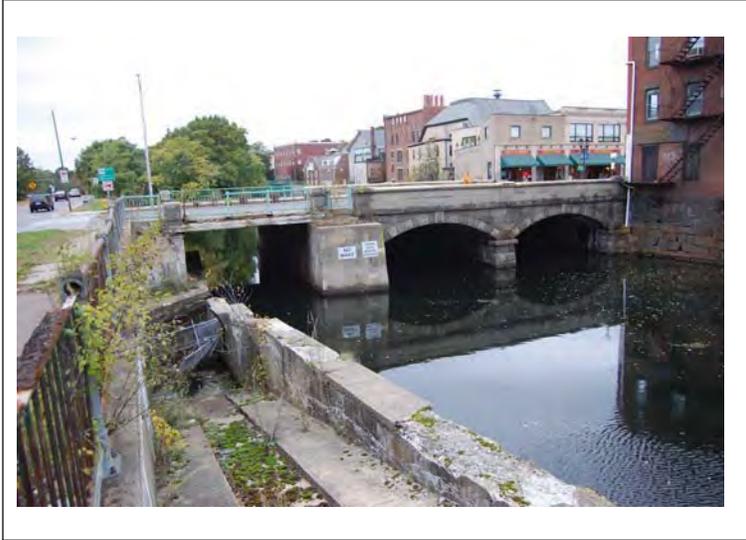
Assessor's Number USGS Quad Area(s) Form Number

09-19	Boston North		
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Town Winchester

Place (*neighborhood or village*) Medford Square

Photograph



Street/Route Main Street (State Route 38)

Carried over Mystic River

(Railroad, river, brook, canal or road)

Historic/Common name Cradock Bridge and Cradock Dam

Ownership Massachusetts Department of Transportation – Highway Division

(Name of state agency or municipality)

Mass. Highway bridge no. M-12-002

Bridge type Masonry arch / concrete deck

Bridge typology code 1 7 / 4 1 12 / 23

Date of Construction 1880

Source Blaisdell 1879

Engineer/Designer Hiram W. Blaisdell

Bridge company/Contractor Nicholas White

Material (s) Stone, concrete, steel

Alterations (*with dates*) Addition of concrete deck span and Cradock Dam and locks (1908); widening of concrete deck (1934).

Posted load limit (*if any*) N/A

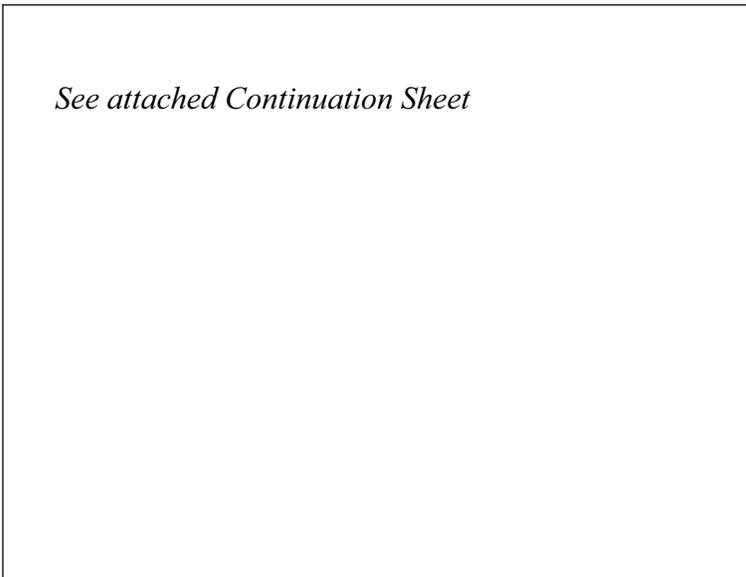
Condition Good

Moved **no** **yes** **Date**

Acreage 0.23

Setting Urban commercial district

Topographic or Assessor's Map



UTM Reference 19.0326286 E; 4698052 N

Recorded by John J. Daly

Organization: PAL, Inc., Pawtucket, RI

Date (*month / year*) November, 2009

STRUCTURE FORM (BRIDGE)

Superstructure

Overall length: 100 ft Deck width: 73 ft Skew: 10 degrees
Main unit: No. of spans: 2 Span length: 25 ft
Approaches: No. of spans: 1 Span length: 20 ft

Substructure *(structure below deck)*

Height above feature spanned: approx. 12 ft Material of abutments or piers: stone, concrete

ENGINEERING/DESIGN ASSESSMENT X *see continuation sheet*

Describe important design features and evaluate in terms of other bridges within the community or region.

The Cradock Bridge (incorrectly referred to as Craddock in other sources) carries Main Street (State Route 38) in Medford on a northeast-southwest course across the tidal portion of the Mystic River immediately east of the Medford's business center at Medford Square (for descriptive purposes, north shall refer to the Medford Square end of the structure, with the Mystic River flowing east beneath the bridge). The Mystic River has been channelized with stone masonry on the north bank and concrete on the south bank at the bridge location. A waterless boat lock (built 1909), previously identified as a loading/unloading ramp, is located immediately downstream of the bridge on the south bank. The bridge is located within the Mystic River Reservation, but is not within the bounds of the Mystic Valley Parkway National Register Historic District (Adams et al 2002).

The three-span structure incorporates represents three building programs. It consists of an two-span stone arch masonry bridge (built 1880) that has been lengthened with a third concrete deck span to the south (built 1908). A concrete deck extension to the west (built ca. 1934) is supported by and incorporates remnant elements of the Cradock Dam (also constructed 1908). The entire bridge measures 100 feet (ft) in length and 73 ft in width with a roadway surface about 12 ft above the water. The structure is oriented to the river at a mild 10 degree skew. The four-lane bridge deck is paved with asphalt and has concrete sidewalks. A low median strip with granite curbs runs the length of the bridge and is planted with annuals and ornamental shrubs.

The 1880 masonry structure is only visible from the east elevation of the Cradock Bridge. The overall visible length of this bridge is about 60 ft. This two-span, rubble-filled, segmental arch bridge is constructed of coursed, rusticated granite ashlar in the abutments, pier arch barrels, spandrel walls, and parapets. The ring stones consist of regular rusticated blocks with prominent raised keystones. The bridge arch spans are 25 ft in length. The north abutment is intact and ties into the north river channel wall. The south abutment is now embedded in a massive poured concrete pier that also supports the newer concrete bridge span to the south. The bridge parapets have incised date stones that read "Cradock Bridge, 1638 – 1880." The east bridge parapet remains in its original location. The west bridge parapet has been relocated to the 1921 concrete portion of the bridge deck on the west side of the structure, as described below.

The 1908 south bridge span consists of a concrete jack arch deck supported by longitudinal steel beams embedded in the concrete. This span is 20 ft between supports. The deck rests on a poured concrete abutment adjacent to the river channel's south wall and on a massive poured concrete pier to the north that also supports the south end of the stone arch structure. Railings on this span are picketed cast iron pipe panels and are punctuated by granite piers whose stonework matches the 1880 parapets.

continued

HISTORICAL NARRATIVE X *see continuation sheet*

Explain the history of bridge and how it relates to the development of the community.

BIBLIOGRAPHY and/or REFERENCES X *see continuation sheet*

 Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

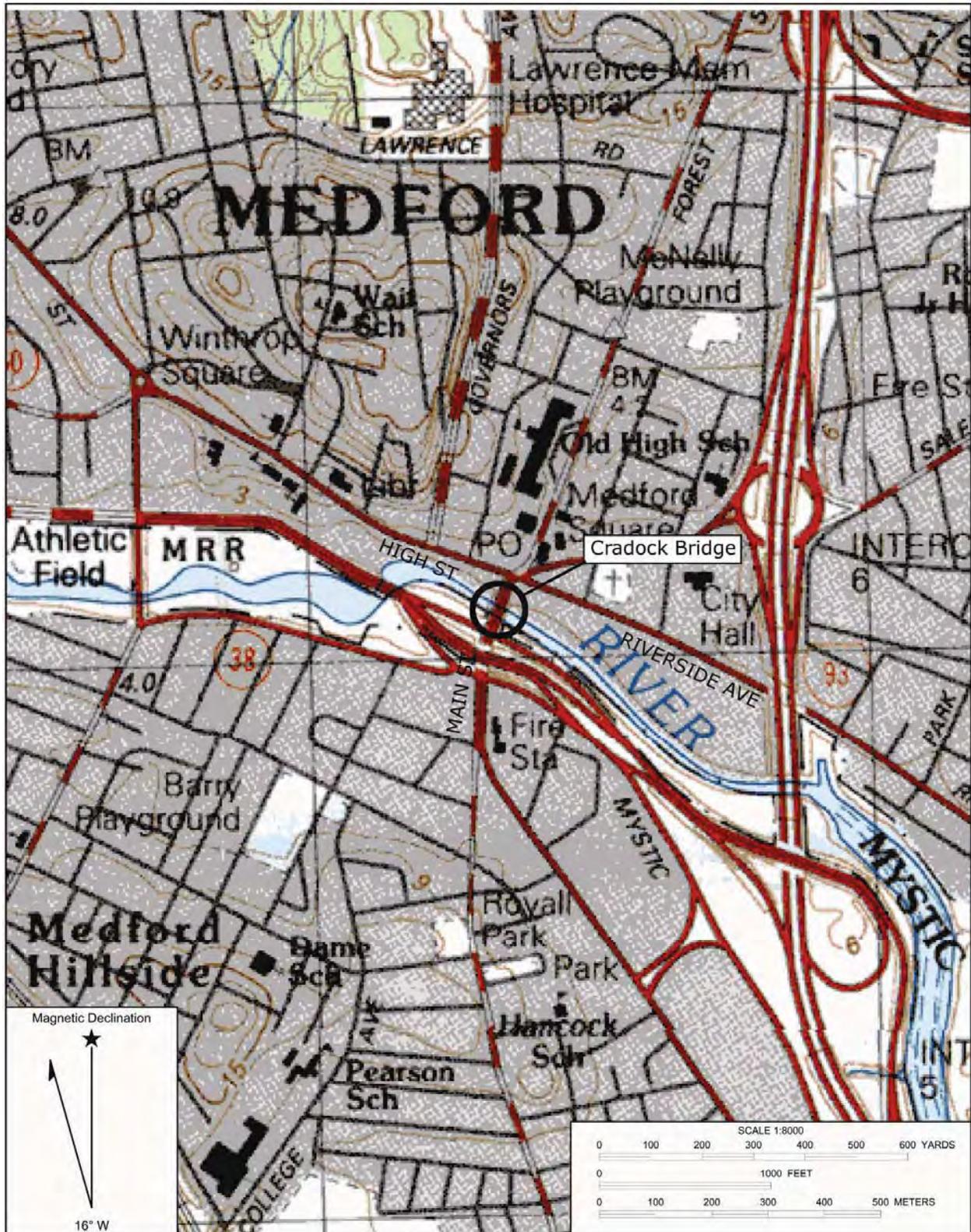
[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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LOCATION MAP



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INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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ENGINEERING/DESIGN ASSESSMENT *continued*

Both the 1880 and 1908 bridge spans are expanded to the west by the addition of a concrete and steel jack arch deck approximately 21 ft wide. This portion of the bridge deck rests on five concrete piers spaced about 13 ft on center. The piers rest on remnants of the Cradock Dam. The openings between the piers are partially obstructed by poured concrete walls and heavy anodized steel debris barriers, which are visible elements of the Cradock Dam. The upstream faces of the piers have been extensively patched or repaired.

The concrete structure of the 1909 waterless boat lock is tied into the south abutment of the Cradock Bridge via a narrow concrete wharf. This lock does not utilize a traditional gated and water-filled chamber. Instead, it consists of two concrete ramps sloping upstream and downstream. Rollers originally set into the ramps are now missing (see discussion below). The ramps are set between the Mystic River's south channel wall and a massive poured concrete wall parallel to the river wall. Vertical notches cast into the wall and a mooring ring on the wall's top surface may be remnants of a second, traditional watered lock erected in 1908 (now demolished).

Integrity

Neither the 1880 stone arch bridge nor the Cradock Dam/Lock complex retains integrity. The setting and design of the 1880 stone arch Cradock Bridge have been severely compromised by the addition of the 1908 bridge span and Cradock Dam and the 1934 widening of the bridge. The tide gates, weirs, and the larger of the two boat locks that formed the water control system have been removed and the structure no longer conveys its historical appearance or function.

HISTORICAL NARRATIVE

The Cradock Bridge is named for Matthew Cradock, the London merchant and Governor of the Massachusetts Bay Colony that first sent settlers to the Medford area in 1629. Various bridge structures have been present at the bridge site since 1637, when the first bridge, the Medford or Mistick [sic] Bridge, was constructed. This early toll bridge was the first across the Mystic River and the only crossing of the waterway until 1787. During the Colonial Period, it served as a lynchpin in transportation routes from northern communities to Boston (MHC 1980; Seaburg and Seaburg 1980).

The masonry arch portion of the current Cradock Bridge was constructed between 1880 and 1882 and replaced a wood version of the Cradock Bridge that included a movable bascule span (Sammarco 1999). The new stone bridge, which was designed by noted Massachusetts bridge engineer Hiram W. Blaisdell, was constructed as a two span, segmental-arched stone structure with rubble-filled spandrels. As built, the bridge measured 68.50 ft in length and 52 ft across the roadway (Blaisdell 1879). Nicholas White was the contractor for the bridge (City of Medford 1877).

The Cradock Bridge was extensively altered in 1908 and 1934. The south concrete bridge span and waterless boat lock are the remnant elements of a Cradock Dam and Lock complex that was built in 1908. In that year, the Metropolitan Parks Commission (MPC) enlarged the bridge as part of an effort to improve the Mystic River within the MPC's Mystic River Reservation (the bridge is not included within the bounds of the Mystic Valley Parkway Historic District). The MPC, which is now incorporated into the Massachusetts Department of Conservation and Recreation (DCR), had first acquired the river channel and shore land adjacent to the bridge in Medford in 1899 for the construction of the Mystic River Parkway. The MPC's consulting landscape architects, the Olmstead Brothers, recommended that a weir and dam system be erected on the Mystic River so that the upstream reaches of the waterway and associated marshes could be improved for recreational and sanitary purposes. MPC consulting engineer John R. Freeman studied design solutions for the concept, which the MPC published in 1904.

continued

INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION

220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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HISTORICAL NARRATIVE *continued*

Freeman recommended a water flow control complex including a dam and tide gates, weirs, and two boat locks immediately upstream of and connected to the Cradock Bridge. This complex would allow improved recreational use of the river, permit landscaping in the Mystic River Reservation, and improve sanitation. The weir would maintain upstream higher water level during low tide so that marshes and mudflats along the river would not be exposed. The highest tide of the Mystic was about 5 feet above the MPC's desired elevation of the upstream river, therefore, a dam and tide gates were required downstream that would allow downstream flow, but exclude saltwater from the upper Mystic. The Cradock Bridge would be lengthened by one span to the south for a future boat waterway, which would be accessed by a boat lock attached to the downstream side of the bridge (Freeman 1904a and 1904b).

The MPC completed construction a dam and lock complex based on Freeman's designs in 1908. The Cradock Bridge was extended about 20 ft south with a concrete jack arch deck span with steel railings. The river channel beneath the new span and the 1882 spans was lined with concrete. The Cradock Dam, tide gates, and weirs were installed immediately upstream of and attached to the bridge (Robbins 1907). The dam incorporated two rows of tide gates transverse to the river channel, with four gates in each row. Two boat locks were installed abutting and downstream of the new west span: a traditional boat lock with gates and a concrete lift chamber (now demolished) and an innovative waterless concrete lock, which is still present abutting the south wall of the stream channel. This second lock was essentially a man-made portage with steps for boaters and a system of rollers (now missing) on which the boaters could pull their craft (Popular Mechanics 1909).

The Cradock Bridge was altered again in 1934, when the bridge was widened on the west side (Massachusetts DOT-Highway Division n.d.). The bridge deck width was increased from 52 ft to its present width of about 73 ft. The new deck was constructed using a concrete jack arch deck system resting on reinforced concrete extensions of the tide gate piers. The original stone parapet of the bridge's west elevation was salvaged and relocated to the west side of the enlarged deck. Available construction plans do not indicate what elements of the stone masonry on the ca. 1880 bridge's west elevation were preserved in situ after this enlargement (MHC n.d.; Robbins 1921).

A final alteration to the bridge occurred in 1978, when the tide gates within the dam were removed (Massachusetts DOT-Highway Division n.d.). Field survey of the Cradock Bridge and Dam indicates that the west (upstream) row of tide gates and associated dam structure are missing and that the weirs and traditional boat lock have also been removed from the dam complex. The extensive repair work noted on the upstream piers probably occurred after the demolition of Cradock Dam elements. It is assumed that these alterations also date to 1978.

A previous survey of the bridge (PAL 2006) stated that a ca. 1802 tidal lock structure associated with the Middlesex Canal is located beneath the Cradock Bridge. A review of available literature indicates that this is a misstatement that confuses the Middlesex Canal with the later MPC construction effort. No evidence for the presence of a tide lock at the bridge location could be found in historical sources relating to the Middlesex Canal. The canal did have a short spur, the Branch Canal, which extended into the Mystic River a short distance south of the Cradock Bridge. The Branch Canal contained tidal lock, but not at the Cradock Bridge site (Adams and Kierstead 1999:8; Clarke 1974; Lawrence 1942:109; Waters 1826). Available photos of the earlier wood iteration of the Cradock Bridge do not show any visible lock structure (Sammarco 1999).

continued

INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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HISTORICAL NARRATIVE *continued*

Hiram W. Blaisdell

The following biographical information is derived from Peter Stott's draft Form F – Structure (Bridge) Form for Flint's Bridge in Concord, Massachusetts and Gerald A. Doyle & Associates, P.C. and John Carollo Engineers' Historic American Engineering Survey documentation of the Yuma Main Street Water Treatment Plant (Stott 1993; Gerald A. Doyle & Associates, P.C. and John Carollo Engineers 1994).

Hiram W. Blaisdell (1851-1934) was an important civil engineer who designed several bridges in Massachusetts before moving on to a more significant career in water treatment, irrigation, and mine engineering. Blaisdell was born in Waltham and was a cousin of Concord resident William Wheeler (1851-1932), who was also a famous engineer. Between 1869 and 1873, Blaisdell attended the Massachusetts Institute of Technology (MIT) as a "special student" without receiving a degree. After graduating, he worked with his cousin on several bridge projects, including Concord's Elm Street Bridge (1874) and the Needham Street Bridge (1875) over the Charles River between Needham and Newton Upper Falls. The two engineers also planned the narrow-gauge Billerica and Bedford Railroad, which was then constructed under Blaisdell's sole direction.

Wheeler left for Japan on a mission to assist the Japanese government in 1876. Blaisdell went on to design at least three Massachusetts bridges: the three-span Newton Street Bridge over the Charles River in Waltham (state bridge no. W-04-002, built 1877-1878), the four-span Flint's Bridge in Concord over the Concord River (state bridge no. C-19-013, built 1877-1878), and the Cradock Bridge. All three of these bridges are segmental-arch granite structures and share similar aesthetic characteristics. They represent the evolution of stone arch bridge design away traditional, vernacular forms to new designs based on modern engineering principles during a period when steel and reinforced concrete were not yet available. Both the Flint's Bridge and the Newton Street Bridge are still extant. Flint's Bridge, a rare four-span stone arch structure, has been determined eligible for individual listing in the National Register and is within the Town of Concord's North Bridge/Monument Square Local Historic District. The Newton Street Bridge was listed individually in the National Register in 1989 (Gerald A. Doyle & Associates, P.C. and John Carollo Engineers 1994; MHC 2009; Massachusetts Department of Transportation – Highway Division's 2009; Stott 1993).

After this early spate of bridge construction in Massachusetts, Blaisdell moved west to Arizona in 1884 with his brother Frank G. Blaisdell. Here, Blaisdell expanded his engineering career with spectacular results. He found work as a mine engineer in Yuma area, and then decided that the region had potential for large-scale agriculture. Between 1886 and 1889, he engineered and helped to finance two irrigation canals, the Araby and the Mowhawk, which would draw from the Gila River. Following this effort, he founded two large farms and orchards in 1891 and 1892, while his continuing his mine work. In 1892, Blaisdell expanded into municipal services, winning a franchise for the supply of electricity and water to Yuma. Under Blaisdell's direction the Yuma Water and Light Company constructed complete electrical and water supply plants for the city. In this capacity, Blaisdell achieved national prominence by designing and patenting a pioneering water filtration system, the Blaisdell Slow Sand Filter Washing Machine. This invention added additional capacity and efficiency to existing water purification technology by providing a means to clean sand in a sand filtration bed rapidly and with only one employee. Blaisdell's original Slow Sand Filter Washing Machine in Yuma was listed individually in the National Register in 1978 and his Yuma Main Street Water treatment Plant was determined eligible for listing in the National Register ca. 1993. Both resources are recorded in an Historic American Engineering Record (HAER) documentation (Gerald A. Doyle & Associates, P.C. and John Carollo Engineers 1994).

In 1899, Blaisdell invested in the King of Arizona Mine, which he improved and expanded by identifying and engineering additional water supplies for ore processing. Blaisdell capitalized on his success in water-supply and mining by moving to Los Angeles, California in 1907. There he established the Blaisdell Sand Filtration Company and the Blaisdell Company, the latter of which manufactured cyanide milling machinery for gold mines. He operated both of these companies until ca. 1922, when Blaisdell retired. He and his wife Alice B. Linder moved to Philadelphia, where Blaisdell died in 1934. Blaisdell is buried in Concord, Massachusetts (Gerald A. Doyle & Associates, P.C. and John Carollo Engineers 1994; Stott 1993). *continued*

INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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National Register Assessment

The Craddock Bridge is a distinguished masonry arch bridge structure designed by a famous Massachusetts-born engineer. It is flanked by and incorporates elements of the MPC's Craddock Dam, which was a significant component of the MPC's metropolitan Boston parks system that was included in the Olmstead Brother's plan for the parks. However, the Craddock Bridge and associated elements of the Craddock Dam are not recommended as eligible for the National Register of Historic Places due to a lack of integrity. The 1908 Craddock Dam construction program and 1934 road widening significantly altered the 1880 stone arch structure's design, setting, and workmanship. Two other extant bridges designed by Blaisdell, the Newton Street Bridge over the Charles River in Waltham (state bridge no. W-04-002, built 1877-1878) and Flint's Bridge in Concord over the Concord River (state bridge no. C-19-013, built 1877-1878), retain their integrity and are superior examples of Blaisdell's work. The 1978 removal of dam and lock components altered the design of the Craddock Dam and rendered it unable to convey its historical significance within the context of the MPC's park construction.

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Continuation sheet 5

INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

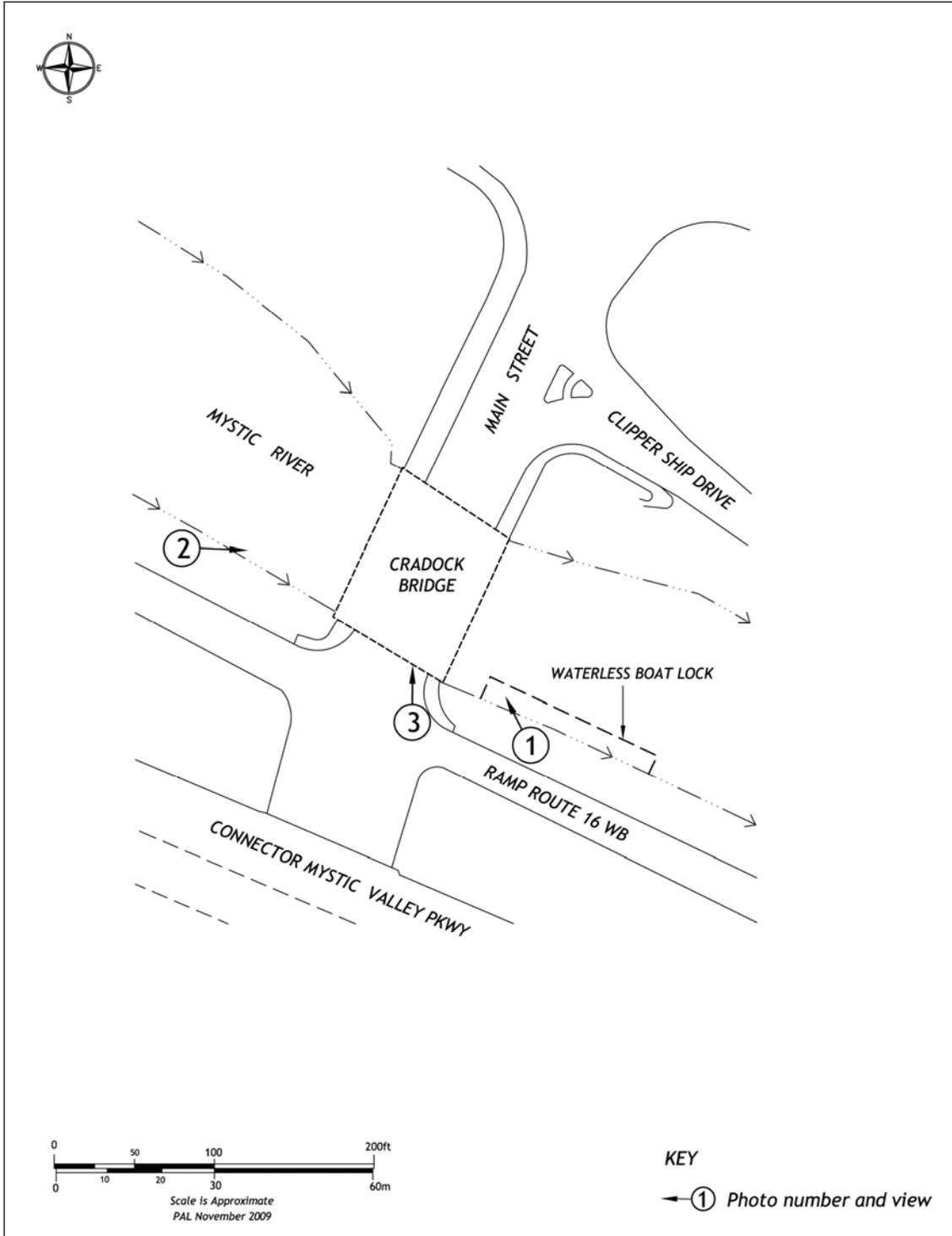
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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PHOTOGRAPHS

Photograph Key



INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

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Photograph 1. East elevation of Cradock Bridge. 1880 masonry arch spans are at right and ca. 1921 concrete span is at left. In foreground is the 1908 waterless boat lock.



Photograph 2. West elevation of Cradock Bridge. Deck on this side of the structure was added in 1934. Below the deck are concrete remnants of 1908 tide gates and dam, which formerly extended upstream.

INVENTORY FORM CONTINUATION SHEET

[MEDFORD]

[Main Street over Mystic River]

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD, BOSTON, MASSACHUSETTS 02125

Area(s) Form No.

--	--



Photograph 3. Deck of Cradock Bridge, looking northwest.



Photograph 4. 1908 waterless boat lock immediately downstream of Cradock Bridge, looking southeast. A second boat lock, also erected in 1908, stood adjacent to this structure.