FINAL REPORT
Waban Hill Reservoir Advisory Group (WHRAG)

June 6, 2013

The Waban Hill Reservoir is like no other site in our city. Perched near the peak of the highest hill in Newton, visitors are treated to breathtaking panoramic views including spectacular sunrises and sunsets. The 5-acre Reservoir site provides a unique opportunity for enjoyment for people of all ages and from all neighborhoods, away from the bustle of the streets below. The WHRAG strongly supports the acquisition by the City of Newton of the Waban Hill Reservoir site, a site of unique topographic and historical significance, to expand and enhance the public open space resources for the citizens of Newton. The Reservoir is easily accessible, being located at the top of Heartbreak Hill, directly adjacent to Commonwealth Avenue.

The Waban Hill Reservoir has long been a potential target for acquisition by the City. The City of Newton *Recreation and Open Space Plan Update 2013- 2019* ("Newton Open Space Plan"), in Section 7, page 10 of 16, explicitly states the goal: "Explore opportunities for acquisition of Manet Rd. MWRA reservoir for possible use to meet active and/or passive recreation needs." (See Appendix 3 for detailed discussion of how the Plan for site use meets Newton's Recreation and Open Space Plan.) Key arguments for acquiring the reservoir site are the following:

- The site's elevation and topographic prominence create a unique Newton landscape that affords to the public broad vistas not available elsewhere in the city.
- The site location along Commonwealth Avenue at the top of Heartbreak Hill, a popular walking, running, biking route, provides an opportunity to create a citywide destination.
- The site is located in a portion of Newton which is relatively underserved in terms of accessible open space resources.

The MWRA is now in the process of decommissioning the reservoir, which presents an unexpected opportunity for the City to purchase a valuable property at a vastly reduced price, provided the site is used as open space.

The Committee believes that preservation of the Reservoir, as a 2.9 acre body of water, is the single most important aspect of future use of the site. Water is a magnet for all types of people and activities. The popularity of water cannot be understated as evidenced by the number of people attracted to places like the Chestnut Hill Reservoir, Bulloughs Pond, the Charles River and the Brookline Reservoir. Water allows for both activity as well as contemplation, as a place to gather and a place to be alone. The Waban Hill Reservoir site will be attractive to many different populations in Newton who will use it for a variety of purposes. There is no other site in Newton, where one can walk or run along a wide, flat path around a large body of water (see Appendix 1, which shows how the Waban Hill Reservoir is unique among other Open Spaces in Newton). Despite the fact that Waban Hill Reservoir has been fenced off for decades, it nevertheless has drawn many visitors, who walk or run around the periphery, or who stop to appreciate the remarkable vista from one of the highest points of elevation in the City of Newton.

By simply making the site safe for public access, the Waban Hill Reservoir could become immediately usable, without requiring expensive, major modifications. Street level access with on-street parking currently exists at three distinct locations on the site, which provide access to both the berm crest as well as the grassy, lower expanse around the earthen dam. While the Reservoir is the most dominent feature of the site, the opportunity exists for additional features to be added in the future. The site could be further enhanced by the addition of: an imaginative pre-school play area with water features (possibly incorporating the berm slope); a informal mini-amphitheater at the highest point of the site; shaded seating at various points, both on the berm and in the lower area; stretching stations throughout the site; terracing of the exterior of the berms to expand plantings and seating; public art located at various points around the site; an orchard of apple trees managed by Newton Community Farm; and tables at the lower part of the site, as well as at the entrance closest to Commonwealth Avenue.

The WHRP Plan transforms a currently inaccessible parcel of land into a welcoming open space, that addresses a number of goals articulated in the Newton Recreation and Open Space Plan. The Plan is a simple, relatively low cost and low maintenance approach that will benefit the entire City and all of its residents, and will be able to support additional uses and features over time.

Abstract

The Waban Hill Reservoir Advisory Group (WHRAG) was appointed by the City of Newton to provide community advice to the Board of Aldermen concerning the acquisition and use of the Waban Hill Reservoir. The committee consisted of the following persons: Steven Bader, Madelyn Bell, Peter Clote, Sharon Cushing (nonparticipating), Novelle DuPen-Meyerhoff, Cathy Eaton, Muriel Esdale, Jean Fulkerson, Ben Ostrow, Gail Silberstein, Susan Servais, Dan Von Kohorn, co-chaired by Gail Silberstein and Peter Clote. The committee was tasked to formulate a vision about how the Waban Hill Reservoir site could be designed as open space to benefit residents from all parts of Newton, if the City of Newton were to acquire the Waban Hill Reservoir site from the Commonwealth of Massachusetts. In this report, we describe background issues, provide a case for Newton's acquisition of the reservoir site, and furnish a compelling vision of how to construct an open space park that provides a unique contribution to the Newton park system.

Contents

1 Background history

The Waban Hill Reservoir dam was constructed in the late nineteenth century, to provide high service pressure and storage of water for the City of Boston and neighboring communities.[1]

The reservoir was filled by water pumped through a water supply pipeline located in the pump house. The dam comprises 2.9 acres in the 5 acre terrain, with a length of 1,100 feet (along Manet Road or Woodlawn Drive), and a height of 22 feet, as measured from the toe of the embankment along the southern (Ward Street) side. Along the entire periphery of the reservoir, the crest of the berm is flat with a width of approximately 15 feet.

Though originally constructed to supply drinking water for proximal residents in Newton and Boston, the reservoir has not been used for that purpose for many years. The MWRA has now determined that the Waban Hill Reservoir is no longer needed, and is now in the process of decommissioning the reservoir. This presents an unexpected opportunity for the City of Newton to acquire a unique landscape, which provides a vista of unparalleled height combined with a large, rain-filled body of water.

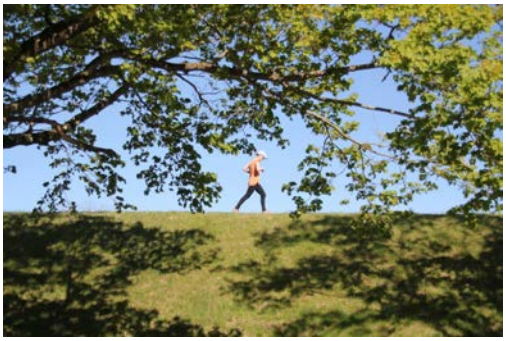
The average height of the dam is 269.5 ft. above sea level, which is one of the highest points of elevation in Newton, thus providing a vista that attracts Newtonites from all over the City, who visit the reservoir to appreciate the peace and quiet afforded by this unique site. Even though there is no access to the site, due to the existing fence, it is still a haven for walkers and runners. The Waban Hill Reservoir affords a remarkable landscape, with a view of the setting sun lying above a canopy of green treetop foliage, with sparkles of luminescence reflecting from the surface of the water in the reservoir.

Figure 1: A view of Waban Hill Reservoir.

2 Plan for use of site

This Committee as well as non-WHRAG members present at the public meetings recognize the uniqueness of the Waban Hill reservoir site. The beautiful views at all times of day and the large body of water far from traffic and streets, around which all ages of people will be able to walk (including those with limited mobility) are not available anywhere in the City.[2]

The WHRAG considered various names for the site. Since the Waban Hill Reservoir is located at the top of Heartbreak Hill, directly adjacent to Commonwealth Avenue, the Committee felt that it would be appropriate for the City of Newton to recognize the connection between the Park, Heartbreak Hill and the Boston Marathon. This desire is especially strong considering the horrific events during the 2013 Boston Marathon and the Committee's desire to honor all the marathon participants and those whose lives are forever changed. One of the names proposed is "Reservoir Park at Heartbreak Hill". For purposes of this report, we will refer to the site as "Reservoir Park".



The entirety of Reservoir Park will be accessible to all visitors. Street level access with on-street parking exists at three distinct locations on the site, which provide access to both the berm crest as well as the grassy, lower expanse around the earthen dam. Terracing of the exterior berm faces will allow the planting of trees, shrubs and flowers. These terraces will also allow for the addition of seating and viewing areas, as well as permitting access to the berm crest from locations not already accessible from street level. Reservoir Park will be enjoyed year round with "four-season of interest" shrubs and trees as well as flower gardens. Seating in both shaded and sunny areas will be added. An innovative tot lot will be built to encourage creative exploration and play. In keeping with the aquatic theme, the play area will include water features – see photos below. We envision that Reservoir Park will have many of the features consistent with an "**Eco-Park**" (`http://www.crexcursions.com/eco-park-development/recrecreational_eco-park_definition/`). An investment now will conserve this special place for future generations, who will come from all across Newton to share this unique Park, accessible to all, to enjoy its beauty, features and activities.

Immediate Use of Reservoir Park

- The Plan can be done in phases. All of the proposed ideas contribute to the strength of the vision but there are some that can be implemented early on, that will allow immediate use of the site by the public without requiring major capital expense and costly maintenance.
- Active public use of the site can begin with: the removal of the existing fence; the creation of accessible walking paths on the crest of the berm; the installation of benches at various locations; for safety purposes, fencing on the top of the berm. Immediate use of the grassy open area (at the corner of Woodlawn Drive and Reservoir Drive area) can be used for non-organized activities from ball sports and kite flying to sunbathing and tai chi.
- Additional features can be added as resources are available.

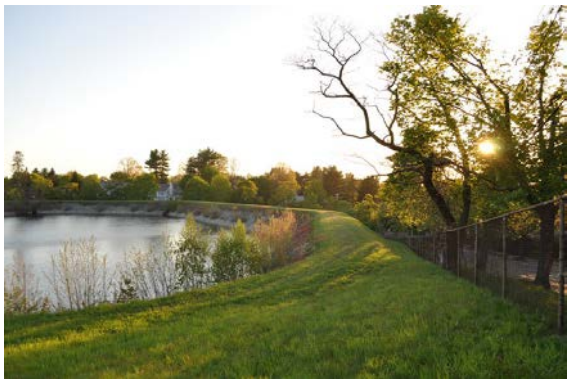
Figure 2: Possible site plan for immediate use. Design prepared by Schnee Architects, Inc.

2.1 Reservoir Park Specific Features

Water: A large body of water, filled by rain and periodically drained to maintain proper water level, is the most prominent feature in Reservoir Park. In keeping with the Park's vision, water naturally promotes a peaceful reflective engagement, whether sitting at or walking around the berm crest. The height of the upper walking paths will allow the visitor to experience a "back to nature" experience truly unique in the City. [3]

Figure 3: Waban Hill Reservoir in spring (left and bottom) and winter (right)

Walk with a View: A 10-15 minute walk along the elevated berm crest allows for a spectacular view around the entire site and surrounding area. Visitors of all ages will appreciate the expansive vista while walking on a flat path that can easily be shared by walkers, including people walking dogs on leashes, joggers, strollers and wheelchairs. On the berm crest, the line of sight is at the level of the treetops, giving the impression of a "sea of green foliage" beyond which is a view of Mount Wachusett. Benches to be constructed along the path will allow visitors to appreciate the natural beauty of the site.



Spectacular Sunsets: Reservoir Park is among the highest points in Newton. It offers unique and stunning views at all times of day but especially at sunset. The tranquil setting is enhanced by the natural body of water. The topographic high point at the corner of Manet and Reservoir will allow for the creation of a seating area to enjoy both the view of the water in the foreground and the wider vista of Newton and beyond at any time of day. This could be a good location for interpretive information about the Park, its history and about significant landmarks beyond the immediate site such as Mt. Wachusett.

Figure 4: Spectacular sunsets

Gateways: The location of Reservoir Park at the top of Heartbreak Hill meshes beautifully with all aspects of both Heartbreak Hill and the Boston Marathon. Reservoir Park will welcome those using Heartbreak Hill for exercise and training at all times of year. Runner/walker specific amenities can be added including: water fountains, stretching areas as well as picnic tables to encourage use of the entrance at Manet and Ward street as a meeting place and/or destination spot. This entrance will be enhanced with signage to provide an overview of the site features and Park and Recreation Department rules in accordance with all disability access regulations.

Figure 5: Commonwealth Avenue Gateway at Manet/Ward.

The Woodlawn/Reservoir corner will be a gateway for those entering Reservoir Park at the relatively flat wide open "lower" section of the Park.

Figure 6: Woodlawn/Reservoir corner

The Manet/Reservoir gateway will welcome visitors whose first step may be at this highest point in the Park.

Figure 7: Gateway at Manet/Reservoir, where berm crest is at street level.

The corner of Ward Street and Woodlawn Drive will be another gateway entrance from street level up to the berm crest possibly using the existing stairs.

Figure 8: Gateway at Woodlawn/Ward.

Multi-Use Paths: Berm-top stone dust paths and new perimeter sidewalks will connect the Gateways to Reservoir Park features.

An Imagination Playground area with creative play equipment: The area at Woodlawn Drive and Reservoir Drive is a relatively flat, wide open section of Reservoir Park, to be designed for pre-school children (age 2-5) which satisfies a need not currently met in Ward 7. It will be equipped with innovative play structures consistent with the vision of the Park providing another opportunity to reinforce the Park's water and environmental themes and will attract families from all over Newton. The play structures will designed for all children, including those with impaired mobility. Age-appropriate water features will enhance sensory play and support learning opportunities. Some earth moving may be necessary to ensure that the facilities accommodate accessibility issues. Parks and Recreation will be consulted on the issue of appropriate fencing and/or separation of this area.

Figure 9: Imaginative playgrounds

A Hands-On Water Feature: This will provide an opportunity for children (and adults) to play and cool themselves in a fountain or spray area that may be designed in a sculptural and/or artistic nature in keeping with other Park themes. This could be a misting fountain, water rills, a slide/sluice, or other form of falling or moving water that creates visual interest and inspires exploration and fun.

Figure 10: Images of water rills

Free space: The grassy open area (at the corner of Woodlawn Drive and Reservoir Drive) will be used for non-organized activities, to accommodate informal recreation from ball sports and kite flying to sunbathing and tai chi. There will be seating and picnic/game tables for adults. (SeeSee photo of Northwest corner of Reservoir and Woodlawn) The berms will be planted with a mix of native wildflowers to provide interest, beauty, and a habitat for birds, butterflies, and other wildlife.


Figure 11: Free space at Waban Hill Reservoir.

Newton Community Farm: Representatives of the Newton Community Farm visited the Waban Hill Reservoir site on May 6, 2013. They are very excited about the proposed Plan and suggest the possibility of planting of a number of 'heirloom' apple trees, representing several 'old fashioned' varieties. Their vision is that the trees would be located in the open area and could provide both shade as well as interest from visitors. The expertise of a landscape architect would be critical in this determination.

Green Decade: The president of Green Decade, Marcia Cooper, visited the Waban Hill Reservoir site on May 4, 2013. She endorsed the proposed Plan and agreed to include her statement in this report.

> "In general, we [Green Decade] support the most environmentally sustainable use of the property and if there is one special request, it is to include the current area of water on the site in the final plans. ... We trust that your committee's final report will have the solid support of our organization, and the good work you are doing is greatly appreciated."

Public Art: Thoughtfully conceived public art installations will energize Reservoir Park. By capturing the spirit and atmosphere of Reservoir Park, public art will appeal to all generations.

Figure 12: Public art examples.

Figure 13: Public art can be functional, as shown in these bike racks.

Informal Mini-amphitheater: An amphitheater of modest size will be created at the highest point (corner of Manet Road and Reservoir Drive) and finished with stone seating or as terraced grass. A flat "stage" area at the base of the slope could support informal performances or presentations.

Figure 14: The northeast corner at Manet/Reservoir could could have terraced stone seating with a view to the water, as shown on the left in this image of Bates College (photo courtesy of Schnee Architects, Inc.

Upper Pathway Pergola: Pergolas of various sizes may frame the highest points of Reservoir Park at the crest of the berm at the corners of Manet and Reservoir Drive. These vine-covered structures will provide shade for the benches beneath and will support the sense of natural continuity. In addition to providing a beautiful, reflective space, the pergolas, with their scenic backgrounds, would be a desired location for photo opportunities.

Figure 15: Pergolas, which provide shade and present photo opportunities.

Stretching Stations: These may be installed along the pathways and/or in the "free space" for use by all.

Self-guided Eco-Education Tour: Signage for multiple stations will be woven through the landscape, integrating the water features, gardens, and four season of interest planting areas, which will create a needed amenity for Newton schools and summer camps.

Cross-Country Skiing After a snowfall, both the top of the berm as well as the perimeter of the Park can be used for cross-country skiing.

Figure 16: Waban Hill Reservoir after snowfall in March 2013.

Gatehouse More research needs to be done to determine the historic significance of the gatehouse. If the gatehouse is restored, it may have multiple uses consistent with the vision of the site. If the gate house is removed, the area could be designed for other uses. Repair of the stairs will be necessary if a determination is made that this is a good access point to the crest of the berm. Repair and maintenance costs must be considered when determining the future of the gatehouse.

Figure 17: Gatehouse of Waban Hill Reservoir.

2.2 Long-term possiblities

In an attempt to integrate water as a dominant feature of Reservoir Park, the Committee felt that providing direct access to the reservoir basin might be an immensely attractive, but potentially complex and expensive feature. Though swimming would not be allowed, direct access to the water would be great fun for children. By draining the water to a level of several inches in the winter, the reservoir could provide a natural area for ice skating. Discussions with City officials highlighted the complexity of water access, both in terms of engineering for accessibility as well as addressing safety issues. The following two features are included as possibilities, understanding that they would require extensive examination of all related issues.

Water Access Access to the water in the reservoir could further encourage exploration, education and creative play including the possibility of ice skating in the winter months. Exact details of how to create safe water access as well as maintain safety of people at the water's edge must be examined by appropriate City officials and may be aided by professional design experts.

Ice Skating Keeping in mind, the safety concerns mentioned above, Reservoir Park could be ideally suited to provide a natural ice skating pond. The water in the reservoir could be drained to a depth of several inches. Currently there are few opportunities for outdoor skating in Newton.

2.3 General Universal Features

The Park operations will be limited to dawn to dusk; therefore, no internal lighting will be required – lighting will be limited to perimeter street lights; There will be no public restrooms on site.

Access and Accessibility

- Walkways in the Park will be of ample dimension to safely accommodate a mix of users/uses;
- All walkways in the Park will meet or exceed universal access standards;
- Paths edges will be variously marked, fenced, or planted to reduce the likelihood of off-path walking, resulting in erosion and maintenance problems; and
- A clear and engaging sign, map, and way-finding system will direct people to the Park and inform them about what it offers.

- Bicycle racks will be provided at the various gateways at Reservoir Park but bicycles will not be permitted inside the Park. Consistent with Ordinances of the City of Newton, WHRAG recognizes that one should not mix pedestrians with bicycle riders.

Art and Design

- The water theme will be incorporated whenever possible throughout the Park.
- Benches, signs, trash cans, playground equipment, and bike racks will be explored as opportunities to incorporate functional art into the Park design.
- A common design/artistic theme (again, perhaps water) will be explored to unify various Park elements.
- Opportunities will be explored to introduce public art into the Park as sculpture or other forms (partnership opportunities with various Newton organizations).

2.4 Sustainability

- Explore innovative approaches to dealing with stormwater management-understanding the timing issues around reduction of reservoir water level during/after storm events.
- Explore and develop sustainability educational opportunities relating to plants, gardens, water, nature.
- Explore and develop sustainable design guidelines for low maintenance, re-use of existing materials, native plants, drought tolerant species and pervious materials.
- The proposed design is low maintenance to withstand "abuse" and periods of reduced maintenance.
- Aim for excellence in design, but find ways to limit maintenance burden on the City staff.
- Sustainable design and construction will be incorporated into project implementation, including the reuse of site elements, planting of native and drought-tolerant plant species, and use of pervious paving materials and other low impact design efforts to reduce storm water run-off.
- The design will seek to create an attractive, but durable landscape that will withstand the test of time and require as little maintenance as possible.

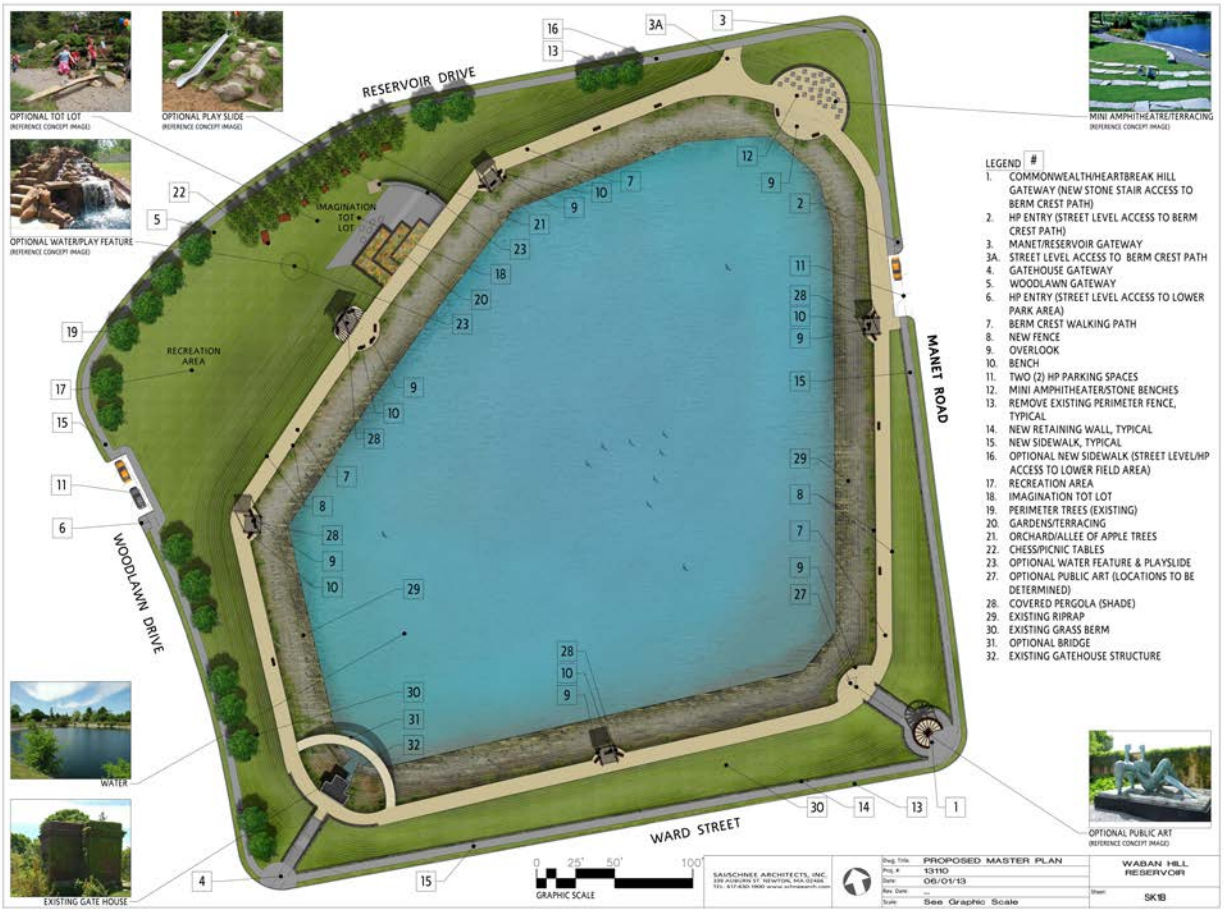


Figure 18: Possible site plan, after the addition of various features suggested in this section. Design prepared by Schnee Architects, Inc.

2.5 Plan details in a nutshell

The WHRAG met from January through April, 2013. After many meetings and hours of discussion, the Committee agreed on all the features just described. In this section, we summarize those features in order of priority, and indicate which are necessary for immediate use of the site.

Steps to be taken for immediate use

1. Retain the reservoir water in its entirety.
2. Remove current periphery fence and install new safety fence(s) along berm crest.
3. Add stone dust handicapped-accessible pathway along berm crest.
4. Provide handicapped parking spaces along Woodlawn Drive (see Figure 18).
5. Add accessible pathway at three existent street-level access points.
6. Use the grassy "free space" for non-organized recreational activities.

Intermediate steps

1. Create an imaginative pre-school playground on the large, flat area of the site.
2. Install benches for seating throughout the site.
3. Create Gateways at each corner of the site for increased visibility, accessibilty, and to welcome visitors.
4. Add accessible pathway from grassy, open area to top of the berm.
5. Work with Newton-based non-profit organizations, such as Newton Community Farm and Green Decade, to install sustainable and eco-friendly features.
6. Create semi-circular seating and viewing area at highest point of the site, which could serve as informal mini-amphitheatre.

Later steps

1. Provide additional handicapped parking spaces along Manet Road (see Figure 18).
2. Install way-finding signage to increase site visibility and highlight site features.
3. Erect a fitness trail or stretching stations.
4. Explore the possible connection between the site and Heartbreak Hill and the Boston Marathon.
5. Install pergolas for shade.
6. Install public art (both functional and aesthetic).
7. Create "hands-on" water features near the pre-school playground.
8. Construct sidewalks along the outer periphery of Reservoir Park.

3 Costs, traffic and safety

3.1 Costs

The Plan is the most fiscally conservative of all possible uses discussed by the Committee, because it creates recreational space with little initial work. Without substantial and costly earth moving, it retains the reservoir surface area at its current size and elevation. While exact costs are largely unknown, the Plan is by far, the most economical proposal for future use of the site, both in terms of initial costs for realization and for ongoing maintenance. Implementation would require no heavy civil engineering work, since it does not involve major modifications to the berm or the existent reservoir floor infrastructure.[4] In addition, no drainage work needs to be done, since the reservoir would continue to collect rainwater.

Immediate Maintenance and Repair

According to Section 3.7 "Opinion of Probable Costs" of the 2012 MWRA Report, the following repairs should be undertaken:

- Clearing unwanted vegetation.
- Reset upstream slope protection (riprap located on the interior walls of the reservoir basin).
- Fill voids at staircase leading to the gatehouse.
- Trap and remove burrowing animals.

MWRA estimates for the above work are between $216,000–$338,000. Additional costs of Engineering and Design, Permitting and a Contingency amount are an addition of $83,000–$142,000 to the above listed work.[5]

After repairs are completed, periodic dam inspections will be necessary, as well as routine maintenance such as regular mowing of the grass and upkeep of the trees and shrubs that may be planted.

Prior to any considering the implementation of any plan, the Committee recommends that a landscape architect be engaged to address existing conditions and implications of the proposed future use.

Ongoing maintenance

According to an email dated 28 May 2013 from Kevin A. McCluskey, Director of Public Affairs for the MWRA, the MWRA out-sources maintenance work for the Waban Hill Reservoir. He states that: "The cost for UNICCO (www.unnico.com) contract landscape services at Waban Reservoir per year is $13,900. This service includes 24 mows, 3 lawn fertilizations, one application of lime, spring cleanup and fall cleanup." Mr. McCluskey goes on to say that "the site is difficult to maintain due to the slope of the land and required weed whacking of the areas by the fence that surrounds the property".

In answer to the question of how often the earthen dam of the reservoir would have to be inspected, if the Waban Hill Reservoir remains a reservoir, Mr. McCluskey stated: "If Waban is to remain a dam and continue to impound water (with impounded water it is classified a High hazard Class dam), it will require a Phase I Dam Safety Inspection every two years. The next inspection is due 09/07/14."

Summary

The Plan is a simple, relatively low cost and low maintenance approach that will benefit the entire City and will be able to support additional uses/features over time, provided there is sufficient funding and interest. WHRAG is sensitive to the fact that the City of Newton has many sites that are currently not properly maintained and wants to offer the Plan as a way to improve the site without significantly adding to the City's maintenance burden.

3.2 Traffic and parking

Traffic and parking issues should be addressed according to uses proposed in the the plan adopted for the site.

WHRAG considered the issues of available parking and determined that there is sufficient on-street parking to accommodate all anticipated visitors to the site. See Figure 19, which indicates nearby street parking; Appendix 3 describes the current parking restrictions near Waban Hill Reservoir. Potential changes in parking should be reviewed as needed by the Traffic Council. Handicapped-only parking spaces will be provided.

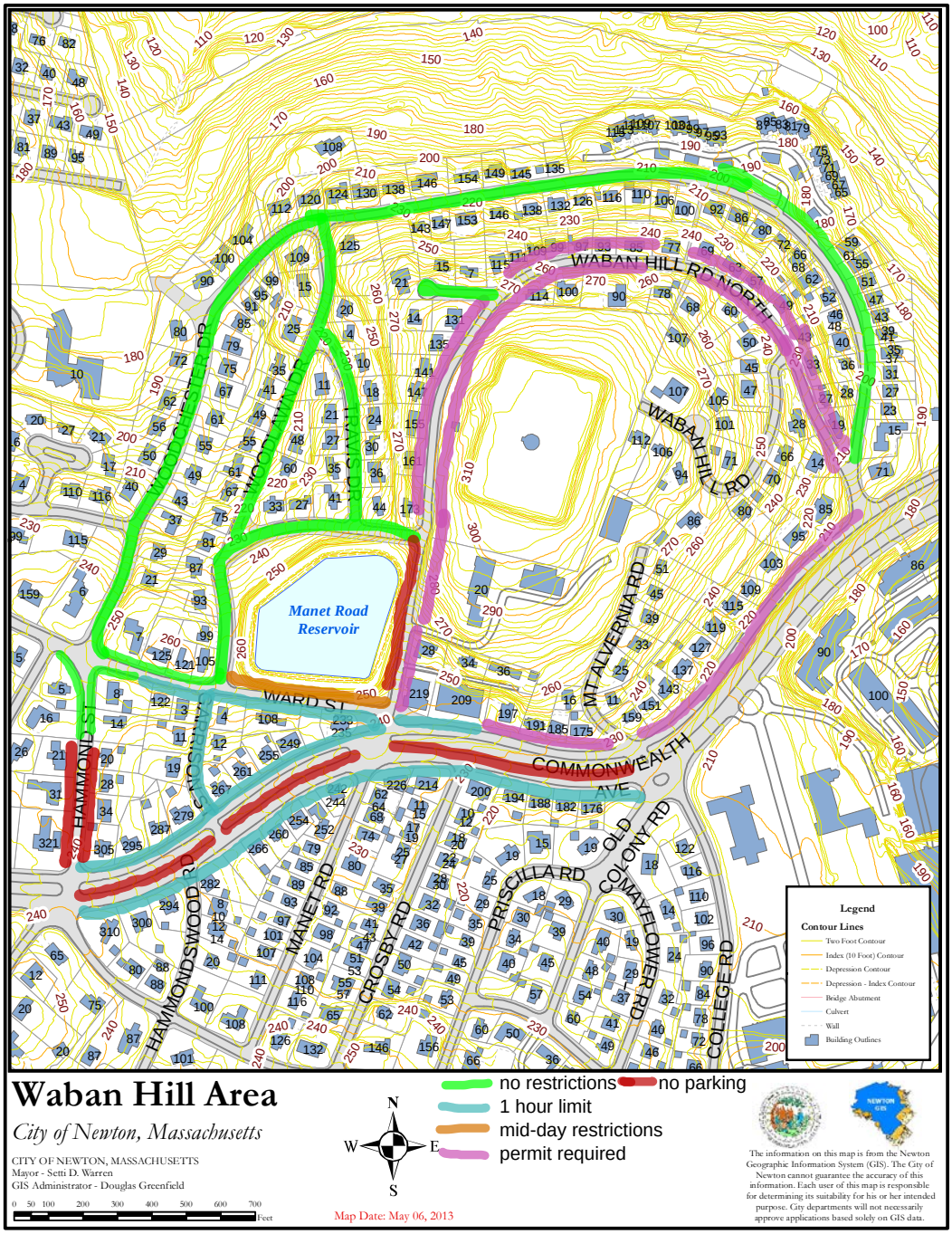


Figure 19: Parking near Waban Hill Reservoir

The Committee supports the consideration of a sidewalk along the periphery of Reservoir Park, which would allow for increased accessibility and for multiple uses, with a separate "bike path" as part of the sidewalk if space permits and if financially feasible. A sidewalk would be a wonderful addition to Reservoir Park, but is not required. In order to incorporate such a sidewalk, while maintaining 2-way traffic on Manet Road, the Committee suggests consideration of whether parking could be **eliminated** on the section of Manet Road that runs between Ward Street and Reservoir Drive.

Figure 20: Need for perimeter sidewalk

Traffic and parking issues in the area should be studied and addressed. The Committee recommends addressing the current traffic issue at at the corner of Woodlawn and Reservoir (currently a traffic hazard – see Figure 8), and suggests a narrowing of the roadways, possibly squaring off the intersection or other methods to slow traffic. This will be especially important since this corner will be a gateway entrance to Reservoir Park. Any resulting additional available land may be used to expand that portion of the park.

3.3 Safety and Security

Public safety is of paramount concern. The WHRAG recognizes the inherent safety issues in Reservoir Park, with its high sloping berms and the large volume of water. Committee members have met with representatives of the *Parks and Recreation* Department, and agree with their safety recommendations. Suitable barriers and/or fences must be considered to ensure that Reservoir Park is a safe place for all to enjoy. (See fence of Jackie Onassis Reservoir in New York City.)

Figure 21: Jackie Onassis Fence in NYC.

The following issues should be addressed by Newton Parks and Recreation Department in conjunction with Legal Counsel.

1. Address safety and liability implications for the City of Newton including consideration of required physical barriers, both on pathways and in pre-school play area.[6]

2. Develop a park security plan including rules, emergency call boxes and explore how the design can create a safe environment for park users in consultation with Newton Police and other experts.

3. Consult with City Public Safety personnel to address areas that could encourage loitering, vandalism, and other crime.

4 Process

As a procedural tool to go beyond the brainstorming stage, the Committee conducted a survey, both from the Committee and wider community, to determine some of the most desired features and uses of the Waban Hill Reservoir site, were the City of Newton to acquire the property from the MWRA. By analyzing the survey results, it became clear, even early in the deliberation process of the Committee, that many people, both from the Committee and the wider community, supported

the concept of a quiet park, with gardens, trees and pathways, in which water plays an integral and historically significant role.

To allow for diligent discussion and due process in considering all the different ideas proposed in the brainstorming sessions, the Committee created a *"vision statement"* to provide a framework against which various options could be discussed and evaluated. That vision statement follows.

Water and stone are an integral historic and architectural feature of the site and should be incorporated into any future use.

- Water should continue to be the dominant theme of the site, with a preference for the maintenance of a natural body of water.
- The water basin should continue to hold water – either at its current size or reduced to no less than one-half the current size.
- Water could be a theme incorporated into any play areas or sensory experiences; additional water features could include, for instance, fountains, rills, sluices, and spray mats.
- Means should be devised to maintain the water quality in a reasonable state – for instance, by judicious introduction of flora/fauna to maintain an ecosystem that avoids stagnation, or by introducing a pump and filtration system.
- Existing stone at the site should be incorporated into future uses.
- Reuse of the gate house could be considered
- A signage program should be developed to help communicate the history of the site, connect the site to its location in Newton, and provide a map of the site.

Maintain the scenic vistas available at the site.

- The views available from the top of the earthen berm are unlike any others in Newton, and should be retained as much as possible.
- The height of the earthen berm running along Manet Road from Reservoir Drive to Ward Street should be retained to allow a full view of the breadth of the site as well of Heartbreak Hill
- All pathways and landscaping should enhance the quality of these scenic vistas and should be accessible to all.

The primary use of the site should be to enjoy its scenic quality, remote from traffic, with an emphasis on universal accessibility.

- A creatively designed network of accessible pathways and accessible seating areas should be installed throughout the site to encourage walking and other activities.
- An accessible path along the top of the earthen berm is critical, as it would provide a unique and special experience for the physically impaired unlike any other accessible park in Newton.

- The site design should include a perimeter route around the top of the earthen berm, around the outer edge of the site, and possibly within the interior of the water basin.
- The path and seating design should emphasize the site's scenic vistas, and provide a historical connection of the park to Heartbreak Hill.
- Entrances to the pathways should be designed with accessibility in mind. Specific parking should be provided near one entrance to accommodate the physically impaired.

Additional landscaping, creative plantings, and public art, should be installed to enhance the scenic quality site through four seasons of use.

- The topography of the site should be seen as an asset and used to enhance the pathways, play areas, and allow for a superior experience for the disabled.
- New plantings should be used to soften the stark quality of the berm as seen from the street.
- Creative terracing, accomplished by adding new soil to the berm embankment, rather than cutting into the berm, should be implemented to improve the site including, but not limited to: creating access paths to the dam crest, creating additional areas for plantings, incorporating water rills or other features into the site.
- Plantings should provide shade, and add to the sensory experience of all users.
- Creative landscaping solutions should offer opportunities for partnering with other organizations within Newton, such as neighborhood associations, garden clubs, and Newton Community Farm.
- Reuse of the site could take advantage of the slope to create a natural grassy amphitheater-like gathering area that could double as a sledding hill in winter months.
- The Committee recognizes the value of public art. It builds a sense of place and community, and contributes to the image and identity of the community and City. Public art is freely accessible-it captures the eyes and minds of people passing through public spaces and can encourage viewers to contemplate their surroundings. The inclusion of public art will certainly enhance the uniqueness of the Waban Hill Reservoir site.

New features of the site should be a creative and universally accessible children's play space, and a grassy multi-purpose area in the northwest corner of the site.

- The unique quality of the reservoir site demands a play space of the most creative design, and should incorporate the topography, water, and stone in a space that would be unlike any other play area in Newton.
- There is currently no play facility for pre-school children in Chestnut Hill and one is needed in the community.
- The low portion of the site, at the intersection of Woodlawn Drive and Reservoir Drive is the most appropriate location for a play area and multi- purpose space.
- Play spaces will broaden the appeal of the site to a multi-generational group of users.

- A flat grassy area should be designed to allow spontaneous play, and should not support organized scheduled activities related to league or team play within Newton.
- New uses could offer multi-seasonal activities, such as a grassy amphitheater- like slope for summer community use that could transition to a sledding hill in winter. The water could be drained to a level of several inches, to permit ice- skating in winter, provided that draining the water does not jeopardize aquatic life or ecosystem.
- The Committee intends to further discuss the desirability (or not) of a hard court surface. The inclusion or not of a hard-court surface will depend on which proposal[7] is adopted, consistency with the neighborhood and its surrounding environment, as well as the neighborhood's desire for such terrain.

The streets around the site need to be made safe for pedestrians before additional users are brought into the site.

- The primary goal should be to make the site pedestrian accessible, even if at the expense of street parking.
- A qualified traffic engineer should review the potential for removing parking from area streets, including portions of Manet Road and Ward Street, and adding sidewalks around the entire site.
- The corner of Woodlawn Drive and Reservoir Drive is a driving hazard and should be re-designed before pedestrians are encouraged to cross the street into the reservoir site.
- Adequate on-street parking is available for the uses envisioned in these principles, but should be monitored to assess if future parking restrictions are needed.

THE WHRAG believes that any future use of the site should be measured against these principles in order to preserve the unique architecture and quiet environment of the site, and to enhance the recreational benefits the site could provide for the residents of Newton.

5 Features discussed and deemed incompatible for the site

The WHRAG was tasked with proposing an open space vision for the Waban Hill Reservoir, if the City of Newton were to purchase the site.

Organized Sports, and in particular Youth Soccer: The WHRAG discussed the option of including organized league sports as well as tennis courts, with particular discussion of youth soccer. While there may be a need for more soccer fields in the City, the WHRAG determined that Reservoir Park is better served by the creation of a space that does not exist anywhere in Newton-and is more valuable as a place to serve all those who are underserved in the City. League sports are an important asset to the City of Newton; however, it was felt to be incompatible with and its inclusion would diminish the vision of the site articulated earlier in this report.

Basketball Court: Basketball was another idea considered by the WHRAG. While some members felt that basketball would be an acceptable addition to the site, the consensus was that this was not an appropriate activity for inclusion. It was felt that basketball is inconsistent with

the vision of the space as a place for engaging in activities in a quiet and peaceful setting. The features in the Plan are varied and inclusive to everyone in the City. The Plan specifically highlights features appealing to adults, families with small children, seniors, people of all ages with limited mobility, and anyone else who wants to enjoy a beautiful peaceful site.

The Open Space Plan recognizes the need for these kinds of spaces:

> Moreover, the emerging "aging in place" trend, points to the need for greater emphasis on passive use approaches such as nature trails and walkable areas which are sensitive to the specific needs of the City's elderly and accessible to persons with disabilities or mobility challenges.

Reservoir Park is a perfect venue to serve this need and this population. The Committee discussed and determined that there are some uses which are incompatible with the "vision" for the site, which include the more "active" uses outlined above.

Finally, the proximity of the the Ward School which has a small basketball court[8] allowed for the discussion of whether facilities at that location should be expanded to serve the activities deemed to be inappropriate for the Reservoir Park.

Off-leash Dog Park: Dogs on leash will be welcome in Reservoir Park and we anticipate that the Park will be used extensively by dog owners. Certainly the inclusion of dogs in Reservoir Park is a wonderful addition to the fabric of use and visitors. Reservoir Park is a particularly unsafe site for dogs off-leash due to the fact that the site has contiguous roads on all sides. In addition, the inclusion of a "tot-lot" precludes dogs off leash from this area as a health and safety issue for the children.

6 Future possibilities

The Waban Hill Reservoir Advisory Group (WHRAG) developed a plan that represents a strong consensus of our vision, while addressing the City's specific Recreation and Open Space Plan. The Plan allows the City to acquire this property to "preserve, protect and provide additional open space,"[9] with a minimal need for investment in reconfiguration of the reservoir or creation of new facilities. The Plan will expand accessibility for persons with disabilities in multiple age groups, allowing both passive and active recreation in a safe environment, hence meeting Newton's goal of "increasing the accessibility of public open spaces in general, while also focusing on access to and within such open spaces and related facilities to persons with disabilities."[10]

Preservation of the distinctive landscape including the vistas and elevation, as well as the opportunity to combine recreation and conservation uses are key to this plan. The proposed Plan meets Newton's open space goals of "accessibility, linkage, multiple uses, and the needs of special groups such as the elderly and people with disabilities".[11] The soothing presence of a large body of water and the unique vista provided by the site's location at one of the highest points of elevation in Newton, will draw residents from all parts of the City. The improved Commonwealth Avenue carriage lane provides a linkage for runners, joggers and bicycles between the Reservoir Park and all of Newton, allowing easy access for City residents.

The WHRAG considered and discussed many options throughout their meeting process. The Plan does not preclude a potential future redevelopment of Reservoir Park. In the future, if a re-evaluation of the site is warranted, or the needs of the City change some of the following ideas

could be considered: larger open space which could be described as a great lawn; a reflecting pool in place of the existing reservoir; expanded seating at the highest area on the site; an expanded community amphitheater space; pathways through the interior of the site.

7 Conclusion

The Plan transforms a currently inaccessible parcel of land into a welcoming open space that addresses many of the goals articulated in the Newton Recreation and Open Space Plan. The WHRP Plan is a simple, relatively low cost and low maintenance approach that will benefit the entire City and all its residents. Following the purchase, without major capital expense, this eco-friendly park can be made available to the public immediately. Additional features can be introduced in phases as resources are available.

The WHRAG recommends that the City purchase the Waban Hill Reservoir and enthusiastically supports the use of the site as detailed in the Plan. The City should act now on this rare opportunity to acquire a unique setting that will enhance the quality of life in Newton for generations to come.

Figure 22: Bird's eye view of the future Reservoir Park, as envisioned by the WHRAG. Design prepared by Schnee Architects, Inc.

8 Acknowledgements

8.1 Staff support

The WHRAG is indebted to the helpfulness of staff members of the City of Newton. In particular, we would like to thank Katy Holmes, Newton Senior Planner, for her dedicated and indefatigable help in providing us access to needed documents, and for her patiently sitting through the sometimes very long committee meetings. We would like to thank Director of Planning and Development Candace Havens, City Engineer Lou Taverna, Assistant City Solicitor Robert Waddick, and the City Engineering staff. Most importantly, the committee would like to thank the three aldermen from Ward 7 – Ward Alderman Lisle Baker, and Aldermen at Large Ruthanne Fuller, and Marc Laredo, for their continuous help and advice.

Finally, we would like to thank Marcis Kempe, Director of Security, MWRA, for help concerning site visits of the Waban Hill Reservoir, and Kevin McCluskey, Director of Public Affairs, MWRA, for providing information on maintenance costs for the reservoir.

8.2 Location of documents

Copies of the minutes from all meetings of the WHRAG, interim subcommittee reports, etc. can be found at this link: `http://www.newtonma.gov/gov/planning/current/devrev/hip/manet_road.asp`.

9 Endnotes

Notes

[1]A portion of the information from this section is taken from MWRA 2010 and 2012 inspection/evaluation reports [2, 3], and from Newton City document located at `http://www.newtonma.gov/civicax/filebank/documents/48622`. The 2010 MWRA report states that "the Waban Hill Reservoir Dam was completed in 1900", and the 2012 MWRA report states that "the Waban Hill Reservoir Dam was reportedly completed in 1900". In contrast, Newton City document located at `http://www.newtonma.gov/civicax/filebank/documents/48622` states that the Waban Hill Reservoir was built by the city of Newton in 1877". Since we were given the MWRA reports by City Engineer Taverna, while the City document posted on Internet was found only serendipitously in mid-May 2013, we have used the date of 1900 taken from MWRA reports.

[2]See the table in Appendix 1, which provides a comparison of Waban Hill Reservoir with other open spaces in Newton providing some access to natural bodies of water.

[3]Though the current water quality of the reservoir appears to be good and to the best of our knowledge, the MWRA has never taken any steps to ensure water quality of Waban Hill Reservoir (or, for that matter, of Chestnut Hill Reservoir, located opposite Boston College), additional steps could be taken to ensure water purity if deemed necessary, by (1) establishment of aptation of appropriate flora and fauna to establish a self-sustaining ecosystem, or (2) artificially circulating an filtering the water.

[4]There is a wide range for the estimate of earth-moving costs if the berms were to be removed or reduced. Depending on the amount of earth to be moved, the cost could run into the millions of dollars.

[5]Research must be done to determine whether to repair or to remove the gate house located at the corner of Woodlawn Drive and Ward Street. For this reason gate house renovation costs are not included in the listing above.

[6]Newton City legal counsel Bob Waddick stated in his email from March 4, 2013, that the City is not legally responsible for drowning or corporal damage of a person in a public park. A portion of his email follows (boldface font is added by the Committee).

> "The Recreational Use Statute, G.L. chapter 21, Section 17C, provides that a landowner (including a municipality) who permits the public to use its land without imposing a fee **shall not be liable for personal injuries to the public** in the absence of willful, wanton or reckless conduct on the part of the landowner. Land, as defined by the statute, includes wetlands, rivers, streams, ponds, lakes and other bodies of water. Therefore, the Recreational Use Statute generally would exempt a municipality that opens its land (including a body of water) freely to the public for recreational use, from liability for ordinary negligence. Claims against municipalities for negligence are generally capped at $100,000.00 pursuant to G.L. chapter 258."

[7]During Committee deliberations, we discussed two distinct possible plans: A,B. Plan A is the

plan that was adopted by the Committee and described in Section 2.

[8]The Ward School basketball court is in good condition, as shown in recent photos the Committee took; however, it is a half-court and inadequate for serious games.

[9]Section 1, page 1 of 2, *Newton Recreation and Open Space Plan* [1].

[10]Section 6, page 2 of 10, [1].

[11]Section 7, page 1 of 16, [1].

10 Appendix 1: Comparison with other open spaces in Newton

On March 31 and April 6, 2013, the Committee co-chairs visited a number of Newton open spaces or parks, including those with natural bodies of water. Results are summarized in the following table, where we have taken the liberty to add the *Waban Hill Reservoir* to the list, assuming that the City of Newton acquires the site and implements the Plan proposed by the Committee. Table headers are given for the name of the open space or park, whether the park is handicapped-accessible, whether there is an impressive or unique vista, whether the site provides sufficient height to see over surrounding treetops and houses, and whether one can walk along or around a body of water.[12] Finally, it should be noted that Chandler Pond is on Kendrick Street in Brighton, not Newton, although it borders the Newton Golf Course – this is the reason an asterisk is placed next to Chandler Pond.

Name	Distance from reservoir	Handicapped-accessible	Vista	Height	Water
Auburndale Park	4.8 miles	✓	✓	—	✓
Dolan Pond Conservation Area	3.9 miles	partially	—	—	—
Hemlock Gorge Reservation	4.2 miles	—	✓	—	—
Mary Hunnewell Fyffe Footbridge	7.0 miles	✓	—	—	✓
Williams-Saco Streets Riverwalk	3.7 miles	—	—	—	—
Newton Cemetery	2.5 miles	✓	✓	—	partially
Bullough's Pond	2.0 miles	✓	✓	—	partially
Crystal Lake	2.1 miles	✓	✓	—	—
Hammond Pond Reservation	1.1 miles	—	—	—	—
Houghton Garden	1.0 miles	—	✓	—	partially
Chandler Pond*	1.2 miles	✓	✓	—	—
Ward School	0.7 miles	—	—	—	—
Newton Centre Playground	1.4 miles	—	—	—	—
Waban Hill Reservoir	0 miles	✓	✓	✓	✓

10.1 Auburndale

Auburndale park is a gem among open space and park facilities in Newton. The park provides substantial distance, that separates active sports from other park activities, such as a playground for small children, picnic area, walking paths, public restrooms. Neighboring houses are distant from the park areas supporting active activities. There is a designated pre-school playground (see photo below, which stipulates age range of children). There is a large parcel of land for an open field, and lots of wooded area to walk near (and at time along) the Charles river. Residents of Ward 7 must travel approximately 5 miles to reach this destination.

Figure 23: Auburndale Park. *(Left)* Playground reserved for pre-school age children. *(Right)* Sign indicating age group for children using the playground.

Figure 24: Auburndale Park. *(Left)* View of Charles River from near picnic tables. *(Right)* Path through woods near Charles River.

Figure 25: Auburndale Park. *(Left)* Neighboring houses are distant from active fields. *(Right)* Swingset for small children.

Figure 26: Auburdale Park. *(Left)* Picnic tables with restrooms in background. *(Right)* Picnic tables with barbecue stoves.

10.2 Dolan Pond

The park facility of Dolan Pond is a small, rustic wetlands area that provides access to a little pond by a boardwalk, followed by a somewhat muddy path through the woods. The location is a low-lying area, providing no height for a vista, and there is no possibility of walking around the pond – only a boardwalk to a small landing to view the pond. Part of the area is handicapped-accessible.

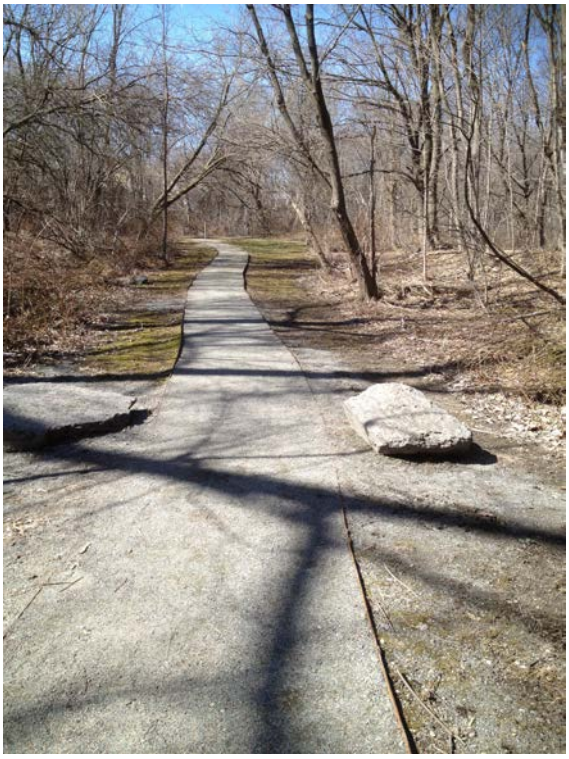


Figure 27: Dolan Pond Conservation Area. *(Left)* Sign at park entrance stating opening hours. *(Right)* Boardwalk from parking lot.

Figure 28: Dolan Pond Conservation Area. *(Left)* Dirt path through wetlands to reach pond. *(Right)* View of Dolan Pond from jetty.

Figure 29: Dolan Pond Conservation Area. View of wetland covered by boardwalk.

10.3 Hemlock Gorge with Echo Bridge

Hemlock Gorge is a destination for anyone in Newton. The park affords a beautiful view of water rushing past a long building, that had functioned as a mill. The water leads to a spillway, causing downstream eddies with suds leading to the Echo Bridge, under which by tradition Newton children call out to hear the echo. Route 9 is nearby, with distant audible traffic. Though one can walk down a rough terrain to the water's edge, there appears to be no real possibility of walking very far along the water's edge. Despite the beauty of this park, **no part is handicapped-accessible** – not even on the far side reached by crossing Echo Bridge. The highest point of the park is the bridge, which is at street level, while the water is found at the bottom of the gorge. It follows that there is no high vantage point, from which to appreciate the sunsets while seeing the sun's reflection off the surface of the water.

Figure 30: Hemlock Gorge. *(Left)* Water in spillway after mill building. *(Right)* Echo Bridge.

Figure 31: Hemlock Gorge. *(Left)* View of site of what had been a mill in the past. *(Right)* Water viewed from land adjacent to river.

Figure 32: Hemlock Gorge. View from top of Echo Bridge, at street level.

10.4 Mary Hunnewell Fyffe Footbridge

This park facility provides a very short walk along the Charles River. From the street, there is a footbridge over the river, leading to a sloped, alphalt-covered path to the water's edge. The entire area is heavily developed on both sides of water.

Figure 33: Mary Hunnewell Fyffe Footbridge. *(Left)* Closeup of footbridge. *(Right)* View of path along rushing current.

Figure 34: Mary Hunnewell Fyffe Footbridge. Railing at beginning of path along water.

10.5 Williams-Saco River Walk

This facility provides a muddy path to the Charles River, with abutting houses and commercial property across the river, leading to a more remote area for active sports (e.g. baseball diamond). At the time of our visit, the paths were uneven, muddy/marshy and certainly **not handicapped-accessible**. There is absolutely no elevation, nor any vista for appreciating the sunsets.

Figure 35: Williams-Saco River Walk

Figure 36: Williams-Saco River Walk

10.6 Newton Cemetery

Newton Cemetery enjoys a small pond within the burial grounds. Though it is possible to walk the cemetery grounds, this is hardly the location for children, the elderly, or families to enjoy a picnic, appreciate the setting sun or engage in any play activities.

Figure 37: Newton Cemetery, near small pond.

Figure 38: Newton Cemetery, near small pond.

10.7 Bullough's Pond

Bullough's Pond is a very nice area near Newton City Hall on Walnut Street. With an elliptical surface, pedestrians can only walk a bit more than halfway around the pond. On one side, pedestrians must walk along Walnut Street, with no pond access, since the private back yards of Walnut Street houses border the pond. Parking is provided on Berkshire Road, but there is no parking allowed at the northern end along Dexter Road. Pedestrians are at the water's level, bordered by houses on one side (Walnut Street) and by a neighborhood street (Dexter Street) on the other side.

Figure 39: Bullough's Pond.

10.8 Crystal Lake

Crystal Lake is a natural pond, which residents of Newton are truly fortunate to enjoy. Although a favorite location for families with children during the summer months, one can only walk for a short distance along the banks of the pond on pathways and sidewalks before heading into neighborhood streets. There is no elevation, from which to enjoy a view above the houses and treetops; moreover, the pond is bordered by houses and MBTA railway.

Figure 40: Crystal Lake.

10.9 Hammond Pond

Hammond Pond Conservation area has many paths through the woods for residents to walk. Newton is fortunate to hold this wholly undeveloped conservation area. There is minimal level walking area, and it is only possible to walk a short distance near the water of Hammond Pond.

Figure 41: Hammond Pond. *(Left)* View of the pond. *(Right)* Landscape near the pond.

Figure 42: Hammond Pond. *(Left)* Parking lot for Hammond Pond. *(Right)* View of back of Chesnut Hill Mall from Hammond Pond.

Figure 43: Hammond Pond. *(Left)* Landscape with rock – one of the very few direct accesses to the water. *(Right)* Another view of the water.

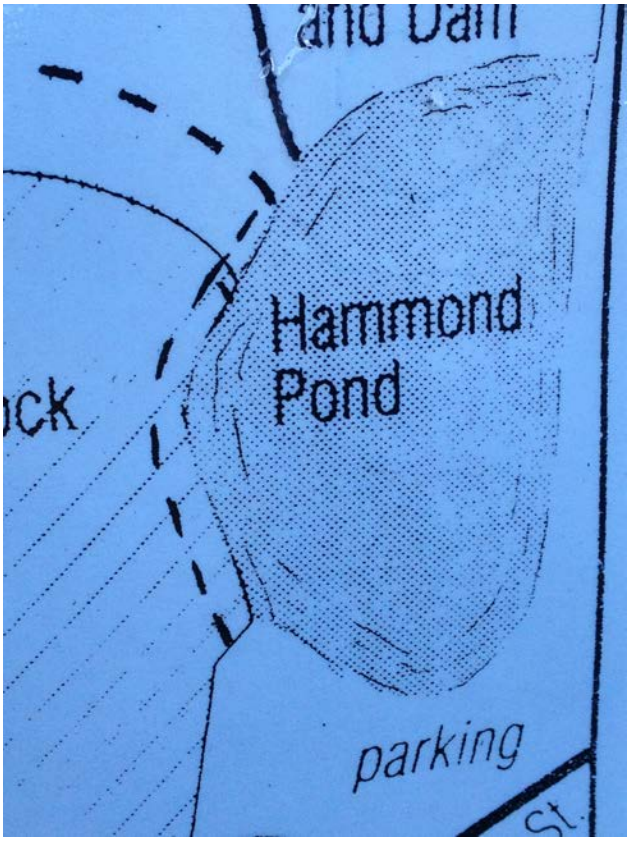


Figure 44: Hammond Pond. Sign showing the limited direct access to the pond.

10.10 Houghton Garden

Houghton Garden is truly a treasure, with lovely trails, separate areas with benches for meditation or just to enjoy the view. While a short distance at the entrance is handicapped accessible, many of the pathways in the interior of Houghton Garden are narrow, with tree roots and uneven surfaces. There is a wooden bridge over one part of the pond, and two stone bridges over more narrow parts. In the spring, there are many flowering bushes and perennials. Like Waban Hill Reservoir, Houghton Garden is located in a residential neighborhood, where no additional parking has been provided. Though there are small streams and ponds in Houghton Garden, water is not the major focal point of the site, but rather the plethora and beauty of the gardens. Houghton Garden is quite different from Waban Hill Reservoir, since it is a site with tall, mature trees, extensive gardens and winding paths through woods.

Figure 45: Houghton Garden. *(Left)* Park indicating opening hours – from dawn to dusk. *(Right)* Rustic, wooden bridge over a stream.


Figure 46: Houghton Garden. *(Left)* End of the handicapped-accessible path. *(Right)* Most parts of Houghton Garden are not handicapped-accessible, such as the path displayed here.


Figure 47: Houghton Garden. *(Left)* Pond with foliage. *(Right)* Path at entrance.

10.11 Chandler Pond

Chandler Pond is on Kendrick Street in Brighton, hence does not belong to Newton Parks/Open Spaces, although it borders the nearby Newton Golf Course. Pedestrians are at the water's level, with no elevation, and one can only walk a very short distance along the banks of Chandler Pond, before apartments and houses prevent further access.

Figure 48: Chandler's Pond.

Figure 49: Chandler's Pond.

10.12 Ward School

During Committee deliberations, some people voiced the opinion that Waban Hill Reservoir should provide a half-size basketball court, due to the "poor condition" of the basketball court at Ward School. A visit to Ward School playground revealed that the basketball court is in good condition; however, the court is small, especially for older adolescents and adults to play. It is the Committee's opinion that it may make sense to consider enlarging this basketball if a determination is made that such a need exists. Ward School is a short walk from the Waban Hill Reservoir, so it would seem to be a duplication of resources to create a new site for basketball. In addition, the Committee felt that an active sport such as basketball is incompatible with the passive recreation and conservation features proposed by the plan.

Figure 50: Ward School. Two views of Ward School basketball court. At the time of our visit, the basketball court was in very good condition, though it is small for a game of older adolescents.

10.13 Newton Centre Playground

At the Newton Centre Playground, we observed a large separation between the basketball court, where a fast game involving older adolescents was in progress, from the playground facilities for pre-school (age 2-5) children and a separate playground area for older children (age 5-12).

Figure 51: Newton Centre Playground.

Figure 52: Newton Centre Playground.

Figure 53: Newton Centre Playground. Signs indicating age group for children using the playground. Ages 2-5.

Figure 54: Newton Centre Playground. Signs indicating age group for children using the playground. Ages 5-12.

10.14 Waban Hill Reservoir

As indicated in the table at the beginning of Appendix 1, Waban Hill Reservoir provides unique qualities compared other Newton open spaces. The reservoir is located in a quiet residential area, close to Commonwealth Avenue, but isolated from major traffic, and due to its elevation, provides a vista depicted in the following photos.

Figure 55: Waban Hill Reservoir. Views of reservoir from northwest corner near intersection of Manet Road and Reservoir Drive.

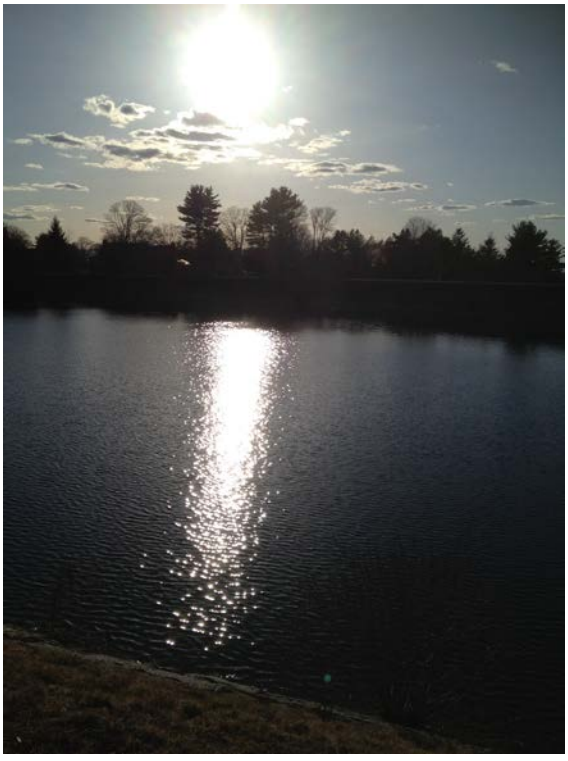


Figure 56: Evening sunset at Waban Hill Reservoir.

Figure 57: Waban Hill Reservoir. *(Left)* View from berm at southeast corner (Ward/Manet) down to Commonwealth Avenue. *(Right)* View on southern edge of impoundment. Note the trees in the riprap that need to be cut, as indicated in the 2012 MWRA report.

Figure 58: Waban Hill Reservoir. *(Left)* View from southeast corner (Ward/Manet) along Manet Road northwards towards intersection of Manet Road and Reservoir Drive. *(Right)* Another view of reservoir.

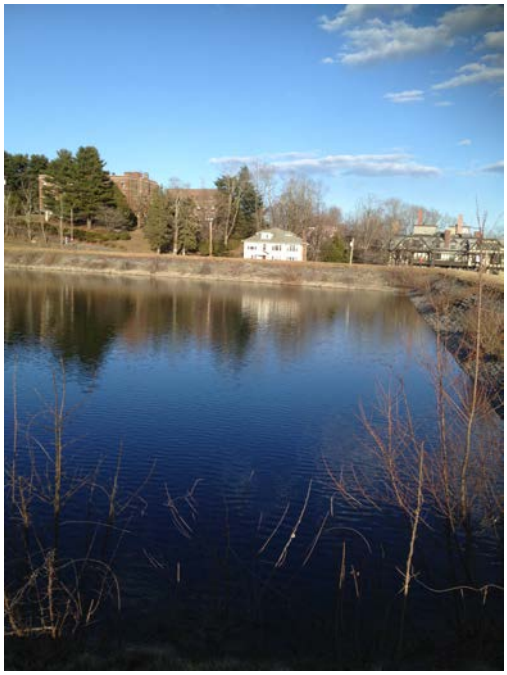



Figure 59: Waban Hill Reservoir. *(Left)* View of reservoir. *(Right)* Corner of Woodlawn Drive and Reservoir Drive.


Figure 60: Waban Hill Reservoir. Waban Hill Reservoir after snowfall in March 2013.

11 Appendix 2: How Plan meets Newton's Open Space Plan

11.1 Open Space Plan targets acquisition of Waban Hill Reservoir and similar open spaces

Open space plays a key role in the City of Newton's current quality of life and continues to be important as the city moves forward into the 21st century. Little new open space is available in a densely developed community, such as Newton, and its acquisition can be difficult, due to escalating real estate values and tight municipal fiscal budgets.

The *Newton Recreation and Open Space Plan Update – 2013-2019* (Update 8/31/12), herein referred to as the *"Open Space Plan"*, traces the development of the city and its environment, providing an overview of Newton's geology, water resources, flora and fauna, and unique resources. The plan looks at the community's overall goals for passive and active open space, catalogs an analysis of needs, and provides specific and general goals and objectives, as well as a five-year action plan. Visit the following link for more details on the Recreaion and Open Space Plan Update: `http://www.newtonma.gov/gov/planning/lrplan/os/default.asp`

Understandably, one site cannot address all the goals articulated in the Open Space Plan. The *Manet Road Reservoir*[13] site will meet specific goals in the Open Space Plan, which are articulated below. We refer to the site as the *Manet Road Reservoir* for consistency with the name of the site in the Open Space Plan. Please note that in the following discussion, relevant excerpts from the Open Space Plan are provided in quotations and/or italicized.

As part of its action plan, the Open Space Plan identifies certain key properties throughout the city that, should they become available, merit serious effort by the city to acquire them. The Manet Road Reservoir property is one such acquisition. In Section 5 (Page 7) of the Open Space Plan (Inventory of Lands of Conservation and Recreation Interest) there is a discussion of Massachusetts Water Resources Authority (MWRA) properties that might become available:

> *"The MWRA has jurisdiction by easement or fee over many segments of the Sudbury Aqueduct and also the Manet Rd./Ward St. (open) reservoir, totaling 21.5 acres of owned public land, or 1.6%. As the MWRA decommissions portions of its older water transport and reservoir system, the reservoir site may become available for other uses in the future, including active and/or passive recreational uses."*

The site is referred to in the Open Space Plan as the *"Manet Road Reservoir" and listed as comprising 5.06 acres. In the Open Space Plan's "Summary of Community's Needs"*, under both Active and Passive Recreation Needs, the Manet Road Reservoir is specifically cited as an acquisition target:

> *"Explore opportunities for acquisition of Manet Rd. MWRA reservoir for possible use to meet active and/or passive recreation needs. Decommissioning by MWRA of parts of its water supply system may make this site available."*

In Section 9 of the Open Space Plan ("Five Year Action Plan"), whose purpose is *"to establish an action program addressing Newton's recreation and open space needs within the context of the City's stated goals, policies, and objectives for open space"*, the Manet Road Reservoir is specifically targeted under both the Active Use Recreation Action Program as well as the Passive Use Recreation Action Program in the 2013-2015 timeframe and noted as:

> *"MWRA Manet Rd. Reservoir – explore opportunities for acquisition for active and/or passive recreation use when site becomes available from the MWRA."*

11.2 Five principal goals of Newton's Open Space Plan

Section 6 of the Open Space Plan (Open Space Plan) lays out a *"Community Vision"* and refers to Newton's Comprehensive Plan (pp 3-12):

> *"Our open space and recreation vision is of being a metropolitan community able to maintain and preserve its natural assets and resources and able to meet both the passive and active recreational needs of its citizens. In such a vision, the well being of Newton residents is promoted by policies that safeguard Newton's land, air and water. Our parks, conservation areas and playgrounds can continue to provide opportunities for active and passive recreation through cooperative efforts – all ingredients of a vital community."*

As stated in this section of the Open Space Plan, Newton's Open Space Goals were directed towards two basic concerns:

- *"The identification of land to be acquired or otherwise preserved as open space;"* and (The Open Space Plan specifically identifies the Manet Road Reservoir as a target parcel to be acquired and preserved as open space in the sections cited above.)
- *"The identification of the best potential use of such land (whether it is most suitable for conservation, for active or passive recreation, and/or for integrated use)."* (This report addresses the goals stated above by putting forth a vision of the usage model for the site – primarily passive recreation including a tot lot along with conservation.)

Section 6 goals also addresses:

- *"Preserving the City's natural resources;"*
- *"Distributing new public recreational open space as equitably as possible and/or expanding availability of existing assets;"*
- *"Increasing the accessibility of pubic open spaces in general while also focusing on access to and within such open spaces and related facilities to person with disabilities;"* and
- *"Encouraging appropriate use of each site while seeking to network open space resources."*

Section 6 of the Open Space Plan further states five primary "Open Space and Recreation Goals" which are listed below along with some commentary on the relevance for the Manet Road Reservoir site:

1. *"To recognize, preserve, and maintain the City's important natural assets and resources."*

   Manet Road Reservoir is recognized by the Open Space Plan as an important asset for the City and is targeted on the action plan for preservation. *"Many Newton residents generally care about the 'garden-city' character of our community and a significant segment of the population responds favorably to a program of land acquisition for conservation purposes using various means. Many Newton residents are aware that open space itself is a valuable natural resource and of positive value to all members in our community."* (Section 6 page 3) *"Some land, because of physical characteristics, warrants preservation in its natural state; other sites are better suited to meet the active and passive recreation needs of the City...[I]t is important for the City to be particularly mindful of preserving water resources in multiple settings as well as special natural features and distinctive landscapes".* (Section 6, page 4)

2. *"To ensure an adequate amount, variety, and distribution of open space for both public benefit and biodiversity."*

   The vicinity of the Manet Road Reservoir is lacking in open space available for public benefit relative to many other regions of the city. As the Open Space Plan details: *"While standards for what constitutes an adequate amount of open space vary, a commonly accepted factor is 15 acres per 1,000 persons as recommended by the National Recreation Association."* According to the Open Space Plan's map of *"Public Open Space – Acres Per 1000 People"*, the ward/precincts near Manet Road Reservoir are in the range of 10-14.99 acres / 1000 people, below average for Newton as a whole.

3. *"To integrate compatible recreation and conservation uses."*

   "Recreation areas in Newton have in the past been developed in response to the large demand for 'active' (structured) recreation. While demand for such areas continue to grow, more recently, there has been a noticeable and continued increase in citizen interest for less structured, 'passive' recreation. Bicycling, hiking, jogging, cross-country skiing and other passive recreational activities can frequently share land initially acquired for other purposes." (Section 6, page 8) *"Since open space has a variety of uses and users permanent open land should be varied, including, for example, parks, playgrounds and conservation land located to be accessible to the City's residents including persons with disabilities."* (Section 6, page 4) The vision for Manet Road Reservoir anticipates both passive recreation features along with conservation features (e.g. in the preservation of a water feature).

4. *"To explore to the maximum extent feasible the appropriate courses of action necessary to protect and preserve large open spaces remaining in the City, including the golf courses and other significant parcels owned by institutions and private entities. "*

   The Manet Road Reservoir is currently owned by the MWRA and the City of Newton is likely to be offered the opportunity to acquire this important and unique open space resource.

5. *"To undergird the City's capacity for sound stewardship of its open space assets."*

   It is anticipated that a local *"Friends of the Reservoir"* organization will be formed, which will assist the city in helping to maintain the site if acquired with volunteer service days, and other means. The design of the site should take continued maintenance costs into account.

In summarizing the Community Needs (Section 7 page 8) the Open Space Plan addresses both Active Recreation and Passive Use Recreation. *"Though stretched as a result of limited resources, high demand and extended seasonal use, it appears that youth recreation needs seem to be met overall."* (Section 7 page 9) The City anticipates the need to continue to address this continual and increasing demand. In contrast to the recognition of meeting the needs of youth recreational needs, there are currently unmet needs for recreational opportunities for both seniors and persons with disabilities. *"The City . . . seeks to provide additional passive recreational options responsive to the specific needs of the elderly and persons with disbilities."* (Section 7, page 9) *"[T]he increase in Newton's 55-74 age group correlates with and suggests a continuing increase in demand for passive use activities suited to this age group . . . In Newton . . . the development of facilities for passive use recreation has been, until recently, secondary to that for active facilities."* (Section 7, page 11) The Manet Road Reservoir site will be a new and exciting place which will provide such passive recreational use for all ages and abilities.

11.3 How the Plan meets each goal of Open Space Plan

Section 8 of the Open Space Plan further elucidates the five broad goals cited above with a variety of specific "Goals, Polices, and Objectives." The goals, listed below, are specifically addressed by the proposed Plan for the Manet Road Reservoir site along, with ways that they may apply to the Manet Road Reservoir project.

GOAL #1: To recognize, preserve, and maintain the City's important natural assets and resources.
POLICY: ENSURE THE PRESERVATION AND ENHANCEMENT OF THE CITY'S NATURAL ENVIRONMENT.
OBJECTIVES: - PROTECT:

- *" The Charles River and the City's streams, brooks, ponds and their banks."*

  The water feature of Manet Road Reservoir transforms the site from a reservoir usage to more of a pond mode and preserves the water resource as well as the *"special natural feature(s) and distinctive landscape(s)"*. (Section 6, page 4)

- *"Biodiversity of natural flora and fauna, especially large open green-spaces."*

  Manet Road Reservoir's pond area can host a variety of waterfowl and in migration season act as an important stopover. Other areas of the site will be planted with native species to encourage biodiversity.

- *"Unique geologic features, such as drumlins and bedrock outcrops, and unique vegetation, wildlife habitats, and woodlands."*

  The water feature currently is utilized as a migratory stopover point by waterfowl and would be expected to serve that function in the future.

- *"Distinctive landscapes, such as land with scenic character and land that affords vistas and panoramic views."*

  Near one of the highest points in Newton, Manet Road Reservoir provides unique high vistas in Newton and spectacular sunrise and sunset viewing. While functioning as a reservoir, the scenic vistas were inaccessible to the public.

- *"Newton's regionally significant natural resources and open space."*

  Manet Road Reservoir has the potential to become one of the most distinctive open spaces in Newton.

- *"The City's urban forest as found in its parks and playgrounds, conservation land, public street trees, cemeteries and other land in municipal ownership."*

  While there are currently limited trees and other plantings on the Manet Road Reservoir site, proposed plantings can transform the look of the site, provided needed shade and aesthetic beauty. Native species will provide food and shelter for songbirds. A proposed orchard may provide educational as well as practical value.

GOAL #2: To ensure an adequate amount, variety, and distribution of open space for both public benefit and biodiversity.
POLICY: ENSURE A VARIETY AND APPROPRIATE DISTRIBUTION OF OPEN SPACE
OBJECTIVES: - PROVIDE:

- *"Active and passive recreation at convenient locations throughout the City, as reflected by standards assessing adequacy of open space for each neighborhood."*

  The Manet Road Reservoir area is below average in the amount of public open space for a given population according the map of Public Open Space provided in the Open Space Plan.

- *"Increased access to and within open space assets for groups such as seniors and persons with various disabilities."*

  The Manet Road Reservoir site will be handicapped accessible. There will be accommodation for users to access both the high and low perimeter paths. Benches and walking exercise features should make the area attractive to seniors.

- *"Open space in amounts sufficient to meet the needs of residents on city-wide, village and neighborhood levels."*

  The Manet Road Reservoir area is below average in the amount of public open space for a given population according the map of Public Open Space provided in the Open Space Plan. In addition, there is a dearth of both active and passive recreation opportunities in the vicinity of the Manet Road Reservoir, particularly in terms of either tot lots, or passive/active recreation opportunities.

- *"Strategic enlargement of selected conservation areas to provide greater wildlife habitat and biodiversity of species."*

  Manet Road Reservoir represents the creation of a new open space area which, with its water feature and native plantings, should provide greater wildlife habitat and the potential for increased biodiversity. It is also only 100 yards from the *covered* Waban Hill Reservoir, providing drinking water to area residents, which is a wildlife refuge, studied by Boston College urban biologists.

- *"Small landscaped areas with seating in village centers contributing aesthetic and respite value while enhancing village fabric."*

Located in the Chestnut Hill section of Newton, the Manet Road Reservoir site could become an area for meeting and congregation for people from all parts of Newton. The uniqueness of the site will drawn people from all areas of the City since there is no other site which offers comparable features.

- *"Trail system linking open space resources and wildlife corridors."*

  Commonwealth Avenue is currently a pathway for walking, running and bicycling. The goal of enhanced use of Commonwealth Avenue for these activities (Section 7, page 12) complements the use of the Manet Road Reservoir site as a place which creates a natural link between the two areas. Fencing around the current site prevents such usage.

GOAL #3: To integrate compatible recreation and conservation uses.
POLICY: ENSURE THAT FACILITY PLANNING AND DEVELOPMENT PROCESS GIVES FULL CONSIDERATION TO MULTIPLE COMPATIBLE USES TO THE EXTENT FEASIBLE.
OBJECTIVES: - ACCOMMODATE:

- *"Green-space linkage between recreation and conservation areas."*

  As proposed, Manet Road Reservoir will feature both passive recreation and conservation usage and will link to Commonwealth Avenue.

- *"Increased and growing demand for passive recreation activities and interests."*

  Manet Road Reservoir provides a number of passive recreation features to help meet the growing demand for such features.

- *"Managed use of designated bike trails in appropriate open spaces subject to protection of and respect for pedestrians as well as for habitat and natural resources."*

  It is envisioned that periphery paths could be used for bicycles.

- *"Shared use of land for appropriate types of active/passive recreation activities in suitable areas."*

  Informal active type recreation is provided for in the open "free space" on the site as well as the possibility of accommodating ice skating in winter.

GOAL #4: To explore to the maximum extent feasible the appropriate courses of action necessary to protect and preserve large open spaces remaining in the City, including the golf courses and other significant parcels owned by institutions and private entities.
POLICY: PURSUE DEVELOPMENT OF MECHANISMS SUITABLE FOR PROTECTION OF LARGE PARCELS
OBJECTIVES: - INVESTIGATE:

- *"Use of conservation restrictions, deed restrictions, and scenic easements."*

A conservation restriction could be placed on the site, if acquired, to prevent future development of the site and change from its open space usage. This has been done for the Newton Golf Course and for Brookline Fisher Hill Reservoir development.

- *"Use of applicable zoning mechanisms, including open space zoning."*

  The site may be currently classified as open space – and should in the future be designated as public open space.

GOAL #5: To undergird the City's capacity for sound stewardship of its open space assets.
POLICY: PURSUE CONCURRENT AND COORDINATED ACTIONS TO FACILITATE OPEN SPACE STRATEGIES, PLANNING EFFORTS, PROCESSES, AND MANAGEMENT.
OBJECTIVES:

- *"Continue master planning for the coordinated improvement of recreational facilities in parks and playgrounds while preserving natural assets."*

  A master plan could be developed for Manet Road Reservoir if it is acquired by the city. It would include immediate use of the site by addressing accessible and safety concerns. Additional features as envisioned in the Waban Hill Reservoir report could be added over time taking into account the budgetary constraints of the City.

- *"Continue master planning for the natural landscapes of Newton's parks."*

  A master plan could be developed for Manet Road Reservoir if it is acquired by the city. It would include the natural landscape features as well as additional features as envisioned in the Manet Road Reservoir report which could be fully developed over time depending on budgetary constraints in the city.

- *"Continue assessment of accessibility to and within active and passive use recreation areas and conservation lands for persons with disabilities."*

  Accessibility is a key element of the Manet Road Reservoir site in pathways construction, signage, and other amenities (e.g. bubblers, accessible picnic tables).

- *"Continue land management planning for conservation areas."*

  Particularly with the element of water included, the input of the Newton Conservation Commission and Environmental Planner may be helpful and necessary in the process.

- *"Continue review and improvement of site identification, directional and use signage."*

  Identification of the Manet Road Reservoir is very important. The goal will be to provide signage and naming consistent with it being a destination spot for Newtonians due to its unique characteristics and linking it to Heartbreak Hill. There will be clear parking, accessibility, entrance, and feature descriptive signage.

- *"Support energy conservation and greater energy efficiency in facilities associated with the City's open space assets."*

If the gate house is retained as part of the final design (e.g. interpretive use), it should be made energy efficient as much as feasible. Care should be used in the design of any pumping facilities required (e.g. spray pool, drainage) in order to minimize energy use (ie solar).

- *"Periodically review jurisdictional assignments of public lands to Department of Public Works, Conservation Commission, Parks and Recreation, and the School Department, to ensure that the assignments continue to be the most effective for control and maintenance."*

  Maintenance of Newton's open space is an ongoing issue in a climate of restricted budgets. It is important that maintenance funds be allocated for Manet Road Reservoir as part of the overall budget plan for the appropriate city departments. The plan proposed in the Manet Road Reservoir Report is a simple, low cost, low maintenance approach that will benefit the entire city and will be able to encompass added features over time if there is sufficient funding and interest. A local "friends" organization could provide a valuable liaison with the city to assist with maintenance,yearly park cleanups, planting and site improvement. (perhaps in conjunction with NewtonSERVES).

11.4 Summary

"The City's goals and policies for passive use recreation reflect the increase in awareness and interest within Newton and in society in general, for unstructured, environmentally sensitive, passive recreation activities." (Section 9, page 15) *"According to the 2010 US Census, two age groups increased significantly since 2000. The 55-74 age group increased by 32% since 2000 and the 0-24 age group increased by 8%. As suggested by the Metropolitan Area Planning Council's 'MetroFuture 2030 Projections' for Newton, the trend toward an aging population is likely to continue over the next several decades."* (Section 3 page 6) The Open Space Plan lists many issues to be addressed in the analysis of a passive use recreation program including but not limited to: *"multiple use of the City's passive recreational and conservation areas, where passive use may be compatible with resource conservation; . . . additional, small scale passive use locations, such as sitting areas and areas with aesthetic qualities . . . [t]he emerging 'aging in place' trend, points to the need for greater emphasis on passive use approaches such as nature trails and walkable areas which are sensitive to the specific needs of the City's elderly and accessible to persons with diabilities or mobility challenges".*

The Manet Road Reservoir site will address many of the needs sited in the Open Space Plan and could become an invaluable asset to the City in furtherance of many of its goals.

12 Appendix 3: Parking availability in nearby streets

All of the streets listed below have the following signs posted: NO PARKING– TOW ZONE– 2 Hours Before and 2 Hours After BC Football Game Dates (6 dates posted)

Woodlawn Drive: no other posted restrictions

Travis Drive: no other posted restrictions

Reservoir Drive: no other posted restrictions

Ward Street beginning at Hammond Street: no signs first half of block, then a sign on the right side of one–way; 1 Hour Parking 8am – 3pm except Sundays and Holidays

Ward Street from Garrison Road to Manet Road (this is a one way street):

- Reservoir side –No Parking 8–10 am 2–4 pm except Saturdays, Sundays and Holidays
- Right side of one–way – l Hour Parking 8am to 3pm except Sundays and Holidays

Manet Road from Commonwealth Ave:

- Across the street from Reservoir – Permit Parking Only
- Reservoir side – No Parking

Garrison Road: Both sides of street– 1 Hour Parking 8am–3pm except Sundays and Holidays

Waban Hill Road North:

- Northbound side of street–Permit Parking Only
- Southbound side of street–Permit Parking Only (one sign in front of 173 Waban Hill Road North)

Manet Circle: no posted restrictions

Commonwealth Avenue Carriage Lane (westbound) from Algonquin Road to Manet Road (one way street):

- Permit Parking Only
- Four spaces are available just before Manet Road with sign: 1 Hour Parking 8am–3pm except Sundays and Holidays

Commonwealth Avenue Carriage Lane (westbound) from Manet Road to Hammond Street (one way street):

- 1 Hour Parking 8am–3pm except Sundays and Holidays
- (no sign from Garrison to Hammond Streets–possibly missing)

Commonwealth Avenue (eastbound) from Hammond Street to Old Colony Road: 1 Hour Parking 7am – 6pm except Sundays and Holidays, along with scattered No Parking areas

Commonwealth Avenue (westbound): all parking is on carriage lane (see above)

Hammond St from Commonwealth Ave: No Parking signs both sides first half of block

Woodchester Drive: no posted restrictions

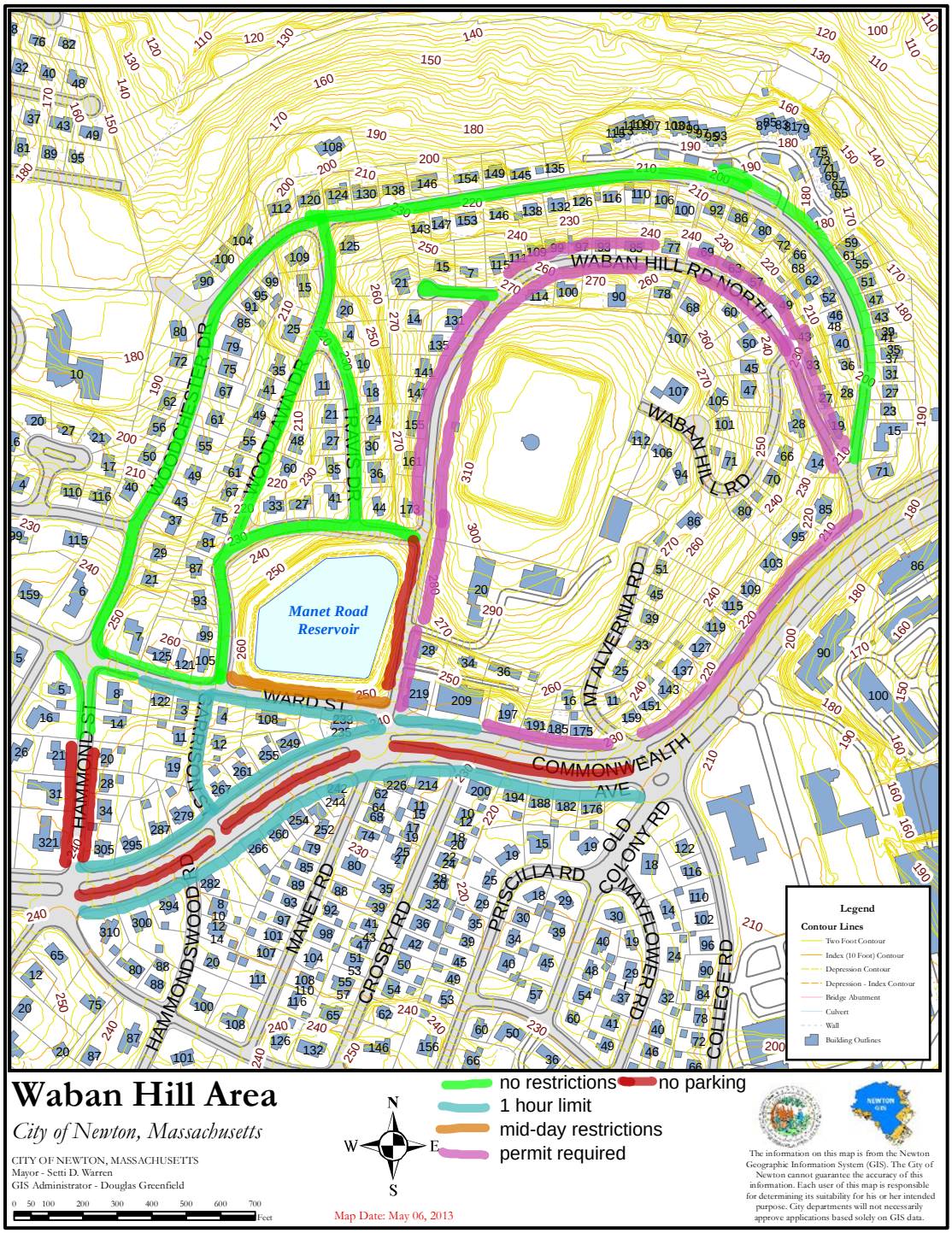


Figure 61: Parking near Waban Hill Reservoir

APPENDIX 4

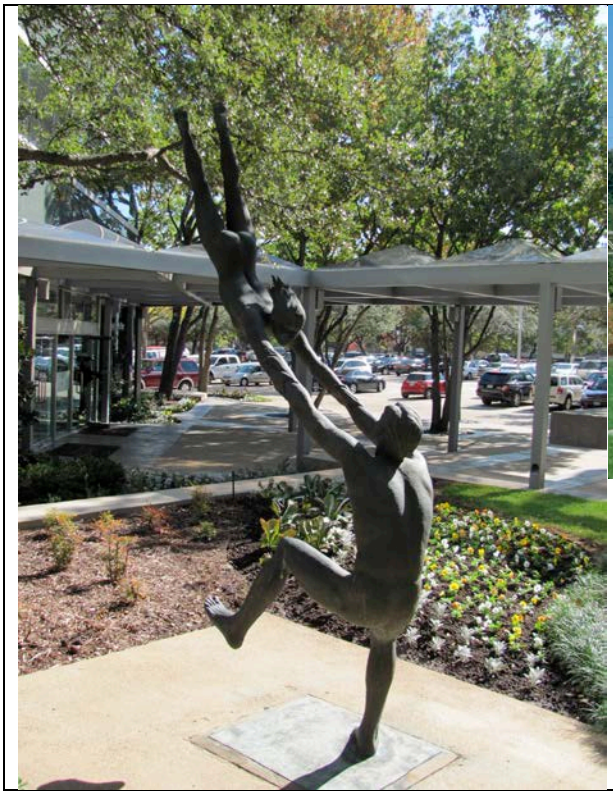
PUBLIC ART

Appendix 4

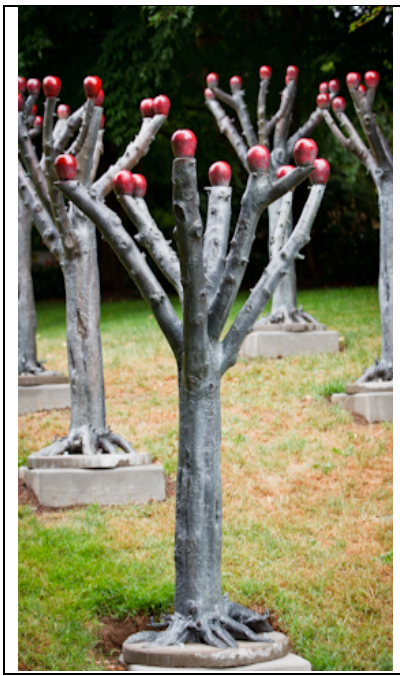
Public Art

Public art can take many forms. It can be abstract

Or figurative



Or whimsical

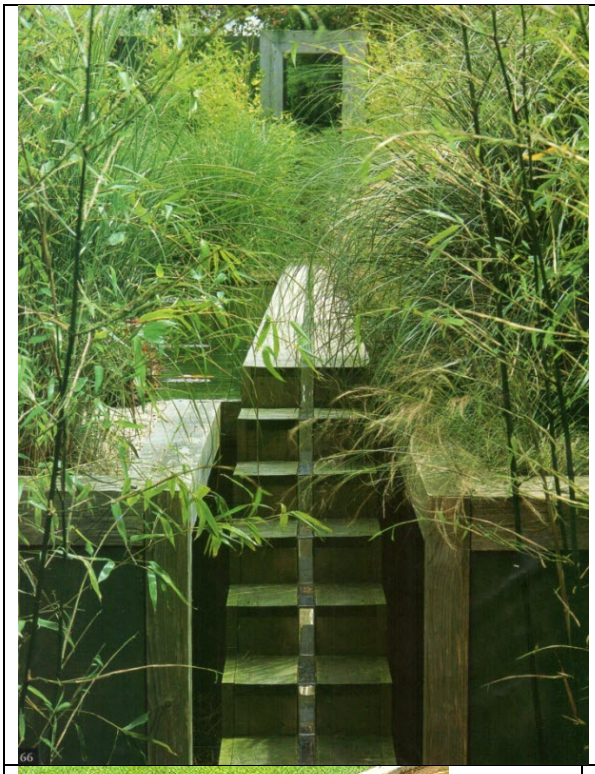


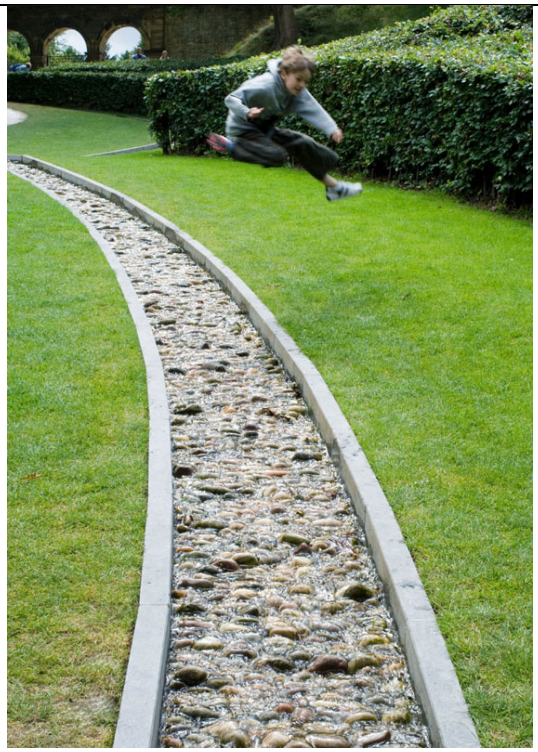
Or appealing to kids

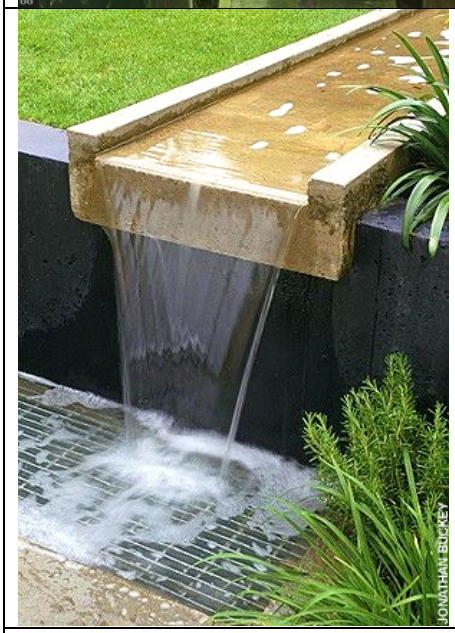
Fountains can be excellent examples of public art:

Public art can also be functional, like these **bike racks**:

Water Rills







APPENDIX 5

MWRA Reports from 2010 and 2012

WABAN HILL RESERVOIR DAM
PHASE I
INSPECTION / EVALUATION REPORT

Dam Name: **Waban Hill Reservoir Dam**

State Dam ID#: **None**

NID ID#: **MA01111**

Owner: **Massachusetts Water Resources Authority**

Town: Newton, MA

Consultant: GZA GeoEnvironmental, Inc

Date of Inspection: August 24, 2010

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GZA
GeoEnvironmental, Inc.

Engineers and Scientists

February 9, 2011
GZA File No. 17585.00

Mr. John Gregoire
Massachusetts Water Resources Authority
266 Boston Road
Southborough, MA 01772

Re: MWRA Owned Dam Inspections
Phase I Inspection/Evaluation Report
Waban Hill Reservoir Dam (MA0111)
Newton, MA
Middlesex County

Dear Mr. Gregoire:

In accordance with MWRA Contract 7192, Task Order 12, GZA GeoEnvironmental, Inc. (GZA), under subcontract to Dewberry-Goodkind, Inc., has completed our visual inspection of the Waban Hill Reservoir Dam in Newton, Massachusetts. The site visit was conducted on August 24, 2010. This work was done at the request of the Massachusetts Water Resources Authority (MWRA) to provide updated Phase I dam safety inspections for a number of MWRA-operated dams. The purpose of our efforts was to provide the MWRA with updated, formal Phase I inspections to maintain compliance with 302 CMR 10.00 Dam Safety Regulations, pertaining to inspection frequency.

Based on our inspection, the dam is currently in **FAIR** Condition. A further discussion of our evaluations and recommended actions items are presented in the Inspection/Evaluation Report. An electronic version and two hard copies of the report, have been provided. In accordance with your instructions, the report also includes a: (a) Dam Evaluation Summary Detail Sheet (b) completed checklist; (c) field sketch; and (d) selected photographs with captions. Our services and report are subject to the Limitations found in **Appendix A.**

We are happy to have been able to assist you with these inspections and appreciate the opportunity to continue to provide the MWRA with dam engineering consulting services. Please contact the undersigned if you have any questions or comments regarding the content of this Inspection/Evaluation Report.

Sincerely,
GZA GeoEnvironmental, Inc.

Chad W. Cox, P.E.
Associate Principal

Peter H. Baril, P.E.
Principal-In-Charge

Jonathan D. Andrews, P.E.
Consultant/Reviewer

One Edgewater Drive
Norwood
Massachusetts 02062
(781) 278-3700
Fax (781) 278-5701
www.gza.com

Dam Evaluation Summary Detail Sheet

1. NID ID:	MA02111	4. Inspection Date:	August 24, 2010
2. Dam Name:	Waban Hill Reservoir Dam	5. Last Insp. Date:	April 18, 2008
3. Dam Location:	Newton, MA	6. Next Inspection:	August 24, 2012
7. Inspector:	Chad W. Cox, P.E.		
8. Consultant:	GZA GeoEnvironmental, Inc.		
9. Hazard Code:	High	9a. Is Hazard Code Change Requested?:	No
10. Insp. Frequency:	2 Years	11. Overall Physical Condition of Dam:	FAIR
12. Spillway Capacity (% SDF)	>100% SDF w/actions by Caretaker		

E1. Design Methodology:	2	E7. Low-Level Discharge Capacity:	4
E2. Level of Maintenance:	3	E8. Low-Level Outlet Physical Condition:	3
E3. Emergency Action Plan:	2	E9. Spillway Design Flood Capacity:	4
E4. Embankment Seepage:	4	E10. Overall Physical Condition of the Dam:	3
E5. Embankment Condition:	3	E11. Estimated Repair Cost:	$785,000 - $1,140,000
E6. Concrete Condition:	N/A		

Evaluation Description

E1: DESIGN METHODOLOGY
1. Unknown Design – no design records available
2. No design or post-design analyses
3. No analyses, but dam features appear suitable
4. Design or post design analysis show dam meets most criteria
5. State of the art design – design records available & dam meets all criteria

E2: LEVEL OF MAINTENANCE
1. Dam in disrepair, no evidence of maintenance, no O&M manual
2. Dam in poor level of upkeep, very little maintenance, no O&M manual
3. Dam in fair level of upkeep, some maintenance and standard procedures
4. Adequate level of maintenance and standard procedures
5. Dam well maintained, detailed maintenance plan that is executed

E3: EMERGENCY ACTION PLAN
1. No plan or idea of what to do in the event of an emergency
2. Some idea but no written plan
3. No formal plan but well thought out
4. Available written plan that needs updating
5. Detailed, updated written plan available and filed with MADCR, annual training

E4: SEEPAGE (Embankments, Foundations, & Abutments)
1. Severe piping and/or seepage with no monitoring
2. Evidence of monitored piping and seepage
3. No piping but uncontrolled seepage
4. Minor seepage or high volumes of seepage with filtered collection
5. No seepage or minor seepage with filtered collection

E5: EMBANKMENT CONDITION (See Note 1)
1. Severe erosion and/or large trees
2. Significant erosion or significant woody vegetation
3. Brush and exposed embankment soils, or moderate erosion
4. Unmaintained grass, rodent activity and maintainable erosion
5. Well maintained healthy uniform grass cover

E6: CONCRETE CONDITION (See Note 2)
1. Major cracks, misalignment, discontinuities causing leaks, seepage or stability concerns
2. Cracks with misalignment inclusive of transverse cracks with no misalignment but with potential for significant structural degradation
3. Significant longitudinal cracking and minor transverse cracking
4. Spalling and minor surface cracking
5. No apparent deficiencies

E7: LOW-LEVEL OUTLET DISCHARGE CAPACITY
1. No low level outlet, no provisions (e.g. pumps, siphons) for emptying pond
2. No operable outlet, plans for emptying pond, but no equipment
3. Outlet with insufficient drawdown capacity, pumping equipment available
4. Operable gate with sufficient drawdown capacity
5. Operable gate with capacity greater than necessary

E8: LOW-LEVEL OUTLET PHYSICAL CONDITION
1. Outlet inoperative needs replacement, non-existent or inaccessible
2. Outlet inoperative needs repair
3. Outlet operable but needs repair
4. Outlet operable but needs maintenance
5. Outlet and operator operable and well maintained

E9: SPILLWAY DESIGN FLOOD CAPACITY
1. 0 - 50% of the SDF or unknown
2. 50-90% of the SDF
3. 90 - 100% of the SDF
4. >100% of the SDF with actions required by caretaker (e.g. open outlet)
5. >100% of the SDF with no actions required by caretaker

E10: OVERALL PHYSICAL CONDITION OF DAM
1. UNSAFE – Major structural, operational, and maintenance deficiencies exist under normal operating conditions
2. POOR - Significant structural, operation and maintenance deficiencies are clearly recognized under normal loading conditions
3. FAIR - Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters
4. SATISFACTORY - Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.
5. GOOD - No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF

E11: ESTIMATED REPAIR COST
Estimation of the total cost to address all identified structural, operational, maintenance deficiencies. Cost shall be developed utilizing standard estimating guides and procedures

Changes/Deviations to Database Information since Last Inspection

EXECUTIVE SUMMARY

This report summarizes the results of the visual dam inspection conducted by GZA GeoEnvironmental, Inc. (GZA) on August 24, 2010 for Waban Hill Reservoir Dam in Newton, Massachusetts.

In general, the overall condition of Waban Hill Reservoir Dam is FAIR. The dam was previously inspected on April 18, 2008 by Weston & Sampson and found to be in a similar condition. During the current visual inspection, the dam was found to have the following deficiencies:

1. Granite block, placed riprap has heaved, sliding, and otherwise displaced on majority of upstream embankment slope.
2. Woody vegetation on upstream slope and within placed riprap joints.
3. Previous inspection identified missing blocks to the left of the gatehouse. These areas were obscured by vegetation at the time of this inspection.
4. Gatehouse superstructure is in poor condition (cracks in brick masonry).
5. Viney overgrowth and woody vegetation establishing on north downstream embankment slope.
6. Scarps at toe of downstream embankment on west side.
7. Minor animal burrows.
8. Several gaps in fence (temporarily patched in most places).
9. Steps to gatehouse appear undermined.
10. No uncontrolled means of passing water out of the impoundment. Lack of uncontrolled spillway raises (remote) possibility for overfilling the reservoir.
11. Evidence of trespass.

GZA recommends the following:

Studies and Analyses:

1. The dam should be re-inspected by a qualified professional engineer at the interval specified in the DCR Dam Safety regulations as per the appropriate hazard classification.
2. Investigate means for providing uncontrolled overflow weir from reservoir.
3. Investigate potential for using uncontrolled outflow to limit maximum water surface elevation in reservoir and thus permit a hazard classification reduction request to be made.
4. Investigate reasons for and extent of undermining of gatehouse steps.
5. Perform slope stability analyzes unless hazard classification is reduced.

Maintenance and Minor Repairs:

1. Continue ongoing regular maintenance.
2. Investigate possible monitoring well(s).
3. Cut all woody vegetation growing through the joints of the rock protection layer on the upstream slope.
4. Cut all overgrowth and woody vegetation on north downstream slope and re-establish grass cover.
5. Fill all animal burrows on the embankment.
6. Repair the damaged perimeter fence panels.

7. Regularly evaluate the operation of the reservoir drain and outlet pipe and exercise them sufficiently to maintain good operating condition.
8. Dress scarps at toe of slope on west side.
9. Continue to monitor heaved upstream granite blocks.
10. Post additional "No Trespass" signage, as needed.
11. Install/program automatic overfilling reservoir level alarm.

Remedial Measures:

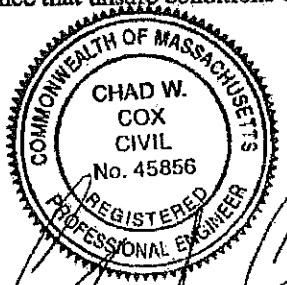
1. Repair gatehouse and surrounding area by repointing brick masonry and replacing adjacent granite blocks. Monitor for future movement.
2. Backfill/grout voids under gatehouse stairs.
3. Repair sloughed riprap (extent or need for riprap repairs may be modified if uncontrolled outlet is constructed).

A preliminary conceptual cost estimate for the studies and analyses recommended above is approximately $785,000 – $1,140,000. Note that repairs to damaged riprap above maximum water elevation may be unnecessary provided an uncontrolled outlet from the reservoir is provided.

The assessment of the general condition of the dam and dike is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dam and dike is based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dams and dikes, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.



02/10/11

Chad Cox, P.E.

Massachusetts License No.: 45856
Associate Principal
GZA GeoEnvironmental, Inc.

1.1 General

1.1.1 Authority

The Massachusetts Water Resources Authority (MWRA) has retained GZA GeoEnvironmental, Inc. (GZA), under subcontract to Dewberry-Goodkind, Inc., to perform a Phase I visual inspection and develop a report of conditions for the dam at Waban Hill Reservoir in Newton, Massachusetts. This work has been performed under MWRA Contract 7192, Task Order 12. This inspection and report were performed in accordance with MGL Chapter 253, Sections 44-50 of the Massachusetts General Laws as amended by Chapter 330 of the Acts of 2002. This report is subject to the Limitations in **Appendix A.**

1.1.2 Purpose of Work

The purpose of this investigation was to visually inspect and evaluate the present condition of the dam and appurtenant structures in accordance with 302 CMR10.07 to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation.

The investigation was divided into four parts: 1) obtain and review available reports, investigations, and data pertaining to the dams and appurtenant structures; 2) perform a visual inspection of the site; 3) evaluate the status of an emergency action plan for the site and; 4) prepare and submit a final report presenting the evaluation of the structure, including recommendations and remedial actions, and opinion of probable costs.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in **Appendix E.** Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; 5) general; and 6) condition rating.

1.2 Description of Project

The Waban Hill Reservoir Dam is listed on the National Inventory of Dams (NID) under ID number (MA01111). The Massachusetts Office of Dam Safety does not assign an identification number.

1.2.1 Location

The Waban Hill Reservoir Dam impounds the off-stream Waban Hill Reservoir in Newton, Massachusetts. The National Inventory of Dams (NID) locates the dam at latitude 42.3384 and longitude -71.1760. A locus map and an aerial photograph of the site are provided in **Figure 1** and **Figure 2** respectively.

From MWRA headquarters in Charlestown, MA, travel to Interstate 93. Merge onto I-93 south and follow to Exit 20B. Merge onto I-90 West toward Worcester. Take Exit 17 toward Newton. Stay straight and follow Washington Street to Center Street. Turn right onto Center

Street. Turn left onto Cheston Street then right onto Stuart Road. Follow Stuart Road until it becomes Ward Street. Follow Ward Street to the intersection of Ward and Winchester Drive. Waban Hill reservoir is located on the left.

1.2.2 Owner/Caretaker

The Waban Hill Reservoir Dam is owned by the Commonwealth of Massachusetts - DCR. The dams are operated and maintained by personnel from the MWRA. See Table 1.1 for current owner and caretaker data (names and contact information).

	Dam Owner	Dam Caretaker
Name	Commonwealth of Mass. – DCR	MWRA
Contact Person	William Salomaa, Office of Dam Safety	John Gregoire, Program Manager
Mailing Address	251 Causeway Street, Suite 600	266 Boston Road
Town	Boston, MA 02114	Southborough, MA 01772
Daytime Phone Number	1-617-626-1410	508-424-3608
Emergency Phone Number	1-617-719-1942	(617) 799-8855 (cell)
Email Address	William.salomaa@state.ma.us	john.gregoire@mwra.state.ma.us

1.2.3 Purpose of the Dam

The Waban Hill Reservoir Dam was completed in 1900 as part of the water supply system for the City of Boston and the surrounding communities. The reservoir is an off-stream impoundment with virtually no watershed area. It was used to provide high service pressure and storage. The reservoir was filled via water pumped through a water supply pipeline. The reservoir is currently intended as an emergency source of water to fill a high service pipeline back to the Chestnut Hill emergency pump station so as to provide the necessary backpressure to allow a pump start. Other than for backpressure, no water is stored for consumption.

1.2.4 Description of the Dam and Appurtenances

The Waban Hill Reservoir Dam is a 1,100 feet long earthen embankment dam. The dam has a maximum height of 22 feet and a crest width of about 15 feet. The upstream face is riprapped with a 1.5 horizontal to 1 vertical (1.5H:1V) slope. The downstream face is sloped at 1.7H:1V and varies in height from zero feet at the abutments to a maximum of 22 feet at the southeast corner of the reservoir. The embankment surrounds approximately three-quarters of the impoundment.

There is a gatehouse located in the southwest corner that contains a pair of sluice gates. The primary outlet is also located in the southwest corner of the reservoir and is a 20-inch diameter cast iron pipe, which contains an air gap and spool piece for reservoir disconnect, the 20-inch pipe then increases to 30-inch, and then connects to a 36-inch diameter water supply pipe via a T-connection. A secondary outlet is an 8-inch diameter cast iron drain which can be used to manually control the reservoir elevation. See Figure 7.

The Waban Hill Reservoir dam does not have an uncontrolled spillway.

1.2.5 Operations and Maintenance

The MWRA is responsible for ongoing operation and maintenance of the dam.

It should be noted that if the primary supply system for the MWRA Southern High Service Area of Boston fails, then Waban Hill Reservoir could be used as part of the emergency backup supply to that system by providing the necessary backpressure to allow a pump start

A Formal Operations and Maintenance plan is available and was reportedly last updated by MWRA in May 2010. The Formal Operations and Maintenance Plan was not reviewed for this inspection.

1.2.6 DCR Size Classification

Waban Hill Reservoir Dam has a structural height of approximately 22 feet and a maximum storage capacity of 60 acre-feet at the top of the dam. In accordance with Department of Conservation and Recreation Office of Dam Safety classification, under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 of the Acts of 2002, based on the reported maximum height and maximum storage, the Waban Hill Reservoir Dam would be classified as **Intermediate** sized (maximum height between 15 to 40 feet and maximum storage volume between 50 to 1,000 acre-feet) structure. Refer to **Appendix E** for definitions of height of dam and storage.

1.2.7 DCR Hazard Potential Classification

Waban Hill Reservoir Dam is located upstream of a residential area in Newton, MA. The residential streets of Woodland Drive, Reservoir Drive, Manet Street, and Ward Street surround the reservoir. It appears that a failure of the dam at maximum pool has the potential to "*likely cause loss of life and serious damage to home(s), industrial, or commercial facilities, important public utilities, main highway(s) or railroad(s).*" Therefore, in accordance with Department of Conservation and Recreation classification procedures, under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 of the Acts of 2002, Waban Hill Reservoir Dam is currently classified as a **HIGH** hazard dam. GZA notes that the MWRA is exploring ways of reducing the risk posed by the structure, which could result in a request for a change in hazard classification.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

The Waban Hill Reservoir does not impound a stream. The drainage area for the reservoir is equivalent to the surface area of the reservoir itself, reported to be approximately 2.9 acres.

1.3.2 Reservoir

See **Table 1.2** for data about normal, maximum, and spillway design flood (SDF) pools.

	Length (feet)	Surface Width (feet)	Surface Area (acres)
Normal Pool (current)	1260	29	2.9
Maximum Pool	1260	60	2.9
SDF Pool	1250	58	2.9

1.3.3 Discharges at the Dam Site

No records of historic discharges at the dam were made available to GZA.

1.3.4 General Elevations (feet)

Elevations are shown in Boston City Base (BCB).

A.	Top of Dam	269.5 ±
B.	Spillway Design Flood Pool	268.1 ± [1]
C.	Normal Pool	259±
D.	Upstream Water at Time of Inspection	257.7±
E.	Toe of the Dam	250.0±
F.	Low Point along Toe of the Dam	247.6±

1.3.5 Main Spillway Data

There is no primary or emergency spillway at the Waban Hill Reservoir Dam.

1.3.6 Regulating Outlets

<u>Water Supply</u>		
A.	Invert	237.6±
B.	Size	20-inch
		(currently disconnected)
C.	Description	Water Supply Pipe
D.	Control	See valve diagram (Figure 7)
<u>Reservoir Drain</u>		
A.	Invert	Unknown
B.	Size	8-inch
C.	Description	Reservoir Drain Pipe
D.	Control	8-inch valve

1.3.7 Design and Construction Records and History

The construction of Waban Hill Reservoir was completed in 1900. Drawings are available upon request from the MWRA.

1.3.8 Operating Records

There are operational records available at the MWRA headquarters facility in Charlestown, Massachusetts.

[1] Weston and Sampson, Dam Inspection and Evaluation Report, Waban Hill Reservoir Dam, ID: MA01111, April 18, 2008

1.4 Summary Data Table

Table 1.1 Summary Data Table

Required Phase I Report Data	Data Provided by the Inspecting Engineer
National ID #	MA01111
Dam Name	Waban Hill Reservoir Dam
Dam Name (Alternate)	
River Name	Off-stream impoundment
Impoundment Name	Waban Hill Reservoir
Hazard Class	High
Size Class	Intermediate
Dam Type	Earthen Embankment
Dam Purpose	Backup water supply
Structural Height of Dam (feet)	22
Hydraulic Height of Dam (feet)	22 (no uncontrolled spillway)
Drainage Area (sq. mi.)	0.0046
Reservoir Surface Area (sq. mi.)	0.0046
Normal Impoundment Volume (acre-feet)	29
Max Impoundment Volume ((top of dam) acre-	60
SDF Impoundment Volume* (acre-feet)	60
Spillway Type	There is no spillway
Spillway Length (feet)	NA
Freeboard at Normal Pool (feet)	Reported by MWRA as 10 +/- feet minimum
Principal Spillway Capacity* (cfs)	NA
Auxiliary Spillway Capacity* (cfs)	NA
Low-Level Outlet Capacity* (cfs)	Unknown
Spillway Design Flood* (flow rate - cfs)	½ PMF
Winter Drawdown (feet below normal pool)	N/A
Drawdown Impoundment Vol. (acre-feet)	N/A
Latitude	42.3384
Longitude	-71.1760
City/Town	Newton
County Name	Middlesex
Public Road on Crest	N/A
Public Bridge over Spillway	N/A
EAP Date (if applicable)	December 29, 2010
Owner Name	Commonwealth of Mass. – DCR
Owner Address	251 Causeway Street, Suite 600
Owner Town	Boston
Owner Phone	1-617-626-1410
Owner Emergency Phone	1-617-719-1942
Owner Type	State Government
Caretaker Name	John Gregoire, Program Manager for MWRA
Caretaker Address	266 Boston Road
Caretaker Town	Southborough, MA 01772
Caretaker Phone	508-424-3608
Caretaker Emergency Phone	(617) 799-8855
Date of Field Inspection	6/10/2010
Consultant Firm Name	GZA GeoEnvironmental, Inc.
Inspecting Engineer	Chad Cox, P.E
Engineer Phone Number	781 278 -5787

2.1 Visual Inspection

Waban Hill Reservoir Dam was inspected by GZA on August 24, 2010. At the time of the inspection, the weather was rainy with temperatures in the 60°s F. Photographs to document the current conditions of the dams were taken during the inspection and are included in **Appendix B.** The level of the impoundment was at elevation 257.7 feet (BCB). Neither underwater areas nor interior portions of the chambers of the gatehouse were inspected as part of our scope of work. A copy of the completed inspection checklist is included in **Appendix C.**

2.1.1 General Findings

In general, Waban Hill Reservoir Dam was found to be in **FAIR** condition. Photographs taken during the site visit are included in **Appendix B.** As with most dams/dikes there are some deficiencies, which are identified in more detail in the sections below:

2.1.2 Dam

- Abutments

The abutments appear to have good contact and no indications of cracking or erosion was found. The abutments are located in the northeast corner of the reservoir at the intersection of Manet Road and Reservoir Drive.

- Upstream Slope

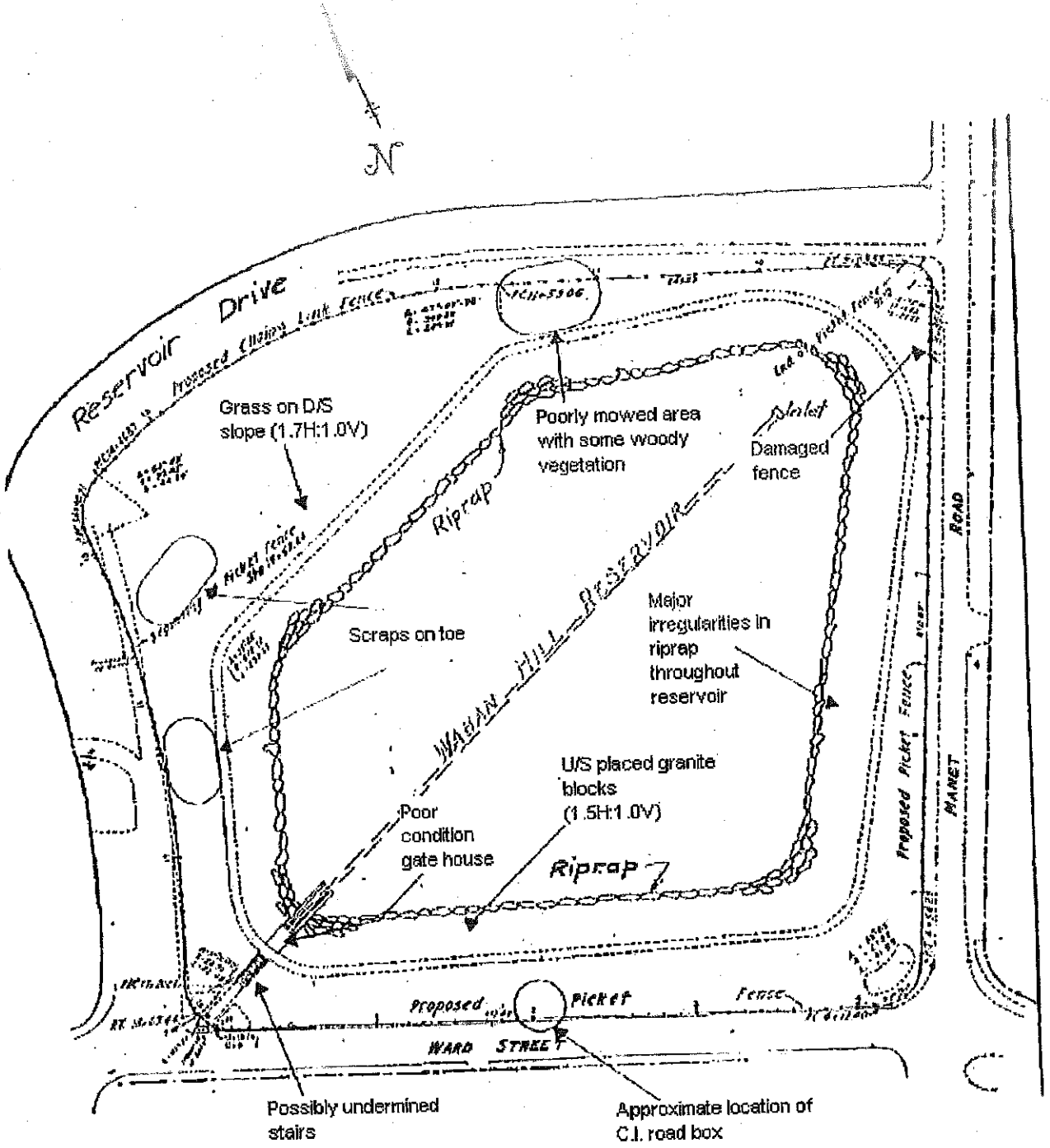
Placed cut granite blocks provide protection on the upstream slopes. The granite riprap blocks appear to have heaved, slid, and otherwise displaced on a majority of the upstream embankment slope. See Photo 11. Woody vegetation was observed on the upstream slope and within the placed riprap joints: however, the upper three feet of the upstream slope is grassed and well maintained. See Photo 1 and 4. Based on the 2009 survey the upstream slope is graded at approximately 1.5:1 (H:V). In the previous inspection report it was noted that at least one granite block was missing from the slope adjacent to the right side of the gatehouse. This area was obscured by vegetation at the time of this inspection.

- Crest

The crest of the dam has a grass surface with a slight pitch to the downstream slope and appears to be well maintained. The grassed crest appeared in good condition with minor ruts and sparce areas. See Photo 5.

- Downstream Slope

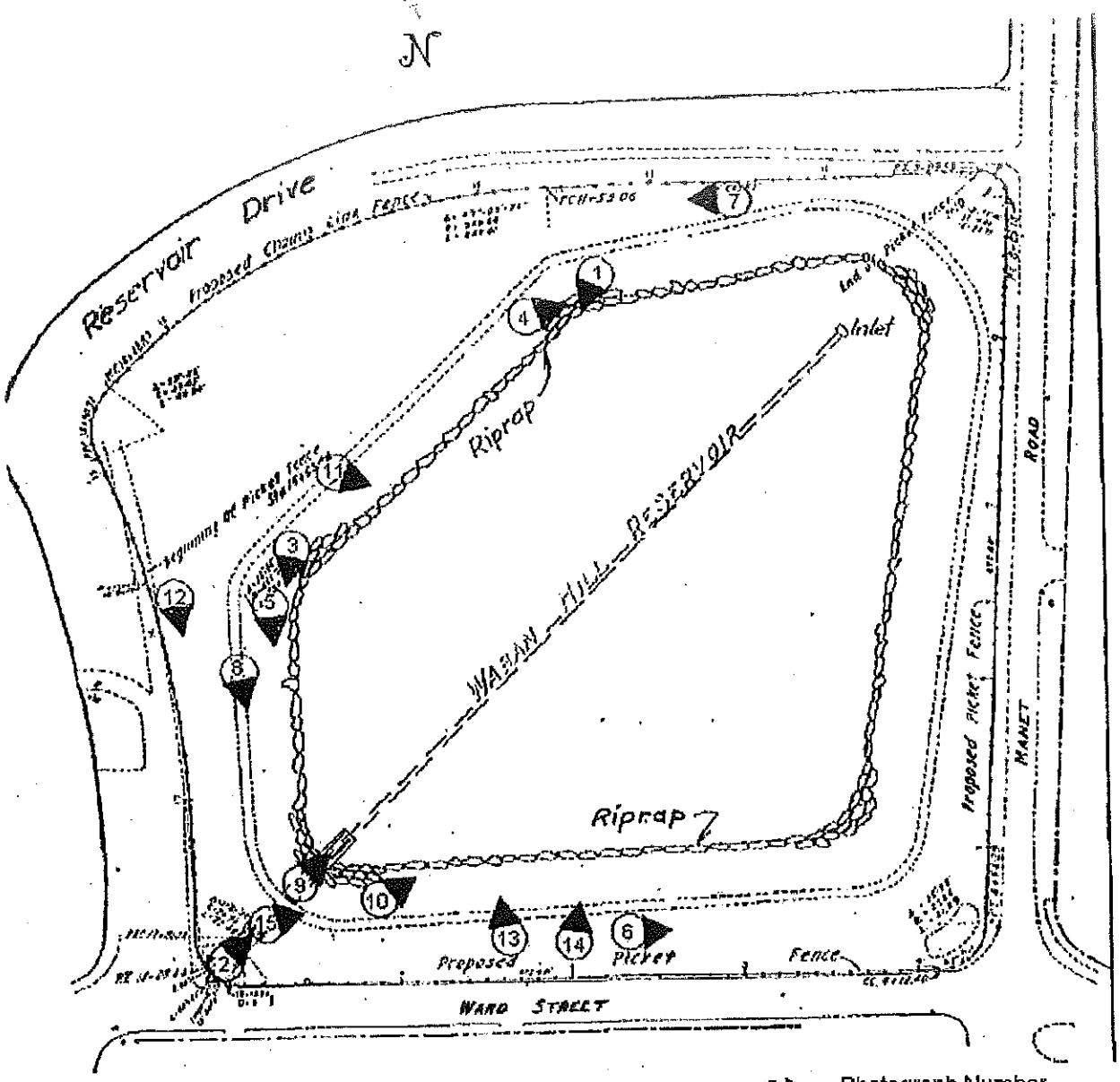
The downstream slope is protected by a well-maintained grass cover and based on the 2009 survey is graded at approximately 1.7:1 (H:V). See Photograph 6. There is a poorly mowed area to the right of the "abutment" along Reservoir Drive, with some woody vegetation in this area. See Photo 7. Thatch lines were noted at the edge of



Site Plan

MDC Plan Dated April 1930

GZA	DATE: 02-01-2011	SITE SKETCH WABAN HILL RESERVOIR DAM - MA01111	JOB NO. 01.0170686.00
	SCALE: NTS	MASSACHUSETTS WATER RESOURCES AUTHORITY - NEWTON, MASSACHUSETTS	FIGURE NO. 5



Site Plan

MDC Plan Dated April 1930

GZA	DATE: 02-01-2011	PHOTOGRAPH LOCATIONS WABAN HILL RESERVOIR DAM - MA01111	JOB NO. 01.0170686.00
	SCALE: NTS	MASSACHUSETTS WATER RESOURCES AUTHORITY - NEWTON, MASSACHUSETTS	FIGURE NO. 6

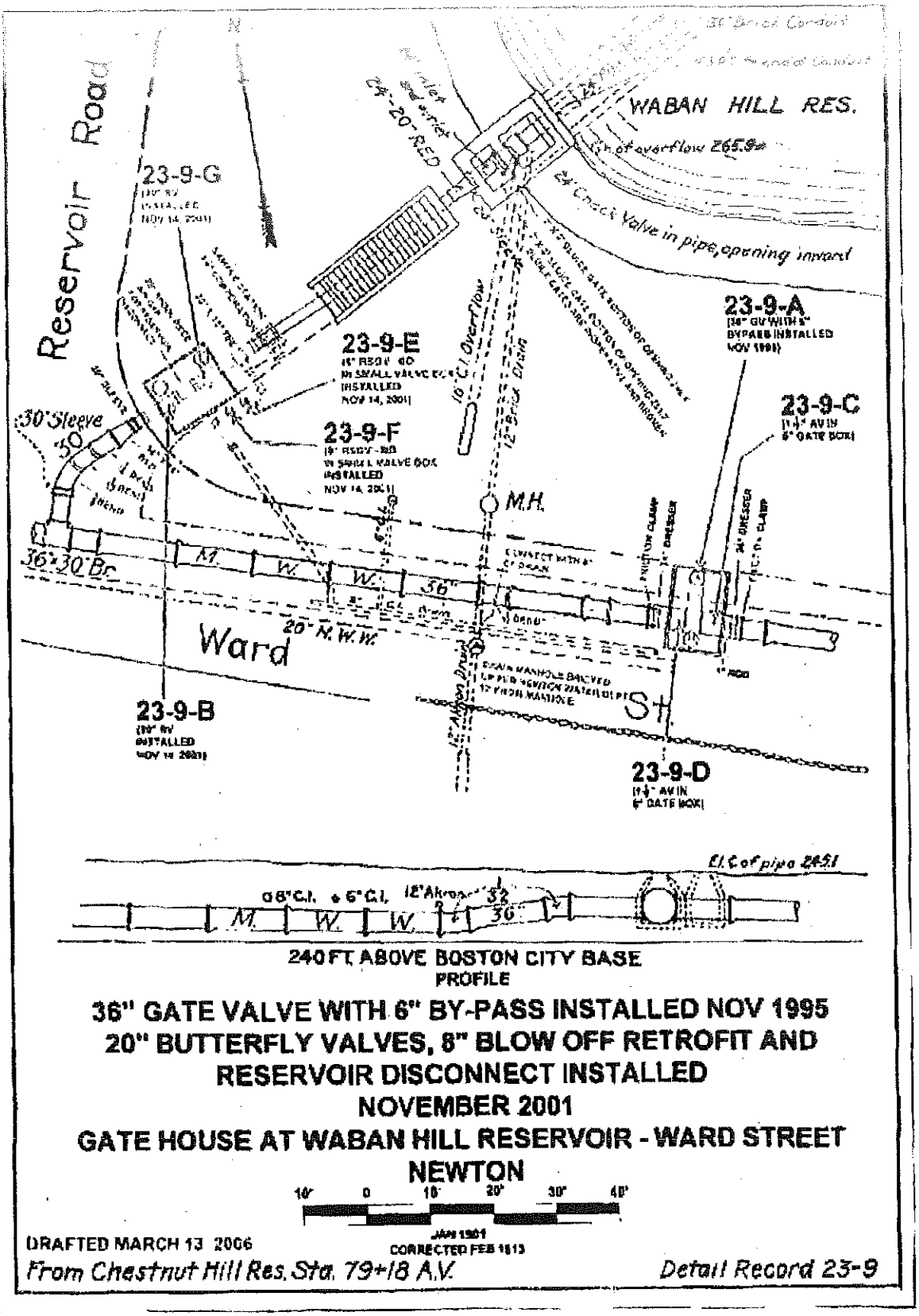
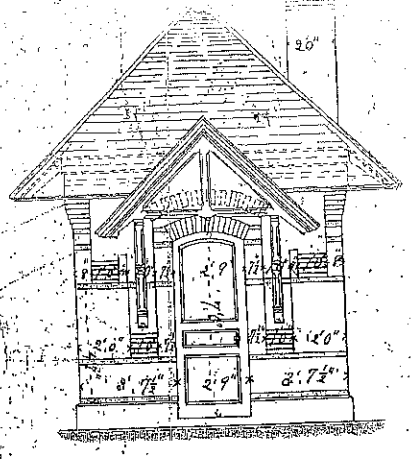


FIGURE 7: WABAN HILL RESERVOIR DAM VALVE DIAGRAM

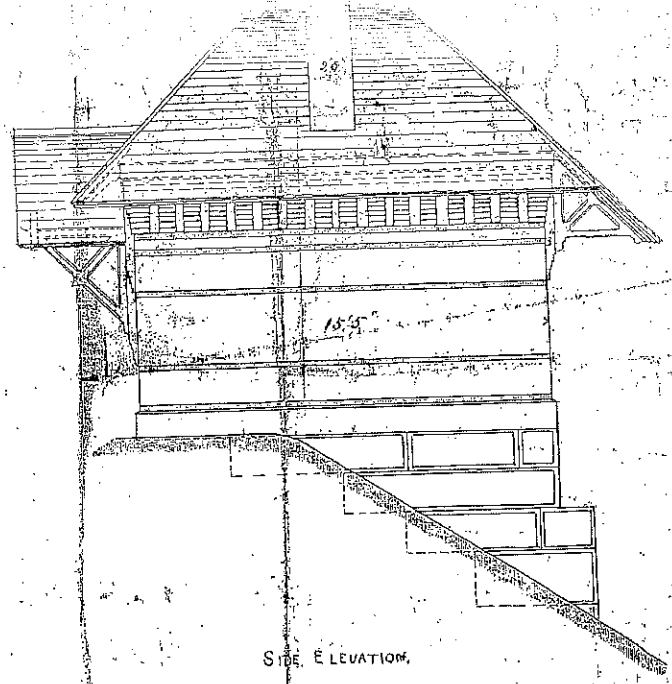
2117

ACCESSION No. B 3539

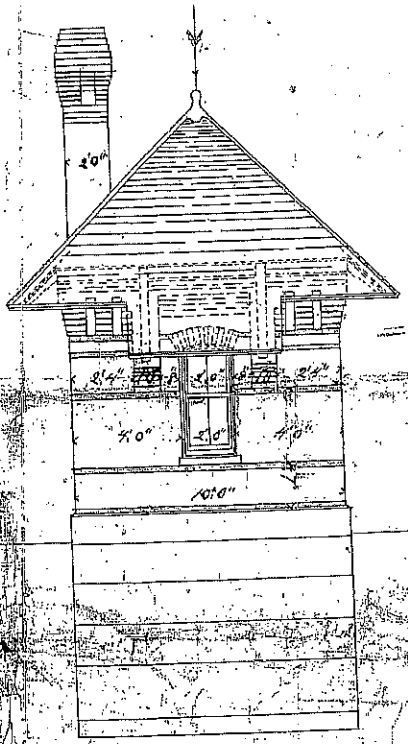
19 - 36 -



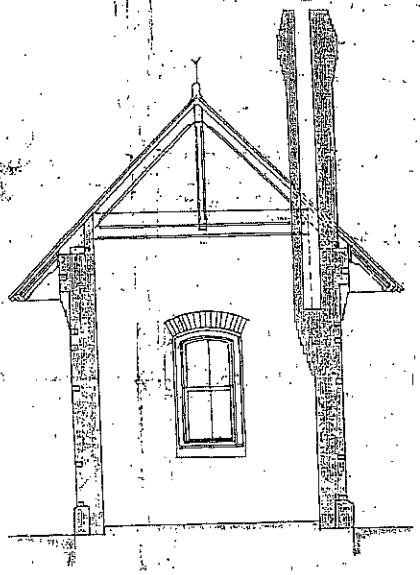
ENTRANCE ELEVATION.



SIDE ELEVATION.



RESERVOIR ELEVATION.



SECTION.

CASE. DRAWER. No IN DRAWER

19 - 36 -

ACCESSION No B 3539

2117

Book I.

CHAS. EDWD PARK, ARCH'T,
No. 39 COURT ST, BOSTON.

Waban Hills Reservoir

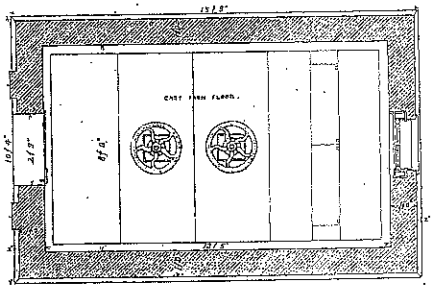
SCALE - 1/8" = 1' 0"

208

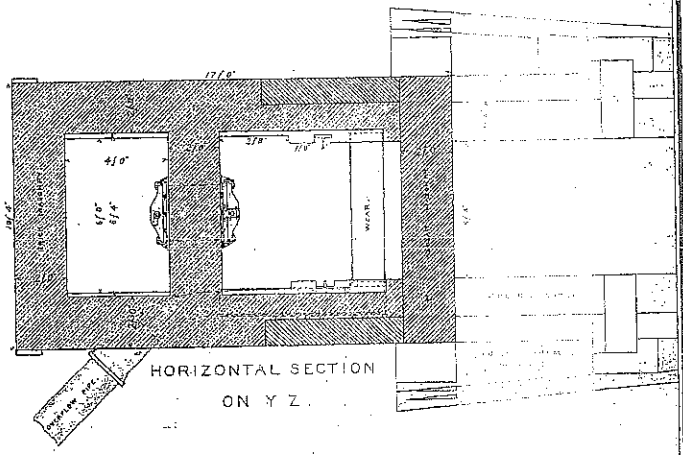
DESIGNS FOR GATE CHAMBER AND HOUSE AT WABAN HILL RESERVOIR.

Sheet No. 2.

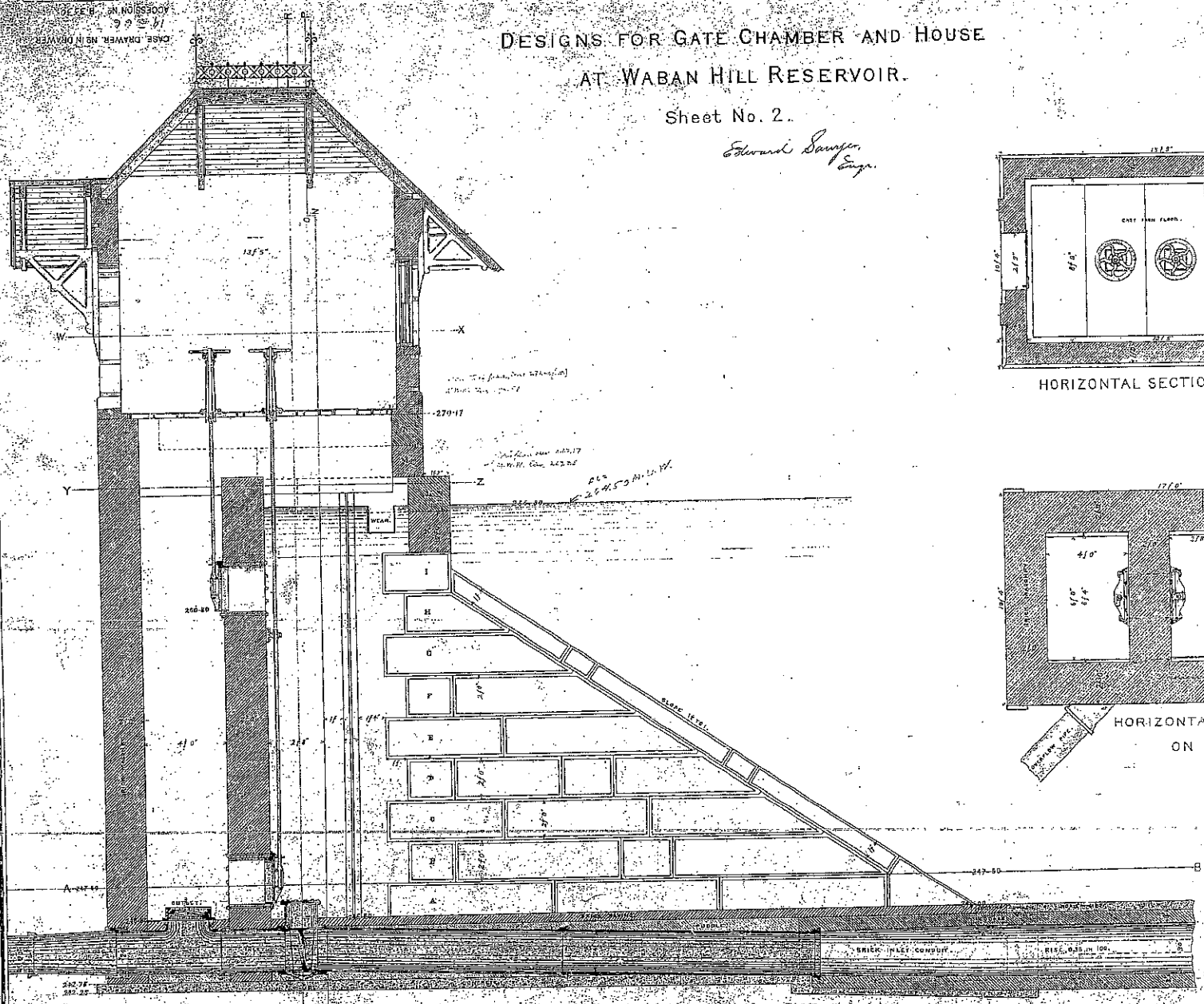
Edward Sawyer, Engr.



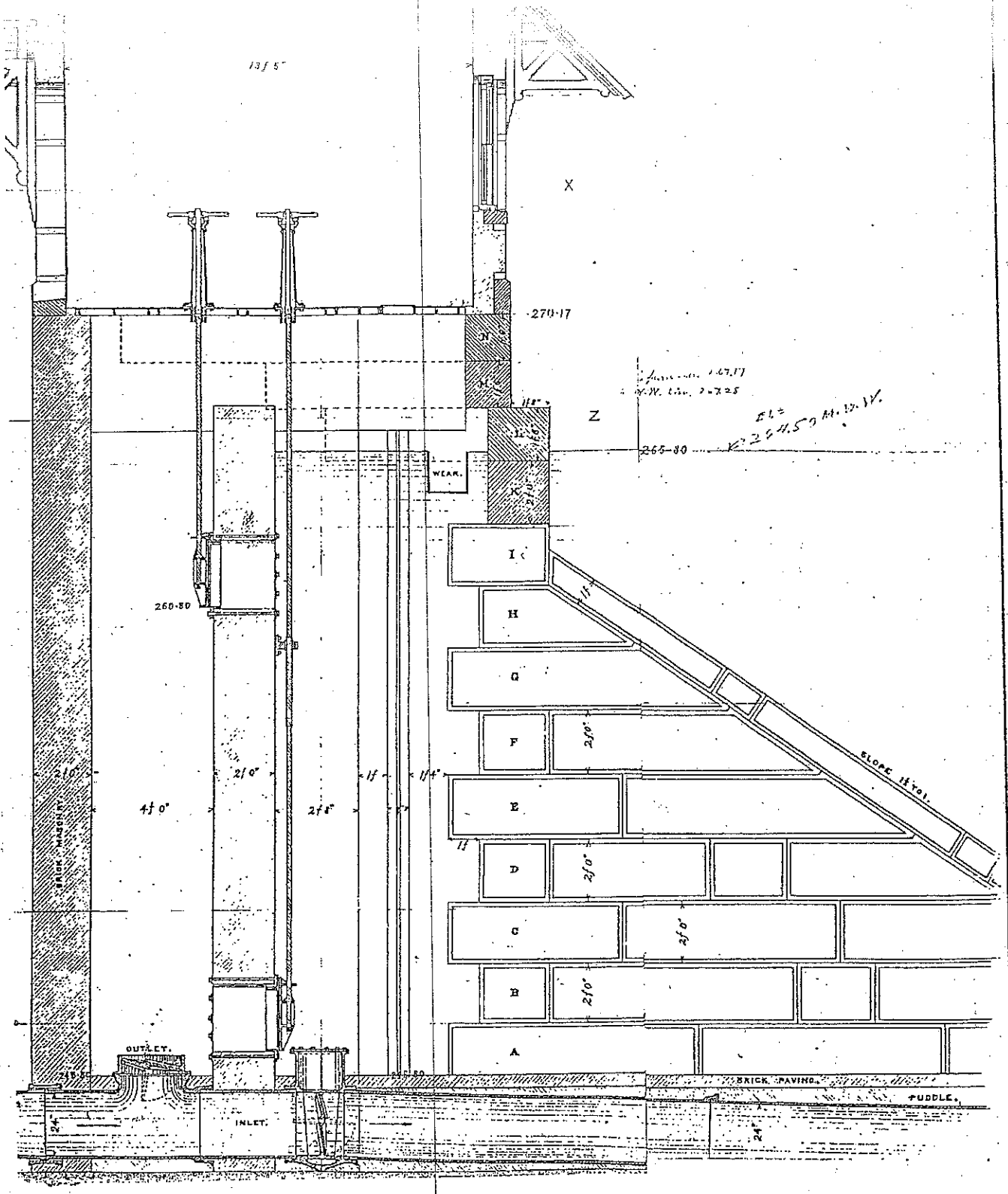
HORIZONTAL SECTION ON W X.



HORIZONTAL SECTION ON Y Z.

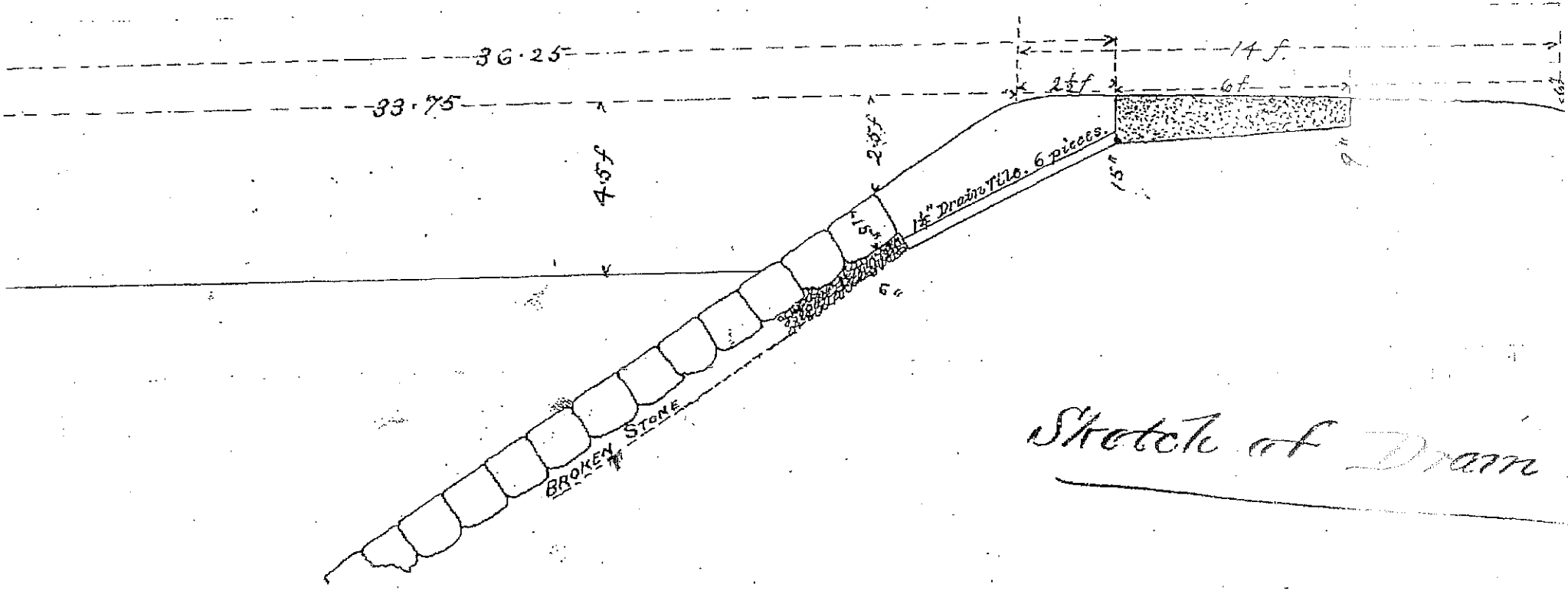


VERTICAL SECTION ON S T U V. OF SHEET No. 1.



Section Through Gatehouse

B-5



Sketch of Drain

Graham Hill

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

March 22, 2013

Lou Taverna
City Engineer
Department of Public Works
Newton City Hall, Room 104
1000 Commonwealth Avenue
Newton Centre, MA 02459

Subject: 2012 Phase I Dam Safety Inspection Report on Waban Hill Dam, Newton MA

Dear Mr. Taverna:

Attached, please find a copy of the above referenced Report per your request.

As discussed in the Report, this reservoir is no longer necessary for operation of the MWRA water system. As discussed in Sections 2.2 and 2.6.3 of the Report, the impoundment is kept near empty with only a base pool to prevent odors and vegetation. MWRA has also met with the Office of Dam Safety to discuss the status of this dam.

Overall, the Report finds the condition of the dam "FAIR." The estimated costs to maintain the dam structure and appurtenances, which are included in the report, are only necessary for continued use of the property as a reservoir. Obviously, other uses of the property by the City would not require the maintenance describe in the report. The inspection found that (Section 3.5), under the present condition and use, "the majority of the work at the dam is considered maintenance and minor repairs."

Should you have any additional questions about the Phase I inspection or the report, feel free to call John Gregoire of my staff at 508-424-3608.

Very truly yours,

Michael J. Hornbrook
Chief Operating Officer

Attachment: 2012 Phase I Dam Safety Inspection Report on Waban Hill Dam, Newton MA

cc: John Gregoire, Program Manager, Reservoir Operations, MWRA
Mark Johnson, Director, Metropolitan Operations, MWRA
Marcis Kempe, Director, Operations Support and Emergency Planning

WABAN HILL RESERVOIR DAM

PHASE I
INSPECTION / EVALUATION REPORT

Dam Name:	Waban Hill Reservoir Dam
State Dam ID#:	4-9-207-6
NID ID#:	MA01111
Owner:	Commonwealth of Massachusetts (MWRA)
Owner Type:	DCR – Water Resource
Town:	Newton
Consultant:	Pare Corporation
Date of Inspection:	September 7, 2012

PARE
CORPORATION

Dam Evaluation Summary Detail Sheet

1. NID ID:	MA01111	4. Inspection Date:	September 7, 2012
2. Dam Name:	Waban Hill Reservoir Dam	5. Last Insp. Date:	August 27, 2010
3. Dam Location:	Newton, MA	6. Next Inspection:	September 7, 2014
7. Inspector:	Allen R. Orsi, P.E.		
8. Consultant:	Pare Corporation		
9. Hazard Code:	High	9a. Is Hazard Code Change Requested?:	No
10. Insp. Frequency:	2 Years	11. Overall Physical Condition of Dam:	FAIR
12. Spillway Capacity (% SDF)	>100% SDF w/actions by Caretaker		

E1. Design Methodology:	2	E7. Low-Level Discharge Capacity:	4
E2. Level of Maintenance:	4	E8. Low-Level Outlet Physical Condition:	4
E3. Emergency Action Plan:	4	E9. Spillway Design Flood Capacity:	4
E4. Embankment Seepage:	5	E10. Overall Physical Condition of the Dam:	3
E5. Embankment Condition:	3	E11. Estimated Repair Cost:	$325k-$518k
E6. Concrete Condition:	N/A		

Evaluation Description

E1: DESIGN METHODOLOGY
1. Unknown Design – no design records available
2. No design or post-design analyses
3. No analyses, but dam features appear suitable
4. Design or post design analysis show dam meets most criteria
5. State of the art design – design records available & dam meets all criteria

E2: LEVEL OF MAINTENANCE
1. Dam in disrepair, no evidence of maintenance, no O&M manual
2. Dam in poor level of upkeep, very little maintenance, no O&M manual
3. Dam in fair level of upkeep, some maintenance and standard procedures
4. Adequate level of maintenance and standard procedures
5. Dam well maintained, detailed maintenance plan that is executed

E3: EMERGENCY ACTION PLAN
1. No plan or idea of what to do in the event of an emergency
2. Some idea but no written plan
3. No formal plan but well thought out
4. Available written plan that needs updating
5. Detailed, updated written plan available and filed with MADCR, annual training

E4: SEEPAGE (Embankments, Foundations, & Abutments)
1. Severe piping and/or seepage with no monitoring
2. Evidence of monitored piping and seepage
3. No piping but uncontrolled seepage
4. Minor seepage or high volumes of seepage with filtered collection
5. No seepage or minor seepage with filtered collection

E5: EMBANKMENT CONDITION (See Note 1)
1. Severe erosion and/or large trees
2. Significant erosion or significant woody vegetation
3. Brush and exposed embankment soils, or moderate erosion
4. Unmaintained grass, rodent activity and maintainable erosion
5. Well maintained healthy uniform grass cover

E6: CONCRETE CONDITION (See Note 2)
1. Major cracks, misalignment, discontinuities causing leaks, seepage or stability concerns
2. Cracks with misalignment inclusive of transverse cracks with no misalignment but with potential for significant structural degradation
3. Significant longitudinal cracking and minor transverse cracking
4. Spalling and minor surface cracking
5. No apparent deficiencies

E7: LOW-LEVEL OUTLET DISCHARGE CAPACITY
1. No low level outlet, no provisions (e.g. pumps, siphons) for emptying pond
2. No operable outlet, plans for emptying pond, but no equipment
3. Outlet with insufficient drawdown capacity, pumping equipment available
4. Operable gate with sufficient drawdown capacity
5. Operable gate with capacity greater than necessary

E8: LOW-LEVEL OUTLET PHYSICAL CONDITION
1. Outlet inoperative needs replacement, non-existent or inaccessible
2. Outlet inoperative needs repair
3. Outlet operable but needs repair
4. Outlet operable but needs maintenance
5. Outlet and operator operable and well maintained

E9: SPILLWAY DESIGN FLOOD CAPACITY
1. 0 - 50% of the SDF or unknown
2. 50-90% of the SDF
3. 90 - 100% of the SDF
4. >100% of the SDF with actions required by caretaker (e.g. open outlet)
5. >100% of the SDF with no actions required by caretaker

E10: OVERALL PHYSICAL CONDITION OF DAM
1. UNSAFE – Major structural, operational, and maintenance deficiencies exist under normal operating conditions
2. POOR - Significant structural, operation and maintenance deficiencies are clearly recognized under normal loading conditions
3. FAIR - Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters
4. SATISFACTORY - Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.
5. GOOD - No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF

E11: ESTIMATED REPAIR COST
Estimation of the total cost to address all identified structural, operational, maintenance deficiencies. Cost shall be developed utilizing standard estimating guides and procedures

Changes/Deviations to Database Information since Last Inspection

EXECUTIVE SUMMARY

This Phase I Inspection/Evaluation Report details the inspection and evaluation of the Waban Hill Reservoir Dam located in Newton, Massachusetts. The inspection was conducted on September 7, 2012 by Pare Corporation of Foxboro, Massachusetts. Waban Hill Reservoir Dam is an approximately 1,300-feet long earthen embankment structure. The dam is currently classified as an Intermediate sized, High (Class I) hazard potential dam.

The Massachusetts Water Resource Authority (MWRA) is responsible for the ongoing operation and maintenance of the dam. A formal Operations and Maintenance manual is available for the structure at MWRA's main office in Southborough, MA.

The purpose of the reservoir was formerly to provide a backup water supply if the primary system for the MWRA Southern High Service Area of Boston fails. Water would be diverted to Waban Hill Reservoir and would aid in supplying water to the area. However, modifications to the MWRA water supply systems have eliminated the need for this redundant component of their infrastructure.

In general, Waban Hill Reservoir Dam was found to be in **Fair** condition with the following major deficiencies noted:

1. Heaving/bulging of slope protection along the upstream slope.
2. Areas of shrubs and unwanted vegetation.
3. Areas of potential movement and irregularities along the downstream slope.
4. Apparent rodent activity in areas of the dam.
5. A brick masonry gate house generally in poor condition.
6. Loose and settling granite staircase at the southwest corner on the downstream slope.
7. Additional minor deficiencies and areas requiring maintenance.

More detailed descriptions, additional deficiencies, recommended repairs, and opinions of probable repair costs are provided within this report.

Based upon the size and hazard potential of this structure, the spillway design flood for the dam is one half the probably maximum flood event (1/2 PMF). As indicated within previous reports, the dam and impoundment have adequate capacity to accommodate the ½ PMF spillway design flood.

Pare Corporation recommends the following actions be taken to address the deficiencies found at the dam during this inspection and evaluation:

- Complete a detailed stability evaluation for the embankment, including:
  - Evaluate/address the bulging of the upstream interlocking granite blocks
  - Evaluate/address bulging/depressions along the downstream slope
- Evaluate/address settlement and voids beneath staircase.
- Clear all vegetation on both the upstream and downstream slopes
- Complete structural repairs as required at the gatehouse.
- Conduct additional studies, evaluations, maintenance and repairs as noted herein

Alternatively, as the impoundment is no longer utilized as part of the MWRA water supply system, the dam and impoundment could be removed and the site abandoned.

These repairs should be made in accordance to standard design practices, specifications, and construction methods. Design of the repairs, analyses to confirm the extent or the work, and observation to verify materials/methods used should be completed by a qualified engineer experienced in the design and rehabilitation of earthen dams throughout the evaluation, design, and construction process.

Prior to undertaking recommended maintenance, repairs and remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of local conservation commissions, MADEP, or other regulatory agencies.

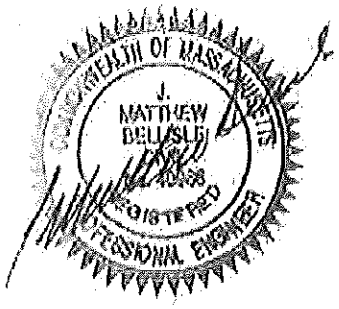
PREFACE

The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection, along with data available to the inspection team.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

J. Matthew Bellisle, P.E.
Massachusetts License No.: 40986
License Type: Civil
Senior Vice President
Pare Corporation



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SECTION 1

1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The Massachusetts Water Resources Authority (MWRA) has retained Pare Corporation (PARE) to perform a visual inspection and develop a report of conditions for the Waban Hill Reservoir Dam in Newton, Massachusetts. This inspection and report were performed in accordance with MGL Chapter 253, Sections 44-50 of the Massachusetts General Laws as amended by Chapter 330 of the Acts of 2002.

1.1.2 Purpose of Work

The purpose of this investigation is to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with 302 CMR10.07 to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation.

The investigation is divided into four parts: 1) obtain and review available reports, investigations, and data previously submitted to the owner pertaining to the dam and appurtenant structures; 2) perform a visual inspection of the site; 3) evaluate the status of and need for an emergency action plan for the site and; 4) prepare and submit a final report presenting the evaluation of the structure, including recommendations for remedial actions, and opinions of probable costs.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in Appendix D. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; 5) general; and, 6) condition rating.

1.2 Description of Project

1.2.1 General

Sections of this report are based upon available documentation, including previous inspection reports and other available information as identified in Appendix C. Other historical information obtained during the inspection, including information provided by the caretaker has also been incorporated into this report. This material is intended to provide general information. The accuracy of this referenced information was not verified as it was outside the scope of work for this inspection.

The completion of detailed hydrologic/hydraulic studies, stability analyses, subsurface investigations, and underwater investigations is beyond the scope of this evaluation.

1.2.2 Location

The Waban Hill Reservoir Dam impounds the off-stream Waban Hill Reservoir in Newton, Massachusetts near coordinates 42.33795°N\71.17663°W[1]. The dam extends around the entire perimeter of the impoundment with the gatehouse and outlets near the southwestern corner of the impoundment, as indicated on Figure 3: Site Sketch.

To reach the dam from MWRA headquarters in Charlestown, Massachusetts, take I-90 West toward Worcester. Take Exit 17 toward Newton and continue straight on Washington Street for 0.3 miles. Turn left onto Church Street and continue for 0.7 miles to the end. Turn right onto Waverly Avenue for 0.8 miles. Turn left onto Ward Street and continue 0.3 miles to the dam on the left.

1.2.3 Owner/Operator

The Waban Hill Reservoir Dam is owned by the Commonwealth of Massachusetts. The dam is operated and maintained by personnel from the MWRA. See Table 1.1 for current owner and caretaker data (names and contact information).

1.2.4 Purpose of the Dam

The Waban Hill Reservoir Dam was reportedly completed in 1900 as part of the water supply system for the City of Boston and the surrounding communities. The reservoir is an off-stream impoundment with virtually no watershed area. It was used to provide high service pressure and storage. The reservoir was filled via water pumped through a water supply pipeline. The reservoir is currently intended as an emergency source of water to fill a high service pipeline back to the Chestnut Hill emergency pump station so as to provide the necessary backpressure to allow a pump start. Other than for backpressure, no water is stored for consumption. MWRA has reported that the presence of the Waban Hill Reservoir is a redundant feature in the system and generally no longer functions in the system.

1.2.5 Description of the Dam and Appurtenances

As paraphrased from the 2010 Phase I Report prepared by GZA GeoEnvironmental:

> The Waban Hill Reservoir Dam is a 1,300 foot long earthen embankment dam. The dam has a maximum height of 22 feet. The upstream face is armored with placed granite block riprap with a 1.5 horizontal to 1 vertical (1.5H:1V) slope. The crest of the embankment is flat with a width of approximately 15 feet. The downstream face is sloped at 1.7H:1V and varies in height from zero feet at the abutments along the northeast portion of the impoundment, to a maximum of 22 feet at the southeast corner of the reservoir. The embankment runs around the majority of the impoundment with an approximately 50-foot section of natural ground at the northeast corner of the impoundment area.
>
> There is a gatehouse located in the southwest corner that contains a pair of sluicegates. The primary outlet is also located in the southwest corner of the reservoir and is a 20-inch

[1] As indicated within the MADCR Office of Dam Safety database.

diameter cast iron pipe, which contains an air gap and spool piece for reservoir disconnect, the 20-inch pipe then increases to 30-inch, and then connects to a 36-inch diameter water supply pipe via a T-connection. A secondary outlet is an 8-inch diameter cast iron drain which can be used to manually control the reservoir elevation.

The Waban Hill Reservoir dam does not have an overflow spillway.

1.2.6 Operations and Maintenance

As indicated in the 2010 Phase I Report:

"MWRA is responsible for ongoing operation and maintenance of the dam.

It should be noted that if the primary supply system for the MWRA Southern High Service Area of Boston fails, then Waban Hill Reservoir could be used as part of the emergency backup supply to that system by providing the necessary backpressure to allow a pump start.

MWRA has indicated that the Waban Reservoir is a redundant component of their system and that the presence of the reservoir is no longer necessary to operate the system.

A formal Operations and Maintenance plan is available for review at MWRA's main office, and was available during the preparation of this report. The O&M was updated was in May 2010.

1.2.7 DCR Size Classification

Waban Hill Reservoir Dam has a maximum embankment height of approximately 22-feet and a reported maximum storage capacity of 60 acre-feet. Therefore, in accordance with Department of Conservation and Recreation Office of Dam Safety classification, under Commonwealth of Massachusetts Dam Safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 of the Acts of 2002, Waban Hill Reservoir Dam is an Intermediate size structure.

1.2.8 DCR Hazard Classification

Waban Hill Reservoir Dam is located in an urban area where the failure of this dam could cause significant property damage to commercial buildings and residential dwellings along the surrounding streets. It appears that a failure of the dam at maximum pool may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities. Therefore, in accordance with Department of Conservation and Recreation classification procedures, under Commonwealth of Massachusetts Dam Safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 Acts of 2002, Waban Hill Reservoir Dam is classified as a **Class I (HIGH)** hazard potential structure.

MWRA stated that they are actively trying to reduce the hazard risk of the dam and are exploring options to that would allow them to accomplish a reduction including implementing measures to eliminate the potential to impound water volumes sufficient to cause damage in the event of failure as well as complete removal.

1.3 Engineering Data

1.3.1 Drainage Area

The Waban Hill Reservoir Dam is located off stream with inflow predominantly limited to water put into the reservoir through operations of the water supply system. The drainage area for the reservoir is limited to the surface area of the impoundment as well as the area of the upstream slope and a small portion of the abutment at the northeast corner of the impoundment. Based upon scaled areas from available aerial imagery, the drainage area is estimated to be approximately 3.0 acres with the surface area of the impoundment accounting for approximately 2.9 acres of the drainage area.

1.3.2 Reservoir[1]

	Length[2] (ft)	Width[2] (ft)	Surface Area (acres)	Storage Volume (acre-feet)
Normal Pool (Historic)	520	320	2.9	29
Normal Pool (Current)	520	320	2.9	15
Maximum Pool	550	350	2.9	60
SDF Pool	540	340	2.9	58

1.3.3 Discharges at the Dam Site

No records of discharges at the dam site were made available during the preparation of this report.

1.3.4 General Elevations (feet)

Elevations are based upon a relative elevation survey complete by PARE personnel during the inspection. Elevations are based upon the average top of dam elevation, reported to be El. 269.5 ft BCB.

A. Average Top of Dam	269.5 ft. +/-
B. Normal Pool	
1. Historic	259.0 ft. +/-
2. Current	255 ft +/-
C. Upstream Water at Time of Inspection	254.2 ft. +/-
D. Toe of the Dam	247.6 ft. +/-

1.3.5 Primary Spillway

There is no overflow spillway at the Waban Hill Reservoir Dam. The outlet works serve as the only discharge structures at the dam.

[1] As indicated in the 2010 Phase I Report and checked for magnitude of accuracy, unless otherwise noted.
[2] Based upon scaled dimensions from available aearial imagery.

1.3.6 Outlet Works

Water Supply	
A. Invert	237.6
B. Size	20-inch (Currently disconnected)
C. Description	Water Supply Pipe
D. Control	Valves
Reservoir Drain	
A. Invert	Unknown
B. Size	8-inch
C. Description	Reservoir Drain Pipe
D. Control	8-inch Valve

1.3.7 Design and Construction Records

The construction of Waban Hill Reservoir was reportedly completed in 1900. Drawings are available upon request from the MWRA.

1.3.8 Operating Records

There are operational records available at the MWRA headquarters facility in Charlestown, Massachusetts. Operating records were not available during the preparation of this report.

1.4 Summary Data Table

Table 1.1 - Summary Data Table

National ID #	MA01111
Dam Name	Waban Hill Reservoir Dam
Dam Name (Alternate)	N/A
River Name	N/A (off-stream)
Impoundment Name	Waban Hill Reservoir
Hazard Class	High
Size Class	Intermediate
Dam Type	Earth Embankment
Dam Purpose	Standby water supply
Structural Height of Dam (feet)	22
Hydraulic Height of Dam (feet)	22
Drainage Area (sq. mi.)	0.00467 (3.0 acres)
Reservoir Surface Area (sq. mi.)	<0.01
Normal Impoundment Volume (acre-feet)	29 (Historical) / 15 (Current)
Max Impoundment Volume ((top of dam) acre-feet)	60
SDF Impoundment Volume* (acre-feet)	60
Spillway Type	N/A (No Spillway)
Spillway Length (feet)	N/A
Freeboard at Normal Pool (feet)	7 +/-
Principal Spillway Capacity (cfs)	N/A
Auxiliary Spillway Capacity (cfs)	N/A
Low-Level Outlet Capacity (cfs)	Not Available / No H&H
Spillway Design Flood (flow rate - cfs)	1/2 PMF / Not Available
Winter Drawdown (feet below normal pool)	None / Not applicable
Drawdown Impoundment Vol. (acre-feet)	N/A
Latitude	42.337951°N
Longitude	71.176633°W
City/Town	Newton
County Name	Middlesex
Public Road on Crest	No
Public Bridge over Spillway	No
EAP Date (if applicable)	Unknown
Owner Name	Commonweath of Massachusetts
Owner Address	251 Causeway Street
Owner Town	Boston, MA
Owner Phone	617-626-1410
Owner Emergency Phone	508-481-2856 (MWRA 24/7)
Owner Type	DCR - Water Resources
Caretaker Name	John J. Gregoire, P.E. - Program Manager
Caretaker Address	266 Boston Road
Caretaker Town	Southborough, MA 01772
Caretaker Phone	617-799-8855
Caretaker Emergency Phone	508-481-2856 (MWRA 24/7)
Date of Field Inspection	9/7/2012
Consultant Firm Name	Pare Corporation
Inspecting Engineer	Allen R. Orsi, P.E.
Engineer Phone Number	508.543.1755

SECTION 2

2.0 INSPECTION

2.1 Visual Inspection

The Waban Hill Reservoir Dam was inspected on September 7, 2012. At the time of the inspection, temperatures were near 80°F with sunny skies. Photographs to document conditions were taken during the inspection and are included in Appendix A. The level of the impoundment was lowered from the reported normal pool in the 2010 inspection report to approximately 15-feet below the crest of the embankment. Underwater areas were not evaluated during this inspection. A copy of the inspection checklist is included in Appendix B.

For reference purposes, a baseline was established along the crest of the dam during the inspection with 0+00 at the left end of the dam and station 13+00 near the right end of the dam. The dam is approximately the entire perimeter of the reservoir with only a small tie into natural terrain at the northeastern corner of the impoundment (i.e, 50-feet between stations 0+00 and 13+00). Observations were made in relation to their location along the baseline as appropriate and as noted herein.

2.1.1 General Findings

In general, Waban Hill Reservoir Dam was found to be in **Fair** condition. In the subsequent subsections are descriptions of the conditions observed during the inspection:

2.1.2 Dam

The following was noted along the embankment portion of the dam during the inspection.

Upstream Side

- Several locations of overgrown shrubs where observed along the slope. The growth was localized to the western half and around the gate house structure of the dam.
- From Sta. 0+50 and Sta. 2+50 and from Sta. 3+50 to Sta. 6+00, it appears that the interlocking granite blocks are bulging outward. The bulge was noted approximately halfway down the slope and extended outward between 12 to 18-inches. The result of the bulge is unknown but appears to be a result of the blocks sliding downward. Cause of the bulging may also be due to root systems of vegetation formerly growing on the slope heaving the blocks.

Crest

- The crest is generally well maintained with a good stand of mowed grass present along the majority of the embankment.
- Between Sta. 11+00 and Sta. 12+00, the crest pitches towards the downstream slope.

Downstream Side

- An 8-inch diameter rodent hole was observed near Sta. 4+60 approximately 12-feet below the crest.
- A 2-inch gap is present between the side walls of the granite staircase at the gatehouse and the granite steps. Several of the granite stairs have settled and are not level, with the 6th stair from the bottom loose and wobbling. It appears that there are voids behind the stairs as there were visible gaps between subsequent stairs.
- A potential depression was noted along the downstream slope left of the stairs for a distance of roughly 25-feet from the stairs around the bend in the embankment.
- An 8-inch diameter rodent hole was observed near Sta. 6+55 approximately 10-feet below the crest.
- A 6-inch diameter rodent hole was observed near Sta. 8+15 approximately 8-feet below the crest.
- Minor sloughing and scars apparently resulting from mowing activity on the steep slope were noted along the downstream slope in most areas of the embankment.
- Between Sta 9+50 and Sta 11+50, the slope appears to have a bulge. The location is along a curve in the dam at the northwestern end.
- Between Sta 11+00 and Sta 12+00, an area of shrubs and other vegetation was noted along the slope.

2.1.3 Appurtenant Structures

The appurtenant structures at the dam include the gate house at the southwestern corner including the low level outlet and water supply gates.

Gate House

- There is some minor cracking at the corners of the exterior bricks and within the mortar joints.
- Significant development of vegetation was noted in the area and on the gatehouse structure.
- Embankment slopes and vegetation limited access for the safe inspection of the upstream side of the gatehouse.

Low Level Outlet

Keys for the gatehouse were not available during the inspection; As such, an inspection of conditions within the gatehouse could not be completed. The following information was noted within the previous inspection report and is provided as noted historical deficiencies and observations:

The floor of the gatehouse is covered by steel or plywood covers over two chambers (roughly 20 feet by 25 feet in plan). The chambers are separated by a brick dividing wall that contains two sluice gates: A lower sluice gate, roughly 25 feet below the gate house floor, on the upstream side of the wall; and an upper sluice gate, roughly ten feet below the floor, on the downstream side of the wall. The upstream side of the upstream chamber is open to a channel in the reservoir that is supported by cut stone retaining walls. There appears to be a series of screens at the opening to

the reservoir. The MWRA reports that the sluice gates were last operated around 2000. The gates are currently inoperable and the lower sluice gate is presumed at least partially open.

The intake to the low-level outlet is located at the northeast end of the reservoir. From there, the intake runs through a 30-inch brick-lined conduit to a 24-inch diameter pipe which extends 25 feet upstream of the check valve located at the bottom of the upstream chamber. Historical records indicate that the "float-controlled" check valve was installed in 1944 to replace the original flap valve, however, the float valve has not been observed in recent inspections. The 24-inch pipe penetrates the dividing wall and connects to a 24-inch diameter flap valve which serves as the outlet to the downstream chamber. The 24-inch pipe then reduces to a 20-inch diameter outlet pipe, just downstream of the gatehouse, which connects via a spool piece to the water supply main under Ward Street...In emergency situations, the system is connected (via the spool piece) to the water supply main to provide pump backpressure.

There is an 8-inch cast iron drainpipe which connects to the 20-inch outlet pipe just downstream of the air gap spool piece. This 8-inch drain discharges to an 8-inch cast iron pipe in Ward Street and is presumably the current means for lowering and controlling the reservoir level with the 20-inch spool piece removed.

There is also a 12-inch valve and drain located at the base of the southwest corner of the upstream chamber. The brick drain line extends southwest to a manhole just outside of the curb of Ward Street and at the manhole was bricked up per the Newton Water Department. Since this brick drain is shown to connect to the outlet upstream of the sluice gates, the pipe may be charged under reservoir pressure as it passes through the embankment. A 16-inch diameter cast iron overflow is also present. The functionality of this drain is not known.

2.1.4 Downstream Area

The downstream area of Waban Hill Reservoir is surrounded by residential areas along the streets of Manet Road, Reservoir Drive, Woodlawn Drive, and Ward Street. The downstream toe of the dam is at the curb line of Manet Road, Ward Street, and Woodlawn Drive. There is a small grass area around the northwest corner of the reservoir along Reservoir Drive. The area is well maintained grass gently sloping towards Reservoir Drive. There are no visible signs of wet areas, indications of embankment or foundation seepage, or any other deficiencies.

2.1.5 Reservoir Area

The banks of the reservoir are armored the interlocking granite blocks which protect the upstream slope of the dam. The impoundment is almost entirely surrounded by the dam with only a small portion in the northeast corner at the intersection of Manet Road and Reservoir Drive tied into the natural hillside.

2.2 Caretaker Interview

Mr. John Gregoire, Ms Ling Chu, and Janet Yun from MWRA were onsite during the inspection of Waban Hill Reservoir Dam. Mr. Gregoire indicated that maintenance is performed on an as needed basis. Operations are performed as required to keep the impoundment near empty; however, a base pool is maintained to prevent odors and vegetation from sediment in the bottom of the reservoir area.

As indicated in the previous report, the reservoir is only needed to provide backpressure to Chestnut Hill Reservoir emergency pump station. Therefore Mr. Gregoire and MWRA are trying to reduce the hazard classification of the dam. Since the previous inspection the level of the impoundment has been lowered and kept at a minimal level. At the time of the inspection, representative from the Town of Newton were present on site evaluating the potential for the Town to take ownership of the site and convert the area into a public park through the removal of the dam.

2.3 Operation and Maintenance Procedures

2.3.1 Operational Procedures

A formal operations and maintenance manual has been developed by MWRA and is kept on file at their headquarters. Reservoir levels are maintained as natural fluctuations in the impoundment level occur. The reservoir impoundment is only effected by rainfall and evaporation. If the impoundment is increased MWRA can manually lower the reservoir by discharging water into the City of Newton storm water system. The level of the impoundment is remotely monitored by MWRA with readings recorded daily.

2.3.2 Maintenance of Dam

Maintenance at the dam is performed on an as needed basis. MWRA is actively trying to reduce the hazard classification to low or non-jurisdictional. Since the previous inspection the normal operating pool level has been lowered. Based on PARE's survey of the dam, it appears that the level of the impoundment is approximately 3-feet above the downstream toe of the dam as recorded at the southwestern corner near the gate house.

2.4 Emergency Warning System

A detailed Emergency Action Plan (EAP) has been prepared for the reservoir and is on file at MWRA's headquarters but was not reviewed as part of this inspection report. A copy of the plan can be reviewed by contacting the MWRA Office of Emergency Preparedness or MADCR Office of Dam Safety.

2.5 Hydraulic/Hydrologic Data

The following provides a summary of the Hydraulic and Hydrologic analysis as presented within the 2010 Phase I Inspection Report.

It has been reported by Weston & Sampson that a hydrologic and hydraulic analysis was performed in 1980 by O'Brien & Gere. The analysis has been subsequently updated as part of the 2006 Metcalf & Eddy Phase I inspection. It is reported that the Spillway Design Flood (SDF) used in 1980 and 2006 was the result of a full Probable Maximum Precipitation (PMP), which generates 28 inches of rainfall in a single event, and was applied over the entire watershed.

The conclusion from the analysis was that the Waban Hill Reservoir has adequate storage capacity to contain the SDF with adequate freeboard. The estimated peak water surface elevation was El. 268.13 (Boston City Base). The embankment crest elevation at the time of these reports was El. 270.2

(no known survey is available for this report), the entire storm is contained within the reservoir with approximately 2 feet of freeboard, and it is not likely that overtopping will occur during the SDF. The following is a summary of the H&H results:

- *Spillway Design Flood (SDF) Probable Maximum Flood (PMF)*
- *SDF Inflow 28 inches of rainfall Inflow was not reported in discharge units (cubic feet per second)*
- *Initial Water Surface Elevation El. 265.9*
- *SDF Outflow 0 cfs*
- *SDF Peak WSEL El. 268.13*
- *Freeboard 2 feet*

Included in the 1980 Army Corps of Engineers Phase I Inspection Report was a test flood analysis. The test flood used in this report is the full Probable Maximum Flood. At the time of the 1980 report, if the entire Probable Maximum Precipitation is stored in the Reservoir the water level would be 22.9 inches above the normal pool. Because the freeboard is typically greater than 2 feet, it is unlikely that the reservoir would overtop during the SDF event.

It is now understood that the probable maximum precipitation is greater than the number used in the 1980 Army Corp of Engineers Phase I Inspection Report; however, GZA understands that the regulatory spillway design flood for this dam is equal to ½ PMF (302 CMR 10) which creates a Probable Maximum Precipitation less than is reported in the Army Corps of Engineer's Phase I Inspection Report and 2006 Metcalf and Eddy Phase I Inspection Report. Therefore Waban Hill Reservoir Dam has sufficient storage capacity.

The 2007 GZA report on the Waban Hill Reservoir Dam Break Analysis and Inundation mapping indicated that the maximum reservoir elevation during the Spillway Design Flood (i.e. Probable Maximum Flood) is 1.6 feet below the top of the dam (268.1 feet, BCB). This reservoir level was utilized to perform a dam break analysis to estimate the inundation area and corresponding time to flooding, thus identifying critical downstream locations that would be affected by a dam failure.

Dams without spillways can fail due to overfilling during diversions into the reservoir. Waban Hill Reservoir is filled via releases from MWRA supply aqueducts. It is possible that the embankment could be overtopped if filling is not discontinued in a timely manner; thus, operational controls are important. Per the MWRA, an air gap exists between the main and the fill line. Therefore filling of the reservoir cannot occur until an active Management decision has been made and the spool piece has been installed. Based on MWRA's description of operations, such filling would only occur as a result of an emergency condition and would therefore be closely monitored by operations staff.

2.6 Structural and Seepage Stability

2.6.1 Embankment Structural Stability

The following information was provided during the previous inspection report and has been provided below given that no additional structural stability has been conducted for the Waban Hill Reservoir Dam.

GZA reviewed the 1983 Phase II report for Waban Hill Reservoir Dam, which contains information regarding subsurface investigations and evaluations conducted at the time. One test section, at the northern edge of the embankment, was analyzed. The test section's upstream and downstream slope's were analyzed for seismic stability with a seismic coefficient of 0.10 and a reservoir pool of 263.5' (approximately 5.8' above normal pool). The downstream slope was analyzed for the "infinite slope" mode of failure. It was determined that the downstream slope will remain basically stable, with possible minor sloughing and spreading along the slope and crest. The upstream slope was analyzed for the mode of "circular sliding surface" under steady state seepage condition. It was determined that the upstream slope will remain basically stable, with possible minor sloughing and spreading along the slope and crest.

2.6.2 Structural Stability of Non-Embankment Structures

Waban Hill Reservoir Dam has no significant non-embankment structures that should be analyzed. The brick gate house was visually surveyed and found to be in poor condition.

2.6.3 Seepage Stability

There were no seepage evaluations available for review during the preparation of this report. There were no indications of seepage observed during the inspection. However, it should be noted that the level of the impoundment has been significantly lowered from historic normal pool levels. It was not apparent if the lowered pool level impacted seepage conditions at the dam.

SECTION 3

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of Waban Hill Reservoir Dam is **FAIR**. The dam was found to have the following deficiencies:

Deficiency No.	Description
1	Heaving/bulging of slope protection along the upstream slope.
2	Areas of shrubs and unwanted vegetation.
3	Areas of potential movement and irregularities along the downstream slope.
4	Apparent rodent activity in areas of the dam.
5	Missing mortar and potential structural concerns at the gatehouse.
6	Loose and settling granite staircase at the southwest corner on the downstream slope.

The dam generally appears to be in a condition similar to that reported in the 2010 Phase I Inspection/Evaluation Report.

Previously Noted Deficiency	*Action Taken to Resolve Condition*
Heaving and bulging of the upstream interlocking granite blocks	The condition is still present but does not appear to have worsened.
Vegetation growth through the joints of the upstream granite blocks	Still some vegetation growth between joints along with smaller diameter tree growth above granite blocks.
Viney overgrowth and woody vegetation establishing on north downstream embankment slope	The viney overgrowth appears to be under control but the woody vegetation is still present.
Scarps at toe of downstream embankment on west side	Scarps where not visible at this location during the inspection
Steps to gatehouse appear undermined, loose, and have shifted slightly down the slope.	Condition is still present with no evidence of action taken
Evidence of trespassing	Broken gates and fences still indicate evidence of trespassing.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the dam. Prior to undertaking recommended maintenance, repairs and remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of local conservation commissions, MADEP, or other regulatory agencies.

3.2 Studies and Analyses

It is recommended that the owner of the dam arrange for the following investigations to be performed by a qualified registered professional engineer experienced with embankment dams and hydrology, maintenance and monitoring activities.

1. Evaluate the current hazard potential classification for the dam. While the dam is currently considered a high hazard potential dam, current operations maintain the level of the impoundment to roughly 3-feet above the downstream toe of the embankment. However, it should be noted that hazard potential and size is dependent upon the maximum potential storage of the impoundment. Modifications to the embankment would likely be required to facilitate a revision to the hazard potential classification.

2. Complete a detailed slope stability evaluation, as is required for all high hazard potential dams. In accordance with current state regulations, all dams classified as high (Class I) hazard potential are required to have a detailed slope stability evaluation on file. Stability evaluations should include models for each of the loading conditions required by the regulations. As part of this evaluation, the cause of irregularities along the upstream and downstream slope should be evaluated.

3. Evaluate/determine the cause of the settlement and undermining of the granite stairs at the gate house.

3.3 Yearly & Recurrent Maintenance Recommendations

The following recommendations should be performed on a regular schedule and allotted for within yearly operational budgets for the structure:

1. Perform regular monitoring and inspection of the dam and appurtenant structures, including areas of depressions, developing erosion, or other areas of suspected movement, or other signs of deteriorating conditions. Complete routine inspection after all significant rainfall events and formal inspections in accordance with current state regulations. As the dam is currently classified as a High hazard potential dam, formal inspection is required every two years. Therefore, formal inspection should be completed in September 2014.

2. Regular maintenance activities should be continued and expanded to control and prevent further growth of unwanted vegetation, and remove accumulated debris from the stanchions at the spillway. Clearing of brush and removal of vegetation should be performed at least once per year. All gates and valves should also be exercised on a yearly basis.

3. Complete routine review and updates of the Emergency Action Plan. Complete periodic training of involved personnel.

3.4 Repair Recommendations

The repairs presented below should be implemented to maintain the integrity of the structure. If deferred these maintenance items could develop into larger deficiencies that are more costly to address.

1. **Remove vegetation from along the upstream side of the dam.** All unwanted vegetation should be removed from the joints of the granite blocks. Given the diameter of the observed vegetation, cutting

and pulling of small trees and brush is recommended. Roots systems that cannot be pulled without further damaging the upstream slope protection should be treated with a herbicide to deter regrowth.

2. **Reconstruct the upstream heaving/bulging interlocking granite block riprap:** The upper layers of the riprap should be removed and reset within the limits of the deteriorated areas. Prior to completing this repair, recommended stability evaluations should be completed to determine if a more extensive repair is required to prevent reoccurrence.

3. **Fill Voids Beneath the Staircase:** The voids should be filled by removing the steps, placing and compacting suitable fill material and resetting the step. Alternatively the voids could be filled with flowable fill or other similar material.

4. **Trap and Remove Burrowing Animals**: Increase the frequency of mowing to deter animals from creating burrows along the slope.

5. **Complete Gatehouse Repairs:** Develop a repair program to address the reported condition of the gatehouse structure, including repointing of brick masonry and other structural repairs.

3.5 Remedial Modification Recommendations

At the time of the inspection, the majority of the work at the dam is considered maintenance and minor repairs. However, if this maintenance is deferred, more expensive repairs will likely be required.

3.6 Alternatives

The following alternatives are presented based upon a conceptual review of approaches for addressing the observed concerns. Additional studies and or considerations may indicate that some or all of the options presented below are not suitable for the conditions specific to this dam and dam site.

All Recommendations: As an alternative to implementing the repairs noted above, removal of the dam is a viable alternative to addressing safety and stability concerns at the dam. As the function of the dam is no longer part of the water supply system, removal is an option for this site.

Typically in evaluating the potential for dam removal, several preliminary studies should be completed including:

- Hydrologic/Hydraulic Analysis similar to those described above should be completed to assess any changes that may occur during routine storm events.
- A review of the historic significance that the structure may have with the community, if any. This review should include discussions with the local and state historic commissions.
- A review of rare or endangered species, which may be present in the area and dependent upon the resources created by the dam.
- An analysis of the volume, character and disposition of the sediment behind the dam. This is required to understand the amount of material to be removed or stabilize the potential for contamination within the sediment, which would require special handling and potential scouring which would result in the migration of sediment through the downstream reaches.

However, given the off stream location of this dam, small impoundment size, and other site specific factors, some of these studies may not be necessary. Once these preliminary studies and reviews have been completed the permit requirements should be reviewed. Based upon a preliminary review, it is likely that permits will be required from the MADEP. Army Corps of Engineers, Office of Dam Safety, local conservation commission, the Massachusetts MEPA office, and the Massachusetts Water Quality Certification program. Additional studies to evaluate loss of habitat could also be requested. Please note that once preliminary studies have been completed, additional requirements may become apparent to address conditions not yet identified.

3.7 Opinion of Probable Costs

The following conceptual opinions of probable costs have been developed for the recommendations and remedial measures noted above. The costs shown herein are based on a limited investigation and are provided for general information only. This should not be considered an engineer's estimate, as actual construction costs may be somewhat less or considerably more than indicated.

Studies and Analyses

1. Hazard Potential Evaluation	$ 4,000 -	$ 8,000
2. Slope Stability Analysis (includes borings)	$ 10,000 -	$ 14,000
3. Evaluate Voids at Staircase	$ 2,000 -	$ 5,000
Subtotal	**$ 16,000 -**	**$ 27,000**

Yearly Recommendations

1. Regular Inspection and Monitoring	$ 2,000 -	$ 4,000 /yr.
2. Regular Maintenance	$ 2,000 -	$ 4,000 /yr.
3. Upstream Slope Monitoring	$ 1,000 -	$ 3,000 /yr.
Subtotal	**$ 5,000 -**	**$ 11,000 /yr**

Repair Recommendations

1. Clear Unwanted Vegetation	$ 5,000 -	$ 10,000
2. Reset Upstream Slope Protection[1]	$200,000 -	$300,000
3. Fill Voids at Staircase	$ 10,000 -	$ 25,000
4. Trap and Remove Rodents	$ 1,000 -	$ 3,000
5. Complete Gatehouse Repairs	*More Information Required*	
Subtotal	**$216,000 -**	**$338,000**
Engineering & Design	$ 25,000 -	$ 50,000
Permitting	$ 8,000 -	$ 12,000
Contingency	$ 50,000 -	$ 80,000
Subtotal	**$299,000 -**	**$480,000**

[1]Note: Costs for addressing upstream slope protection may be substantially higher if stability evaluations suggest that remedial measures beyond remove vegetation, removing blocks, providing a base layer, and reinstalling stone is required.

RECOMMENDATIONS TOTAL	**$325,000 -**	**$518,000**

When comparing costs, the total cost including design, engineering, permitting, construction and long-term maintenance should be considered.

While some of these activities can be undertaken as maintenance activities under 302 CMR 10 Dam Safety and will only require that the Office of Dam Safety be notified of the activities, the applicability of other environmental permits (ie., NOI, PGP, Water Quality Certificate, etc.) needs to be determined prior to undertaking maintenance activities that may occur within resource areas under the jurisdiction of MADEP, the local conservation commission or other regulatory agencies.

APPENDIX 6

Supporting emails from Newton residents

Waban Hill Reservoir Community Comments

Dear Gail:
I am writing about the City's potential purchase of the
Reservoir on Ward Street near Boston College. We understand that there are currently ongoing discussions about potential uses for this space.
I am resident of Newton Centre. My wife and I have lived in Newton with our children for 21 years.
We would strongly support the development of the space as a beautiful place for the community to gather for walking, picnics and enjoying nature. While Newton has much to offer, it is lacking an outdoor community place like the Arnold Arboretum in Jamaica Plain, where people of all ages can walk, picnic and enjoy nature. While the Reservoir would obviously not be as large an area, there is plenty of space to create walking paths and beautiful plantings and trees. This could serve as a real gathering place for the City and help foster a spirit of community. Further, using the water that is already present at the site would enhance the beauty of a park and make this a truly unique place in Newton. This type of use is something that ALL residents could enjoy. Newton has a rare opportunity to create an open space that is both unique and beautiful, and would truly help Newton to live up to its name as "The Garden City"

James Cohen
45 Gralynn Road
Newton Centre, MA 02459

Hi Gail,
Amy and JIm told me that you are chair of a committee overseeing the future use of the reservoir on Ward Street. I support the idea of turning that space into a garden with walking trails. Everyone would benefit!

All the best,
Abby Rischin
88 Brackett Road
Newton, MA 02458

Hi Susan,
I am very much opposed to a basketball court on the reservoir property. The sounds of basketballs
hitting the pavement is a very irritating one. There is a basketball hoop at the Ward School, and
I think the neighborhood would not benefit from this at the reservoir--the space is too special to have such a
potentially disruptive court. Ideally, a park-type use seems quiet and most useful, with quiet activities (e.g.,
swings, exercise stations and/or walking trails, etc.).

Best,
Esther Greif
112 Woodchester Drive

Hi Gail:
We got Amy's note regarding the potential purchase of the reservoir--what a cool opportunity. Bill and I would be very enthusiastic to see it developed as an open space with walking trails. Ideally there would also be space for kids to bike, roller blade or skateboard without knocking over pedestrians. My sense is that parents would find this kind of safe space for their kids to be on wheels to be valuable. For what it's worth, we'd also support a half court basketball court at the site as well.

Good luck!
Marnie Seif and Bill Land
Mandalay Road

Hi Gail,
We heard from Amy and Jim that you're chairing the committee about the use of the Reservoir space on Ward Street. We really like the idea of making it into a park with walking trails/plantings etc and
incorporating the water as an integral part of the park design. Although we live in Newton Highlands, south of Route 9, we find ourselves always crossing over to the other side of Newton for all kinds of reasons and
I'm sure we'd be coming to this space frequently to enjoy the trails etc. Newton already has plenty of open spaces that are used as fields for sports teams; these spaces are not conducive to walks and

exploration even when they are free.
Something new and different, a Newton Arboretum so to speak, would be a great addition to our city!

Roz and Michael Leshin
Woodcliff Road
Newton HIghlands

Vote for quiet activities, not attracting groups, crowds, noise or cars.

Carole Black
147 Waban Hill Rd. N

You can count me as a "NO" vote! Thanks Susan!!

Jessica & Geoff Gilmartin
11 Garrison Street, Chestnut Hill

Dear Members of the Committee,
I am writing to register my reservations about making the reservoir area even a partially active use site.
This is a small area. As a resident who has driven past the reservoir thousands of times, and as a driver who twenty years ago hit (and only slightly injured) a child who was darting across a street after a lost basketball, I question the safety of this small, street confined site for children's activities.
Most likely an active use project would be a magnet for Boston College Students. i for one have had my fill of picking up my emptied trashcans on the mornings after athletic events.
The argument that building a halfcourt basketball court will be an antidote to childhood obesity strikes me as somewhat naive. Childhood obesity is an issue, to be sure. But a half court hoop? I've played a lot of basketball. Courts such as the one proposed are not magnets for kids in need of exercise, they draw kids who already play, and they tend to be dominated by the better players.
I will freely admit that my explicit agenda involves the wish to keep our small neighborhood quiet and attractive, but I want to add that Newton is, at its best, a diverse community. There is a tremendous amount of

emphasis in our city on what is best for our kids. Fair enough. but what about the wishes and needs of some of our older residents (like myself)? It seems to me that all too often "What is best for our kids" trumps all other needs, as if one is somehow being shortsighted or curmudgeonly to think about anything else. But Newton is only partly about its children (a message that is not a terrible message for the children themselves).

Sincerely,
Mark O'Connell
Waban Hill Rd. N

Hi Susan –
Don and I are against any athletic activity (other than walking) on the reservoir site.

Rita Moerschel and Donald Batting
19 Garrison St.
Chestnut Hill, Ma. 02467

Definitely AGAINST any kind of basketball court on any part of the reservoir property.

Carolyn Goldman
15 Woodlawn Drive

Hi Susan,
Sorry I wasn't there to cast my vote. Had to leave before it was over. Glad to see such a packed room!!
Bruce and I are certainly on the side of NO basketball court. Full or half. We envision Plan A for the site. Basically leaving the reservoir AS IS and adding some passive amenities like walking paths/benches. Also THE CHEAPEST to the city. A basketball site would promote noise and more cars coming into the area. As one of the board stated, a body of water is special in the city. Let's keep it!
Thanks again for coordinating all these e-mails.

Karen Green
44 Travis Dr.

Hi, Susan

This is to express my wife's and my opposition to the inclusion of a basketball court (either half or full court) in any new use of the Waban Hill Reservoir. The WHRAG's guiding principles document which describes a "scenic quiet place of respite" perfectly captures the spirit of what the community would like to see honored at this site. A basketball court would be a terribly discordant feature. It would be a true sour note clashing with other uses more in keeping with the high goals which we have all set.

I stand 6'4" tall and played basketball through college competitively. I still love the game and am a fan of both the professional and college sport, but the game has significant limitations as recreation. Basketball skews heavily male in the public space where it becomes as much performance as game. It is a contact sport in spite of perceptions to the contrary. In it's organized form with proper officiating, it can be a disciplined art. However, friendly pickup games among strangers are very unusual in my experience since it is a game that does not allow players of unequal skill or size to compete together effectively. I lived directly across the street from a public basketball court in Brookline for 6 years. The court was essentially a preserve for competitive young males to the exclusion of every other group. Profanity and argument were endemic. It was not a pleasant atmosphere and was avoided by all, but the very narrow demographic of direct participants.

Noise is also a legitimate concern. The sound of the bouncing ball is significant, repetitive, and echoes widely. It has been the subject of lawsuits between neighbors. Mitigation measures are typically expensive and inelegant. Once established, a basketball court is sure to bring pressure for expansion and to add lighting. Both of these outcomes would be disasters at this site.

There is a great difference between lifetime outdoor activities, which are an important antidote to sedentary lifestyles, and competitive sports like basketball, which attract and serve the most athletic. This City and the broader culture gives an outsized sense of importance to sports as evidenced by athletic budgets and facilities. This needs to be balanced by the encouragement of lifelong activities which can be enjoyed across generations, body types, and genders. The unique Waban Hill Reservoir site with its potential for everything from astronomical observation and radio control sailboat regattas to jogging and tai chi is a perfect place in

which to honor alternatives.
A public basketball court is NOT what we want for our neighborhood.

James Harrington
108 Ward Street (directly across from Waban Hill Reservoir)

Hello Gail and Peter,
After the last meeting at city hall I felt that I needed to express my feelings directly to both of you. In addition, my meetings in New York City next week might keep me from attending the advisory meeting next week. First, let me tell both of you that I think that you both are doing a great job, in what is really a thankless job. Both of you need to make sure that all views are presented fairly despite what your personal opinions are-not easy. As for myself, I feel I need to pursue what I feel is in the best interest of the neighborhood-which is what I believe we all are trying to do. For those who have known me for a long time, know it takes a lot to get me mad. When people outside of the neighborhood keep pushing to have something put in the neighborhood-active sportscourts/
fields- that I feel will potentially destroy the neighborhood, then that finally crosses the line for me. Especially when what they want is available 2 blocks away (Ward School fields)-actually closer to them then this park would be. If people in the neighborhood push for this use, then that is a different story. I might disagree with what they want, but I respect their wishes.
Regarding the purpose of the committee, I thought it was supposed to present what is best for the neighborhood, that also has a good chance to be accepted by the city/state and that at the same time can also produce a Park that also does provide benefits to residents outside of the immediate neighborhood. For instance, the other day I was out next to the reservoir and met a man walking who came from about a mile away (I have seen him and his wife before) and when I informed him what was happening, he said he hoped it would remain an open space park (which he would support), as he and his wife enjoy walking up here to see views from this area of the different seasons. In addition, I have had the same reaction from people from other parts of Newton. One person who lives in Waban and on another advisory environment committee, said he would support our plan. He also said that he thought Alderman Yates would support our concept of

a quiet activity park with water. I do believe that this committee was supposed to be a neighborhood advisory committee and not a Newton Advisory committee. There are enough people that will be pushing for the interests of Newton as a whole, so we need to provide a neighborhood point of view to provide a balance. To be candid, I do not know why any special interest person was put on this committee. I do not consider my self unreasonable-just someone who is trying to promote what I feel is best for the neighborhood.

As for the plan/diagram submitted by Andrew, the only part I agree with is where the entrance is located. In my opinion it effects the least amount of home owners in the neighborhood. Of course, I disagree with an active activity use for the park. Some quiet activities yes. So far mainly two people on the committee have strongly promoted active use and both live outside the neighborhood, one many miles outside the neighborhood. To make the park an active use Park would involve the berms and based on what we know so far, this would most likely be cost prohibitive. Also, to make changes to the berms could result in leaks, in which case Gail I might end up in your living room!

People should STOP trying to put an active park right in the middle of a quiet neighborhood. Most, if not all, parks are NOT in the middle of a neighborhood. If people want a full court or half court basketball court, then fix up the one on the Ward School property. We already have an active park in the neighborhood-at Ward School, which seems to me to be under utilized. Why set up another one a block away. Ward school is not such a long walk-especially for those people who are looking to be active! In addition, the city should/could use their influence to have private schools make their fields available on the weekends-such as the ones at MT Alvernia academy, Alvernia high school, Chestnut Hill school and others in the area. We do need a quiet, peaceful place where people of all ages can relax, think, communicate with each other and nature, walk and meditate I apologize for going on and on, but since I will most likely not be able to be at the next meeting, I wanted my thoughts and concerns to be clear. I do plan to be at the meeting after the one next week.

Thanks again for your work and for listening to me.

Jerry Butter
81 Woodlawn Drive

Dear Gail & Committee,

Thank you very much for your service on the exploratory committee.

As a Newton resident, I would very much like to see the reservoir preserved as is with features added to enhance quiet recreational uses. For example, walking trails along the top of the berm, a tot lot, or a place for quiet contemplation and relaxation. It would be a shame to lose such a special place or to fill in the water feature which lends the site its character and uniqueness.

Aside from the water, the other unique aspect of the site is of course its wonderful sunsets and westward views. This should be enhanced with seating. It offers spectacular views of the sunset all year round and is also a great place to watch birds, geese and ducks. There is no other park like it in Newton.

It could become a very special place for quiet reflection, viewing the sunset, bird watching/nature exploration, and play for children. Similar to the packed-gravel pathway around the Central Park Reservoir in New York, this could become a really attractive place for walkers or the elderly who want to exercise on a non-concrete surface.

Watching the sunset from the top corner, with the water in front of you, makes you feel like you're in New Hampshire. I urge you not to change its essential character. Please make it into a special place of respite for the people of Newton.

Best regards,

Linda Bentley Gillespie
41 Woodlawn Drive
Newton MA

Dear Gail,

I have heard that you are working hard to organize an off-street safe area for running/walking in your neighborhood. I am writing to let you know that I would love to make use of this area. I currently jog with 2 friends who also live in Newton. We jog for over an hour on Monday, Wednesday, and Friday from 8:30 am until about 10:00 am. It would make so much sense to have a safe area where friends could meet and walk/run. Thank you for working to make Newton a better, safer place.

Sincerely,

Michele Weinfeld

179 Kirkstall Road

Newtonville

Hi Gail –

As you know there are a lot of people like me who take long walks on a regular basis, frequently on Commonweath Ave, where we often see friends and acquaintances on the street. One of the things that I love about Newton is that I feel like we have a community of walkers and runners. I personally look forward to having an additional place where we can see each other and congregate. I find that there are not a lot of places to gather in Newton that are not near a busy street or parking lot. I can't tell you how much I'm looking forward to having a place, off the street, where I will be able to walk, run and get to know my neighbors better. I suspect the Nathan Road walking crew is going to get quite a bit of use out of what will be a lovely off-street outdoor opportunity.

Thanks much for your hard work.
Nancy Brandeis

21 Nathan Road
Newton, MA 02459

To: Waban Hill Reservoir Advisory Group

I live at 65 Eliot Ave in West Newton. I have driven around the Waban Hill Reservoir many times. If the City of Newton is able to buy this beautiful property, the body of water should be preserved as is with the rest of the surrounding land made into a small park. It is also a fantastic spot to watch the sunset from on top with the water in front of you. It would be a shame to fill in this beautiful body of water. I would love the chance to explore it with my children. I hope that you will consider preserving this beautiful spot.

Sincerely,
Rosa Clark

Dear Gail,

I have heard that you are working hard to organize an off-street safe area for running and walking in the area around the Waban Hill Resevoir.I live in Newton and walk daily and would be very interested in a safe, off street place to walk. Thank you for your efforts to add a safe and appealing place for runners and walkers in our area.

Nancy R. Smith

504 Ward St.

Newton., MA

16 References

[1] Newton recreation and open space plan update, 2013-2019.

[2] Inc. GZA GeoEnvironmental. Waban hill reservoir dam: Phase I, inspection/evaluation. Inspection date: August 24, 2010.

[3] MA PARE Comporation of Foxboro. Waban hill reservoir dam: Phase I, inspection/evaluation. Inspection date: September 7, 2012.