Mill Brook Corridor and Wellington Park Revitalization Project Summary

Mystic River

" A TAN THE AND A BUNNED

August 2018 100% Schematic Design Final Report



Cover Photo by Elise Bluell, Weston & Sampson

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AVAILABLE RESOURCES (FROM TOWN OF ARLINGTON)

- Public Meeting Presentations, 2018
- Online Public Survey Results, 2018
- Mill Brook Evaluation DRAFT, 2017
- Mill Brook Linear Park Report, 2010
- Mystic River Master Plan Report, 2009
- Mill Brook Linear Park Report, 1976

ACKNOWLEDGEMENTS

This project was made possible through the support of the Town of Arlington Community Preservation Committee and generous funding through the Arlington Community Preservation Act.

With gratitude, we recognize the Town of Arlington's dedicated Steering Committee members, each of whom participated in this effort. Their commitment to Mill Brook Corridor and Wellington Park will yield positive benefits for all residents of the Town of Arlington for generations to come.

Amber Christoffersen, Mystic River Watershed Association Lela Shepherd, Environmental Planner / Conservation Agent Nat Strosberg, Senior Planner Ann LeRoyer, Open Space Committee Don Vitters, Park and Recreation Commission Don Topaz, Resident Jerry Clabaugh, Resident Sarah Tuttle, Resident

Thanks to the Arlington community who expressed their thoughts and insights and to the many representatives of other Town departments and committees who provided guidance.

Cheri Ruane, RLA, ASLA Jeanne Lukenda, ASLA Elise Bluell, Associate ASLA Farah Dakkak, Associate ASLA Weston & Sampson

August 2018

PROJECT SUMMARY

The Town of Arlington and the Mystic River Watershed Association are developing a Schematic Design and Environmental Restoration Plan for Wellington Park and the Mill Brook Corridor segment between Grove and Brattle Streets. The primary purpose of this project is to explore and identify opportunities for improving public access amenities and the ecological quality of this park and the Brattle-Grove Streets portion of the corridor. Funding has been provided by the Arlington Community Preservation Act managed by the Town of Arlington Community Preservation Committee and approved by Town Meeting.

Weston & Sampson was retained for this project by the Town of Arlington in the fall of 2017. The team focused on developing improvements that reflect the needs of this diverse community, and creating a Plan that will serve as a guide for all future improvements of this park and brook segment, as well as a tool to strategize for funding opportunities. Developed as a pilot project with braod-scale potential impact, it identified public access and ecological improvements that can be applied to other segments along the entire corridor of Mill Brook.

The scope of work undertaken by Weston & Sampson included:

- Review, evaluation, and validation of the prior planning concepts completed by various stakeholder groups including the Mystic River Watershed Association.
- Compilation of base map data showing project boundaries and Town of Arlington owned land (land survey to be done during a future phase of work).
- Assessment of general environmental conditions.
- A robust public engagement process in order to solicit public input, foster dialogue, and build consensus about future actions and implementation plans.
- Establishment of a compelling schematic-level design, to be validated and endorsed through steering committee and public dialogue.
- A final preferred plan that is reflective of the physical capacity of the property and the Town's ability to operate and manage the property going forward.
- Establishment of a strong and achievable implementation and funding strategy with proritized phases for implementaion of improvements.







EXISTING CONDITIONS / INITIAL ENVIRONMENTAL ASSESSMENT MILL BROOK CORRIDOR AND WELLINGTON PARK REVITALIZATION PROJECT 11 MAY 2018 - 75% SCHEMATIC DESIGN SUBMISSION

Weston & Sampson design studio





Existing Conditions Legend:

Town-Owned

- Approximate Limit of Work (For this Project)
- Approximate Water Edge of Brook
- Minuteman Bikeway



1' = 30-0' 0 10 20 30 60FT

SPOLE STR

BA

ENVIRONMENTAL ASSESSMENT: INVASIVE SPECIES AND BANK EROSION INVESTIGATION

On April 10, 2018, the presence of invasive species and bank erosion areas was investigated at Wellington Park and along Mill Brook, between Grove Street and Brattle Street. A GPS unit was used to locate these areas, and data points can be seen on the attached map (Figure 1). Further discussions concerning invasive species and erosion areas at the site are presented below.

Invasive Species

A total of six areas containing invasive species were identified (see Figure 1). Some of the invasive species identified at the site included:

- Japanese knotweed (Fallopia japonica)
- Asian bittersweet (Celastrus orbiculatus)
- Multiflora rose (Rosa multiflora)
- Japanese barberry (Berberis thunbergii)
- Garlic mustard (Alliaria petiolate)

The most dominant invasive species, by far, was Japanese knotweed (Fallopia japonica). The largest patch of knotweed was located at the western edge of Wellington Park (see Photo 1). GPS points Inv-1 through Inv-4 were used to identify the outer limits of this knotweed patch. This area was approximately 6,800 square feet (sf), or 0.16 acres.

Longer, thinner patches of knotweed were located along the bank of Mill Brook. These smaller patches were located along both the southern bank (between Inv-5 and Inv-6 (500 sf), inv-9 and inv-10 (2,700 sf)) and the northern bank (between inv-7 and inv-8 (900 sf), and at the Brattle Street culvert (800 sf – see Photo 2). GPS points were not taken near the Brattle Street culvert due to access issues.

One additional area was noted on the northern bank, with gps point Area-1 taken at the middle of this area. This area did not have one dominant invasive species, but rather a small number of different species, with the overall area being dominated by invasive species. The invasive species in this area included Japanese knotweed (Fallopia japonica), Multiflora rose (Rosa multiflora), and Garlic mustard (Alliaria petiolate).

Multiflora rose was frequently seen along the northern bank, east of the foot bridge, but large patches were not noted.

Asian bittersweet was noted along the southern bank of the brook at Wellington Park.

Bank Erosion Areas

A total of four bank erosion areas were identified (see Figure 1). Three of these locations are on the southern bank (gps points Erosion-1, -2, and -4) and one of these locations (Erosion-3) is on the north bank.

Erosion-1 is located on the southern bank just west of the foot bridge. The bank has been armored, but erosion in this area has broken through the stone/cement bank. A steep slope is immediately upgradient of this erosion area. (See Photo 3 for this erosion area.)

Erosion-2 is on the southern bank, further west of Erosion-1. This is a natural, steep bank with evidence of sloughing, making the bank unstable.

Erosion-3 is on the northern bank, further west of Erosion-2. This bank is near vertical on the edge of the stream and consists of man-made material that has not been cemented, bonded, or reinforced in any visible way. This area appears to be very unstable.

Erosion 4 is on the southern bank. This is a natural bank just east of the Brattle Street culvert. Bank sloughing was observed in this location.

All four of the bank erosion areas are located on private property. As such, agreements with the owners would be required before permitting and construction efforts occur.

Conclusions and Preliminary Recommendations

The most dominant invasive species at the site is Japanese knotweed (Fallopia japonica). The largest area of knotweed is located on the western edge of Wellington Park and should be the primary focus of any invasive species management plan. It has been suggested that this area might be re-graded to provide additional flood storage. If this were to occur, removing all of the topsoil, along with the knotweed, its root system, and seeds in the soil, would be an optimal method of removal. While this method would include more disruption, it is preferred because virtually all of the invasive plant material would be removed from site with a small probablitly of regrowth. If regrading does not occur, because of the sheer volume of knotweed, one method that could work well for management is to cut down the knotweed in late May or early June, and then spray a non-glyphosate herbicide in late summer, during the flowering period. Alternatively, the cut and dab method could work. The cut and dab method is considered the preferred management strategy of the Conservation Commission. These management options would need to occur over a several year time period.

Where the knotweed is along the bank in long, thin patches, the cut and dab method would likely work better since there are fewer clumps of plants in these areas. The mowing method likely will not be an option as it may be impracticable to get a machine to these areas.

Asian bittersweet (Celastrus orbiculatus) along the southern bank at Wellington Park could be cut and a non-glyphosate herbicide applied to the trunk. Ridding the park of this invasive would help uncover the brook to the general public and make for a more attractive park feature.

All four of the erosion areas would benefit from a bank stability project. One such project was conducted on the southern bank of Mill Brook within this limit of work. It was constructed over 10 years ago and remains in excellent condition. (See Photo 4 for this bank stabilization "living wall" structure.)



Photo 1. Knotweed at western edge of Park; winter dormant period shown.



Photo 2. Knotweed at north bank by Brattle Street; winter dormant period shown.



Photo 3. Erosion area west of bridge, southern bank. (Private property)



Photo 4. Erosion control "living wall" project along Mill Brook. (Private property)



ENVIRONMENTAL ASSESSMENT: GEOTECHNICAL INVESTIGATION

A site investigation walk took place on April 10, 2018 with the intention of preliminarily identifying geotechnical considerations related to the proposed work. Based on our understanding of proposed conditions, observations were mainly related to the following:

- areas for possible stormwater storage,
- signs of existing erosion,
- geotechnical issues related to widening the stream bed for water storage, and
- geotechnical issues related to widening the side slopes for pathways.

Areas for Stormwater Storage

Based on visual observation of topography, it appears the section between the footbridge and the "living wall" (which roughly corresponds with the section between "Erosion-1A and Erosion-1B" and "Erosion-2A and Erosion-2B" points (see Figure 2 and Photos 5-10) is most favorable for potential stormwater storage during rain events.

Existing Erosion Areas

Signs of erosion and scarp were observed at four locations, as shown on Figure 2. Of the four areas, "Erosion-1" and "Erosion-2" located on the south bank were observed to have eroded more significantly than the other two locations. Erosion-2 area is immediately adjacent to and downstream of the "living wall" (see Photo 8). It appears erosion and scarp of the brook bank has advanced downstream of the erosion control "living wall" project, while the "living wall" has performed well against continued erosion. Erosion-1 area is just upstream of the footbridge and is generally located where the brook makes a turn. The erosion appears to be a surficial slope failure, suggesting possible scouring of the bank toe and eventual slope movement. Both locations should be monitored by the property owners for future movement.

Widening the Stream Bed for Water Storage

Based on visual observation of topography and the location of buildings on top of slope, if widening of the stream bed is considered, it should be widened towards the northern bank (see Photo 9). Based on erosion already observed on the southern bank, the toe of that slope should not be altered.

Widening the Side Slopes for Pathways

Based on visual observation of topography and building locations, if a pathway is considered on the northern bank to make a walking path "loop", there is room for a narrow (\pm 5 ft.) walkway, with a retaining wall to support the buildings on top of the slope (see Photo 10).



Draft Sketch: Possible Water Storage Option.



Photo 5: Looking west toward "Erosion-1A". (Private property)



Photo 6: Looking west toward south bank and "Erosion-1B". (Private property)



Photo 7: Looking south toward south bank and "Erosion-2A". (Private property)



Photo 8: Looking south-west; "Erosion-2B" adjacent to "living wall". (Private property)



Photo 9: Looking west toward northern stream bed. (Private property)



Photo 10: Looking east toward narrow pathway location.



ENVIRONMENTAL ASSESSMENT: PERMITTING CONSIDERATIONS

The following initiative would need to be conducted in order to create any flood storage in the invasive species area:

- Identify area for soil removal
- Identify and map any/all utilities in the area, including:
 - o location of utility
 - o depth of utility
 - o location of any manhole structures
 - o document any outfalls in the area
- Identify any other obstructions that may be present that would not allow excavation
- Evaluate impacts to adjacent properties from soil removal
 - o foundations, buildings, parking areas, drainage
- Conduct subsurface investigation to determine material to be removed
 - o test pits/borings
 - o sampling for quality for disposal of soil
- Determine Ordinary High Water (OHW) of Mill Brook
- Determine flood stage/elevation of Mill Brook
- Evaluate river bank of Mill Brook adjacent to storage areas
 - o need to protect/harden area if flood waters are to overtop bank at this location
- Develop invasive species removal plan
- Design flood storage areas
 - o this can be done as a Bordering Vegetated Wetland (BVW) or,
 - o part of the park built below the flood plain elevation but above the wetland zone
- Develop permits for park and flood storage area
 - o this can take on a few forms; if the work is only in the upland, then most likely just a Notice of Intent (NOI) under the Wetland Protection Act and with the Arlington Conservation Commission would be required
 - o if touching the bank and working within the brook, then additional permitting may be necessary, based on impacts



DETAIL 1



DETAIL 2



DETAIL 3



DETAIL 4

Conditions along north property line: steepest slopes west of foot bridge; trees & overgrown vegetation; variety of fencing/walls; views of Dudley Street buildings & properties beyond.

Conditions along north property line: steep slopes; trees & overgrown vegetation; variety of fencing/walls; views of Dudley Street buildings & properties beyond. Approximately 3 acres of park land.

Pollution Rating "D" predominantly caused by run-off and discharge. Most of Mystic River water ratings are "A" & "B"

MILLEROOK

CONDONINIUM

DUDLEY STREET

PRIVATELY-OWNED

Various conditions at

destabilization is evident

water's edge. Slope

Limited park furnishings (benches & trash receptacles)

MINUTEMAN BIKEWAY

Climbing wall - used infrequently and mostly by high school students

TOWN-OWNED

Floods regularly. After flooding, the area remains wet; walking and general use is limited; location of historic "small" mill pond

> No formal access to bridge

Dumpster not screened

Secondary entrance at Prentiss Road; no signage



THESTREE

Overgrown vegetation offers privacy and natural setting

Natural dams, fallen trees & debris in brook (location varies)

> Corridor is "front yard" of condominium residents. Building is in close proximity to edge of steep 27 slope. Location of historic "large" mill pond

> > MASSACHUSETTS AVENUE

LIMIT OF WOF





Weston(&)Sampson design studio







Weston & Sampson design studio

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CORRIDOR PATH FEASIBILITY PLAN MILL BROOK CORRIDOR AND WELLINGTON PARK REVITALIZATION PROJECT 29 JUNE 2018 - 100% SCHEMATIC DESIGN SUBMISSION Legend:

Privately-Owned

Town-Owned

- Approximate Limit of Work (For this Project)
- Approximate Water Edge of Brook

Minuteman Bikeway

otential improvements:

Specialty Planting (Type Varies)

Open Lawn

Existing woodland (Cleaned Up)

Primary Pedestrian Route - Asphalt (ADA)

Primary Pedestrian Route - Boardwalk (ADA)

Primary Pedestrian Route - Trail (ADA)

Secondary Pedestrian Route - Asphalt (ADA)

Secondary Pedestrian Route - Trail (ADA)

Entry Signage / Gatewa

Wayfinding / Ecological / Historical Signage Minuteman Bikeway Connection Signage

Existing Bridge Crossing (ADA)

New Bridge Crossing (ADA)

---- Off-Site Access



1'= 30-0' 0 10 20 30 60FT





WELLINGTON PARK SCHEMATIC DESIGN PLAN MILL BROOK CORRIDOR AND WELLINGTON PARK REVITALIZATION PROJECT AUGUST 2018 - POST-PUBLIC MEETING #3 UPDATES

Legend:
Privately-Owned
Town-Owned
Approximate Limit of Work (For this Project)
Approximate Water Edge of Brook
Minuteman Bikeway
Potential Improvements:
Constructed Wooded Wetland
Open Lawn
Existing Woodland (Cleaned Up)
No-Mow / Native Grass
Buffer Planting
Garden
Asphalt Paving
Accessible Trail Surfacing
Boardwalk
New Bridge Crossing (ADA)
Wayfinding / Ecological / Historical Signage
Entry Signage / Gateway
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Weston & Sampson design studio 30





WELLINGTON PARK - GROVE STREET ENTRANCE Mill Brook Corridor and Wellington Park Revitalization Project 29 June 2018 - 100% Schematic Design Submission







WELLINGTON PARK - INTERIOR VIEW Mill Brook Corridor and Wellington Park Revitalization Project 29 June 2018 - 100% Schematic Design Submission



DETAILED COST LIST - DRAFT

		Quantity	Unit	Unit Price	Total	
1.	Site Prep and Demolition					
	Site Prep (protection of elements to remain, etc.)	1	IS	\$5,000	\$5,000	
	Temporary Construction Fence	1435	LE	\$6	\$8,610	
	Invasive Species Removal	1	1.5	\$20,000	\$20,000	
	Tree Stump Grinding (24")	8	FΔ	\$500	\$4,000	
	Tree Bruning, Clearing and Grubbing	20		\$500 \$500	¢10,000	
	Strip & Stocknile Toppoil (C" dopth)	1620		φ000ψ Φ0	\$12,000	
	Missellansous Demolition	1030		ው ድን ድርስ	\$13,037 \$2,500	
	Deursh Creating (52000 et)	0.044	LO	φ2,500 ¢2	\$2,500	
	Fine Creding (52000 st)	6044	01 0V	ອວ ¢ວ	\$10,133 ¢40,000	
	Pile Glading (52000 SI)	0044	01 0V	¢۲ شار	φ12,009 ¢0,440	
	R&D Asphalt Paving	241	51	\$10	\$2,413	
	Erosion Control Device - Straw Wattles and Silt Fence	1	LS	\$5,000	\$5,000	
						* 400 7 00
	Subtotal					\$100,783
2.	Trail Surfacing					
	Full-depth Asphalt Paving (3" depth) (7455 sf)	139	TON	\$180	\$25,049	
	Gravel Borrow Base at Full-depth Asphalt (8" depth) (7455 sf)	184	CY	\$35	\$6,436	
	ADA Trail Surfacing and Gravel Borrow Base (1560 sf)	29	CY	\$50	\$1,444	
	Steel Edging (at Trail Surfacing)	593	LF	\$15	\$8,895	
	Boardwalk Trail Surfacing	1690	SF	\$75	\$126,750	
	Bridge (Pre-fabricated, \$65k x 2.1 installation)	2	LS	\$136.500	\$273.000	
				+	,	
	Subtotal					\$441.574
						* · · · , • · ·
3.	Natural Play Elements					
•.	Wood Fiber Surfacing	550	SE	20	\$11,000	
	Nature-Based Play Structure	1	10	\$8,000	000 82	
	Landscape Boulder (Natural)	20		ψ0,000 \$200	\$6,000 \$6,000	
		20	LA	\$300	\$0,000	
	Subtotal					\$25,000
						φ23,000
1	Site Amenities and Improvements					
	Banchas	0	E۸	¢1 900	\$14.400	
	CIP Constate at Panahaa	0	EX eV	\$1,000 ¢65	\$14,400 \$2,260	
	CIP Concrete at Dertokla Tailet (100 af)	30	01 0V	\$00 \$00	\$∠,309 ¢700	
		11	SY	\$65	\$722	
	Gravel Borrow at CIP Paving (8" depth)	8	CY	\$35	\$281	
	Bike Racks	4	EA	\$500	\$2,000	
	Picnic Tables - Large	3	EA	\$6,000	\$18,000	
	Drinking Fountain w/ Bottle Filler	1	EA	\$6,000	\$6,000	
	Trash and Recycling Receptacles	4	EA	\$1,200	\$4,800	
	Signage - Type 1 - Gateway	3	EA	\$900	\$2,700	
	Signage - Type 2 - Wayfinding	5	EA	\$750	\$3,750	
	Signage - Type 3 - Historic / Ecologic	3	EA	\$750	\$2,250	
	Granite Piers	12	EA	\$1,800	\$21,600	
	Wood Guardrail at Granite Piers	56	LF	\$20	\$1,120	
	Bank Stabilization (Wood Planted Crib / "Living Wall")	1	LS	TBD		
	Subtotal					\$79,992
5.	Planting					
	Tree Planting (medium height multi-stem)	6	EA	\$750	\$4,500	
	Shrub Planting	24	EA	\$200	\$4,800	
	Loam and Seed (6" Loam Borrow)	2444	SY	\$6	\$14,667	
	No-Mow Grass / HvdroSeed	19550	SF	\$10	\$195.500	
	Wetland Plantings (Flood Storage)	1	LS	\$10.000	\$10.000	
	Display / Butterfly Garden	1	LS	\$10.000	\$10,000	
	Native Buffer Garden	1	IS	\$10,000	\$10,000	
				+ · •,• • •	* • • • • • • • •	
	Subtotal					\$249,467
						<i>4</i> 2.0, 101
	GRAND TOTAL					\$806 815
	15% Bonds Insurance Overhead Profit					\$134 522
	10% Contingency					\$80 682
	Design & Engineering Costs					\$54 600
	Supplemental Services (Survey + Test Pits)					\$15 200
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GRAND TOTAL \$1,190,819

FUNDING SOURCES FOR IMPLEMENTATION AND MAINTENANCE

Parks:

EEA Land and Water Conservation Fund

EEA PARC Grant

River/Habitat Restoration:

MA Environmental Trust (~\$25,000 up to \$75,000)

Division of Ecological Restoration Priority Project (technical assistance, small grants)

Water Quality:

MassDEP 604b Water Quality Planning Grants

MassDEP 319 Water Quality Implementation Grants

Trails:

DCR Recreational Trail Grant

Resiliency:

EEA Municipal Planning Grant* (needs to prioritize alleviation of flood risk of Mill Brook) (*awarded: municipal MVP Report, due June 2018)

EEA MVP Action Grant* (prioritizes alleviation of flood risk of Mill Brook) (* grant awarded to Town of Arlington May 2018 in the amount of \$399K)

Flooding:

FEMA – Pre-Disaster Mitigation Grant (municipal applications are rolled up through the Commonwealth; municipal Hazard Mitigation Plan needs to call out flood risk of Mill Brook)

Culvert Assistance Grant

