

Horsley Witten Group

Sustainable Environmental Solutions

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Notice of Intent Willard Street Drainage Improvement Project

Cambridge, MA

March 2018



Prepared for:
City of Cambridge
Department of Public Works
147 Hampshire Street
Cambridge, MA 02139

Prepared by:
Horsley Witten Group, Inc.



March 22, 2018

Cambridge Conservation Commission
c/o Jennifer Letourneau, Director
147 Hampshire Street
Cambridge, MA 02139

Re: Notice of Intent (NOI) – Willard Street Drainage Improvement Project
Cambridge, Massachusetts

Dear Ms. Letourneau and Members of the Cambridge Conservation Commission:

On behalf of the Applicant, the City of Cambridge Department of Public Works, Horsley Witten Group, Inc. (HW) in conjunction with HDR Engineering, Inc. (HDR), is submitting the enclosed Notice of Intent (NOI) application and supporting materials for the proposed drainage improvements at Willard Street in Cambridge, Massachusetts. Willard Street has experienced periodic flooding in recent years. The proposed redevelopment project will involve replacement of aging stormwater infrastructure and reestablishing an outfall along the Charles River.

Proposed activities will occur within Land Under Waterbodies and Waterways, inland Bank, Riverfront Area, Bordering Land Subject to Flooding and within the 100-foot buffer zone to inland Bank, areas subject to jurisdiction under the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 § 40).

Mitigation will include in-kind restoration of temporary resource areas impacts, including one-for-one replacement of trees, and implementation of an extensive erosion and sedimentation program. This Project also advances the goals of the Massachusetts Water Resources Authority (MWRA) Combined Sewer Overflow (CSO) Long Term Control Plan, and will result in a net improvement in water quality within the receiving waters. Removing stormwater flows generated in the contributing watershed area around Willard Street from the existing MWRA system will improve capacity in the MWRA system, thereby reducing the frequency and volume of CSO events to the river.

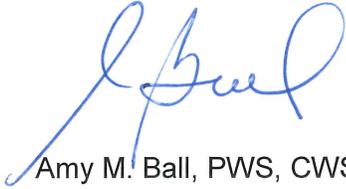
Enclosed please find one original and nine copies (10 total copies) of the NOI application, supporting documentation, and project plans. An electronic copy is also included. A copy of this NOI application has also been provided to the Massachusetts Department of Environmental Protection (MassDEP), Northeast Regional Office. As the Applicant is a municipal entity, the project is exempt from filing fees; however, a copy of the fee transmittal form has been forwarded to the DEP Lockbox. The Applicant has sent notification of the pending public hearing to abutters in accordance with State and local filing regulations and policies.

Cambridge Conservation Commission
March 22, 2018
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Thank you for your consideration of this NOI application. We look forward to meeting with you. If you have any questions and/or require additional information pertaining to this submittal, please do not hesitate to contact me at (508) 833-6600 or at aball@horsleywitten.com.

Sincerely,

Horsley Witten Group, Inc.



Amy M. Ball, PWS, CWS
Project Manager – Senior Ecologist

Enclosure(s)

cc: MassDEP, Northeast Regional Office
Jerry Friedman, PE, Cambridge DPW
Roch Laroche, PE, HDR Engineering, Inc.
Robert Lowell, MA Department of Conservation and Recreation
Kevin McKenna, Massachusetts Water Resources Authority

Willard Street Drainage Improvement Project Cambridge, Massachusetts

March 2018

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NOI Wetland Fee Transmittal Form

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ATTACHMENT A – LOCUS MAPS

Figure 1 – USGS Topographic Map

Figure 2 – Aerial Photograph

Figures 3 & 3A – FEMA Flood Zones & National Flood Insurance Program, Flood Insurance Rate Map

Figure 4 – Environmental Constraints

Figure 5 – NRCS Soils Map

ATTACHMENT B – WETLAND REPORT

ATTACHMENT C – STORMWATER REPORT (bound separately)

ATTACHMENT D – PROJECT PLANS

“Willard Street Drainage Improvement Project,” prepared by HDR Engineering, Inc., in conjunction with Horsley Witten Group, Inc. and Halvorson Design Partnership, dated March 22, 2018



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Provided by MassDEP:

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CAMBRIDGE

City/Town

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

<u>Willard Street and vicinity</u>	<u>Cambridge</u>	<u>02138</u>
a. Street Address	b. City/Town	c. Zip Code
<u>Latitude and Longitude:</u>	<u>42.374156</u>	<u>-71.128521</u>
	d. Latitude	e. Longitude
<u>N/A</u>	<u>N/A</u>	
f. Assessors Map/Plat Number	g. Parcel /Lot Number	

2. Applicant:

<u>James</u>	<u>Wilcox, PLS, PE</u>	
a. First Name	b. Last Name	
<u>City of Cambridge, Department of Public Works</u>		
c. Organization		
<u>147 Hampshire Street</u>		
d. Street Address		
<u>Cambridge</u>	<u>MA</u>	<u>02139</u>
e. City/Town	f. State	g. Zip Code
<u>617-349-4800</u>	<u>jwilcox@cambridgema.gov</u>	
h. Phone Number	i. Fax Number	j. Email Address

3. Property owner (required if different from applicant): Check if more than one owner

<u>Robert</u>	<u>Lowell</u>	
a. First Name	b. Last Name	
<u>MA Department of Conservation and Recreation</u>		
c. Organization		
<u>251 Causeway Street, Ste. 600</u>		
d. Street Address		
<u>Boston</u>	<u>MA</u>	<u>02114</u>
e. City/Town	f. State	g. Zip Code
<u>508-5091757</u>	<u>Robert.Lowell@state.ma.us</u>	
h. Phone Number	i. Fax Number	j. Email address

4. Representative (if any):

<u>Amy</u>	<u>Ball</u>	
a. First Name	b. Last Name	
<u>Horsley Witten Group, Inc.</u>		
c. Company		
<u>90 Route 6A</u>		
d. Street Address		
<u>Sandwich</u>	<u>MA</u>	<u>02563</u>
e. City/Town	f. State	g. Zip Code
<u>508-833-6600</u>		
h. Phone Number	i. Fax Number	j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid



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A. General Information (continued)

6. General Project Description:

The Applicant seeks to reduce periodic flooding in Willard Street by restoring an outfall to the Charles River. Work will result in a net improvement to water quality within the receiving waters by improving the capacity of the Massachusetts Water Resource Authority (MWRA) infrastructure, and thereby contributing to the reduction in frequency and volume of CSO events in the Charles River.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- 1. Single Family Home
- 2. Residential Subdivision
- 3. Commercial/Industrial
- 4. Dock/Pier
- 5. Utilities
- 6. Coastal engineering Structure
- 7. Agriculture (e.g., cranberries, forestry)
- 8. Transportation
- 9. Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

- 1. Yes No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(3)(l)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR 10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Middlesex

a. County

N/A

c. Book

N/A

b. Certificate # (if registered land)

N/A

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- 1. Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- 2. Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Table with 3 columns: Resource Area, Size of Proposed Alteration, Proposed Replacement (if any). Includes rows for Bank, Bordering Vegetated Wetland, and Land Under Waterbodies and Waterways.

Table with 3 columns: Resource Area, Size of Proposed Alteration, Proposed Replacement (if any). Includes rows for Bordering Land Subject to Flooding and Isolated Land Subject to Flooding.

f. Riverfront Area
1. Name of Waterway (if available) - specify coastal or inland
Charles River - Inland

- 2. Width of Riverfront Area (check one):
[checked] 25 ft. - Designated Densely Developed Areas only
[] 100 ft. - New agricultural projects only
[] 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: N/A square feet

4. Proposed alteration of the Riverfront Area:
3,706 (temporary)
a. total square feet b. square feet within 100 ft. c. square feet between 100 ft. and 200 ft.

- 5. Has an alternatives analysis been done and is it attached to this NOI? [checked] Yes [] No
6. Was the lot where the activity is proposed created prior to August 1, 1996? [checked] Yes [] No

3. [] Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete Section B.2.f. above.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	_____	
	1. square feet	

	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	_____	_____
	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	_____	_____
	1. square feet	2. cubic yards dune nourishment

	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	_____	
	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	_____	
	1. square feet	
h. <input type="checkbox"/> Salt Marshes	_____	_____
	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	_____	
	1. square feet	

	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	_____	
	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	

	1. cubic yards dredged	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	
	1. square feet	

4. Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

_____	_____
a. square feet of BVW	b. square feet of Salt Marsh

5. Project Involves Stream Crossings

_____	_____
a. number of new stream crossings	b. number of replacement stream crossings



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C. Other Applicable Standards and Requirements

- This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. Yes No **If yes, include proof of mailing or hand delivery of NOI to:**

**Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581**

August 1, 2017
b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

1. Percentage/acreage of property to be altered:

(a) within wetland Resource Area _____
percentage/acreage

(b) outside Resource Area _____
percentage/acreage

2. Assessor's Map or right-of-way plan of site

2. Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work**

(a) Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) Photographs representative of the site

*Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

**MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



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C. Other Applicable Standards and Requirements (cont'd)

- (c) MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/ mesa/ mesa_fee_schedule.htm).
Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

- (d) Vegetation cover type map of site
- (e) Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

1. Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/ mesa/ mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. Separate MESA review ongoing. _____ a. NHESP Tracking # _____ b. Date submitted to NHESP

3. Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?
- a. Not applicable – project is in inland resource area only b. Yes No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

Division of Marine Fisheries -
NorthShore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.



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Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

C. Other Applicable Standards and Requirements(cont'd)

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
 a. Yes No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
-
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
 a. Yes No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
 a. Yes No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
 a. Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
 1. Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
 2. A portion of the site constitutes redevelopment
 3. Proprietary BMPs are included in the Stormwater Management System.
 b. No. Check why the project is exempt:
 1. Single-family house
 2. Emergency road repair
 3. Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

- This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative



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to the boundaries of each affected resource area.

D. Additional Information (cont'd)

3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. List the titles and dates for all plans and other materials submitted with this NOI.

Willard Street Drainage Improvement Project

a. Plan Title

HDR Engineering, Inc. &
Horsley Witten Group, Inc.

March 22, 2018

d. Final Revision Date

Roch D. Laroche, P.E.

Richard A. Claytor, Jr., P.E.

1"=20' with details at 1"=10'

e. Scale

f. Additional Plan or Document Title

g. Date

5. If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. Attach NOI Wetland Fee Transmittal Form

9. Attach Stormwater Report, if needed.

E. Fees

1. Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

James F. W. [Signature]
 1. Signature of Applicant

[Signature]
 3. Signature of Property Owner (if different)

[Signature]
 5. Signature of Representative (if any)

3/21/2018
 2. Date

21 March 2018
 4. Date

6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

Willard Street Cambridge
 a. Street Address b. City/Town
N/A Fee Exempt
 c. Check number d. Fee amount

2. Applicant Mailing Address:

James Wilcox, PLS, PE
 a. First Name b. Last Name
City of Cambridge, Department of Public Works
 c. Organization
147 Hampshire Street
 d. Mailing Address
Cambridge MA 02139
 e. City/Town f. State g. Zip Code
617-349-4800 jwilcox@cambridgema.gov
 h. Phone Number i. Fax Number j. Email Address

3. Property Owner (if different):

Robert Lowell
 a. First Name b. Last Name
MA Department of Conservation and Recreation
 c. Organization
251 Causeway Street, Ste. 600
 d. Mailing Address
Boston MA 02114
 e. City/Town f. State g. Zip Code
508-509-1757 Robert.Lowell@state.ma.us
 h. Phone Number i. Fax Number j. Email Address

B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.



**CITY OF CAMBRIDGE
ASSESSING DEPARTMENT
795 MASS. AVE., CAMBRIDGE, MA 02139**

Tel.: 617-349-4343 Fax: 617-349-4357

Robert P. Reardon
Director of Assessment
Walter H. Pennell
Assessor

Andrew Johnson
Assessor

March 21, 2018

To Whom It May Concern:

The letter is to attest that the attached **Abutters List** for Map 220, Williard Street is a true City of Cambridge Assessing Department record.

Parcel ID	Address	Unit	Parcel ID	Address	Unit
220-185-28	28 Foster St	28	219-16	173 Mt Auburn St	
220-185-30	28 Foster St	30	220-136	189 Mt Auburn St	
219-46	33-35 Hawthorn St		219-37	177 Mt Auburn St	
220-165-101	221 Mt Auburn St	101	219-44	37 Hawthorn St	
220-165-103	221 Mt Auburn St	103	220-88	11 Foster St	
220-165-104	221 Mt Auburn St	104	220-106	60 Foster St	
220-165-105	221 Mt Auburn St	105	220-177	Bradbury St	
220-165-106	221 Mt Auburn St	106	219-32	2 Willard Street Ct	
220-165-107	221 Mt Auburn St	107	220-21	52 Foster St	
220-165-108	221 Mt Auburn St	108	220-105	62 Foster St	
220-165-109	221 Mt Auburn St	109	220-87	19 Willard St	
220-165-201	221 Mt Auburn St	201	221-40-237	237 Mt Auburn St	237
220-165-202	221 Mt Auburn St	202	221-40-239	239 Mt Auburn St	239
220-165-203	221 Mt Auburn St	203	220-134	197 Mt Auburn St	
220-165-204	221 Mt Auburn St	204	220-104	68 Foster St	
220-165-205	221 Mt Auburn St	205	219-14	41 Hawthorn St	
220-165-206	221 Mt Auburn St	206	220-33	5 Dinsmore Ct	
220-165-208	221 Mt Auburn St	208	220-170	30 Bradbury St	
220-165-22A	221 Mt Auburn St	22A	221-37	7 Sparks St	
220-165-22B	221 Mt Auburn St	22B	220-75	20 Brown St	
220-165-22C	221 Mt Auburn St	22C	219-17	175 Mt Auburn St	
220-165-22D	221 Mt Auburn St	22D	220-139	8 Dinsmore Ct	
220-165-24A	221 Mt Auburn St	24A	221-31	17 Sparks St	
220-165-24B	221 Mt Auburn St	24B	220-132	14 Foster St	
220-165-24C	221 Mt Auburn St	24C	219-38	7 Longfellow Pk	
220-165-24D	221 Mt Auburn St	24D	220-181	27 Willard St	
220-165-26A	221 Mt Auburn St	26A	220-138	12 Dinsmore Ct	
220-165-26B	221 Mt Auburn St	26B	220-186	24 Foster St	
220-165-26C	221 Mt Auburn St	26C	219-45	31 Hawthorn St	

220-165-26D	221 Mt Auburn St	26D	221-38	5 Sparks St	
220-165-28A	221 Mt Auburn St	28A	220-179	36 Foster St	
220-165-28B	221 Mt Auburn St	28B	219-31	18 Willard St	
220-165-301	221 Mt Auburn St	301	220-137	185-187 Mt Auburn St	
220-165-302	221 Mt Auburn St	302	220-130	50 Foster St	
220-165-303	221 Mt Auburn St	303	220-141	35 Willard St	
220-165-304	221 Mt Auburn St	304	221-87-2	13 Sparks St	2
220-165-305	221 Mt Auburn St	305	221-87-4	13 Sparks St	4
220-165-306	221 Mt Auburn St	306	221-87-8	13 Sparks St	8
220-165-307	221 Mt Auburn St	307	221-87-6A	13 Sparks St	6A
220-165-308	221 Mt Auburn St	308	221-87-6B	13 Sparks St	6B
220-165-309	221 Mt Auburn St	309	221-105	9 Sparks St	
220-165-310	221 Mt Auburn St	310	220-167	38 Bradbury St	
220-165-311	221 Mt Auburn St	311	220-140	4 Dinsmore Ct	
220-165-401	221 Mt Auburn St	401	220-89	21 Foster St	
220-165-402	221 Mt Auburn St	402	221-39	1 Sparks St	
220-165-403	221 Mt Auburn St	403	220-176-1A	205 Mt Auburn St	1A
220-165-404	221 Mt Auburn St	404	220-176-1B	205 Mt Auburn St	1B
220-165-405	221 Mt Auburn St	405	220-176-1C	205 Mt Auburn St	1C
220-165-406	221 Mt Auburn St	406	220-176-1D	205 Mt Auburn St	1D
220-165-407	221 Mt Auburn St	407	220-176-2A	205 Mt Auburn St	2A
220-165-408	221 Mt Auburn St	408	220-176-2B	205 Mt Auburn St	2B
220-165-501	221 Mt Auburn St	501	220-176-2C	205 Mt Auburn St	2C
220-165-502	221 Mt Auburn St	502	220-176-2D	205 Mt Auburn St	2D
220-165-503	221 Mt Auburn St	503	220-176-3A	205 Mt Auburn St	3A
220-165-504	221 Mt Auburn St	504	220-176-3B	205 Mt Auburn St	3B
220-165-505	221 Mt Auburn St	505	220-176-3C	205 Mt Auburn St	3C
220-165-506	221 Mt Auburn St	506	220-176-3D	205 Mt Auburn St	3D
220-165-507	221 Mt Auburn St	507	220-176-4A	205 Mt Auburn St	4A
220-165-508	221 Mt Auburn St	508	220-176-4B	205 Mt Auburn St	4B
220-165-509	221 Mt Auburn St	509	220-176-4C	205 Mt Auburn St	4C
220-165-511	221 Mt Auburn St	511	220-176-4D	205 Mt Auburn St	4D
220-165-602	221 Mt Auburn St	602	220-166	18 Sparks St	
220-165-603	221 Mt Auburn St	603	220-133	23 Willard St	
220-165-604	221 Mt Auburn St	604	220-172	46 Foster St	
220-165-605	221 Mt Auburn St	605	220-168	34 Bradbury St	
220-165-606	221 Mt Auburn St	606	220-34	9 Dinsmore Ct	
220-165-607	221 Mt Auburn St	607	219-15	49 Hawthorn St	
220-165-608	221 Mt Auburn St	608	220-102-22	22 Sparks St	22
220-165-701	221 Mt Auburn St	701	220-102-24	24 Sparks St	24
220-165-702	221 Mt Auburn St	702	220-102-26	26 Sparks St	26
220-165-703	221 Mt Auburn St	703	220-32	31 Willard St	
220-165-704	221 Mt Auburn St	704	220-32-31	31 Willard St	31
220-165-705	221 Mt Auburn St	705	220-32-33	31 Willard St	33

220-165-706	221 Mt Auburn St	706	221-99	23 Sparks St	
220-165-707	221 Mt Auburn St	707	220-169	32 Bradbury St	
220-165-708	221 Mt Auburn St	708	220-103	74 Foster St	
220-165-802	221 Mt Auburn St	802	220-135	195 Mt Auburn St	
220-165-510A	221 Mt Auburn St	510A	220-180	25 Willard St	
220-165-801A	221 Mt Auburn St	801A	221-35	11 Sparks St	
220-165-801B	221 Mt Auburn St	801B	220-17	20 Sparks St	
220-165-PKG	221 Mt Auburn St	PKG	221-27	21 Sparks St	
219-39	16 Longfellow Pk		220-62	35 Foster St	
219-7	100 Brattle St				

Sincerely,



Andrew J. Johnson
Assessor

AJJ:fm
Attachment

COMMONWEALTH OF MASSACHUSETTS Middlesex County

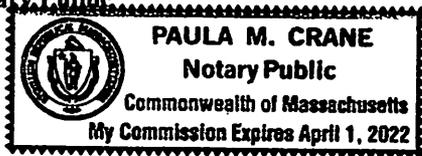
On this 21st Day of March, 2018, before me, the undersigned notary public, personally appeared Andrew J. Johnson, proved to me through satisfactory evidence of identification, which was personally known to be the person whose name is signed on the preceding or attached document, and acknowledge to me that he/she signed it voluntarily for its stated purpose.

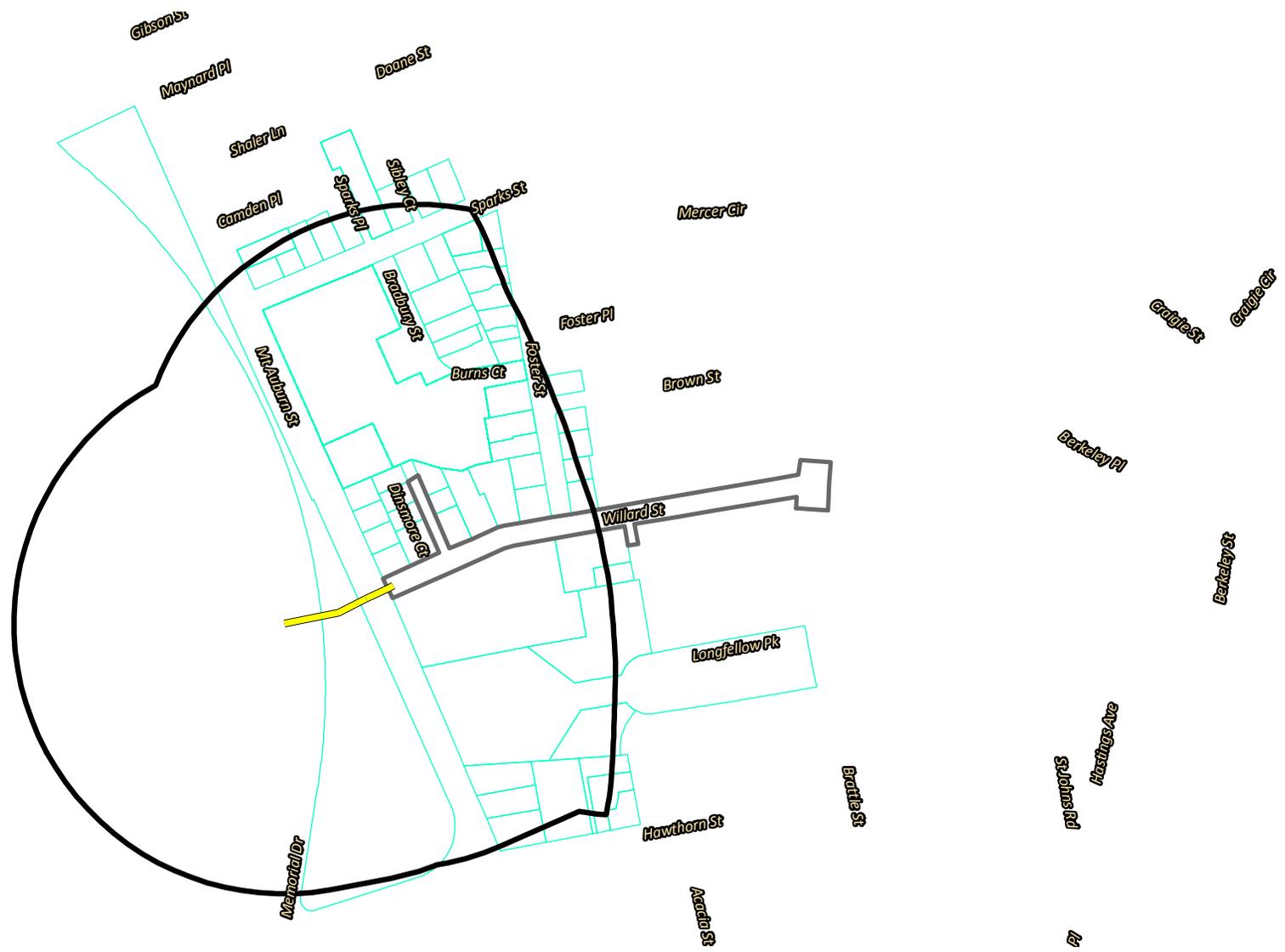


Notary Public

My commission expires:

4/1/2022



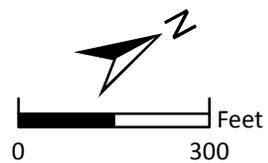


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*Parcels - City of Boston, 2017

Legend

-  Project Limit
-  500-ft. abutter notification within jurisdictional areas
-  Abutters
-  Outfall Pipe
-  Parcels
-  100-ft. Buffer to Inland Bank



[Redacted]

500-ft. Jurisdictional Buffer
Willard Street
Cambridge, MA

**NOTICE OF INTENT
NOTICE TO ABUTTERS**

DATE: March 22, 2018

RE: Upcoming Cambridge Conservation Commission Public Hearing

To Whom It May Concern:

As an abutter within 500 feet of the proposed work within jurisdictional resources, please be advised that a Notice of Intent application was filed with the Cambridge Conservation Commission and the Massachusetts Department of Environmental Protection (MassDEP) regarding the project described below.

APPLICANT: City of Cambridge – Department of Public Works

PROJECT LOCATION: Willard Street (vicinity)

ASSESSOR'S MAP & PARCEL: N/A

PROJECT DESCRIPTION: The Cambridge Department of Public Works is seeking approval for the restoration of an outfall along the Charles River to improve flooding conditions along Willard Street. Proposed work will occur within Land Under Waterbodies and Waterways, Bank, Riverfront Area, Bordering Land Subject to Flooding, and within the 100-foot buffer zone to Bank.

APPLICANT'S REPRESENTATIVE: Horsley Witten Group
c/o Amy M. Ball, PWS
90 Route 6A, Sandwich, MA 02563
(508) 833-6600

PUBLIC HEARING LOCATION: 147 Hampshire

DATE/TIME: April 9, 2018; beginning at 7:00 PM

Copies of the NOI plans and application materials may be obtained from the Cambridge Conservation Commission by calling 617-349-4680 (Mon 8:30 AM – 8:00 PM, Tues-Wed-Thurs 8:30 AM – 5:00 PM and Fri 8:30 AM – noon).

Notice of the public hearing (including the date, time and place) will be published in a local newspaper at least 5 business days before and posted in Cambridge City Hall at least 48 hours in advance.

Information on the NOI filing and the Massachusetts Wetlands Protection Act may also be obtained by calling the Massachusetts Department of Environmental Protection (MassDEP), Northeast Regional Office, 205B Lowell Street, Wilmington, MA 01887 (978-694-3200).

PROJECT NARRATIVE

Willard Street Drainage Improvement Project Cambridge, Massachusetts

PROJECT NARRATIVE

1.0 INTRODUCTION AND BACKGROUND

The Applicant, the City of Cambridge Department of Public Works, is seeking approval for the restoration of an outfall along the Charles River to improve flooding conditions along Willard Street, in Cambridge, MA. The Willard Street Neighborhood has experienced significant flooding on several occasions (Photo 1). These flooding events impact public health and quality of life for those affected.

In the 1970s, the Metropolitan District Commission or MDC, the predecessor to the current agencies, Massachusetts Water Resources Authority (MWRA) and Massachusetts Department of Conservation and Recreation (DCR), constructed the North Charles Relief Sewer (NCRS). The City's 36-inch diameter drainage pipe, which had directed flow through an existing outfall to the Charles River, was abandoned at that time, and the flow was redirected to the MWRA's Metropolitan Sewer in Mt. Auburn Street, and ultimately directed to the wastewater treatment facility on Deer Island. This effort required the City's flow regulator in Mount Auburn Street to be modified. Based on past studies, it appears that the localized flooding is caused by surcharging during major storm events from this modified structure, as well as limited capacity of the MWRA sewer.

The City of Cambridge Department of Public Works is seeking approval for the restoration of an outfall to the Charles River to reduce flooding conditions along Willard Street. The City has undertaken extensive public outreach to incorporate public comment, resulting in the proposed project design.

The Project is an integral component of the City of Cambridge Long-Term Stormwater Management Plan. This Project also advances the goals of the MWRA's Combined Sewer Overflow (CSO) Long Term Control Plan by eliminating an existing connection between the existing stormwater system and the MWRA sewer system near the intersection of Mt. Auburn and Willard Streets. Work will result in a net improvement to water quality within the receiving waters by improving the capacity



Photo 1. Flooded conditions following storm event looking north along Willard Street.

within the MWRA infrastructure, and thereby reducing the number and volume of CSO events in the Charles River.

The Project includes restoration of the previously existing 36-inch reinforced concrete pipe (RCP) and outfall to the Charles River. The proposed restored location for the outfall is approximately 35 feet north of the previously existing outfall. This is south of the intersection of Willard Street and Mt. Auburn Street, and adjacent to Memorial Drive. The project will convey stormwater from a similarly-sized watershed of approximately 18.1 acres that discharged to the previously existing outfall. The project also involves installation of associated infrastructure to convey treated stormwater runoff from Willard Street and Dinsmore Court, water main replacement, installation of green infrastructure (GI) stormwater treatment along Willard Street, and surface reconstruction of Willard Street. Two adjacent offsite areas, the Cambridge Skating Club and Longfellow Park, will also have upgraded stormwater treatment and runoff reduction, but will remain in the combined system and not discharge to the Charles River. The City also proposes to construct an overlook at the outfall location to promote recreational opportunities along the Charles River, and public access within tidelands which were previously filled in the early 1900s to support the construction of Memorial Drive.

While outside of jurisdictional areas, secondary benefits of the project include improved transportation and streetscape conditions, by correcting narrow inaccessible sidewalks, and accommodating bicyclists, and upgrading deteriorated hardscape and landscape conditions along Willard Street.

Proposed work associated with the outfall will occur within Land Under Waterbodies and Waterways, Bank, Riverfront Area, Bordering Land Subject to Flooding, and within the 100-foot buffer zone to Bank, as well as within prior filled tidelands. The majority of the project elements within jurisdictional areas will be located either underground or underwater and will not be visible.

The Project will avoid adverse construction-related or operational impacts to state-regulated resource areas by incorporating extensive short-term construction-related mitigation measures along with restoration and enhancement of the vegetation community within jurisdictional areas. The project is filed as a limited project under the provisions at 310 CMR 10.53(3)(l), which is discussed below, and also meets the definition of redevelopment under the Massachusetts Stormwater Management Standards.

2.0 GENERAL SITE DESCRIPTION

Willard Street is located between Brattle Street and Mt. Auburn Street, oriented perpendicular to the Charles River (receiving waterbody) (Attachment A, Figures 1 and 2). Willard Street is a two-way street with sidewalks on both sides, and is heavily used as a route between Brattle Street and Mt. Auburn Street. The proposed location of the restored outfall is along the embankment to the Charles River, where a narrow strip of vegetation along a steep slope separates the Dr. Paul Dudley White Bike Path from the River. The bike path parallels Memorial Drive (Photo 2).



Photo 2. Existing conditions in the approximate location of proposed outfall looking downstream along the Charles River. Memorial Drive is located to the left, with the Dr. Paul Dudley White Bike Path in center of photo. DCR controlled Riverbend Park is located in the far left background.

In addition to the work proposed immediately along the Charles River, the project work site area consists of an additional approximately 4.9 acres located in the contributing watershed, within and along segments of Willard Street, Willard Street Court, Foster Street, Dinsmore Court, and Mt. Auburn Streets, as well as portions of the grounds of the Cambridge Skating Club and Longfellow Park (though, as stated above, the drainage for the Skating Club and Longfellow Park will not discharge to the restored outfall). These areas, while outside of the 100-foot buffer zone to Bank (the most landward jurisdictional area), are included in the project site, as work in these portions of the supporting watershed is an integral part of an effort to reduce stormwater pollutant discharges to the Charles River and to the existing combined sewer system.

2.1 FEMA Designation

According to the current FEMA Flood Insurance Rate Map (FEMA FIRM) for Middlesex County (Community Panel 25017 C 0557E, effective date June 4, 2010), the portion of the project site in closest proximity to the Charles River is mapped within Zone AE (elevation 4 feet NGVD 89 and 15.66 Cambridge City Base (CCB)): *Areas subject to inundation by the 1% annual chance flood (Base flood elevations determined)*. Elsewhere, the site is located within Zone X: *Areas of Minimal Flood Hazard* (Attachment A, Figures 3 and 3A).

2.2 State-listed Rare Species Habitat

According to the most recent version of the *Massachusetts Natural Heritage Atlas* (14th Edition, August 1, 2017), the project does not occur within areas of *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* and/or *Priority Habitat of Rare Species* as designated by the Massachusetts Natural Heritage and Endangered Species Program (NHESP)(Figure 4).

2.3 Wetland Resource Areas

Jurisdictional wetland resource areas under the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 § 40) were identified and delineated by LEC Environmental Consultants, Inc. (LEC) along a 330± linear foot segment of the Charles River in September 2016. LEC identified the following resource areas at this location:

- Land Under Waterbodies and Waterways
- Inland Bank
- Riverfront Area (25-foot)
- Bordering Land Subject to Flooding

LEC's assessments included soils and vegetation analyses; no Bordering Vegetated Wetland (BVW) was identified along this reach of the Charles River. This may be due to a combination of the steep bank and river current. Definitions and descriptions of these resource areas are provided in Attachment B.

3.0 PROPOSED PROJECT

The proposed project consists of a restored outfall pipe and structure to the Charles River, as well as restoration efforts and vegetation enhancements along this portion of the Charles River. Additional project elements located outside of jurisdictional areas include a series of roadway, sidewalk, and drainage/stormwater management improvements in the upper watershed, including the following:

- New surface roadway treatments along Willard Street from Mt. Auburn Street to Brattle Street;
- New utilities including gas, sewer, water, stormwater facilities (deep sump catchbasins) and drainage pipes within Willard Street proper;
- New stormwater treatment systems along the west side of Willard Street (tree trenches and subsurface gravel infiltration trenches, including planting of street trees);
- Incorporation of a 2-foot wide permeable pavement strip along the western side of Willard Street;
- Stormwater management improvements within a grassed area at Longfellow Park; and
- Stormwater management improvements within the Cambridge Skating Club.

Details of the proposed project are discussed further in the following sections and within the attached Stormwater Management Report (Attachment C), and are provided in the attached project plans entitled, "Willard Street Drainage Improvement Project" prepared by HDR Engineering, Inc., in conjunction with Horsley Witten Group, Inc. and Halvorson Design Partnership, dated March 22, 2018 (Attachment D).

3.1 Design Considerations

The proposed project design takes into consideration several design constraints, and in particular the ability of the project to meet the project purpose, protection of the wetland resource areas and meeting their respective performance standards, as well as meeting the MA Stormwater Management Standards as a redevelopment project.

The project design and construction schedule must also adhere to the Time-of-Year (TOY) restrictions established for the Charles River for work within Land Under Waterbodies and Waterways. According to the Mass Division of Marine Fisheries database, the TOY restrictions for construction activities within the Charles River in Cambridge, MA include both spring and fall restrictions for protection of Alewife Herring; Blueback Herring; American Shad; American Eel; White Perch, and, Atlantic Tomcod. The spring TOY restriction is from February 15th – July 15th; the fall TOY restriction is September 1st – November 15th.

Proposed stormwater management practices, as discussed further in the Stormwater Management Report (Attachment C) include considerations for the effectiveness of the stormwater controls.

3.2 Alternatives Analysis

The Applicant explored several alternatives to the proposed design, taking into account the design considerations discussed above. These include the No Action alternative, alternative designs, and the preferred alternative (the proposed project).

- No Action. The No Action Alternative would not address the primary project purpose of alleviating flooding in Willard Street and its abutting private properties. Under this Alternative, there would be no impacts to existing resource areas, but the flooded condition along Willard Street would remain and the project would not result in net improvements to water quality within the receiving waters. Further, there would be no proposed vegetation enhancements or overlook that would enhance recreational opportunities at this location along the Charles River.
- Alternative Design. The Applicant explored alternatives for the configuration of the restored outfall, including, restoration in the same footprint, which would have placed the outfall at an angle to the river, rather than the proposed outfall location which places the outfall at a right angle with the River to minimize erosion and construction impacts to existing infrastructure. Other design constraints including protection of existing MWRA infrastructure located immediately adjacent to the bank, and restoration of existing DCR lands. Additional design alternatives include restoration options, including the option for incorporating a small informal overlook above the outfall structure.
- Preferred Alternative – Proposed Design. The proposed project involves the restoration of an outfall at a right angle to the Charles River, resulting in minimal impacts to wetland resource areas and the jurisdictional buffer zone. The project will alleviate flooding along Willard Street, contribute to net water quality improvements to the Charles River, and provide for additional vegetation enhancements and recreational opportunities at this location along the Charles River.

3.3 Project Details

3.3.1 Outfall Structure/Drainage Design

The outfall structure design was predicated by an existing 42-inch RCP MWRA sewer located near the existing bank of the Charles River. The existing sewer pipe is supported on piles and located at a depth that precluded recent similar City of Cambridge outfall designs. The outfall structure design is actually a system of structures designed to meet two significant constraints: 1) to allow the proposed outfall pipe to cross over and protect the structural integrity of the existing MWRA-owned sanitary sewer pipe, and 2) to allow for discharge into the Charles River below the mean low water line.

The outfall structure system is to be composed of a reinforced concrete precast transition structure and a reinforced concrete precast outfall structure.

- The transition structure acts as a junction to transition from the proposed 30-inch reinforced concrete pipe (RCP) to the a 60-inch x 24-inch reinforced concrete box (RCB) that will be supported on micropiles, to reduce the height of the pipe and provide adequate cover over the existing 42-inch MWRA sanitary sewer pipe. The RCB spans the existing MWRA sewer and connects to the proposed outfall structure.
- The outfall structure uses a 60" x 24" rectangular orifice to discharge treated stormwater flows to the Charles River. The velocity of the stormwater is considerably lessened when it drops from elevation 12.78 at the inlet to elevation 9.00 at the outlet below the mean low water line (the existing water surface elevation is approximately ± 12.5 feet). The system will discharge flow by building a pressure head upstream in the drainage system. (All elevations cited in CCB datum.)

3.3.2 Scour Protection

The outfall has been located perpendicular to the existing riverbank to minimize erosion and construction impacts. The outfall orifice will discharge to the Charles River at an invert of 9.00 with the top of orifice at elevation 11.00, which is below the low water elevation of the Charles River, which is dam controlled. The elevation of the waterline shown on the plans is ± 12.5 feet.

In addition, stone rip rap is proposed at the water's edge directly below the proposed outfall to protect against scour and shoreline erosion, and to prevent erosion and undermining of the outfall structure. The scour protection will consist of 6- to 9-inch diameter riprap stone, 18 inches deep based upon modeling results. The scour protection pad will be enclosed along its perimeter by 2-foot diameter stones. The longitudinal profile of the riprap will be flat and transition at a 1:1 slope to meet existing grade.

3.3.3 Spill Containment and Maintenance Access

The outfall system will include measures capable of closing off each chamber to provide access for maintenance. Additionally, in the event of a spill emergency, the system will be able to significantly contain the spill from entering the Charles River. The outfall system's two structures (the transition structure and the outfall structure) will each have a cast iron slide gate attached to a crank

mechanism that could be lowered or raised to block the outflow from the structure. The design of the spill containment system will be confirmed and approved by the DPW.

3.3.4 Restoration Efforts and Tree Replacement

Surface work within DCR Memorial Drive and the DCR river edge parkland includes restoration of the roadway to existing conditions within the limits of the work zones, protection of existing trees, and embankment restoration. The roadway, metal guard rail, lawn strip along the roadway, multi-use asphalt path, and stone dust jogging path will all be restored to existing dimensions and conditions. New street trees, London Plane (*Platanus acerifolia* 'Bloodgood') are proposed along the grass strip in the vicinity of the outfall structure.



Photo 3. Existing conditions along the bank of the Charles River looking upstream at the approximate location of the proposed outfall. Vegetation enhancements are proposed to improve resource area habitat.

It is anticipated that a 3-inch caliper common alder tree (*Alnus glutinosa*) may be adversely impacted along the shoreline during construction. This tree will be replaced in kind with a similarly sized (8-10-foot tall) alder. In addition, the Applicant proposes enhancement plantings of two additional London Plane trees (3 to 3½-inch caliper size) along the roadway edge at the back of guardrail in the lawn strip as shown on the drawing. This will result in a net gain of at least 5 caliper inches in this location.

3.3.5 Overlook along Charles River

The Applicant proposes to install a small overlook above the outfall to enhance recreational opportunities and public enjoyment along the Charles River in this location. There are two options for the restoration of the embankment landscape. In both cases, existing trees in the vicinity of the construction will be protected in place with fence barriers at the canopy (drip line) of the trees. The disturbed bank areas will be fine graded, planted, and watered for establishment. The plant material is as shown in the planting list and will be a combination of riparian herbaceous material and native and ornamental grasses. Details are provided on the Planting Plan and Detail sheets (Sheet L-1, L-2, L-3, L-4.1, and L-4.2) of the attached project plans (Attachment D). The final design of the embankment restoration will incorporate comments from DCR.

- Option 1: Option 1 restores the landscape to its current existing conditions including installation of specified hydro-seeded mix, plugs, and plant material at existing shoreline grades. This option is basically a restoration in-kind.

- Option 2: In addition to the bank restoration described above, Option 2 introduces a small overlook with natural boulders for seating and viewing the river. The pavement material in the modest sized overlook area is a permeable flexi-pave affording permeability and drainage.

The Applicant's preferred option is Option 2, which introduces a small overlook at this location. The boulders provide screening of the outfall structure and provide a welcome place to sit and view the river that is easily accessible from the path network and is located at a bend in the river affording views both upstream and downstream. The Applicant seeks feedback from the Conservation Commission as to whether there is a preference for the proposed restoration option. The final design will also require DCR approval.

3.3.6 Off-site Efforts – Longfellow Park and Skating Club

Two additional stormwater improvement projects are proposed as part of an effort to reduce stormwater pollutant discharges to the combined sewer system. These are located on the grounds of the Cambridge Skating Club and at Longfellow Park.

- Cambridge Skating Club. The Applicant proposes to install new piping, a drainage inlet/catchbasin, and a grass infiltration swale system within an approximately 0.1-acre portion of the Cambridge Skating Club property to capture runoff exceeding ½ inch across the contributing area. Flows beyond the capacity of grass infiltration swale will overflow to the combined system.
- Longfellow Park. At Longfellow Park, the Applicant proposes to install new piping, catchbasins, and infiltration chambers in a 0.3-acre grassy area. These measures are designed to infiltrate runoff from up to the 10-year storm. Similar to the Skating Club, flows beyond the capacity of the chambers will overflow to the combined system.

3.4 Construction Sequence

The Applicant proposes the following construction sequence for work within jurisdictional areas.

1. Wetland delineation flagging will be verified and replaced as necessary.
2. Compost filter tubes will be installed and staked in place. The entire limit of construction will be isolated, and access will be provided with a locked gate. A silt curtain and floating boom will be positioned around the site in the river. The contractor will be required to maintain a spill kit on-site.
3. The existing bike path (Dr. Paul Dudley White Bike Path) will be detoured between Memorial Drive at Gerry's Landing Road and Hawthorne Street. Appropriate signage and protections will be provided to safely detour pedestrian and bicycle traffic.
4. Temporary double floating curtains will be erected in the Charles River.
5. A temporary steel sheeting cofferdam will be installed in the Charles River within the period allowed under the TOY restrictions. The area within the upstream portion of the cofferdam will be filled with crushed stone of a sufficient thickness as needed to create a working pad for equipment. A ramp will be constructed of crushed stone to create equipment access to the

interior of the cofferdam. Temporary cut and fill will occur within the embankment adjacent to the Charles River and restored to existing grades upon completion of the outfall work.

6. A dewatering system will be installed and excavated within the cofferdam to required subgrades. Dewatering pumps will discharge to the river within the floating curtains and be of sufficient capacity to maintain dry conditions. All excess dredged material will be disposed of offsite.
7. Subgrade crushed stone will be installed before placing precast and ancillary materials.
8. Piles and pile caps will be installed adjacent to the existing MWRA 42-inch concrete sewer. The MWRA sewer will be protected at all times.
9. The outfall structure, reinforced concrete box, transition structure, riprap, and stone stabilization within the cofferdam will be installed. The entire installation downstream of the transition structure will be completed, backfilled, compacted, and the dewatering operation stopped before installation of the storm drain pipe upstream of the transition structure.
10. The cofferdam will be removed. Once the cofferdam is removed, compost filter tubes will be restored.
11. The storm drain pipe upstream of the transition structure will be installed using temporary support of excavation with dewatering.
12. Restorative grading, topsoil restoration, planting, and seeding of the work zone within the embankment will be completed. Additional surface improvements for the overlook will then be installed as shown on the landscape design sheets and as discussed above.
13. The bike path, curbing, grass strip, and guard rail will be restored after the storm drain pipe is installed, backfilled, and compacted.
14. The storm drain pipe and manholes on Memorial Drive and Mt. Auburn Street will be installed, backfilled, and compacted and restored with a permanent asphalt pavement patch.
15. The environmental controls (floating curtains, compost filter tubes and silt sacks) will remain in place until the construction site is stabilized. The contractor will check and maintain the environmental controls daily. Upon stabilization and growth of vegetated cover, the environmental controls will be removed and disposed offsite at a secure facility.

4.0 PROTECTION OF RESOURCE AREA INTERESTS

Proposed work associated with the outfall will occur within Land Under Waterbodies and Waterways, Bank, Riverfront Area, Bordering Land Subject to Flooding, and within the 100-foot buffer zone to Bank, as well as within filled tidelands. The majority of these impacts will be temporary in nature and will be restored in-kind following project completion. Table 1 summarizes the proposed resource area impacts. Work within filled tidelands overlaps with work other resource areas (Figure 4).

Table 1. Summary of Resource Area Impacts Associated with the Proposed Restored Outfall.

Resource Area	Impacts (SF)		
	Temporary	Permanent	
		Outfall Restoration Option 1	Outfall Restoration Option 2
Bordering Land Subject to Flooding	632	0	0
Land Under Waterbodies	2,874	722	722
Bank (LF)	129	23	23
25-foot Riverfront Area	3,706	0	0
100-foot Buffer to Bank	11,236	0	0
Impervious Cover	--	20	40

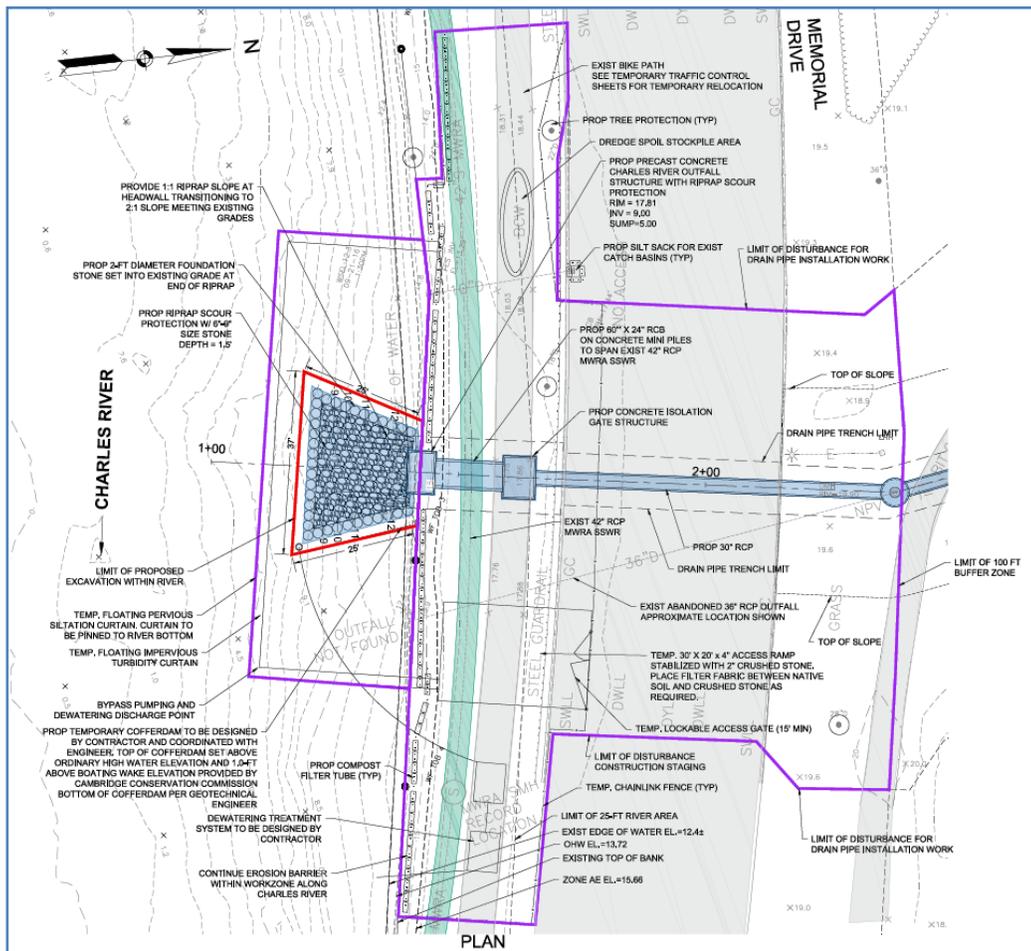


Photo 4. Graphic representation of proposed temporary and permanent alterations within jurisdictional areas.

4.1 Limited Project

The proposed project is filed as a limited project under the provisions at 310 CMR 10.53(3)(l):

(l) The construction, reconstruction, operation or maintenance of water dependent uses; provided, however that:

- 1. any portion of such work which alters a bordering vegetated wetland will remain subject to the provisions of 310 CMR 10.55,*
- 2. such work in any other resource area(s) found to be significant to flood control or prevention of storm damage will meet the performance standards for that interest(s), and*
- 3. adverse impacts from such work in any other resource area(s) will be minimized regarding the other statutory interests for which that resource area(s) is found to be significant.*

The proposed outfall qualifies as a “Water-dependent Use” in accordance with the definition under 310 CMR 10.04 and as further clarified under 310 CMR 9.12(2)(a)13. The Project has undergone an alternatives analysis, and has been designed to avoid and minimize permanent impacts to wetland resource areas to the extent practicable, and to meet performance standards to the extent practicable as discussed below. Restoration and vegetation enhancements are proposed to contribute to the protection of interests identified in M.G.L. Ch. 131 § 40.

4.2 Land Under Waterbodies and Waterways

The proposed project will result in temporary and permanent impacts within Land Under Waterbodies and Waterways. The regulations at 310 CMR 10.56(4) state that any proposed work in Land Under Waterbodies and Waterways shall not impair the following:

- 1. The water carrying capacity within the defined channel, which is provided by said land in conjunction with the banks;*

The project will not adversely affect the water carrying capacity within the Charles River, as it will not result in a net placement of fill below ordinary high water. Sediments within the footprint of the proposed riprap stabilization pad will be excavated prior to placement of the stone to avoid impacts to the water carrying capacity of the Charles River. The project will restore flows from the 18.1-acre watershed to the Charles River. These flows were truncated and redirected to the Deer Island facility when the MWRA relief sewer was previously constructed.

- 2. Ground and surface water quality;*

The project will protect groundwater and surface water quality and result in net water quality improvements by removing stormwater flows generated by the 18.1-acre watershed area from the existing MWRA system. Removing these flows will improve capacity in the MWRA system, thus reducing the frequency and volume of Combined Sewer Overflow (CSO) events to the river.

- 3. The capacity of said land to provide breeding habitat, escape cover and food for fisheries; and*

The project will result in permanent alteration to approximately 723 SF of Land Under Waterbodies and Waterways beneath the Charles River, where the existing substrate will be replaced with a riprap pad. This small displacement of potential habitat represents a negligible percentage of the approximately 675-acre Charles River Basin. This loss will be outweighed by the overall net

improvement of water quality within the Charles River, and therefore the project will not result in a significant reduction of habitat for resident fisheries.

4. *The capacity of said land to provide important wildlife habitat functions. A project or projects on a single lot, for which Notice(s) of intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, will not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures established under 310 CMR 10.60.*

The project will result in permanent alterations to approximately 723 SF of Land Under Waterbodies and Waterways beneath the Charles River, an alteration less than 5,000 SF, and substantially less than 10 percent of the habitat within the entire Charles River Basin. Therefore, the proposed project complies with this performance standard.

5. *Work on a stream crossing will be presumed to meet the performance standard set forth in 310 CMR 10.56(4)(a) provided the work is performed in compliance with the Massachusetts Stream Crossing Standards by consisting of a span or embedded culvert in which, at a minimum, the bottom of a span structure or the upper surface of an embedded culvert is above the elevation of the top of the bank, and the structure spans the channel width by a minimum of 1.2 times the bankfull width. This presumption is rebuttable and may be overcome by the submittal of credible evidence from a competent source. Notwithstanding the requirements of 310 CMR 10.56(4)(a)4., the impact on Land under Water Bodies and Waterways caused by the installation of a stream crossing is exempt from the requirement to perform a habitat evaluation in accordance with the procedures established under 310 CMR 10.60.*

Not applicable. The project does not involve a stream crossing.

(b) Notwithstanding the provisions of 310 CMR 10.56(4)(a), the issuing authority may issue an Order in accordance with M.G.L. c. 131, § 40 to maintain or improve boat channels within Land under Water Bodies and Waterways when said work is designed and carried out using the best practical measures so as to minimize adverse effects such as the suspension or transport of pollutants, increases in turbidity, the smothering of bottom organisms, the accumulation of pollutants by organisms or the destruction of fisheries habitat or nutrient source areas.

Not applicable. The project does not involve maintenance or improvements to a boat channel.

(c) Notwithstanding the provisions of 310 CMR 10.56(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.

Not applicable. The project site is not located in rare species habitat.

4.3 Bank

The regulations at 310 CMR 10.54 regulate naturally occurring banks. The Bank of the Charles River at the Project Site is not a naturally occurring Bank as this section of the Charles River shoreline is comprised of fill material placed during the construction of Memorial Drive in the early 1900s. The LEC report identifies the presence of boulders within the bank at this site (see Attachment B).

That said, the proposed project is designed to meet the performance standards for bank to the extent practicable. The regulations at 310 CMR 10.54(4) state that any proposed work on a Bank will not impair the following:

1. *the physical stability of the Bank;*

The Project will not affect the long-term stability of the Bank because the alterations will result in an area of reinforced bank, replacing existing boulders with a concrete outfall structure. Temporary alterations to the Bank will be stabilized with jute netting or similar, and restored with vegetation.

2. *the water carrying capacity of the existing channel within the Bank;*

The water-carrying capacity of the Charles River will not be reduced as a result of this project. The proposed outfall structure will result in only a negligible displacement of water within the approximately 675-acre Charles River Basin, and a negligible effect on the water carrying capacity.

3. *ground water and surface water quality;*

The project will protect groundwater and surface water quality and result in net water quality improvements by removing stormwater flows generated by the 18.1-acre watershed area from the existing MWRA system. Removing these flows will improve capacity in the MWRA system, thereby contributing to the reduction in frequency and volume of CSO events to the river.

4. *the capacity of the Bank to provide breeding habitat, escape cover and food for fisheries;*

The Project will not result in any adverse impacts to the capacity of Bank at the site to provide breeding habitat, escape, cover, or food for fisheries. Under existing conditions, the bank is supported by boulders and stone armoring. Temporary impacts will be restored in kind, and only 23 LF of bank will be altered long-term. This negligible loss of bank habitat will not result in a significant reduction of habitat for resident fisheries.

5. *the capacity of the Bank to provide important wildlife habitat functions. A project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 50 feet (whichever is less) of the length of the bank found to be significant to the protection of wildlife habitat, will not be deemed to impair its capacity to provide important wildlife habitat functions. In the case of a bank of a river or an intermittent stream, the impact will be measured on each side of the stream or river. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

The project will result in permanent alteration to approximately 23 LF of bank, a small fraction of the amount of this resource area along the Charles River basin, and less than the threshold for requiring a wildlife habitat evaluation. While temporary alterations to inland Bank exceed the regulatory thresholds for requiring a wildlife habitat evaluation, there are no documented important habitat features at this location, given the urban setting (see Appendix B), and the habitat features that include boulders and fill material along the artificially armored shoreline, a condition that is fairly common along this reach of the Charles River Basin.

Proposed mitigation includes revegetation and planting of enhancement vegetation along the Bank and the upgradient Riverfront Area/buffer zone that will improve habitat for local wildlife.

4.4 Bordering Land Subject to Flooding

The project will not result in long-term alterations to BLSF. Temporary alterations will be restored in kind following completion of construction. The project is designed to meet these performance standards under 310 CMR 10.57(4)(a) as follows.

1. *Compensatory storage will be provided for all flood storage volume that will be lost as the result of a proposed project within Bordering Land Subject to Flooding, when in the judgment of the issuing authority said loss will cause an increase or will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows.*

Compensatory storage will mean a volume not previously used for flood storage and will be incrementally equal to the theoretical volume of flood water at each elevation, up to and including the 100-year flood elevation, which would be displaced by the proposed project. Such compensatory volume will have an unrestricted hydraulic connection to the same waterway or water body. Further, with respect to waterways, such compensatory volume will be provided within the same reach of the river, stream or creek.

The Project will not result in any permanent loss of flood storage capacity within BLSF. There will be no direct change in water surface elevations or horizontal extent, and temporary disturbances within BLSF will be restored in kind at project completion.

2. *Work within Bordering Land Subject to Flooding, including that work required to provide the above-specified compensatory storage, will not restrict flows so as to cause an increase in flood stage or velocity.*

Not applicable. The project will not require compensatory storage as there will be no change in flood storage or displacement of floodwaters following project completion.

3. *Work in those portions of bordering land subject to flooding found to be significant to the protection of wildlife habitat will not impair its capacity to provide important wildlife habitat functions. Except for work which would adversely affect vernal pool habitat, a project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, will not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold, or altering vernal pool habitat, may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

Not applicable. The project will result in just 632 SF of temporary disturbance within BLSF, and will not result in any permanent alterations within BLSF. Disturbed areas will be restored in kind once construction is complete.

4.5 Riverfront Area Redevelopment

The proposed project will occur within the 25-foot Riverfront Area, which includes a narrow vegetated strip of land, the existing bikepath, and guardrail, ending at a point just short of Memorial Drive.

In order to meet the project goals of reducing flooding along Willard Street, as well as lessening overall demands on the MWRA system and thereby reducing the frequency and volume of CSO events to the river, any alternative design to the proposed outfall project would require similar temporary alterations to Riverfront Area. As a redevelopment project, the proposed outfall is required to adhere to the performance standards at 310 CMR 10.58(5) as follows.

(a) At a minimum, proposed work will result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40.

The proposed project will result in a net improvement to water quality over existing conditions by reducing demands on the MWRA system and contributing to the reduction in frequency and volume of CSO events to the river, supporting the long term goals of the MWRA's Combined Sewer Overflow Long Term Control Plan. On-site stormwater management within Willard Street proper will exceed the recharge requirements and meet the pollutant removal standard to the maximum extent practicable. Additional restoration and enhancement efforts will also improve habitat in this area.

(b) Stormwater management is provided according to standards established by the Department.

The project is designed to meet the MA Stormwater Management Standards to the maximum extent practicable for a redevelopment project (see Attachment C).

(c) Within 200 foot riverfront areas, proposed work will not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25 foot riverfront areas, except in accordance with 310 CMR 10.58(5)(f) or (g).

The Charles River is afforded a 25-foot Riverfront Area in the City of Cambridge. The proposed restored outfall is no closer to the river than under existing conditions where boulders armor the embankments.

(d) Proposed work, including expansion of existing structures, will be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).

Not applicable. The proposed outfall, and any similar project designed to meet the project goals would result in similar temporary alterations to Riverfront Area.

(e) The area of proposed work will not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).

Not applicable. Proposed alterations within Riverfront Area are temporary in nature and will not result in long-term alterations above that already degraded. Surface work within Riverfront Area includes restoration of the roadway to existing conditions within the limits of the work zones, protection of existing trees, and embankment restoration. The roadway, metal guard rail, lawn strip along the roadway, multi-use bituminous concrete path, and stone dust jogging path will all be restored to existing dimensions and existing conditions. Additional London Plane trees as well as a variety of herbaceous plants are proposed along the grass strip in the vicinity of the outfall structure to replace lost vegetation and enhance the habitat of this area.

(f) *When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river will be selected for restoration. Alteration not conforming to the criteria will begin at the riverfront area boundary. Restoration will include:*

1. *removal of all debris, but retaining any trees or other mature vegetation;*
2. *grading to a topography which reduces runoff and increases infiltration;*
3. *coverage by topsoil at a depth consistent with natural conditions at the site; and*
4. *seeding and planting with an erosion control seed mixture, followed by plantings of herbaceous and woody species appropriate to the site;*

Not applicable.

(g) *When an applicant proposes mitigation either on-site or in the riverfront area within the same general area of the river basin, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), or (e) at a ratio in square feet of at least 2:1 of mitigation area to area of alteration not conforming to the criteria or an equivalent level of environmental protection where square footage is not a relevant measure. Alteration not conforming to the criteria will begin at the riverfront area boundary. Mitigation may include off-site restoration of riverfront areas, conservation restrictions under M.G.L. c. 184, §§ 31 to 33 to preserve undisturbed riverfront areas that could be otherwise altered under 310 CMR 10.00, the purchase of development rights within the riverfront area, the restoration of bordering vegetated wetland, projects to remedy an existing adverse impact on the interests identified in M.G.L. c. 131, § 40 for which the applicant is not legally responsible, or similar activities undertaken voluntarily by the applicant which will support a determination by the issuing authority of no significant adverse impact. Preference will be given to potential mitigation projects, if any, identified in a River Basin Plan approved by the Secretary of the Executive Office of Environmental Affairs.*

Not applicable.

4.6 Work within the 100-Foot Buffer Zone

In accordance with regulations at 310 CMR 10.53(1),

For work in the Buffer Zone subject to review under 310 CMR 10.02(2)(b)3., the Issuing Authority shall impose conditions to protect the interests of the Act identified for the adjacent Resource Area. The potential for adverse impacts to Resource Areas from work in the Buffer Zone may increase with the extent of the work and the proximity to the Resource Area. The Issuing Authority may consider the characteristics of the Buffer Zone, such as the presence of steep slopes, that may increase the potential for adverse impacts on Resource Areas. Conditions may include limitations on the scope and location of work in the Buffer Zone as necessary to avoid alteration of Resource Areas. The Issuing Authority may require erosion and sedimentation controls during construction, a clear limit of work, and the preservation of natural vegetation adjacent to the Resource Area and/or other measures commensurate with the scope and location of the work within the Buffer Zone to protect the interests of M.G.L. c. 131, § 40.

The proposed Project has been designed to avoid and minimize impacts to the 100-foot buffer zone to Bank. The buffer zone at this site encompasses the vegetated embankment, the bike path, the

guardrail, Memorial Drive, and a portion of Riverbend Park. Temporary alterations within the buffer for construction and staging will be restored in kind following construction. Steep slopes along the embankment will be protected with erosion control matting or other measures to control erosion and sedimentation. Additional London Plane trees as well as a variety of herbaceous plants are proposed along the grass strip in the vicinity of the outfall structure to replace lost vegetation and enhance the habitat of this area.

4.7 Filled Tidelands

Figure 4 depicts the extent of filled tidelands at this site, a jurisdictional area that encompasses the resource areas, and a portion of the buffer zone and a portion of Memorial Drive. The work proposed is water-dependent in nature and therefore is presumed to serve a proper public purpose under the Chapter 91 Waterways provisions at 310 CMR 9.01 and meeting the intent and purpose of the Chapter 91 Waterways regulations. Areas of filled tidelands will be restored in kind following construction of the outfall. Restoration and vegetation enhancements will promote the public use of these tidelands by creating a small overlook for recreational use along the Charles River.

4.8 Stormwater Management

In addition to meeting the performance standards for work within jurisdictional areas under the Massachusetts Wetlands Protection Act, the project is required to meet the Massachusetts Stormwater Management Standards in accordance with the regulations at 310 CMR 10.05(6)(k). The attached Stormwater Management Report provides a summary of the existing stormwater management systems and the proposed stormwater best management practices (BMPs) located along Willard Street, as part of an overall drainage, sewer separation, and streetscape improvement project. This report describes the pre- and post-project site conditions, and the practices that will be implemented to reduce the discharge of stormwater-borne pollutants to the combined storm sewer network and the Charles River during and after construction.

The proposed drainage improvements have been designed to conform to the requirements of the Massachusetts Stormwater Management Standards (revised January 2008) to the maximum extent practicable for a redevelopment project. The proposed modifications to the existing stormwater system conform to the Standards and improve water quality by providing stormwater treatment. The report also provides a discussion of how the project is designed to meet the Standards. Additional details of the proposed stormwater management practices as well as the Stormwater Checklist are provided in Attachment C.

5.0 MITIGATION

In addition to the proposed water quality improvements through stormwater management, the Applicant proposes additional mitigation measures for temporary and permanent impacts to regulated resource areas include implementation of erosion and sedimentation control measures, stormwater improvements, and restoration and enhancement efforts.

5.1 Erosion and Sedimentation Control

The applicant will implement an erosion and sedimentation control program prior to construction to protect adjacent undisturbed resources during and immediately following construction activities. Erosion controls consisting of compost filter tubes will be installed and staked in place prior to commencement of any work and will serve as the limit of work. In addition, the entire limit of construction within jurisdictional boundaries will be isolated with chainlink fencing and a locked gate.

In order to protect downstream waters, a silt curtain and floating boom will be positioned around the site in the river. Additionally, a temporary steel cofferdam is proposed to contain sediment and allow for dewatered construction and installation of the proposed outfall structure and rip rap scour protection.

5.2 Revegetation along Charles River Bank

As discussed above, in-kind resource area restoration efforts will mitigate for temporary alterations to Bank, BLSF, Riverfront Area, and the 100-foot buffer zone. One tree anticipated to be lost during the proposed work will be replaced in kind, and additional London Plane trees as well as a variety of herbaceous plantings are proposed to enhance the restoration efforts around the proposed outfall. The minimum caliper size of the proposed trees is 3 to 3½ inches.

6.0 ADDITIONAL PROJECT PERMITTING

While the project will result in minimal impacts to resource areas regulated under the Massachusetts Wetlands Protection Act, the overall project will require additional permitting and approvals through several federal, state, and local agencies. In addition to requiring approval through an Order of Conditions (OOC) from the Cambridge Conservation Commission, the project also requires the following:

- U.S. Army Corps of Engineers (ACOE) General Permit. Work within land below the ordinary high water (OHW) of the Charles River falls within the jurisdiction of the ACOE.
- MassDEP Waterways Program – Ch. 91 License. The project will result in work within filled tidelands, requiring a Chapter 91 License.
- Mass DCR – Construction Access Permit. Work in Memorial Drive and Riverbend Park will require coordination and a Construction Access Permit from DCR.
- MWRA – 8(m) Permit. An 8(m) permit is required from MWRA to ensure protection of the MWRA infrastructure.

7.0 REFERENCES

Charles River Basin Master Plan (2002) and Master Plan Update (2017)

Massachusetts Department of Environmental Protection (DEP). 2006. Guidance within the Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands.

ATTACHMENT A – LOCUS MAPS

Figure 1 – USGS Site Location

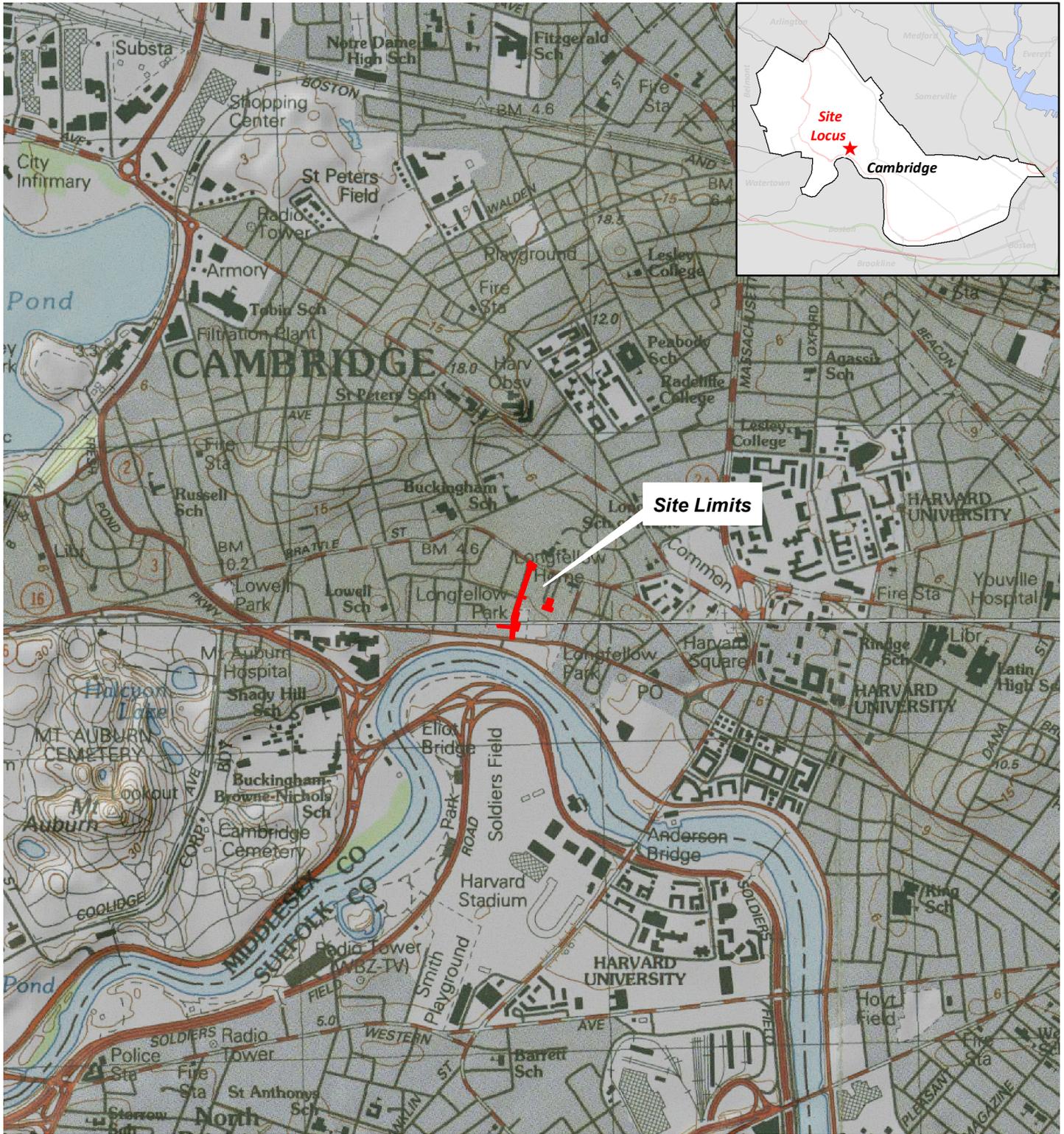
Figure 2– Aerial Photograph

Figure 3 – FEMA National Flood Hazard Layer

Figure 4 – Environmental Constraints

Figure 5 – NRCS Soils

Figure 6 – Resource Area Impacts



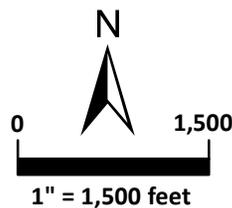
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Legend

 Site Limits

*Boston North, Boston South, Lexington & Newton Topographic Quadrangles

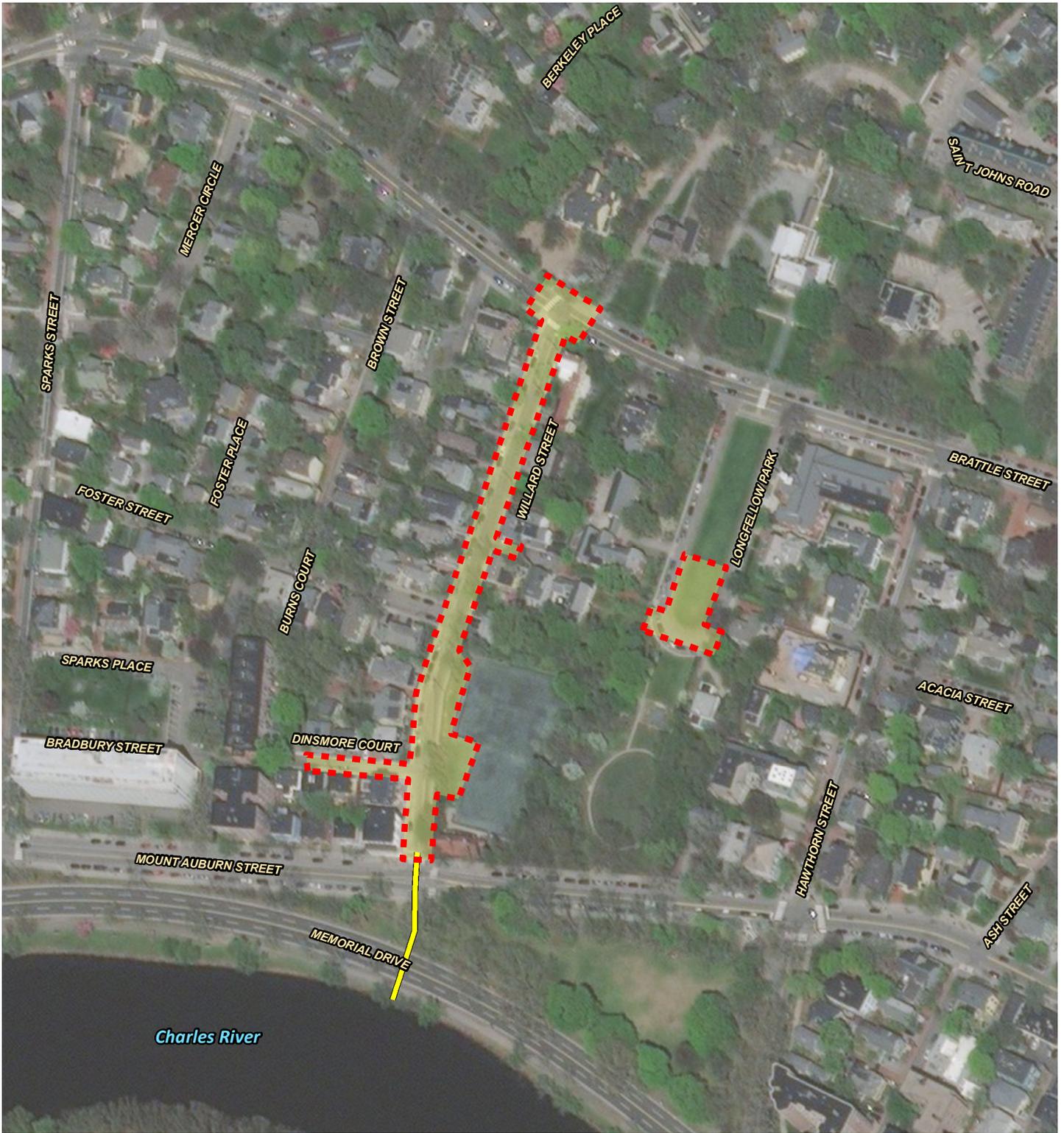
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 508-833-8600 • horsleywitten.com

USGS Locus
 Willard Street
 Cambridge, MA

Date: 3/20/2018

Figure 1



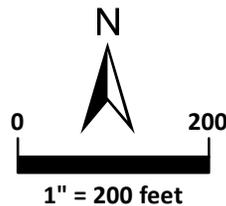
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Legend

-  Site Limits
-  Restored Outfall

*Aerial Imagery - ESRI 2017

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Aerial Photo
 Willard Street
 Cambridge, MA

Date: 3/20/2018

Figure 2



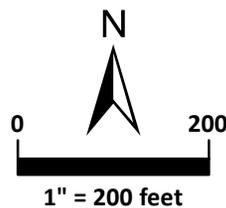
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Legend

-  Site Limits
-  Restored Outfall
-  AE: 1% Annual Chance of Flooding, with BFE

*Aerial Imagery - ESRI 2017

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FEMA's National Flood Hazard Layer
 Willard Street
 Cambridge, MA

Date: 3/20/2018

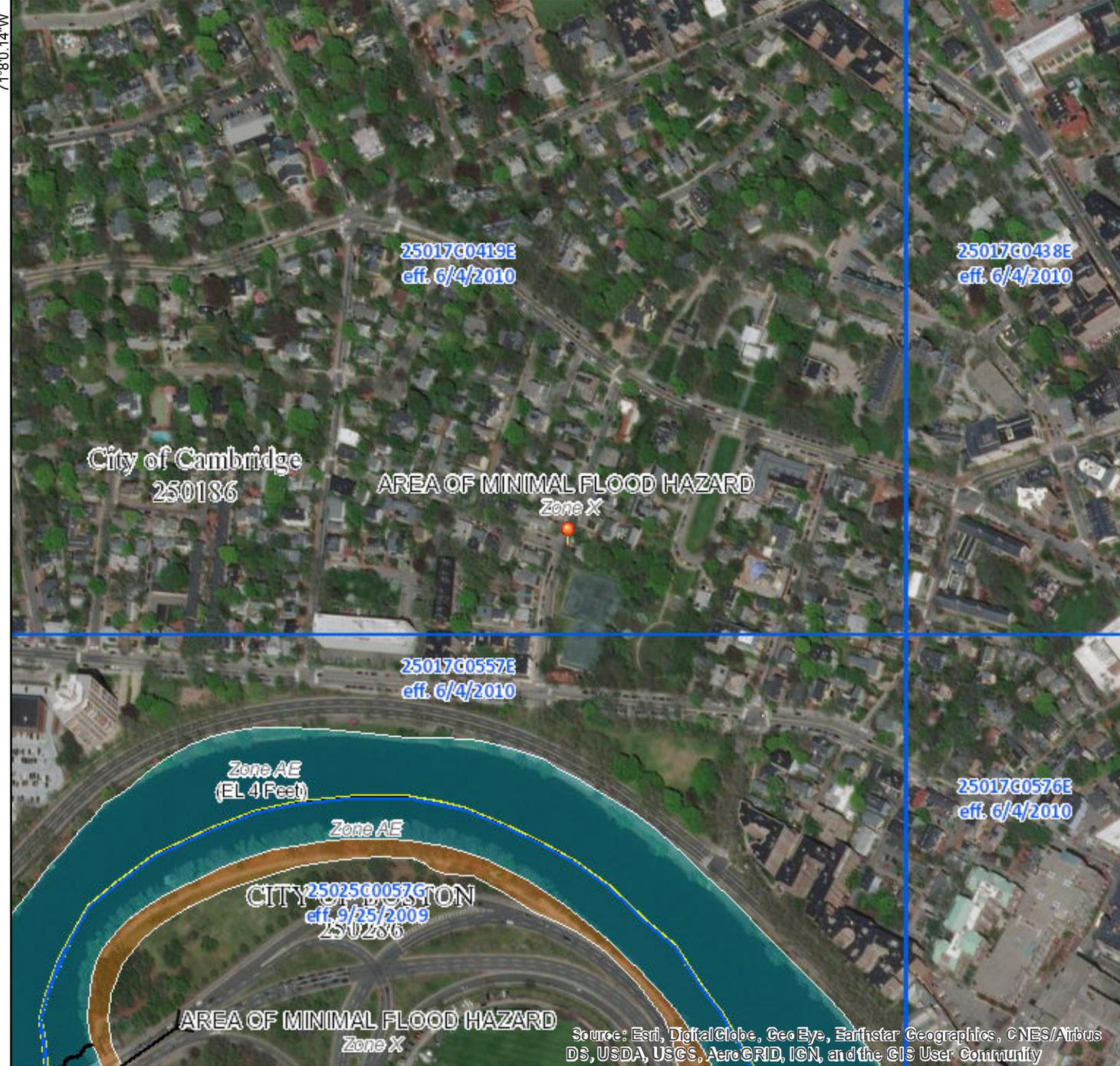
Figure 3

National Flood Hazard Layer FIRMette



FEMA

42°22'45.79"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
OTHER AREAS OF FLOOD HAZARD		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
OTHER FEATURES		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
MAP PANELS		Unmapped

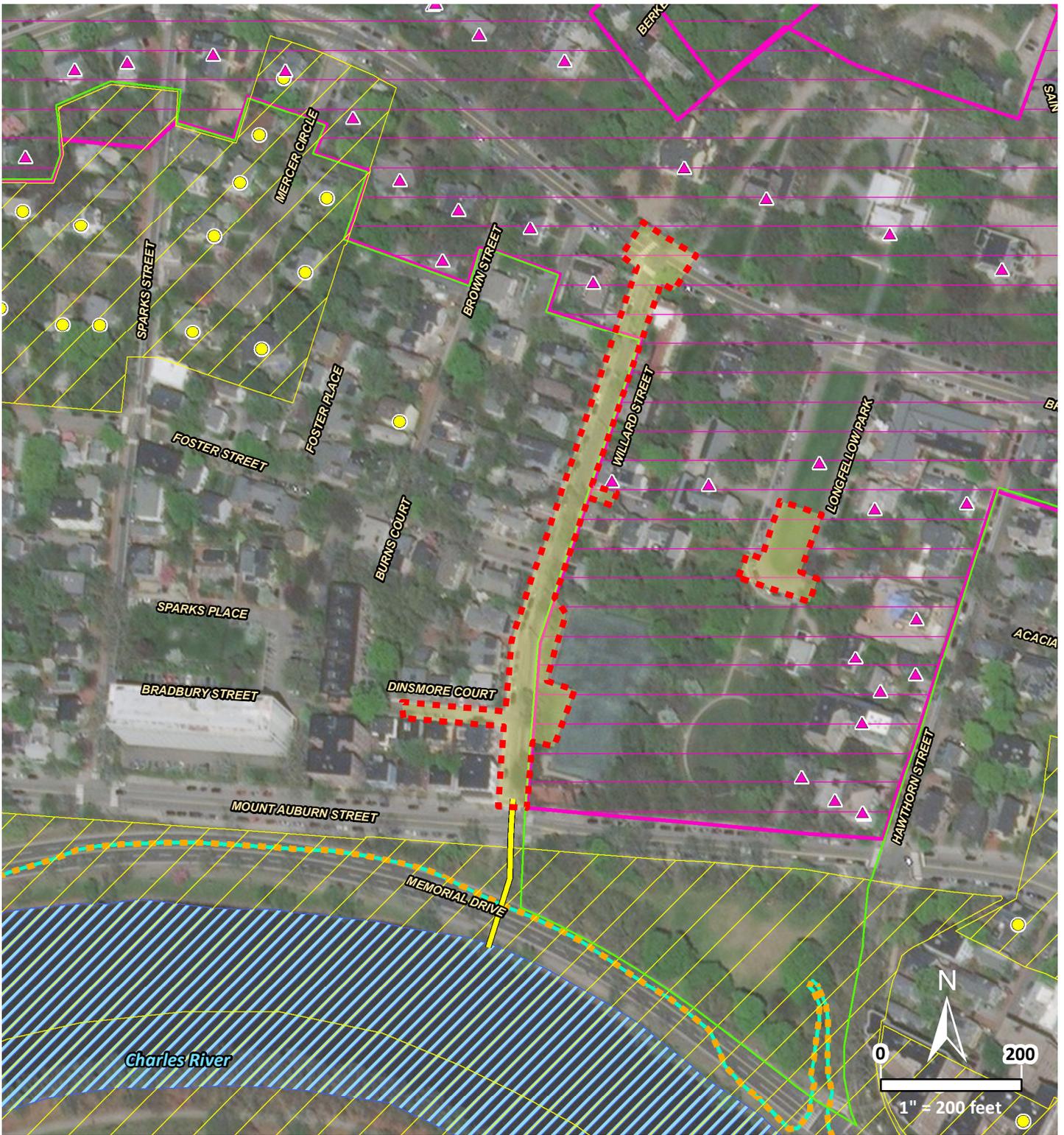
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/20/2018 at 7:39:20 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

0 250 500 1,000 1,500 2,000 Feet 1:6,000 42°22'19.21"N

Figure 3A



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*Aerial Imagery - ESRI 2017

Legend

- | | | | |
|--|---------------------|---|----------------------------|
|  | Site Limits |  | DEP Wetlands
Open Water |
|  | Restored Outfall | | |
| Tidelands Jurisdiction | | | |
|  | Jurisdiction | | |
|  | Historic High Water | | |

- MHC Historic Inventory**
-  Nat'l Register of Historic Places
 -  Nat'l Register Historic Places & Local Historic District
 -  Local Historic District
 -  Nat'l Registry Historic Places & Local Historic District
 -  Nat'l Register of Historic Places

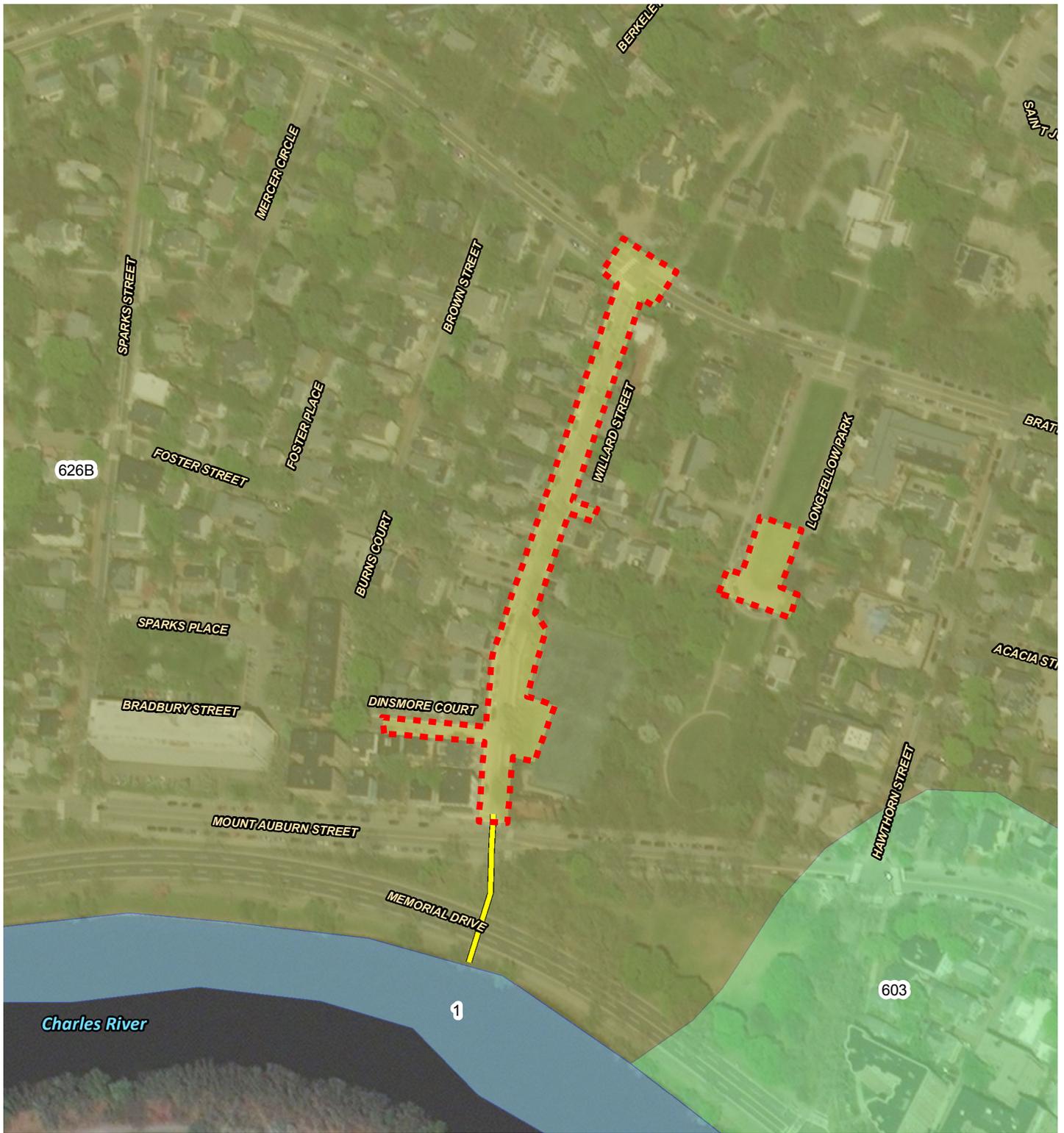
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**Environmental Constraints
 Willard Street
 Cambridge, MA**

Date: 3/21/2018

Figure 4

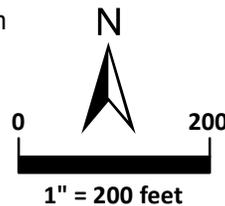


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Legend

- | | | | |
|--|------------------|---|---------------------------------|
|  | Site Limits |  | 1, Water |
|  | Restored Outfall |  | 603, Urban Land, wet substratum |
| | |  | 626B, Merrimac - Urban Land |

*Aerial Imagery - ESRI 2017



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NRCS
 Middlesex County Soil Map
 Willard Street
 Cambridge, MA

Date: 3/21/2018

Figure 5

ATTACHMENT B – WETLANDS REPORT

Wetland Resource Area Analysis Report
Memorial Drive, Cambridge, MA
prepared by LEC environmental Consultants, Inc.
November 1, 2016



November 1, 2016

Email [npoynton@smcsurvey.com]

Mr. Noel Poynton
SMC Surveying & Mapping Consultants
325 Wood Road, Suite 109
Braintree, MA 02184



**Re: Wetland Resource Area Analysis Report
Memorial Drive
Cambridge, Massachusetts**

[LEC File #: SMC\16-340.01]

Dear Mr. Poynton:

As requested, LEC Environmental Consultants, Inc., (LEC) conducted a site evaluation and Wetland Boundary determination along a 330 linear foot segment of the Charles River along Memorial Drive in Cambridge, Massachusetts. The evaluation was conducted in accordance with the *Massachusetts Wetlands Protection Act* (M.G.L. c. 131, s. 40) and its implementing Regulations (310 CMR 10.00). The following report provides a general site description, a description of the Wetland Resource Areas, and potential regulatory implications.

General Site and Wetland Resource Area Description

The survey area refers to an approximately 330± linear foot segment of the Charles River shoreline and adjacent upland to the west of the Hawthorn Street and Memorial Drive intersection in southwestern Cambridge, Massachusetts (Attachment A). Residential and commercial development associated with Mt. Auburn Street and Memorial Drive, the Dr. Paul Dudley White Bike Path, and a small park borders the survey area to the north, east, and west. The shoreline of the Charles River is located immediately to the south of Memorial Drive, extending roughly parallel to the roadway and Bike Path. The survey area includes the northern shoreline of the Charles River, its associated Bank, and a strip of upland immediately to the north between the shoreline and the Bike Path.

Topography slopes steeply downgradient in a southerly direction from the Bike Path towards the shoreline of the Charles River. According to the Soil Survey of Middlesex County, the survey area contains Merrimac-Urban Land Complex and Water. Field evaluations of the soil conditions were generally consistent with the soil survey mapping.



Vegetation observed within the survey area includes individual mature sweet gum (*Luquidambar styraciflua*), American elm (*Ulmus americana*), and red maple (*Acer rubrum*), and a fringing shrub layer dominated by false indigo shrub (*Amorpha fruticosa*) immediately upgradient of the Bank. Groundcover includes manicured lawn with scattered patches of white panicle aster (*Aster lanceolatus*), Virginia creeper (*Parthenocissus quinquefolia*), lambs-ear (*Stachys byzantina*), Queen Anne's lace (*Daucus carota*), burdock (*Arctium minus*), and various goldenrod (*Solidago* spp.) and grasses (*Gramineae* spp.).

According to the 13th edition (October 1, 2008) of the *Massachusetts Natural Heritage Atlas* published by the Natural Heritage & Endangered Species Program (NHESP), the western portion of the site is not located within a *Priority Habitat of Rare Species* or *Estimated Habitat of Rare Wildlife*. No Certified Vernal Pools (CVP) or Potential Vernal Pools (PVP) are mapped on or within the immediate vicinity of the site.

According to the June 4, 2010 FEMA Flood Insurance Rate Map (FEMA FIRM) for Middlesex County (*Community Panel 25017 C 0557E*), the entire site is mapped within a Zone AE (el. 4) – *Areas subject to inundation by the 1% annual chance flood (Base flood elevations determined)*.

Findings

On September 22, 2016, LEC conducted a site evaluation to identify and characterize existing protectable Wetland Resource Areas located on the site in accordance with the *Massachusetts Wetlands Protection Act* (M.G.L. c. 131, s. 40), its implementing Regulations (310 CMR 10.00). Wetland Resource Areas associated with the site include Bank, Riverfront Area, Bordering Land Subject to Flooding (BLSF), and Land Under Waterbodies and Waterways (LUW). The boundary of Bank associated with the Charles River was delineated in accordance with the definition of Bank at 310 CMR 10.54(2)(a) and demarcated in the field with blue flagging numbered TOB 1 – TOB 8. A brief description of each Resource Area is provided below.

Bank

Bank is defined at 310 CMR 10.54(2)(a) as *the portion of land surface which normally abuts and confines a water body. The upper boundary of a bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a bank is the mean annual low flow level.*

Bank is associated with the Charles River, a perennial river flowing in a southeasterly direction eventually discharging into Boston Harbor. The Bank is composed of boulders and is partially vegetated with a monoculture of false indigo bush. Embankments reach up to 4 feet in height, and the channel width reaches up to 100 feet wide. During LEC's site evaluation, the water depth was observed approximately 2 feet below the Mean Annual High Water (MAHW) Line, which is essentially coincident with Bank.



Riverfront Area

Riverfront Area is defined at 310 CMR 10.58(2)(a)(3) as *the area of land between a river's mean annual high water line measured horizontally outward from the river and a parallel line located 200 feet away except that the parallel line is located: (a.) 25 feet away in Boston, Brockton, Cambridge, Chelsea, Everett, Fall River, Lawrence, Lowell, Malden, New Bedford, Somerville, Springfield, Winthrop, and Worcester.*

Mean Annual High Water (MAHW) is defined at 310 CMR 10.58(2) as *the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts.*

The 25 foot Riverfront Area extends in a northerly direction from the Bank/MAHW boundary of the Charles River. The developed Riverfront Area consists of the Bike Path, paved roadways, a small park, and commercial and residential development.

Bordering Land Subject to Flooding (BLSF)

BLSF is defined at 310 CMR 10.57(2)(a)(1) as *an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland.*

BLSF is associated with the mapped Zone AE (el 4) encompassing the entire site. BLSF is present only where the Zone AE extends beyond any Bank/MAHW boundary in areas where there is no BVW adjacent to the waterbody.

Land Under Waterbodies and Waterways (LUW)

Land Under Water Bodies and Waterways is defined at 310 CMR 10.56(2)(a) as *the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock. The boundary of Land Under Water is the mean low water level.*

LUW is present within the confines of the Banks along the Charles River.

Summary

LEC delineated the boundary of Bank/MAHW and identified the boundaries of Riverfront Area and BLSF and LUW located along a 330± linear foot segment of the Charles River and adjacent upland in Cambridge, Massachusetts. The aforementioned Wetland Resource Areas are protected under the



Massachusetts Wetlands Protection Act (M.G.L. c. 131, s. 40) and its implementing Regulations (310 CMR 10.00). Any proposed work activities within the Wetland Resource Areas or the 100-foot Buffer Zone may require filing the necessary permit applications with the Cambridge Conservation Commission and the Massachusetts Department of Environmental Protection (DEP).

We appreciate the opportunity to work with you on this project. Should you have any questions or require additional information, please do not hesitate to contact us at (508) 746-9491 or mmanganello@lecenvironmental.com.

Sincerely,

LEC Environmental Consultants, Inc.

Mark L. Manganello
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Claire Hoozeboom
Wetland Specialist



LEC

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Attachment A
Memorial Drive
Cambridge, Massachusetts



October 6, 2016

ATTACHMENT D – SITE PLANS

Willard Street Drainage Improvement Project,” prepared by HDR Engineering, Inc.,
in conjunction with Horsley Witten Group, Inc. and Halvorson Design Partnership
March 22, 2018

ATTACHMENT C – STORMWATER MANAGEMENT REPORT

(UNDER SEPARATE COVER)