Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Office of Long Island Sound Programs

Permit Application for Programs Administered by the Office of Long Island Sound Programs

CPPU USE ONLY
App #:
Doc #:
Check #:

IMPORTANT - Please refer to the instructions (DEEP-OLISP-INST-100) for completing this application form to ensure that all required information is provided. Print or type all information within the form, providing additional pages as necessary.

Part I: Permit Type and Fee Information

Check only one of the boxes below identifying the applicable state permit program(s). You must submit the initial fee indicated below and a copy of the published notice of permit application and the completed Certification of Notice Form with this application.

Type of Permit	Initial Fee
☐ **Structures, Dredging & Fill** *CGS sec. 22a-361 [#1085]*	$660.00
☐ **Structures, Dredging & Fill and 401 Water Quality Certificate** *[#1632]*	$660.00
☐ **Structures, Dredging & Fill, and Tidal Wetlands** *CGS sec. 22a-361 & sec. 22a-32 [#438]*	$660.00
☒ **Structures, Dredging & Fill, and Tidal Wetlands and 401 Water Quality Certificate** *[#417]*	$660.00
☐ **401 Water Quality Certificate** *33 U.S.C. 1341* ***(For Federal Use Only)*** *[#1195]*	None

Note: The fee for municipalities is 50% of the above listed rates. Additional fees based on the water area occupied by the project will be invoiced. The application will not be processed without the initial fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy and Environmental Protection.

Town where site is located: Norwalk

Brief Description of Project: The Connecticut Department of Transportation (CTDOT) proposes to construct a vertical lift span structure and fixed approach spans to replace the existing movable bridge, Bridge No. 04288R. The project consists of the removal of the existing bridge, including the superstructure, substructure elements (abutments and piers), timber pier protection system, and deactivated electrical and railroad submarine cables; and construction of the replacement bridge. The four-span replacement bridge includes two side-by-side, 240-foot vertical lift spans across the Norwalk River, each with independently operated mechanical and electrical equipment. The pair of 240-foot vertical lift spans provides 170 feet horizontal navigational clearance between fenders, 60.73 feet vertical clearance above mean high water (MHW) when the span is fully raised, and 25.73 feet vertical clearance above MHW when the span is closed. See Part III for a more detailed description of the project.

The public notice of application must be published ***prior*** to submitting an application, as required in CGS section 22a-6g. A copy of the published notice of application and the completed Certification of Notice Form must be included as Attachment AA to this application. Your application will **not** be processed if Attachment AA is not included.

Date of Publication: **August 28, 2019**

☐ Check here, in addition to one of the boxes above, if your application is being submitted pursuant to CGS sec. 22a-361(a)(2)(d) to address a violation.

Connecticut Department of Energy & Environmental Protection

Certification of Notice Form - Notice of Application

DEEP USE ONLY
Division
Application No.

I , **Kimberly C. Lesay** , certify that
(Name of Applicant)

the attached notice represents a true copy of the notice that appeared in **The Hour**
(Name of Newspaper)

on **August 28, 2019**
(Date)

I also certify that I have provided a copy of said notice to the chief elected municipal official listed below as required by section 22a-6g CGS.

Harry Rilling	**Mayor**	
Name of Official	*Title of Official*	
125 East Avenue, P.O. Box 5125		
Address		
Norwalk	**CT**	**06856-5125**
City/Town	*State*	*Zip Code*
Kimberly Lesay	8/29/19	
Signature of Applicant	*Date*	
Kimberly C. Lesay	**Transportation Assistant Planning Director, Office of Policy & Planning**	
Name of Applicant (print or type)	*Title (if applicable)*	

Part II: Applicant Information

- *If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, registrant's name shall be stated **exactly** as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of State's database (CONCORD). (**www.concord-sots.ct.gov/CONCORD/index.jsp**)*
- *If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).*
- *If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the Request to Change Company/Individual Information to the address indicated on the form. If there is a change in name of the entity holding a DEEP license or a change in ownership, contact the Office of Planning and Program Development (OPPD) at 860-424-3003. For any other changes you must contact the specific program from which you hold a current DEEP license.*

1. **Applicant Name: Connecticut Department of Transportation**

Mailing Address: **2800 Berlin Turnpike**

City/Town: **Newington** State: **CT** Zip Code: **06131**

Business Phone: **860-594-2931** ext.

Contact Person: **Kimberly C. Lesay** Title: **Transportation Assistant Planning Director, Office of Environmental Planning**

*E-mail: **Kimberly.Lesay@ct.gov**

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject application. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes.a) Applicant Type (check one):

☐ individual ☐ federal agency ☒ state agency ☐ municipality ☐ tribal

☐ *business entity (*If a business entity complete i through iii):

i) check type: ☐ corporation ☐ limited liability company ☐ limited partnership ☐ limited liability partnership ☐ statutory trust ☐ Other: _____

ii) provide Secretary of the State business ID #:_____This information can be accessed at database (CONCORD). (**www.concord-sots.ct.gov/CONCORD/index.jsp**)

iii) ☐ Check here if your business is **NOT** registered with the Secretary of State's office.

b) Applicant's interest in property at which the proposed activity is to be located:

☒ site owner ☐ option holder ☐ lessee

☐ easement holder ☐ operator ☐ other (specify): _____

☐ Check if any co-applicants. If so, attach additional sheet(s) with the required information as requested above.

Note: If the applicant is not the owner, submit written permission from the owner as Attachment B.

2. **List billing contact, if different than the applicant.**

Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.

Contact Person: Title:

E-mail:

Part II: Applicant Information (continued)

3. List primary contact for departmental correspondence and inquiries if different than applicant.

Name:
Mailing Address:
City/Town: State: Zip Code:
Business Phone: ext.
Contact Person: Title:
*E-mail:

4. List Site Owner, if different than applicant:

Name:
Mailing Address:
City/Town: State: Zip Code:
Business Phone: ext.
Contact Person: Title:
E-mail:

5. List Facility Owner, if different than applicant:

Name:
Mailing Address:
City/Town: State: Zip Code:
Business Phone: ext.
Contact Person: Title:
E-mail:

6. List attorney or other representative, if applicable.

Firm Name:
Mailing Address:
City/Town: State: Zip Code:
Business Phone: ext.
Attorney: Title:
E-mail:

7. List all engineer(s), surveyor(s) and/or other consultant(s) employed or retained to assist in preparing the application and designing or constructing the activity.

Name: **HNTB Corporation**
Mailing Address: **55 Capital Boulevard, 4th Floor**
City/Town: **Rocky Hill** State: **CT** Zip Code: **06067**
Business Phone: **913-221-3327** ext.
Contact Person: **Christian J. Brown** Title: **Project Manager**
E-mail: **cbrown@hntb.com**
Service Provided: **Design and Permitting**

☐ Check if additional Applicant Information sheets are included, and label and attach them to this sheet.

8. A pre-application meeting with Office of Long Island Sound Program (OLISP) staff is strongly recommended prior to application submission. Please note the meeting date and OLISP staff person's name:

Staff Name: **Micheal Grzywinski** Meeting Date: **July 23, 2019**

Part III: Project Information

1. Describe the proposed regulated work and activities in a detailed narrative, including the number and dimensions of structures. Refer to both the instructions and Appendix A of the instructions (Activity Specific Instructions).

   See Attachment, Part III Question 1 and Appendix A.

2. **a.** Describe the construction activities involved for the project in detail, including methods, sequencing, equipment, and any alternative construction methods that might be employed.

   See Attachment, Part III, Question 2a.

   b. Describe any erosion and sedimentation or turbidity control installation and maintenance schedule and plans in detail.

   See Attachment, Part III, Question 2b.

   c. Indicate the length of time needed to complete the project and identify any anticipated time period restrictions.

   See Attachment, Part III, Question 2c.

Walk Bridge Replacement Project Bridge Number 04288R
Norwalk CT
State Project Number 0301-0176

Part III: Project Information
(continued)
Question 1

1. Describe the proposed regulated work and activities in a detailed narrative, including the number and dimensions of structures. Refer to both the instructions and Appendix A of the instructions (Activity Specific Instructions).

In cooperation with the Federal Transit Administration (FTA), the Connecticut Department of Transportation (CTDOT) proposes to replace the New Haven Line Railroad Bridge (Walk Bridge, Bridge No. 04288R) crossing the Norwalk River in Norwalk, Connecticut. The existing Walk Bridge over the Norwalk River, constructed in 1896, is a four-track movable railroad bridge consisting of a 200-foot swing span, supported by a center pivot pier, and two fixed approach spans to the west of the swing span and one fixed approach span to the east of the swing span. The structure carries four tracks of Metro-North Railroad (MNR) commuter rail, Amtrak, and two freight carriers. The fixed spans consist of eight 15-feet deep Warren trusses, two per track; and the swing span consists of three planes of double intersection Warren trusses with stringers and floorbeams.

The project consists of the removal of the existing bridge, including the superstructure, substructure elements (abutments and piers), timber pier protection system, and deactivated electrical and railroad submarine cables; and construction of the replacement bridge. The four-span replacement bridge includes two side-by-side, 240-foot vertical lift spans across the Norwalk River, each with independently operated mechanical and electrical equipment. The pair of 240-foot vertical lift spans provides 170 feet horizontal navigational clearance between fenders, 60.73 feet vertical clearance above mean high water (MHW) when the span is fully raised, and 25.73 feet vertical clearance above MHW when the span is closed. There are two western approach spans and one eastern approach span. The approach spans are side-by-side, two-track structures; the north structure carries Tracks 1 and 3 and the south structure carries Tracks 2 and 4. Each structure is comprised of a precast concrete composite ballasted deck supported on four simply-supported built-up welded plate girders. The lift spans are 40-foot deep through trusses, each with a double-intersection Warren truss configuration without verticals. Each lift span is an open-deck two-track structure made up of trusses with floor beams supporting track stringers. Tower structures at the end of the lift spans support the lifting mechanisms and counterweights for both lift spans. Short deck-girder spans through the towers at each end provide continuity from the approach spans to the movable spans.

The following provides a summary of the overall project construction approach, construction restrictions, construction methodology, existing bridge removal and disassembly, and channel dredging and earthwork.

Overall Construction Approach: A primary goal of the Walk Bridge design and construction is to minimize disruptions to rail and river traffic. As such, the lift span was designed and configured to allow for four-track service to continue well into the construction period and for the swing span to remain operational for boat traffic until the first of the two lift spans is ready to be installed. For most of the project duration, it is anticipated that the river will remain open to traffic by restricting construction activity to one existing channel and keeping the other channel open to marine traffic. There will be certain construction activities that will require either a vertical restriction or a complete channel closure. Coordination with the United States Coast Guard Sector Long Island Sound and the Norwalk Harbormaster of channel restrictions and closures will be required for overall staging of barges and equipment during the following construction activities:

- removal of the existing pivot pier and rest piers;
- removal of the existing swing span;
- removal of the existing submarine cables;
- installation of the duct bank (MNR power and signal and bridge power and control cables);
- dredging of the navigation channel;
- installation of the south lift span;
- installation of the north lift span;
- installation and removal of the slide rail assemblies.

Initial construction activities include installation of construction work platforms in the four quadrants of the bridge site, installation of mooring piles and temporary fender systems, and demolition of the existing control house. Cranes and other construction equipment placed on the temporary work platforms will be used to build the new lift span piers and lift span towers. The replacement bridge lift spans will be assembled at the project's Marine Staging Yard (68-90 Water Street), located less than 0.2 mile south of the bridge, and transported upstream along the Norwalk River via barge to the bridge site where they will be prepared for final installation. A temporary slide rail system supported on the southwest and southeast construction work platforms will be used to install the south lift span into its final position. The north lift span will be floated into its final position on a barge.

The swing span will be operational for river traffic during the initial bridge construction activities. These activities include removal of the south half of the existing bridge approach spans, construction of the south half of the approach spans, and assembly of the south lift span. Upon assembly of the south lift span and reconstruction of the south portion of the west approach, east approach, approach spans, and overhead contact system (OCS) structures, the navigation channel will be closed. The existing swing span will be slid to the north and will be replaced by the first (south) lift span being slid in from the south via the slide rail system. The horizontal channel restriction will be lifted once the swing span and the swing span slide rails have been removed. The channel will be fully restored to navigation once the south lift span is made operational. Upon assembly of the north lift span and reconstruction of the north portion of the west approach, east approach, approach spans, and OCS the navigation channel will be closed. At this time, the north lift span will be floated under the new south lift span (in the raised position) for final installation. During this phase, the channel will be vertically restricted prior to the north lift span becoming fully operational, but otherwise it will open for river traffic.

Environmental Protection Measures: CTDOT has coordinated with the National Oceanic and Atmospheric Administration/ National Marine Fisheries Service/ Greater Atlantic Regional Fisheries Office (NOAA/NMFS/, GARFO), CTDEEP Bureau of Wildlife, CTDEEP Marine Fisheries, CTDEEP Natural Diversity Data Base (NDDB), Norwalk Shellfish Commission (NSC), and the U.S. Army Corps of Engineers (USACE) in developing environmental protection measures for the project. Through coordination with NOAA NMFSGARFO, CTDEEP Wildlife, CTDEEP NDDB, CTDEEP Marine Fisheries, NSC, and USACE, CTDOT has agreed to implement the following environmental protection measures:

***Time of Year Restrictions*:**

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.
- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.
- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.
- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.
- Dredging from February 1st through November 30th will be conducted within a marine enclosure enclosed by a turbidity curtain.
- No work will be conducted between April 1st and July 31st within 500 feet of any active peregrine falcon (*Falco peregrinus*) nest.

Resource Protection Measures:

- Pile driving/extraction and drilled shaft and micropile drilling activities will be coordinated to ensure activities are only taking place on one half (or occupy less than 50% when working in the middle of the river) of the navigation channel at a time.
- Barge movements will take place during slack water conditions coincident with the high tide to minimize river bottom disturbances.
- Marine enclosures will be installed prior to the start of certain construction activities as indicated in the response to **Question 2a** and shown in **Attachment I.** Marine enclosures are steel sheet pile structures that are not to be considered as being water-tight. The sheeting allows low velocity flow between the enclosure and the outer tidal waters; the elevation of water inside the enclosure is isolated from tidal waters and therefore lags the tide. The marine enclosures will be installed so that the top of the enclosure is at, or above, Elevation 6.2 (1 foot above the high tide line). To further prevent siltation outside of the marine enclosure, a turbidity curtain will be deployed around its exterior perimeter.
- All pile driving and extraction (including sheet piles) activity will be enclosed within turbidity curtains.

- Turbidity curtains [Type Department of Transportation (DOT) heavyweight curtains] (CTDOT Specification Item #0210306A, Turbidity Control Curtains) will be installed prior to the start of the following activities:

  - Marine enclosure installation,
  - Pier construction (with marine enclosure),
  - Pier removal (with marine enclosure),
  - Duct bank and submarine cable installation (with marine enclosure),
  - Existing submarine cable removal,
  - Slide rail installation and removal for swing span removal,
  - Fender pile installation and existing fender removal,
  - Navigational/maintenance dredging,
  - Construction platform pile driving,
  - Pile installation and removal at the vessel docks,
  - New dredging (with marine enclosure if outside the dredging work window) at Vessel Dock Relocations
  - Bulkhead installation and removal (with marine enclosure outside of the dredging work window) at Marine Staging Yard,
  - Sheet pile installation and outfall reconstruction at the IMAX,
  - IMAX Theater removal (with marine enclosure),
  - Wetland restoration.

- Water quality monitoring for turbidity, specific conductivity, salinity, dissolved oxygen, pH, temperature and water level (at one location) will be conducted during the duration of in-water construction activities, as further described in **Part III, Question 2c** (CTDOT Section 1.10 Environmental Compliance Number 14. Refer to ATT M 6).

Construction Methodology: Construction of the in-water portions of the project will be primarily completed with cranes and other equipment placed on construction work platforms in the four quadrants of the bridge site. Crawler-type cranes positioned on the work platforms will facilitate the following: removal of the existing approach superstructure; erection of new approach superstructure and substructure; and erection of new lift span foundations, towers, counterweights and bridge mechanical and electrical components . The cranes will be accompanied by material barges and a collection of helper boats and work shuttle vessels. The placement of the floating marine construction equipment will be such that either the east or west channel of the existing swing span will remain accessible for navigation prior to the installation of the first vertical lift span truss. (Refer to "Dredging and Earthwork" for a description of impacts to the existing channel during dredging operations). Once the first lift span truss is in service, barge placement will be predicated on accessing the existing substructure units during their removal while maintaining at least half of the channel for navigation.

Barges will also be used for the installation of the new vertical lift spans and the removal of the existing swing span. The new lift spans will be transported by barges from the Marine Staging Yard for final placement at the Walk Bridge location. These activities are further described in **Part III, Question 2a.** CTDOT will prepare a Marine Use Plan in coordination with the U.S. Coast Guard prior to construction start to coordinate the use of construction barges with existing commercial and recreational traffic in the Norwalk River.

U.S. Coast GuardCG prior to construction start to coordinate the use of construction barges with existing commercial and recreational traffic in the Norwalk River.

Existing Bridge Removal and Disassembly: Removal and disassembly of existing Walk Bridge includes the bridge superstructure and substructure. The existing bridge superstructure consists of the bridge approach spans, swing span, open deck track, control house, and seven overhead contact systems (OCS) structures (Structures 529A, 529B, 529C, 529D, 529E, 529F, and 529G). These elements will be removed in their entirety; details of their removal are described in **Part III, Question 2a, Section 1.4, 2.3, and 7**. The existing bridge substructure consists of the east and west abutments, Pier 1 (east of North Water Street), Pier 2 (west swing span rest pier), the pivot pier, and Pier 3 (east swing span rest pier). The east and west abutments and Pier 1 are landward of the Coastal Jurisdiction Line (CJL); Piers 2 and 3 and the pivot pier are below the CJL. The piers in the river consist of stone masonry founded on timber piles and timber matting. The pier masonry and timber matting will be removed in their entirety. Pier 1 will be removed to 2 feet below ground. The existing bridge foundations in the river (Piers 2 and 3 and the pivot pier) will be removed to elevation -14.98, which is 1 foot below the authorized dredge elevation of -13.98, to accommodate an allowance for over-dredging.

Existing bridge part substructure and superstructure, as well as other components previously cited, will be loaded onto a barge and hauled off-site. Initially, the eastern construction work platforms will be used for initial loading of the material from the barges. The Marine Staging Yard (68-90 Water Street; Parcels 2/84/19, 2/84/63, and 2/84/33) and the construction yard at the bridge site (1 Goldstein Place; Parcel 3/1/25) will be used for off-loading of materials from the construction barges. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction.

Transmission towers (Structures 529 and 530) on the east and west sides of the bridge will be removed in their entirety, along with the overhead lines that cross the navigation channel. All open deck track on the existing bridge will be removed with the structure. Three existing submarine cables will be deactivated and removed in their entirety; these include the cable providing electrical power and control to the existing swing span, a temporary railroad signal and communication cable installed as part of the CP-243 Interlocking Project (scheduled for December 2019), and the signal express cable.

The existing timber fender protection system includes timber protection for Piers 2 and 3 and the pivot pier. At each pier, the protection system, including the timber piles, will be completely removed.

Dredging and Earthwork: Upon completion of the existing pier demolition, the marine enclosures will be removed and the surface around the piers will be dredged to the final channel depth to match the existing federal navigational channel as approved by the USACE. The dredging activity will include a crane with a clamshell bucket and/or excavator working from the crane barge and loading the material barge to one of the platforms for off-loading. During channel/maintenance dredging operations, the existing east channel will be closed, and with the exception of a partial restriction of the existing west channel for a period of time, the west channel will otherwise remain open during the dredging. Dredged material will be loaded onto a modified, contained barge and moved off-site, as further described in **Part III, Question 2a, Section**

2.6. Similar to the removal of the bridge components, the Marine Staging Yard (68-90 Water Street; Parcels 2/84/19, 2/84/63, and 2/84/33) and the construction yard at the bridge site (1 Goldstein Place; Parcel 3/1/25) will be used for material off-loading. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). The excavated material and dewatered wastewaters will be managed in accordance with the CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (General Permit).

Drawing s SUM-1 and SUM-2 provides Walk Bridge Replacement Project summaries of temporary and permanent impacts to coastal resources and dredging volumes. **Appendix A** provides additional descriptions of specific activities required for the Walk Bridge Replacement Project regarding 1) dredging and disposal of dredged material and 2) shoreline erosion or stabilization structure. Construction activity details, including impacts, are described and quantified in response to **Question 2a**.

Walk Bridge Replacement Project Bridge Number 04288R
Norwalk CT
State Project Number 0301-0176

Part III: Project Information
Question 2
(continued from application form)

2a. Describe the construction activities involved for the project in detail, including methods, sequencing, equipment, and any alternative construction methods that might be employed.

The Walk Bridge Replacement Project will involve project construction activities at Sites 1 through 5, compensatory wetland mitigation at Site 6 (consisting of multiple areas), and harbor mooring locations at Sites 7 through 9. Detailed permit plates are provided in **Attachment I**. Attachment I includes general plans showing existing conditions (EP), proposed conditions (PP), and details of project construction activities (CAs). Figures 1 and 2 present the nine project sites.

Sections 1-5 describe project construction activities at each Site. For each activity within a site, resource impacts are identified according to temporary impacts and permanent impacts. Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration. Resource impacts are shown for vegetated tidal wetlands, intertidal flats, the intertidal zone, and below the Coastal Jurisdiction Line (CJL). Intertidal zone impacts represent areas that are in the intertidal zone but are not defined as either a vegetated tidal wetland or intertidal flat. Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

The impacts reported in **Question 2a** are for each individual activity only; they are not additive and do not account for multiple activities occurring at the same location. In some instances, the same impacts are reported for two separate activities. For example, impacts reported for the duct bank installation (CA-2), which is reported as a Site 1 activity (Section 1.2), a Site 2 activity (Section 2.1), and a Site 3 activity (Section 3.1), also are reported in dredging operations (CA-17) at Site 2 (Section 2.6) and Site 3 (Section 3.7). **Drawing SUM-2 in Attachment I** reports the aggregate of project impacts to resources by area (square footage) and volume (cubic yards). Impacts reported in Drawing SUM-2 are additive and account for multiple activities occurring at the same location.

Section 6 describes compensatory wetland mitigation at six separate areas.

Section 7 describes project construction activities within the 100-year floodplain, including temporary and permanent impacts below the 100-year floodplain. The total for impacts below the 100-year floodplain also identifies impacts below the CJL elevation.

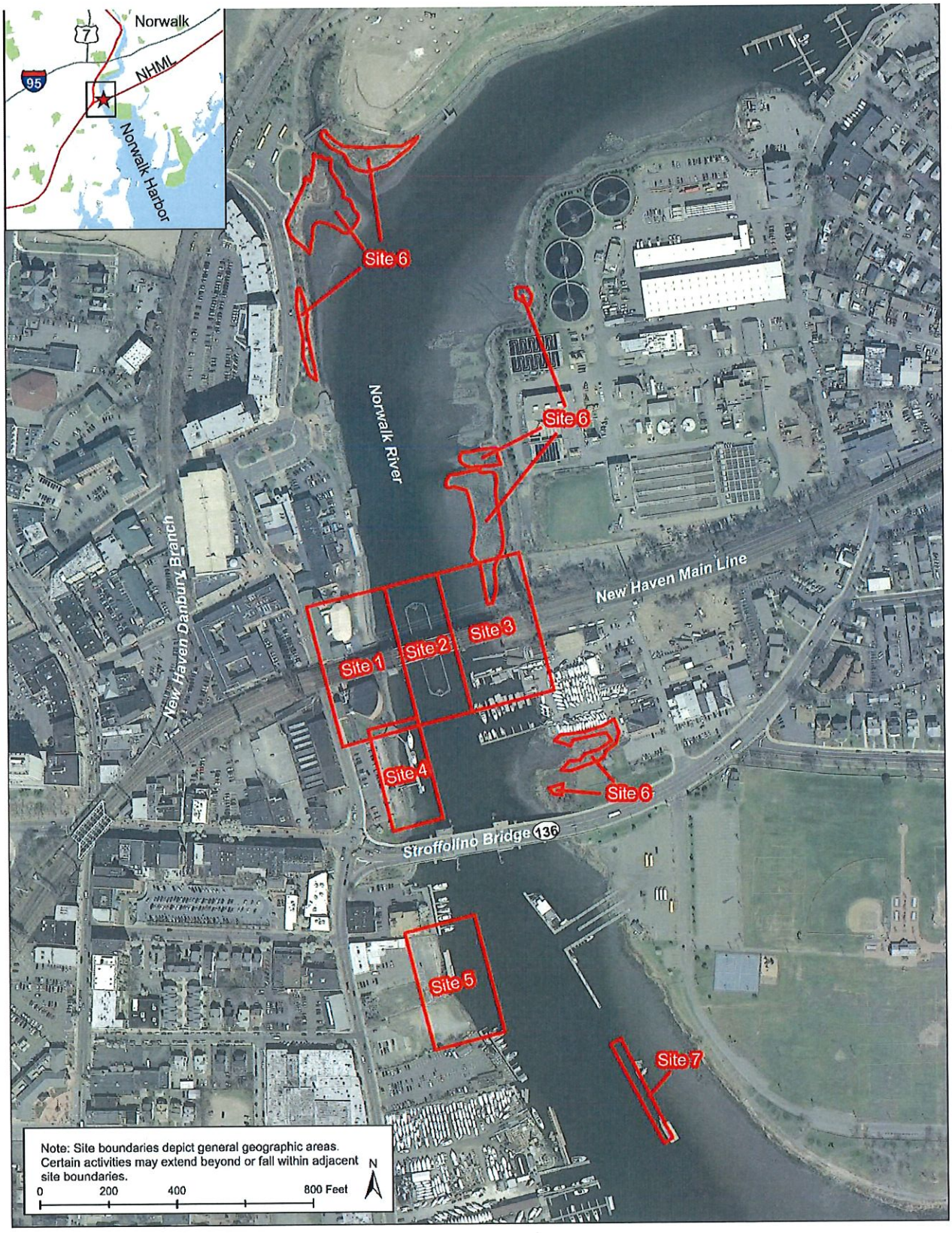

Figure 1 – Project Sites 1 through 7

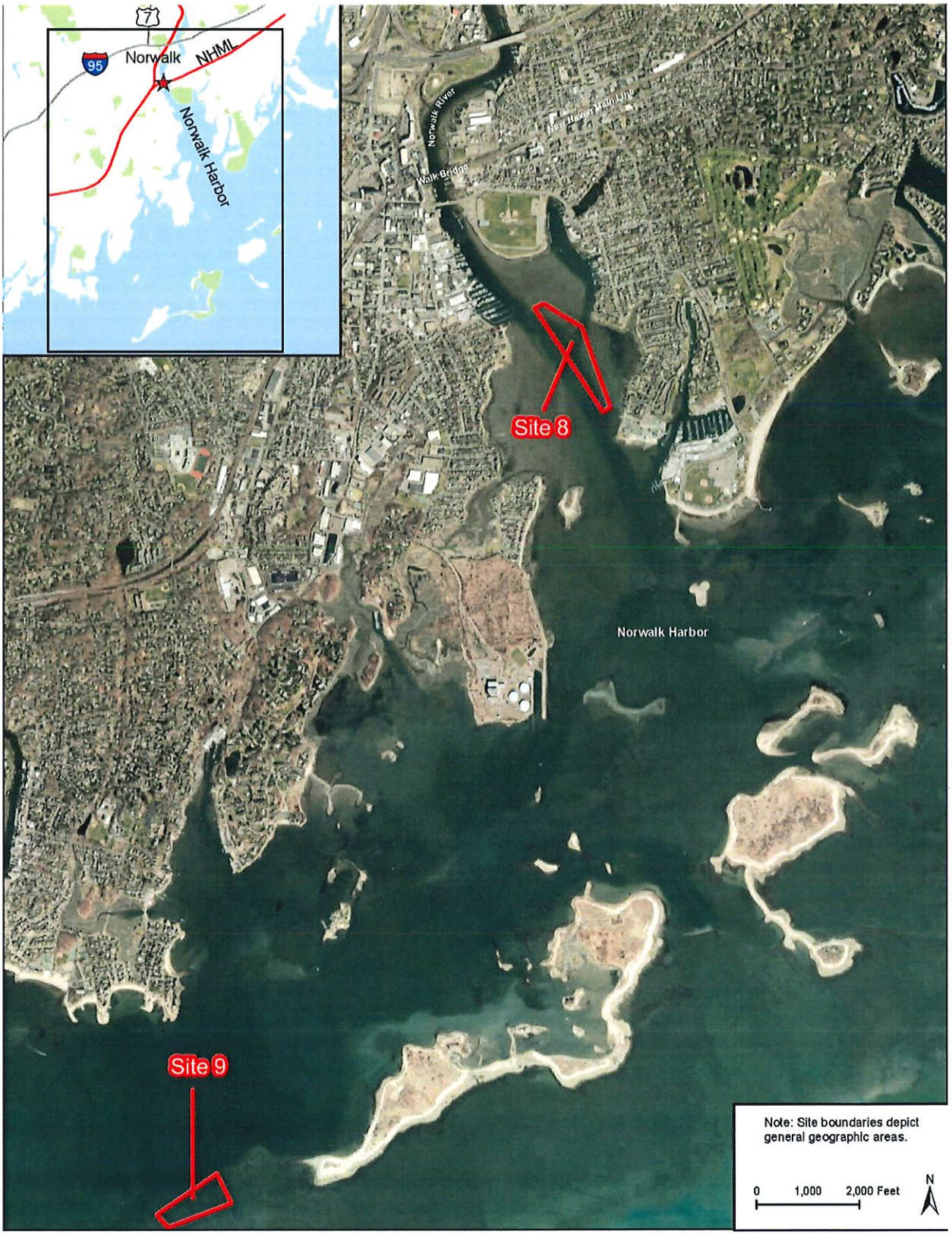

Figure 2 – Project Sites 8 and 9

1. Site 1 Construction Activities - West of the Navigation Channel

Site 1 is at the bridge site west (outside) of the navigation channel (Figure 1). Site 1 includes two parcels at 10 North Water Street (Parcel 2/19/3, the Maritime Aquarium; and Parcel 2/19/2, the IMAX Theater), encompassing the 100-year floodplain and extending waterward to include the Mean Low Water (MLW), but landward of (outside) the navigation channel. Table 1 lists the eight construction activities (CAs) that will occur at Site 1.

Table 1 –Site 1 Construction Activities

Construction Activity	Description	Construction Activity (CA) # / Permit Plates
IMAX Removal	Removal of the existing IMAX Theater, site improvements for construction staging, and site restoration upon project completion. Also includes the realignment of the existing stormwater outfall.	CA1 / CA1-1 through CA1-7
Duct Bank Installation	Installation of the Metro-North Railroad (MNR) power and signal conductors between the east and west banks of the Norwalk River, and ducts for the bridge power and control cables, crossing beneath the river via cut and cover.	CA2 / CA2-3 through CA2-4
Northwest Trestle	Installation and removal of construction work platforms on the west side of the Norwalk River at the bridge site to be used for primary access to the bridge throughout construction.	CA5 / CA5-1 through CA5-5
Southwest Trestle		CA6 / CA6-1 through CA6-5
Pier 2 Construction	Construction of Pier 2 lift span tower foundation	CA9 / CA9-1 through CA9-7
Existing Pier Removal	Removal of existing Pier 2 in the river after removal of the swing span, including removal of existing fender and excavation around the pier	CA14 / CA14-4 through CA14-6, CA14-8
Fender System Installation	Installation of the proposed fender system after removal of the existing fenders and rest Pier 2	CA15 / CA15-1 through CA15-6
Existing Submarine Cable Removal	Removal of three existing submarine cables that will no longer be used upon completion of the replacement bridge	CA12 / CA12-1, CA12-3,CA12-4

1.1 CONSTRUCTION ACTIVITY: IMAX Removal and Relocation of Stormwater Outfall

Permit Plates: EP-4, PP-4, CA1, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Demolition of the IMAX Theater will be from land and require excavators, front-end loaders, and disposal trucks. The existing IMAX Theater is adjacent to the Norwalk River. Its easterly wall is on the riverbank bordering tidal wetlands and its removal will require containment. Before starting demolition activities, a turbidity curtain (all turbidity curtains will be Type III and conform to Item # 0210306A-Turbididty Control Curtains found in Att. M 6) will be installed around the eastern edge, landward of mean low water (MLW). During low tides and as needed, the existing stone riprap will be adjusted in place along the bank to allow the installation of a sheet pile marine enclosure to contain the outer wall demolition. The marine enclosure will involve the installation of steel templates, steel sheet piles, and bracing, driven with a vibratory hammer. East wall demolition will follow the installation of this sheet pile containment and be scheduled to coincide with periods of low tide; at elevations other than low tide, the wall is below the water elevation. The entire structure foundation will then be removed, the stormwater outfall at the northern end of the parcel will be realigned to avoid conflict with the proposed bridge foundation, and the site will be graded to Elevation 8.0 (NAVD88). Following the duct bank installation (CA2) and southwest trestle construction (CA6), crane mats will be installed on the IMAX parcel at Elevation 9.0 to facilitate construction staging.

Prior to the realignment of the existing stormwater outfall, a turbidity curtain and marine enclosure will be installed. To install the marine enclosure, a vibratory hammer will be used to drive temporary sheet piles around the proposed outfall location in a U configuration from elevation 0 ft (NAVD88) to elevation 6.5 ft (NAVD88). Within the marine enclosure, steel wales and struts will be installed followed by the end wall and modified riprap. A 24-inch reinforced concrete pipe (RCP) and manhole will then be installed and backfilled, with a modified riprap apron installed for slope stabilization. The temporary sheeting will then be removed.

Activities to create permanent conditions at the IMAX site will begin following removal of the southwest work trestle (CA6). The crane mats and fill material will be removed to final elevation and grade. Riprap will be placed to match existing materials and the slope will be treated with fertilizer, seed and mulch for erosion control.

Table 2 – Resource Impacts: IMAX Removal and Relocation of Outfall

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	2,300	0	2,600	100

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

1.2 CONSTRUCTION ACTIVITY: Duct Bank Installation

Permit Plates: PP-4, CA2, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Metro-North Railroad (MNR) traction power cables and communication and signal cables, as well as bridge power and controls, will be routed on the south side of the bridge. The cables for the north half of the bridge and the south half of the bridge will be separated into two separate 42-inch diameter pipes. The cables will be contained in individual fusible polyvinyl chloride (PVC) conduits inside the fully-grouted high-density polyethylene (HDPE) pipes. The installation of the cables across the channel will be performed utilizing a three-stage cut and cover installation process, meaning that the work will be conducted in one third of the river at a time. The cut and cover installation method is a traditional construction method of placing the pipe at the desired elevation by excavating and removing material to create a trench, placing the pipes and then backfilling the trench. Work will be restricted to one channel at a time; barges will be mobilized to the closed channel.

The work will be conducted within a marine enclosure surrounded by a turbidity curtain. Dredging for the submarine cables will be completed using a crane on a crane barge, excavating with a clamshell bucket, and loading the material (hopper) barge. The two large pipes will cross the channel to the south of the bridge. The two pipes will be placed at the desired elevation by excavating and removing material to create a trench, placing the pipes and then backfilling the trench with clean material. The cables will be installed by trenching in between sheet piles. The vertical profile for the pipes has been established to meet requirements for channel dredging and minimum cover as measured from the top of the pipes. The pipes will be installed side-by-side. In the east channel, the top of the pipe is a minimum of seven feet below the dredge line, EL -14.0, plus one foot additional for over-dredging (EL -15.0). In the west channel, the top of the pipe is four feet below the bottom of the west channel, EL -22.0. The river bottom on the west side is several feet lower than the dredge elevation; it is not required to be dredged as deep, and the over dredge allowance does not apply. In both the east and west channels, the top of the pipe is EL -22.0, setting the bottom of the pipe at EL -26.5 and the bottom of the dredged trench at EL -28.5 (with 24 inches of bedding material under the pipe). The tie-in point on the west side of the river is approximately 113 feet from the North Water Street baseline and approximately 96 feet south of the Walk Bridge baseline. The tie-in point on the east side of the river is near and landward of the existing east abutment. Outside of the navigation channel, the pipe elevation transitions from the minimum elevation to the tie-in elevation of approximately EL -7.0 (tie-in elevation to be confirmed as design advances). The duct bank installation extends into Sites 1, 2 and 3; Table 3 identifies resource impacts to Site 1 only.

Table 3 – Resource Impacts: Duct Bank Installation (Site 1)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	100	0	2,300	3,200

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging)

1.3 CONSTRUCTION ACTIVITY: Installation and Removal of Northwest and Southwest Trestles (Construction Work Platforms)

Permit Plates: CA5, CA6, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

To facilitate access to the bridge site and support construction of Pier 2 and other construction operations, while presenting the least impact to rail or marine traffic, two construction work platforms, one north and one south of the bridge, will be constructed on the west side of the river and completely outside the limits of the navigation channel. The platforms will consist of pipe piles driven to bearing on rock and capped with steel beams and timber decking. The top decks of the work platforms are anticipated to be at Elevation 10.5 feet NAVD88. The structural depth of the work platforms will be approximately 7 feet. For Pier 2 lift span installation (CA9), the temporary slide rail system will be incorporated into the southwest construction work platform. A temporary fender system and navigational lighting will be installed at each platform. Equipment will include cranes, excavators, vibratory and impact hammers, manlifts, push/work boats, and various barges. Prior to work start, turbidity curtains will be installed around the work area. The pile driving activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

When construction of the replacement bridge is complete, the platform decks, bulkheads, and materials will be removed using similar construction means and methods as required for installation. The turbidity curtains will be removed once the river bottom has been stabilized. Impacted shoreline will be restored to preconstruction conditions. Platforms will remain in place for approximately four years and then removed. While the platforms will be in Site 1 and outside the navigation channel, at times, material barges used for their construction and removal will be situated in the existing west navigation channel (Site 2).

Table 4 – Resource Impacts: Installation and Removal of Northwest and Southwest Trestles (Construction Work Platforms)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	2,200	0	300	400

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

1.4 CONSTRUCTION ACTIVITY: Pier 2 Construction

Permit Plates: PP-4, CA9, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Pier 2 construction may require closure of the west channel to navigation. Prior to work start, a marine enclosure and turbidity curtain will be installed around the work area. Equipment will include cranes, hydraulic oscillator, sedimentation tanks, backhoe, and excavator. The pile driving and drilled shaft and micropile drilling activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

Pier 2 will be supported by four drilled shafts and two micropile clusters constructed within marine enclosures. The Pier 2 foundations will be constructed in the tidal zone between low and high tide elevations. The four drilled shafts are each 12 feet in diameter and consist of a minimum 1-inch thick permanent steel round casing that extends from above the high-water line at the top to a bottom seated and sealed into rock at the bottom. The casing is seated a few feet into rock and has a water tight seal keeping the water inside the casing separate from any outside water. This is a crucial step in being able to maintain a head of water higher inside the casing than outside. Since the drilled shaft casing is sealed into bedrock, the water within the drilled shaft rock socket and casing will be separate and independent of any river water. Water will be pumped in and out of the drilled shaft in a closed system that facilitates removal of drill cuttings. The fluid in the closed system will be contained and disposed of properly in compliance with requirements of the CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (General Permit). After drilling of the rock socket, the shaft is cleaned by circulating clean water to remove

the debris on the bottom and the suspended solids in the fluid contained in the sealed casing. A reinforcing cage is assembled and lowered to the bottom of the shaft. A water tight tremie pipe is inserted to the bottom of the shaft and concrete is continuously placed from the bottom while displacing water to the top. The water is pumped out of the drilled shaft casing and returned to the holding tanks.

At the two micropile cluster locations, a 10-foot diameter steel casing will be installed within the marine enclosure, with the casing extending from Elevation -7.0 to the bottom of the lift span pier. Inside the steel casing, ten 13-inch diameter micropiles will be installed using a low-headroom micropile rig. Micropile installation will include steel casing installation, drilling into rock, and placement of reinforcing steel and cementitious grout. Once the ten micropiles have been installed, the area within the 10-foot diameter casing will be filled with reinforcing steel and concrete to the top of the casing.

The four drilled shafts and two micropile clusters comprising the Pier 2 foundation will be surrounded by a sheet pile marine enclosure during installation. Each steel sheet is interlocked with the adjacent sheet and forms an almost water tight barrier. Water levels within the marine enclosure will lag the rising and falling tidal water in the river, producing a minor flow, or seepage, through the walls of the enclosure. This seepage will transmit little to no sediment and will not create a turbid condition. As added protection to the drilled shaft casing and marine enclosure, a turbidity curtain will surround all sides of the enclosure and rise and fall with the outside water levels.

Once the group of Pier 2 foundation elements within the marine enclosure is complete, there may be excavation within the marine enclosure to construct the concrete caps which span between the tops of the drilled shafts and micropile clusters. Turbid water from within the enclosure will be managed by pumping to holding tanks for decanting prior to testing and returning the clean water to the river, in compliance with CTDEEP General Permit requirements. Any excavation within the marine enclosure will be backfilled with original organic material to the original ground surfaces.

Prior to installing the drilled shafts at the south side of Pier 2, demolition of the existing control house will be required. Activities will begin by relocating swing span controls to the motor control center at the swing span, followed by removal of all furnishings and equipment from the existing control house. Debris shields will be used to catch and contain debris from control house removal. Working from the IMAX pad/southwest work platform, the control house will be detached and removed from the existing truss supporting Track 4.

Table 5 – Resource Impacts: Pier 2 Construction

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	700	0	4,200	3,900

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.

*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.

**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

1.5 CONSTRUCTION ACTIVITY: Existing Pier 2 - Fender and Pier Removal

Permit Plates: EP-9, CA14, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Prior to fender removal, a turbidity curtain will be installed around the work area. The fender system around existing Pier 2 consists of vertical piles and walers (horizontal members). It will be removed via a crane or an excavator situated on a crane barge stabilized by spuds. The walers extend below the waterline, depending on the tide. The walers will be cut into sections with a chainsaw, removed, and loaded on a material barge. A debris shield will be deployed below the cuts to help prevent wood chips and saw dust from entering the water. The timber piles will be fully removed with an excavator and/or crane using a vibratory pile extractor and impact hammer. The pile extraction activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

Prior to pier removal, a marine enclosure and turbidity curtain will be installed around the work area. Existing Pier 2 and its timber mat will be removed to an elevation no higher than the authorized over dredge limit. Pier 2 is constructed of a perimeter of dimension stone which contains a core filling of unreinforced rubble stone and concrete. Since the pier is constructed of unreinforced stone blocks with a rubble stone core, it is anticipated to be dismantled with a track hoe located on a barge. The individual blocks will be taken apart with the force of the track hoe and bucket/thumb attachment. The dismantling will keep the blocks intact and not require breaking with a hoe ram or jack hammer type equipment. Turbid water from within the enclosure will be managed by pumping to holding tanks for decanting prior to testing and returning the clean water to the river, in compliance with CTDEEP General Permit requirements. Removal of Pier 2 will be conducted so that one channel remains open to marine traffic.

Once the blocks and rubble stone are dismantled from Pier 2, they will be loaded onto a barge and hauled off-site. Initially, the eastern construction work platforms will be used for loading of the material from the barges. The Marine Staging Yard (68-90 Water Street; Parcels 2/84/19, 2/84/63, and 2/84/33) and the construction yard at the bridge site (1 Goldstein Place; Parcel 3/1/25) will be used for off-loading of materials from the construction barges. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction.

Removal of existing Pier 2 and fender will involve pile driving and removal, and pier demolition and removal using cranes, excavators, vibratory and impact hammers, clamshell and digging buckets,

push/work boats, and various barges. When demolition is complete, and the pier has been removed, the marine enclosure will be removed using similar construction means and methods as required for installation.

Table 6 – Resource Impacts: Existing Pier 2 - Pier and Fender Removal

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	2,200

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging)

1.6 CONSTRUCTION ACTIVITY: Pier 2 Fender Installation

Permit Plates: PP-4, CA15, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Prior to work start, a turbidity curtain will be installed around the work area. The permanent fender for Pier 2 will be comprised of hollow Fiberglass Reinforced Polymer (FRP) pipe piles and composite lumber walers. Equipment will include a crane and vibratory and impact hammers. A work barge with a man-lift, compressor, and hand tools will be utilized for access to the work. The pile driving activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

Table 7 – Resource Impacts: Pier 2 Fender Installation

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	400

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.

*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.

**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

1.7 CONSTRUCTION ACTIVITY: Submarine Cable Removals

Permit Plates: PP-4, CA12, SUM-3

Time of Year Restrictions:

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

Three existing submarine cables will be deactivated and removed in their entirety; these include the cable providing electrical power and control to the existing swing span, a temporary railroad signal and communication cable installed as part of the CP-243 Interlocking Project, and the signal express cable. The removal of the existing submarine cables will be completed by hoisting the cables through the existing soil layers using a crane or an excavator. If this method is not successful for fully removing one or more of the cables, then a trench for the cable will be dredged, working during the winter excavation window (December and January) using a crane on a crane barge, excavating with a clamshell bucket and loading the material barge. The material barge will be contained; it will be modified to include side boards and containment fabric as a holding area. This work will be completed within a turbidity curtain. Dredging will only continue until enough soil is removed to allow pulling the cables. Except for the temporary cable installed during the CP-243 Interlocking Project, where clean sediment was used as backfill, the excavated sediment along the submarine cable routes is assumed to be contaminated and unsuitable for reuse; it will be loaded onto the material barge, managed, and disposed at an off-site location.

The Marine Staging Yard and the construction yard at the bridge site will be used for off-loading of dredged material. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction.

The remaining trenches will then be backfilled with soils of similar structural and organic characteristics as the material removed. During removal of the submarine cables, work will progress from one channel to another, with one channel remaining open for marine traffic. The removal of the submarine cables extends into Sites 1, 2, and 3; Table 8 identifies resource impacts to Site 1 only.

Table 8 – Resource Impacts: Submarine Cable Removals (Site 1)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	200	0	600	4,600

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging).

2. Site 2 Construction Activities - Navigation Channel

Site 2 is at the bridge within the navigation channel (Figure 1). Site 2 resources include the 100-year floodplain and subtidal area. Table 9 lists the six construction activities that will occur at Site 2.

Table 9 – Site 2 Construction Activities

Construction Activity	Description	Construction Activity (CA) # / Permit Plates
Duct Bank Installation	Installation of the MNR power and signal conductors between the east and west banks of the Norwalk River, and ducts for the bridge power and control cables, crossing beneath the river via cut and cover	CA2/ CA2-2 through CA2-4
Existing Submarine Cable Removal	Removal of three existing submarine cables that will no longer be used upon completion of the replacement bridge	CA12/CA12-1 through CA12-4
Existing Swing Span Removal	Installation of the slide rail system, and removal and disassembly of the existing swing span	CA13/CA13-1 through CA13-7
Existing Pier Removal	Removal of the existing pivot pier in the river after removal of the swing span, including removal of existing fender and excavation around the pier	CA14/CA14-1 through CA14-3, CA14-7
Dredging Operations	Maintenance dredging at the bridge site to match the existing federal navigation channel depths, including removal of existing fender system and installation of temporary fender system at the pivot pier	CA17/CA17-1 through CA17-3, CA17-6
Lift Span Installation	Slide-in and float-in operations for installation of the proposed lift spans	CA18/CA18-1 through CA18-6

2.1 CONSTRUCTION ACTIVITY: Duct Bank Installation

Permit Plates: PP-4, CA2, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Installation of the MNR traction power cables and communication and signal cables and the bridge power and controls cables is described in Section 1.2. This activity extends into Sites 1, 2 and 3; Table 10 identifies resource impacts to Site 2 only.

Table 10 – Resource Impacts: Duct Bank Installation (Site 2)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	9,400

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging).

2.2 CONSTRUCTION ACTIVITY: Submarine Cable Removals

Permit Plates: EP-4, PP-4, CA12, SUM-3
Time of Year Restrictions:

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

Removal of the three existing submarine cables is described in Section 1.7. These activities extend to include Sites 1, 2, and 3; Table 11 identifies resource impacts to Site 2 only.

Table 11 – Resource Impacts: Submarine Cable Removals (Site 2)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	16,500

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging).

2.3 CONSTRUCTION ACTIVITY: Swing Span Removal

Permit Plates: EP-4, CA13, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Prior to work start, a turbidity curtain will be placed around the work area. Removal of the swing span will require a full navigation channel closure and vertical and horizontal channel restriction and will be coordinated with the installation of the lift spans and other construction activities. Equipment for the removal of the swing span will include an excavator, hydraulic sheer, crane, loader, and barges. Equipment for the installation of the slide rail system will include a crane, vibratory and impact hammers, and barges.

Removal of the existing swing span will be conducted using a slide rail system that will require the swing span to be in the open position for installation. The slide rail system will be supported by piles in the navigation channel. Barges will be positioned beneath the existing swing span in the navigation channel on both sides of the pivot pier for working and catching demolition debris. Barges will maintain a draft of 4 to 5 feet and will maintain adequate clearance during low tide to avoid contact with the riverbed. The existing swing span will be raised from its existing supports at the pivot pier and will be moved to the north along the slide rail system. Before sliding the existing swing span to the north, the steel end sections of the approach span will be removed and loaded on the northeast and northwest platforms for later disposal via truck. Once the swing span is supported on the slide rails north of the bridge, the east and west ends will be disassembled. Smaller structural components will be removed with an excavator and hydraulic sheer; larger sections will be detached with a crane. Debris will be loaded onto the northeast and northwest work platforms. The remaining center portion of the swing span will be floated upstream on a barge where it will be transported off-site for disposal. The installation and removal of the slide rail system will be

conducted within a 90-day full channel closure, and it will be coordinated with the removal of the existing bridge substructure and superstructure (refer to Section 2.4).

The eastern construction work platforms will be used for initial loading of existing bridge components from the barges. The Marine Staging Yard and the construction yard at the bridge site will be used for off-loading of materials from the construction barges. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction..

Table 12 – Resource Impacts: Swing Span Removal

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	200
Permanent	0	0	0	0

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

2.4 CONSTRUCTION ACTIVITY: Pivot Pier Removal

Permit Plates: EP-4, CA14, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Prior to work start, a marine enclosure and turbidity curtain and will be installed around the pivot pier. Removal of the pivot pier will involve pile driving and removal, and pier demolition and removal using cranes, excavators, vibratory and impact hammers, clamshell and digging buckets, push/work boats, and various barges. When demolition is complete, and the pier has been removed, the marine enclosure will be removed using similar construction means and methods as required for installation.

The existing pivot pier and timber mat will be removed to an elevation no higher than the authorized over dredge limit. The pivot pier is constructed of a perimeter of dimension stone which contains a core filling of unreinforced rubble stone and concrete. Since the pier is constructed of unreinforced stone blocks with a rubble stone core, it is anticipated to be dismantled with a track hoe located on a barge. The individual

blocks will be taken apart with the force of the track hoe and bucket/thumb attachment. The blocks and rubble stone will be loaded into a barge and hauled off-site. (Potential off-site locations to be confirmed include Devine Brothers, Inc., King Industries Inc., and/or the construction yard at the bridge site.) The dismantling will keep the blocks intact and not require breaking with a hoe ram or jack hammer type equipment. Use of a hoe ram is allowable for the removal of the concrete pier cap and any other obstacles above MHW, if necessary. Turbid water from within the enclosure will be managed by pumping to holding tanks for decanting prior to testing and returning the clean water to the river, in compliance with CTDEEP General Permit requirements. Removal of the pivot pier will be coordinated with removal of the swing span and and installation and removal of the slide rail system; a full channel closure of 90 days is anticipated to be required for these activities.

Following excavation, the area will be backfilled to the authorized dredge elevation [Elevation -14.98 (NAVD88)]. Demolition and removal of the pivot pier will involve an excavator working from a crane barge, accompanied by a material barge outfitted with a corral for containing the stone and concrete demolition debris.

Table 13 – Resource Impacts: Pivot Pier Removal

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	6,100

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging)

2.5 CONSTRUCTION ACTIVITY: Removal of Existing Fender and Installation of Temporary Fender at Pivot Pier

Permit Plates: EP-4, CA14, SUM-3
Time of Year Restrictions:

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

Prior to work start, a turbidity curtain will be installed around the work area. The fender around the existing pivot pier consists of vertical piles and walers and will be removed via a crane or an excavator situated on a crane barge stabilized by spuds. The fender system walers extend below the waterline, depending on the tide. The walers will be cut into sections with a chainsaw, removed, and loaded on a material barge. A debris shield will be deployed below the cuts to help prevent wood chips and saw dust from entering the water. The timber piles will be completely removed with an excavator and/or crane using a vibratory pile extractor and impact hammer. The pile extraction activities will be coordinated to ensure they occupy only 50 percent of the river at a time. Following total removal of the existing fender system, a temporary fender system will be installed around the existing pivot pier, consisting of floating bumpers secured to the

center pier using chains and mounting plates at the pier. The temporary fender system will be installed using a crane and a work barge.

Table 14 – Resource Impacts: Removal of Existing Fender and Installation of Temporary Fender at Pivot Pier

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	500

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

2.6 CONSTRUCTION ACTIVITY: Channel (Maintenance) Dredging

Permit Plates: CA17, SUM-3
Time of Year Restrictions:

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

During the winter excavation window (December and January) and within turbidity curtains, the areas immediately north and south of the pivot pier will be dredged using a crane on a spudded crane barge, excavating with a clamshell bucket, and loading onto material barges. The material barges will be contained; they will be modified to include side boards and containment fabric as a holding area. Water will be contained in the holding area and pumped into a sedimentation tank. When the barge is fully loaded it will be moved off-site, where it will be off-loaded with an onshore crane or excavator. The Marine Staging Yard and the construction yard at the bridge site will be used for off-loading of dredged material. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction. The excavated material and dewatered wastewater will be managed per CTDEEP General Permit guidelines, including placement into water tight trucks for shipping to the CTDOT-designated waste stockpile area (WSA). The work will be scheduled so that one existing channel will remain open to navigation. Channel dredging primarily occurs within Sites 2 and 3; Table 12 identifies resource impacts in Site 2 only.

Table 15 – Resource Impacts: Channel Dredging (Site 2)

Impact	Removal		Fill	Net
	(sf)	(cy)	(cy)	(cy)
Maintenance Dredging	40,800	4,210	0	4,210

Impacts shown for this activity are also reported in CA2, CA12, and CA14

2.7 CONSTRUCTION ACTIVITY: Lift Span Installations

Permit Plates: CA18, PP-4, SUM-3

The lift span installations will require a full navigation channel closure and channel restrictions. This activity will be coordinated with removal of the existing swing span and other construction activities. The south lift span will be supported by a slide rail system which is built in place on the southwest and southeast construction work platforms. The north lift span will be floated into place.

Once the new lift spans are assembled (one at a time) at the Marine Staging Yard, they will be transported to the Walk Bridge location for their final installation. Once the existing swing span has been moved to the north (described in Section 2.3), it will be replaced by the first (south) lift span being slid in from the south. Once the south lift span is in place, the channel will reopen to river traffic with a vertical restriction of 25 feet until the span can be operated. The second, north lift span will then be floated under the new south lift for float-in installation from the north. During this phase, the channel may be vertically restricted for a brief period prior to the north lift span becoming fully operational, but otherwise it will open for river traffic. The installation of the lift spans will not impact existing resources.

3. Site 3 Construction Activities – East of the Navigation Channel

Site 3 is at the bridge site east of the navigation channel (Figure 1). Site 3 includes two parcels at 21 Goldstein Place (Parcel 3/2/6) and 11 Goldstein Place (Parcel 3/1/15), both of which are designated for construction staging. From the east, Site 3 encompasses the 100-year floodplain and extends waterward to include the Mean Low Water (MLW), but landward of (outside) the navigation channel. Table 16 lists the eight construction activities that will occur at Site 3.

Table 16 –Site 3 Construction Activities

Construction Activity	Description	Construction Activity (CA) # / Permit Plates
Site 3		
Duct Bank Installation	Installation of the MNR power and signal conductors between the east and west banks of the Norwalk River, and ducts for the bridge power and control cables, crossing beneath the river via cut and cover	CA2/ CA2-1 through CA2-4
Northeast Trestle	Installation and removal of work platforms on the east side of the river at the bridge site to be used for primary access to the bridge throughout construction.	CA7/CA7-1 through CA7-6
Southeast Trestle		CA8/CA8-1 through CA8-5
Pier 3 Construction	Construction of Pier 3 lift span tower foundation	CA10 / CA10-1 through CA10-7

Construction Activity	Description	Construction Activity (CA) # / Permit Plates
Existing Submarine Cable Removal	Removal of three existing submarine cables that will no longer be used upon completion of the replacement bridge – east bank of the river	CA12 / CA12-2, CA12-4
Existing Pier Removal	Removal of existing Pier 3 in the river after removal of the swing span, including removal of existing fender and excavation around the pier	CA14/ CA14-4 through CA14-6, CA14-8
Fender System Installation	Installation of the new fender system at Pier 3 after removal of the existing fenders	CA15/CA15-1 through CA15-6
Dredging Operations	Maintenance dredging at the bridge site to match the existing federal navigation channel depths	CA17/CA17-2, CA17-3, CA17-6

3.1 CONSTRUCTION ACTIVITY: Duct Bank Installation

Permit Plates: PP-4, CA2, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

Installation of the MNR traction power cables and communication and signal cables and the bridge power and controls cables is described in Section 1.2. This activity extends to include Sites 1, 2 and 3; Table 17 identifies resource impacts in Site 3 only.

Table 17 – Resource Impacts: Duct Bank Installation (Site 3)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	200	7,400

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

3.2 CONSTRUCTION ACTIVITY: Installation and Removal of Northeast and Southeast Trestles (Construction Work Platforms)

Permit Plates: CA7, CA8, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

To facilitate access to the bridge site and support construction of Pier 3 and other construction operations, while minimizing impacts to rail or marine traffic, two construction work platforms, one north and one south of the bridge, will be constructed on the east side of the river. The platforms will consist of pipe piles driven to bearing on rock and capped with steel beams and timber decking. The top decks of the work platforms are anticipated to be at Elevation 10.5 feet NAVD88. The structural depth of the work platforms will be approximately 7 feet. Prior to work start, a marine enclosure and turbidity curtain will be installed around each work area. For Pier 3 lift span installation (CA10), the temporary slide rail system will be incorporated into the southeast construction work platform. A temporary fender system and navigational lighting will be installed at each platform. Equipment will include cranes, excavators, vibratory and impact hammers, manlifts, push/work boats, and various barges. The pile driving activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

When construction of the replacement bridge is complete, the platform decks, bulkheads, and materials will be removed using similar construction means and methods as required for installation. The turbidity curtains will be removed once the river bottom has been stabilized. Impacted shoreline will be restored to preconstruction conditions. Platforms will remain in place for approximately 4 years. While the platforms will be in Site 3 and outside the navigation channel, at times, material barges used for their construction will be situated in the existing east navigation channel (Site 2).

Table 18 – Resource Impacts: Installation and Removal of Northeast and Southeast Trestles (Construction Work Platforms)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	2,500	100	300	800

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

3.3 CONSTRUCTION ACTIVITY: Pier 3 Construction

Permit Plates: PP-4, CA10, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Pier 3 construction may require closure of the east channel to navigation. Prior to work start, a marine enclosure within a turbidity curtain will be installed. Equipment will include cranes, hydraulic oscillator, sedimentation tanks, backhoe, and excavator. The pile driving and drilled shaft and micropile drilling activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

Pier 3 will be supported by four drilled shafts and two micropile clusters constructed within marine enclosures. The Pier 3 foundations will be constructed in the tidal zone between low and high tide elevations. The four drilled shafts are each 12 feet in diameter and consist of a minimum 1-inch thick permanent steel casing that extends from above the high-water line at the top to a seated and sealed into rock at the bottom. The casing is seated a few feet into rock and has a water tight seal keeping the water inside the casing separate from any outside water. This is a crucial step in being able to maintain a head of water higher inside the casing than outside. Since the drilled shaft casing is sealed into bedrock, the water within the drilled shaft rock socket and casing will be separate and independent of any river water. Water will be pumped in and out of the drilled shaft in a closed system that facilitates removal of drill cuttings. The fluid in the closed system will be contained and disposed of properly in compliance with CTDEEP General Permit requirements. After drilling of the rock socket, the shaft is cleaned by circulating clean water to remove the debris on the bottom and the suspended solids in the fluid contained in the sealed casing. A reinforcing cage is assembled and lowered to the bottom of the shaft. A water tight tremie pipe

is inserted to the bottom of the shaft and concrete is continuously placed from the bottom while displacing water to the top. The water is pumped out of the drilled shaft casing and returned to the holding tanks.

At the two micropile cluster locations, a 10-foot diameter steel casing will be installed within the marine enclosure, with the casing extending from Elevation -7.0 to the bottom of the lift span pier. Inside the steel casing, ten 13-inch diameter micropiles will be installed using a low-headroom micropile rig. Micropile installation will include steel casing installation, drilling into rock, and placement of reinforcing steel and cementitious grout. Once the ten micropiles have been installed, the area within the 10-foot diameter casing will be filled with reinforcing steel and concrete to the top of the casing.

The four drilled shafts and two micropile clusters comprising the Pier 3 foundation are surrounded by a sheet pile marine enclosure during installation. Each steel sheet is interlocked with the adjacent sheet and forms an almost water tight barrier. Water levels within the marine enclosure will lag the rising and falling tidal water in the river, producing a minor flow, or seepage, through the walls of the enclosure. This seepage will transmit little to no sediment and will not create a turbid condition. As added protection to the drilled shaft casing and marine enclosure, a turbidity curtain will surround all sides of the enclosure and rise and fall with the outside water levels.

Once the group of Pier 3 foundation elements within the marine enclosure is complete, there may be excavation within the marine enclosure to construct the concrete caps which span the tops of the drilled shafts and micropile clusters. Turbid water from within the enclosure will be managed by pumping to holding tanks for decanting prior to testing and returning the clean water to the river, in compliance with CTDEEP General Permit requirements. Any excavation within the marine enclosure will be backfilled with original organic material to the original ground surfaces.

Table 19 – Resource Impacts: Pier 3 Construction

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	7,600	7,700

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.
Impacts shown for this activity are also reported in CA-17 (Dredging)

3.4 CONSTRUCTION ACTIVITY: Submarine Cable Removals

Permit Plates: EP-4, PP-4, CA12, SUM-3
Time of Year Restrictions:

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

Removal of the three existing submarine cables is described in Section 1.7. These activities extend to include Sites 1, 2, and 3; Table 20 identifies resource impacts in Site 3 only.

Table 20 – Resource Impacts: Submarine Cable Removals (Site 3)

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	1,200	100	2,000	4,700

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

3.5 CONSTRUCTION ACTIVITY: Existing Pier 3 and Fender Removal

Permit Plates: EP-4, PP-4, CA14, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Prior to fender removal, a marine enclosure and a turbidity curtain will be installed around the work area. The fender around existing Pier 3 will be removed via a crane or an excavator situated on a crane barge stabilized by spuds. The fender system will be cut into sections with a chainsaw, removed, and loaded on a material barge. A debris shield will be deployed below the cuts to help prevent wood chips and saw dust from entering the water. The timber piles will be fully removed with an excavator and/or crane using a vibratory pile extractor and impact hammer. The pile extraction activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

Prior to pier removal, a marine enclosure and turbidity curtain will be installed around the work area. Existing Pier 3 and its timber mat will be removed to an elevation no higher than the authorized over dredge limit. below the mudline. Pier 3 is constructed of a perimeter of dimension stone which contains a core filling of unreinforced rubble stone and concrete. Since the pier is constructed of unreinforced stone blocks with a rubble stone core, it is anticipated to be dismantled with a track hoe located on a barge. The individual blocks will be taken apart with the force of the track hoe and bucket/thumb attachment. The dismantling will keep the blocks intact and not require breaking with a hoe ram or jack hammer type equipment. Turbid water from within the enclosure will be managed by pumping to holding tanks for

decanting prior to testing and returning the clean water to the river, in compliance with CTDEEP General Permit requirements. Removal of Pier 3 will be conducted so that one channel remains open to marine traffic.

Once the blocks and rubble stone are dismantled from Pier 3, they will be loaded onto a barge and hauled off-site. Initially, the eastern construction work platforms will be used for loading of the material from the barges. The Marine Staging Yard and the construction yard at the bridge site will be used for off-loading of materials from the construction barges. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction.

When demolition is complete, and the pier has been removed, the marine enclosure will be removed using similar construction means and methods as required for installation.

Table 21 – Resource Impacts: Existing Pier 3 – Pier and Fender Removal

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	2,200

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

3.6 CONSTRUCTION ACTIVITY: Pier 3 Fender Installation

Permit Plates: PP-4, CA15, SUM-3
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

Prior to work start, a turbidity curtain will be installed around the work area. The permanent fender for Pier 3 will be comprised of hollow FRP pipe piles and composite lumber walers. Equipment will include a crane and vibratory and impact hammers. A work barge with a man-lift, compressor, and hand tools will

be utilized for access to the work. The pile driving activities will be coordinated to ensure activities are only taking place on one half of the navigation channel at a time.

Table 22 – Resource Impacts: Pier 3 Fender Installation

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	400

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

3.7 CONSTRUCTION ACTIVITY: Channel (Maintenance) Dredging

Permit Plates: CA17, SUM-3
Time of Year Restrictions:

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

Channel dredging is described in Section 2.3. This activity primarily occurs in Sites 2 and 3; Table 23 identifies resource impacts in Site 3 only.

Table 23 – Resource Impacts: Channel Dredging (Site 3)

Impact	Removal		Fill (cy)	Net (cy)
	(sf)	(cy)		
Maintenance Dredging	7,500	770	0	770

Impacts shown for this activity are also reported in CA2, CA12, and CA14.

4. Site 4 Construction Activities - Vessel Dock Relocations

Site 4 is located approximately 100 yards south of the bridge site, to the west of the navigation channel (Figure 1). Site 4 is waterward of 4 North Water Street (Parcel 2/19/1) and includes activities waterward of the Coastal Jurisdiction Line (CJL) but landward of (outside) the navigation channel. Table 24 lists the two construction activities that will occur at Site 4.

Table 24 –Site 4 Construction Activities

Construction Activity	Description	Construction Activity (CA) # /Permit Plates
Vessel Dock Relocation	Temporary and permanent reconfiguration of the Maritime Aquarium and Sheffield Island Ferry vessel docks, including construction of a new permanent public fishing pier with	CA3/ CA3-1 through CA3-6

Construction Activity	Description	Construction Activity (CA) # /Permit Plates
	small boat short term docking on the west bank of the river between Walk Bridge and the Stroffolino Bridge.	
Dredging Operations	New dredging for access to vessel docks	CA17/CA17-4, CA17-7

4.1 CONSTRUCTION ACTIVITY: Vessel Dock Temporary and Permanent Relocation

Permit Plates: EP-6, PP-6, CA3, CA17, SUM-4
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

- Dredging from February 1st through November 30th will be conducted within a marine enclosure enclosed by a turbidity curtain.

The existing Maritime Aquarium and Sheffield Island Ferry vessel docks will be relocated due to a conflict with the planned location of the southwest work platform required to access the bridge during construction. Prior to construction of the work platform, the existing docks will be relocated south to a temporary location for the duration of the project construction. In addition to the vessel docks, the timber observation deck immediately adjacent to the IMAX Theater will be removed. Upon completion of the project, the docks and observation deck will be reconstructed in their original locations. One of the existing docks relocated for the temporary condition (the southern-most dock) will be retained in the final condition for public use based on consultation with the City of Norwalk. This activity will involve existing pile removal, new pile driving, new gangway abutment construction, and gangway and float installation. Equipment will include cranes, excavators, vibratory and impact hammers, push/work boats, and various barges. This activity is primarily in Site 4, with a small portion of the activity overlapping with Site 1.

The removal of the existing dock sections for the Maritime Aquarium and Sheffield Island Ferry vessels (80-foot x 10-foot and 48-foot x 9-foot) will take place on the west bank located south of the IMAX Theater and will involve a crane or an excavator situated on the crane barge. The dock walkway will be hoisted onto a material barge and off-loaded at the Marine Staging Yard, which is 700 feet south of the work area.

Following the removal of the dock sections, a turbidity curtain will be installed around the work area. Timber piles will be removed from the existing dock and added for the temporary dock configuration. The existing observation platform, support framework and piles will be removed and disposed of offsite.

The new temporary docking facilities for the Aquarium and Sheffield Island Ferry vessels, approximately 100 feet to the south of their existing location, will require dredging to provide sufficient depth for docking. Depending upon the time of year in which the dredging is conducted, dredging will be conducted either within a turbidity curtain (December and January) or within a marine enclosure surrounded by a turbidity curtain (February through November). Dredging will be completed using a crane on a crane barge excavating with a clamshell bucket and loading the modified material barge. The material barges will be contained; they will be modified to include side boards and containment fabric as a holding area. Water will be contained in the holding area and pumped into a sedimentation tank. When the barge is fully loaded, it will be moved off-site where it will be off-loaded with an onshore crane or excavator. The Marine Staging Yard and the construction yard at the bridge site will be used for off-loading of dredged material. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction. The excavated material and dewatered wastewater will be managed per CTDEEP General Permit requirements, including placement into water tight trucks for shipping to the CTDOT-designated WSA.

Construction of the new permanent docking facility and observation deck includes the installation of new wooden piles and floats. The observation dock and superstructure will be replaced in kind at the existing location. New timber piles will be installed using a crane and vibratory and impact hammers working from a crane barge. The replacement dock sections will be constructed at the Marine Staging Yard and loaded onto the material barge along with the piles and moved 600 feet to the work site for installation.

Table 25– Resource Impacts: Vessel Dock Temporary and Permanent Relocation

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	600	4,600
Permanent	200	0	1,400	7,000

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

Table 26– Resource Impacts: New Dredging

Impact	Removal		Fill	Net
	(sf)	(cy)	(cy)	(cy)
New Dredging	7,900	350	0	350

5. Site 5 Construction Activities - Marine Staging Yard

Site 5 is south of the Route 136/Stroffolino Bridge, directly waterward of 68 and 90 Water Street (Parcels 2/84/19 and 2/84/33), and west of the navigation channel (Figure 1). It is less than 0.2 mile from the bridge location. Work at Site 5 includes activities waterward of the Coastal Jurisdiction Line (CJL) but landward of (outside) the navigation channel. Table 27 lists the two construction activities that will occur at Site 5.

Table 27 –Site 5 Construction Activities

Construction Activity	Description	Construction Activity (CA) # /Permit Plates
Marine Staging Yard	Construction of permanent improvements to properties on the west bank of the river south of the Stroffolino Bridge (68 and 90 Water Street).	CA4/CA4-1 through CA4-4
Dredging Operations	New dredging for vessel access at the Marine Staging Yard bulkhead	CA17/CA17-5, CA17-7

5.1 CONSTRUCTION ACTIVITY: Marine Staging Yard Improvements

Permit Plates: EP-8, PP-8, CA4, CA17, SUM-5
Time of Year Restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

- Dredging from February 1st through November 30th will be conducted within a marine enclosure enclosed by a turbidity curtain.

A Marine Staging Yard will be developed at 68, 70, and 90 Water Street to store materials and equipment and to construct large bridge components, including the two lift spans. A bulkhead will be constructed to provide a mooring location for the barges that will support the assembly of the two lift spans. The placement of the assembly barges adjacent to the bulkhead will enable transfer of equipment and materials from land to construction barges.

The existing bulkhead and piles along the shoreline will be removed, and a permanent sheet pile bulkhead will be installed along 68-90 Water Street. The Marine Staging Yard bulkhead will be constructed as a

combination pile bulkhead. A combination pile wall is a system that uses sheet piles that are reinforced with pipe or W-shape piles. **Appendix A** includes an assessment of the Marine Staging Yard bulkhead as a shoreline erosion or stabilization structure. Prior to work start, a marine enclosure will be installed within a turbidity curtain to minimize impacts to existing resources during the removal of existing material and construction of the new bulkhead.

This activity will involve pile driving (including sheet piles), bulkhead excavation and construction, and dredging using cranes, excavators, vibratory and impact hammers, clamshell and digging buckets, manlifts, push/work boats, and various barges. Depending upon the time of year in which the dredging is conducted, dredging will be conducted either within a turbidity curtain (December and January) or within a marine enclosure surrounded by a turbidity curtain (February through November). Dredging will be completed using a crane on a crane barge excavating with a clamshell bucket and loading the modified material barge. Dredging will be conducted to Elevation -11 (NAVD88) between the bulkhead and the marine enclosure, using a crane on a spudded crane barge, excavating with a clamshell bucket, and loading onto a modified material barge. The material barge will be contained; it will be modified to include side boards and containment fabric as a holding area. Water will be contained in the holding area and pumped into a sedimentation tank. When the barge is fully loaded it will be moved off-site, where it will be off-loaded with an onshore crane or excavator. The Marine Staging Yard and the construction yard at the bridge site will be used for off-loading of dredged material. Additional potential off-site locations include two upstream locations at Devine Brothers, Inc. (38 Commerce Street) and King Industries Inc. (1 Science Road). CTDOT is continuing to coordinate with the upstream businesses for use of the sites during project construction. The excavated material and dewatered wastewater will be managed per CTDEEP General Permit requirements, including placement into water tight trucks for shipping to the CTDOT-designated WSA.

Table 28 – Resource Impacts: Marine Staging Yard Improvements

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	100	200
Permanent	1,900	0	8,100	9,900

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

Table 29– Resource Impacts: New Dredging

Impact	Removal		Fill	Net
	(sf)	(cy)	(cy)	(cy)
New Dredging	21,600	6,400	0	6,400

6. Site 6 Construction Activities – Compensatory Wetland Mitigation Areas

Site 6 consists of six individual wetland mitigation sites in various locations along both river banks near the bridge. A portion of Site 6 will overlap with Site 3. Table 30 lists the construction activity that will occur at Site 6.

Table 30 –Site 6 Construction Activities

Construction Activity	Description	Construction Activity (CA) # /Permit Plates
Compensatory Wetland Mitigation	Wetland restoration at six areas in the vicinity of the WALK bridge, consisting of treatment and removal of invasive species, restoration of shoreline and salt marsh; including access requirements	CA16/ CA16-1 through CA16-20

6.1 CONSTRUCTION ACTIVITY: Wetland Mitigation

Permit Plates: EP-1 – EP-7, PP-1 – PP-7, CA16

Compensation for permanent impacts to the vegetated tidal wetlands and intertidal mudflats due to construction of the Walk Bridge replacement project will be in the form of mitigating tidal wetland areas within the intertidal zone. The loss of vegetated tidal wetlands and intertidal mudflats will be mitigated through treatment and removal of invasive common reed (*Phragmites australis*) in existing tidal wetlands, the restoration of degraded vegetated tidal wetlands dominated by *Phragmites*, and by restoration of a low-functioning intertidal flat previously impacted by riprap placement. All tidal wetland mitigation areas are within the intertidal zone of the Norwalk River or adjacent to the high tide line.

Prior to work start, a turbidity curtain will be installed around the work area. Work will be timed to occur during periods of low tide to avoid increasing turbidity in the river. Vegetated tidal wetland mitigation activities will include the following, shown on Figure 3:

- Invasive *Phragmites* treatment (Mitigation Areas 1, 3, 6B)
- Invasive *Phragmites* treatment with subsequent shrub planting (Mitigation Areas 4 & 5)
- Tidal salt marsh restoration through invasive *Phragmites* removal, living shoreline riprap sill installation, grading and topsoil placement, salt marsh restoration through vegetation planting, and establishment of a northern diamondback terrapin (*Malaclemys terrapin terrapin*) habitat area in the buffer above the high tide line (Mitigation Area 2)
- Excavation and removal of in-water rock riprap, living shoreline riprap sill installation from reused existing riprap, regrading and topsoil placement, and salt marsh restoration through vegetation planting (Mitigation Area 6). A portion of Area 6A will be replanted vegetation as mitigation for shading under a construction trestle.

At Mitigation Area 2 and Mitigation Area 6, the proposed mitigation will consist of developing "Living Shorelines," the components of which are a rock riprap sill/berm, with establishment of low salt marsh

vegetation on the landward side of the sill. In addition, oyster cultch will be placed among the exposed rocks on the waterward side of the riprap sill, in accordance with CTDOT's specification Item # 0948013A –found in Attachment M6. **Appendix A** contains additional information about the Living Shoreline development.

The restored vegetated tidal wetland areas will be dominated by smooth cordgrass (*Spartina alterniflora*). This type of salt marsh is one of the most valuable habitat types in the estuarine environment and performs many functions including fish and shellfish habitat, wildlife habitat, sediment/toxicant retention, nutrient removal, shoreline stabilization and production export. The root system and structure of the vegetation in the tidal wetlands can help to stabilize the shoreline, as well as to retain sediments and toxicants. The City of Norwalk's Wastewater Treatment Plant and local runoff are potential sources of nutrients in the river and the salt marsh vegetation can locally aid in nutrient removal, thereby improving water quality.

The wetland mitigation areas will be monitored in accordance with CTDEEP and USACE requirements. The monitoring effort will include assessments of planting success, presence of invasive species, natural establishment of native species, and any concerns regarding the success of the mitigation efforts. The frequency of the assessments can vary. CTDOT OEP will oversee monitoring. Monitoring reports are required after each assessment and must include recommendations for corrective actions if the mitigation areas are not making acceptable progress toward becoming established within the first five years.

All wetland mitigation areas will be constructed and treated for invasives during the first growing season of Bridge construction. This will allow for any tweaks or corrections to be accomplished during the 4-5 years of active construction. As part of the overall tidal mitigation package CTDOT will be including 2 weatherproof interpretive signs, one on each side of the Norwalk River, describing the important role of the low saltmarsh in the ecosystem and the overall functionality of tidal wetlands. The following provides a description of the *Phragmites* treatment and tidal salt marsh restoration activities at each mitigation area. **Attachment M6** contains CTDOT's specification Item # 0948013A –Tidal Wetland Creation and includes all compensatory wetland mitigation specifications, which are cited for each mitigation area.

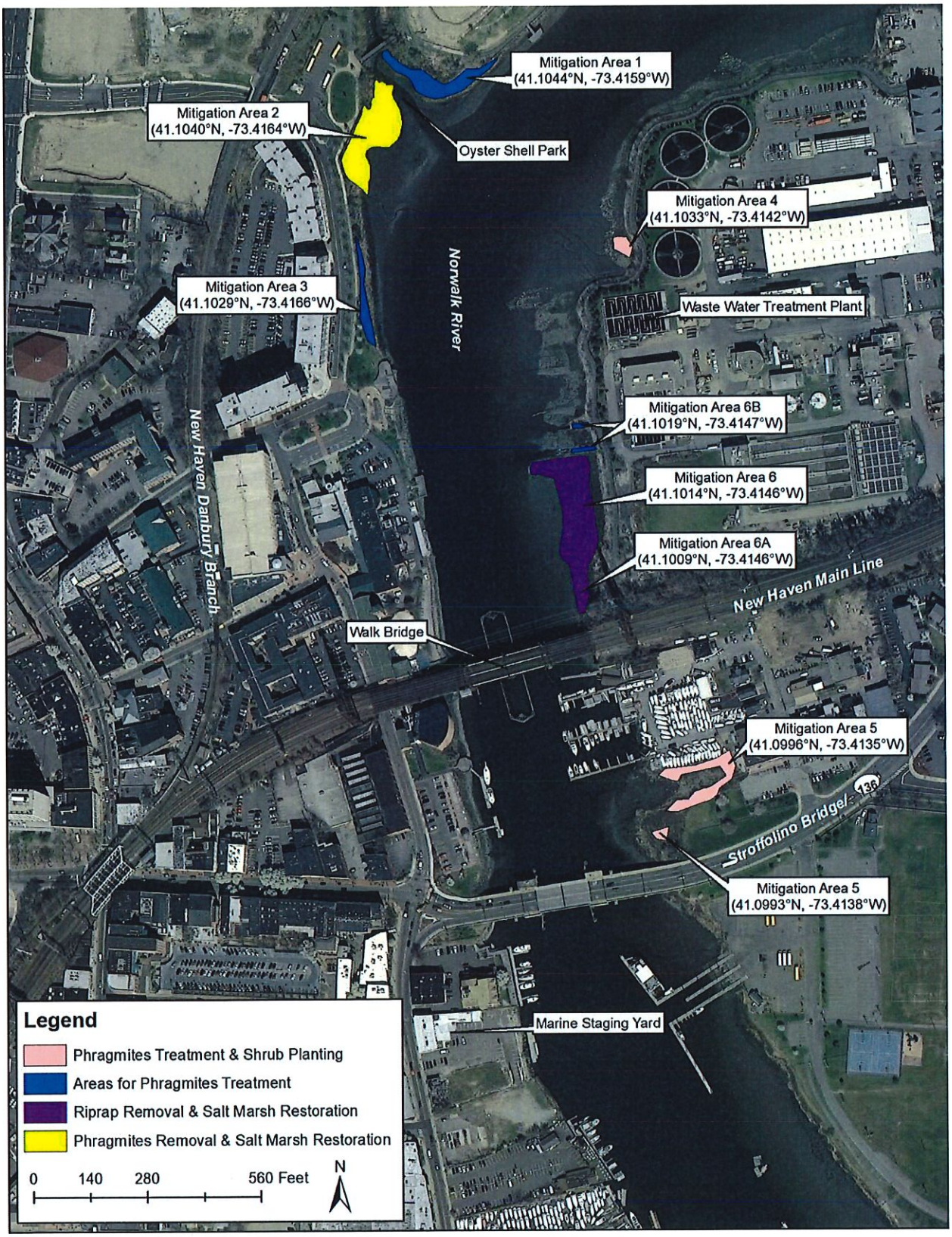

Figure 3 – Compensatory Wetland Mitigation Sites

Invasive Species (Phragmites) Treatment – Areas 1, 3 and 6B. One of the restoration components, and recommended through consultation with CTDEEP, includes treatment and eradication of invasive common reed (*Phragmites australis*) stands embedded within or adjacent to areas of existing salt marsh dominated by smooth cordgrass (*Spartina alterniflora*) along the Norwalk River banks in the project vicinity. These include Area 1 at the edge of Oyster Shell Park, Area 3 along North Water Street just south of Area 2, and Area 6B on top of the stormwater outfalls north of Area 6. The exact boundaries of each of the *Phragmites* treatment sites will be located and refined at the time of treatment. Although some of the *Phragmites* to be treated is on the slope above the coastal jurisdiction line (CJL), the objective is to control and prevent the spread of the invasive species into other areas with desirable species. Additionally, Areas 1 and 3 are on property owned by the City of Norwalk, are adjacent to a public trail and public recreation, and are highly visible.

For areas identified for *Phragmites* treatment, annual herbicide spraying of these areas will require walk-in access, which can be attained via adjacent walking paths or roadways. After plants have died, the debris will be cut and removed from the areas. The process will be repeated, as necessary, throughout the construction period until project completion. It is anticipated that these areas will naturally establish with volunteer native vegetation. The type(s) of herbicide and methods of cutting and spraying will be completed in accordance with contract specifications for control and removal of invasive vegetation.

CTDOT specifications which apply to Areas 1, 3, and 6B include: CTDOT Specification Item #0952051A Control and Removal of Invasive Vegetation –and can be found in Att M6.

Invasive Species (Phragmites) Treatment and Shrub Planting – Areas 4 and 5. *Phragmites* that has invaded two additional existing salt marsh areas will be treated, cut and removed in the same process as that described for Areas 1,3, and 6B. These include Area 4 near the WWTP and Area 5 in Constitution Park, southeast of Walk Bridge. The treatment process will be repeated, as necessary, throughout the construction period. It is anticipated that these areas will naturally establish with volunteer native vegetation. However, during the final year of construction, and if determined to be necessary by an Environmental Scientist from CTDOT Office of Environmental Planning (OEP), the areas will be enhanced with strategic locations of native shrub plantings, including Eastern baccharis (*Baccharis halimifolia*) and marsh elder (high-tide bush) (*Iva frutescens*).

CTDOT specifications which apply to Areas 4 and 5 include: CTDOT Specification Item #0952051A, Control and Removal of Invasive Vegetation; and CTDOT Specification Item #0949875A, Wetland Plantings--these specifications can be found in Att M6.

Phragmites Removal and Salt Marsh Restoration – Area 2. Vegetated tidal wetlands restoration at Mitigation Area 2 (adjacent to Oyster Shell Park) will include removing invasive *Phragmites* and regrading the area to elevations more suitable for tidal lowmarsh vegetation. The areas will be over excavated to a minimum of 3 feet deep to remove the rhizomes. In the area above the *Phragmites*, other invasive species will also be controlled and removed. The over excavated soil and rhizomes and all invasive species debris will then be disposed of at an approved offsite location. Where needed, these areas will be backfilled with topsoil/planting soil and regraded. The low marsh area will be regraded to the elevation conducive to low salt marsh vegetation growth and at which elevation *Spartina alterniflora* is currently growing. The area will be graded to also include salt panne depressions that will initially remain unplanted to create a microhabitat to provide refuge for forage and juvenile fish species as well as forage areas for wading birds

and waterfowl. The remainder of the low marsh area will be planted with salt marsh vegetation including smooth cordgrass and sea lavender (*Limonium carolinianum*).

At the landward edge of the low marsh area, a slope will be graded and sea lavender will be planted on the slope approximately one foot above the low marsh area where cord grass will be planted. The slope above the sea lavender area will be seeded with a salt tolerant shoreline grass mixture, and plantings of eastern baccharis shrubs, marsh elder shrubs, and seaside goldenrod (*Solidago sempervirens*) an herbaceous perennial, will be interspersed throughout. The CJL elevation of 5.4 feet (for State jurisdictional water resources) was used as the upper boundary of the proposed vegetated tidal wetland. (Note that this elevation is 0.2 feet above the HTL elevation of 5.2 feet, which is the USACE's jurisdiction for Tidal Waters of the U.S. in the project area.)

The area above the CJL, which is considered a buffer between the vegetated wetland area and the City park, will be backfilled with topsoil where necessary and regraded. It will be seeded with a salt tolerant shoreline grass mixture and planted with the same species of shrubs and perennials described above. In addition, a portion of this buffer area above the HTL (17 feet wide by 110 feet in length) will be constructed as a northern diamondback terrapin (*Malaclemys terrapin terrapin*) habitat area, consisting of a minimum 30-inch deep sand layer over a 6-inch granular layer. This area will also be moderately planted with American beachgrass (*Ammophila breviligulata*).

As a component of a living shoreline, the waterward perimeter of Area 2 will be lined with a riprap sill to initially retain the soils for the marsh plantings, ensuring that the root systems mature enough to achieve long-term stability and resist wave energy. The riprap sill will also function to provide shoreline stabilization, erosion control, and protection of the salt marsh edge by absorbing wave energy. Water quality can also be improved from settling or trapping sediment on the landward side of the sill and filtering pollution. The riprap sill will be constructed of 24-inch to 30-inch diameter rock embedded 6-inches to 12-inches in the soil substrate, with a minimum 3-foot wide base and an approximate 18-inch to 24-inch height placed at or slightly above the proposed final grade of the low marsh area. In addition, oyster cultch will be placed among the exposed rocks on the waterward side of the riprap sill, in accordance with CTDOT's Tidal Wetland Creation Specification.

CTDOT specifications which apply to Area 2 include: CTDOT Specification Item #0952051A, Control and Removal of Invasive Vegetation; CTDOT Specification Item #0949875A, Wetland Plantings; CTDOT Specification Item #0950202A, Shoreline Grass Establishment; CTDOT Specification Item #0948013A, Tidal Wetland Creation; and CTDOT Specification Item #0949315A, Fiber Roll.

Riprap Removal and Salt Marsh Restoration – Area 6. Vegetated tidal wetland restoration at Mitigation Area 6 will include restoring salt marsh vegetation at an area within the river currently containing low-functioning rock riprap on the surface of the intertidal flat area, along the shoreline northeast of the bridge. Scattered individual plants of smooth cordgrass are growing within some of the voids of the riprap in locations with suitable elevation and substrate. The restoration activities will involve excavation of the existing riprap, placing topsoil/planting soil, establishing appropriate elevations, and planting native low salt marsh vegetation to create a higher functioning salt marsh.

The low marsh area will be regraded to the elevation conducive to low salt marsh vegetation growth and at which elevation *Spartina alterniflora* is currently growing. The area will be graded to also include salt panne depressions that will initially remain unplanted to create a microhabitat to provide refuge for forage

and juvenile fish species as well as forage areas for wading birds and waterfowl. The remainder of the low marsh area will be planted with salt marsh vegetation including smooth cordgrass and sea lavender.

Area 6B is an area of Phragmites treatment on top of stormwater outfalls. In addition, Area 6A is an existing tidal wetland area of cord grass which will be shaded by a construction trestle and will therefore not survive during the construction period. After the trestle is removed when construction has ended in that area, dead vegetation will be removed, and the area will be replanted with cord grass plugs. No excavation or other disturbance will take place in that area during or after construction.

As a component of a living shoreline, the waterward edge of Area 6 will include a riprap sill to initially retain the soils for the marsh plantings, ensuring that the root systems mature enough to achieve long-term stability and resist wave energy. The riprap sill will also function to provide shoreline stabilization, erosion control, and protection of the salt marsh edge by absorbing wave energy. Water quality can also be improved from settling or trapping sediment on the landward side of the sill and filtering pollution.

A portion of the existing riprap in this area will remain along the waterward boundary to provide a substrate base for placing and reusing some of the existing excavated riprap to construct the sill. The configuration of the riprap sill will vary in height from 2 feet to 3 feet, with a 1:1 side slope on the landward side and 1.5:1 side slope on the waterward side. The width of the base will vary from 7 feet to 9.5 feet, depending on the height. The reused rock will be an average size of 18 inches in diameter, although some rock could be as small as 12 inches or as large as 24 inches in diameter. In addition, oyster cultch will be placed among the exposed rocks on the waterward side of the riprap sill, in accordance with CTDOT's specification.

CTDOT specifications which apply to Area 6 include: CTDOT Specification Item #0949875A, Wetland Plantings; and CTDOT Specification Item #0948013A, Tidal Wetland Creation.

7. Sites 7, 8, and 9 Construction Activities – Barge Mooring

Barge mooring locations for project construction vessels will occur at Sites 7, 8, and 9. Site 7 is south of the Stroffolino Bridge, on the eastern shore of the Norwalk River along the west side of Veteran's Memorial Park. Site 8 is within the south anchorage basin east of the Norwalk Harbor navigational channel, and Site 9 is in Long Island Sound, just west of Sheffield Island. Table 31 lists the construction activity that will occur at Sites 7, 8 and 9.

Table 31 –Sites 7, 8 and 9 Construction Activities

Construction Activity	Description	Construction Activity (CA) # /Permit Plates
Barge Mooring	Barge mooring location for construction barges south of the Stoffolino Bridge on the eastern shore of the Norwalk River (Site 7).	CA11/ CA11-4, CA11-5
Barge Mooring	Barge mooring location for construction barges east of Norwalk Harbor (Site 8).	CA11/ CA11-3, CA11-5
Barge Mooring	Barge mooring location for construction barges in Long Island Sound (Site 9).	CA11/CA11-2, CA11-5

7.1 CONSTRUCTION ACTIVITY: Barge Mooring

Permit Plates: GEN 8-10, SUM-1, CA11

In addition to the barge mooring location at the Marine Staging Yard (CA4), three additional barge mooring locations will be required for staging construction barges for the Walk Bridge Replacement Project. Typical barge widths range from 30 feet to 54 feet, and typical barge lengths range from 72 feet to 280 feet (as shown of the Vessel Berthing Plan, GEN 8-10). Each mooring consists of a 60-inch diameter mooring buoy and a 5-ton anchor. The anchors will be lowered to the streambed or seabed from barges and properly secured to prevent migration. No dredging will be required for installation of the moorings. Temporary aids to navigation will be installed at each mooring location in coordination with the U.S. Coast Guard.

Table 32 – Resource Impacts: Barge Mooring – Site 7

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	100

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts.

Table 33 – Resource Impacts: Barge Mooring – Site 8

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	300

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts

Table 34 – Resource Impacts: Barge Mooring – Site 9

Impacts	Vegetated Tidal Wetland (sf)	Intertidal Flat (sf)	Intertidal Zone* (sf)	Below CJL** (sf)
Temporary	0	0	0	0
Permanent	0	0	0	400

Temporary impacts are construction impacts less than 24 months duration. Permanent impacts include temporary impacts of 24 or more months duration.
*Represents areas in the intertidal zone that are not defined as a vegetated tidal wetland or intertidal flat.
**Impacts below the CJL include areas below the CJL elevation, shore to shore, that are not included as vegetated tidal wetlands, intertidal flat, or intertidal zone impacts

8. Construction Activity Impacts to the 100-Year Floodplain

Project construction activity impacts to the 100-year floodplain have been calculated for ten floodplain areas, listed in Table 35 and shown in Figures 4 and 5 (and included in **Attachment I** [FP-2- FP-10]). In addition to the construction elements previously described in Sites 1 through 9, the Walk Bridge Replacement Project will include non-bridge related railroad elements. Railroad track work will include replacing about one-half-mile of tracks and ballast within the existing railroad right-of-way from approximately the Washington Street Bridge to approximately 300 feet east of the Fort Point Street Bridge. Overhead catenary and supports will be replaced within the limits of the project, generally from the Washington Street Bridge to a point approximately 300 feet east of the Fort Point Street Bridge. All approach track, catenary and signal work for the project will be within the existing state right-of-way, which is higher than the 100-year floodplain.

Table 35 – Floodplain Impact Areas

Floodplain Area	Location	Description of Activities
FP-2	Wetland Mitigation Area 2	Wetland restoration activities along the west bank of the Norwalk River, in the river bend north of the bridge
FP-3	Wetland Mitigation Area 6	Wetland restoration activities along the east bank of the Norwalk River, north of the bridge
FP-4	From west approach to east of Navigation Channel	All construction activities previously identified in Site 1 (West of Navigation Channel), Site 2 (Navigation Channel), and Site 3 (East of Navigation Channel) and additional areas in west and east. In west: repaving of North Water Street, removal of existing Pier 1, construction of new Pier 1, removal of Maritime Aquarium covered walkway (pedestrian link), development of MNR duct bank and vaults. In east: construction of pedestrian/bicycle trail north of bridge, trail and construction access road south of railroad, and MNR duct bank;

Floodplain Area	Location	Description of Activities
		use of construction yard (11 Goldstein Place); and northern limit of Mitigation Area 6.
FP-5	East Approach	Construction of pedestrian/bicycle trail and construction access road south of railroad; MNR duct bank, and construction yards east and west of Goldstein Place (multiple parcels).
FP-6	From Vessel Dock Area to Goldstein Place	All construction activities previously identified in Site 4 (Vessel Dock Relocations). In west: repaving of parking lot (4 North Water Street); maintenance dredging in navigation channel; in east: construction yard (11 Goldstein Place), repaving of Goldstein Place/Route 136.
FP-7	Marine Staging Yard	All construction activities previously identified in Site 5 (Marine Staging Yard) and development of temporary construction yard for lift span construction and other construction staging activities.
FP-8	Barge Mooring on eastern river front	All construction activities previously identified in Site 7.
FP-9	Barge Mooring east of Norwalk Harbor	All construction activities previously identified in Site 8.
FP-10	Barge Mooring in Long Island Sound	All construction activities previously identified in Site 9.

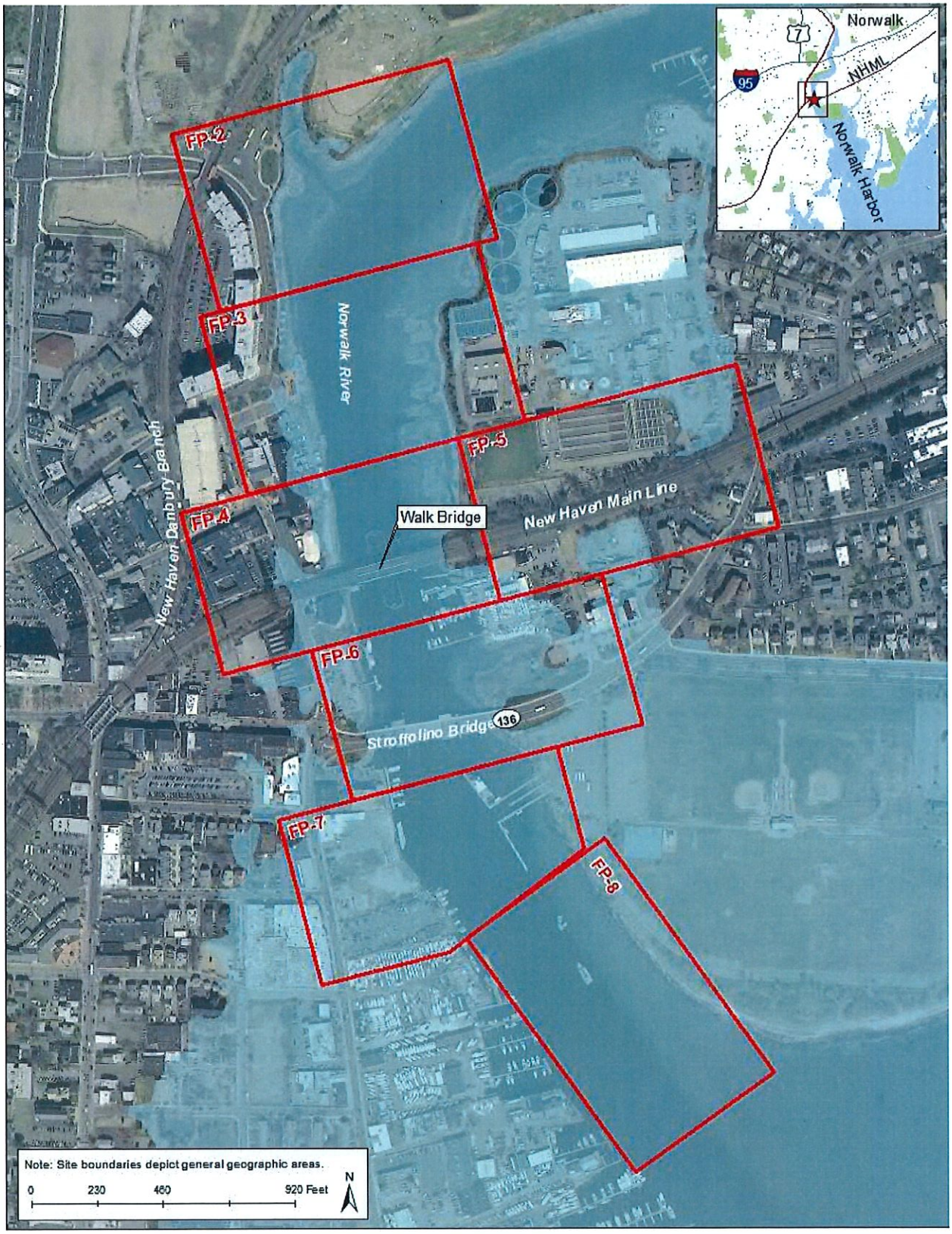

Figure 4 – Project Floodplain Areas, FP-2 through FP-8

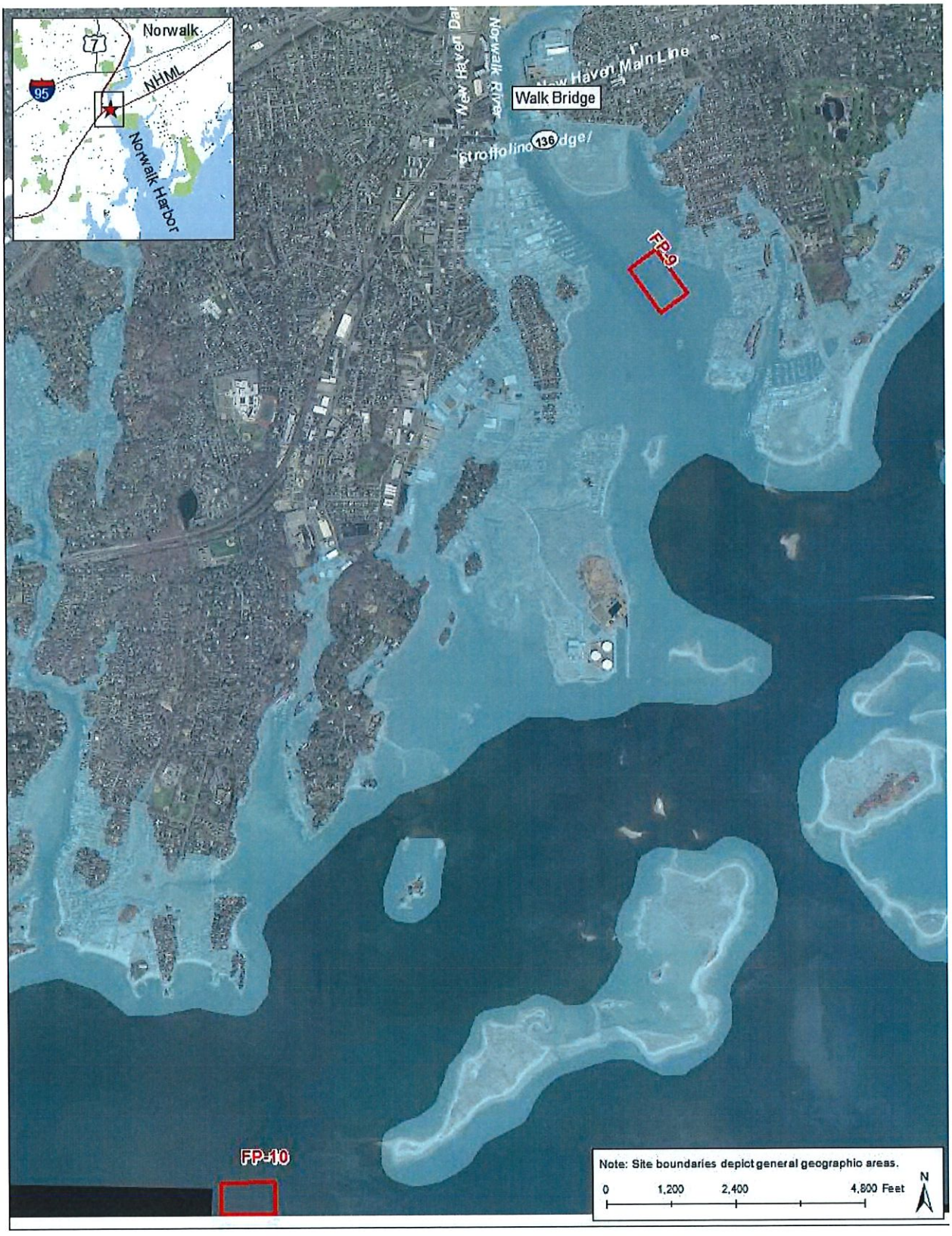

Figure 5 – Project Floodplain Areas, FP-9 and FP-10

8.1 FLOODPLAIN IMPACT AREA FP-2: Wetland Mitigation Area 2

Permit Plans: FP-2

Floodplain Impact Area FP-2 consists of temporary and permanent impacts to the 100-year floodplain associated with Wetland Mitigation Area 2, located northwest of the bridge site and south of Oyster Shell Park. Included in the temporary impacts are site access to the mitigation area. Note that Wetland Mitigation Area 1 is also in FP-2 (north of Mitigation Area 2 at Oyster Shell Park), however, it does not require any temporary or permanent fill in the floodplain.

Table 36 – Floodplain Impacts: Wetland Mitigation Area 2

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	300	400	700
Permanent	3,100	16,400	19,500

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.2 FLOODPLAIN IMPACT AREA FP-3: Wetland Mitigation Area 6

Permit Plans: FP-3

Floodplain Impact Area FP-3 consists of temporary and permanent impacts to the 100-year floodplain associated with Wetland Mitigation Area 6, along the eastern bank of the Norwalk River fronting the Waste Water Treatment Facility. Included in the temporary impacts are site access to the mitigation area. Note that Wetland Mitigation Area 3 is also in FP-3, located on the western bank of the Norwalk River, however, it does not require any temporary or permanent fill in the floodplain.

Table 37 – Floodplain Impacts: Wetland Mitigation Area 6

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	0	0
Permanent	10,500	0	10,500

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.3 FLOODPLAIN IMPACT AREA FP-4: From west approach to east of Navigation Channel

Permit Plans: FP-4

Floodplain Impact Area FP-4 includes all construction activities previously identified in Site 1 (West of Navigation Channel), Site 2 (Navigation Channel), and Site 3 (East of Navigation Channel). Additional floodplain impacts to the west include milling and paving of North Water Street, removal of existing Pier 1, construction of new Pier 1, removal of the Maritime Aquarium's covered walkway (pedestrian link)

under the bridge, preparation of the construction staging area at 10 North Water Street (Parcel 2/19/2), and construction of MNR duct bank and vaults. Floodplain impacts also include the contractor's access area from North Water Street/Ann Street to the east side of the Maritime Aquarium (Parcel 2/19/3). Floodplain impacts to the east include the northern limit of Mitigation Area 6, construction of a portion of the pedestrian/bicycle path north of the bridge (connecting to the Norwalk Harbor Loop Trail), construction of a portion of the pedestrian/bicycle path and construction access road immediately south of railroad corridor, and construction of the MNR duct bank.

Table 38 – Floodplain Impacts: From west approach to east of Navigation Channel

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	9,100	9,100
Permanent	147,400	58,200	205,600

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.4 FLOODPLAIN IMPACT AREA FP-5: East Approach

Permit Plates: FP-5

Floodplain Impact Area FP-5 consists of the construction of a portion of the pedestrian/bicycle path and the construction access road immediately south of the railroad corridor, and development of the construction yard east of Goldstein Place. The construction staging and storage area east of Goldstein Place includes multiple parcels (Parcels 3/1/30, 3/1/19, and 3/1/29) at 4, 6, and 10 Goldstein Place. Note that the existing eastern bridge abutment is being partially removed; however, it will be removed to Elevation 12.0 (NAVD88), therefore, there will be no floodplain impacts.

Table 39 – Floodplain Impacts: East Approach

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	0	0
Permanent	0	61,400	61,400

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.5 FLOODPLAIN IMPACT AREA FP-6: From Vessel Dock Area to Goldstein Place

Permit Plates: FP-6

Floodplain Impact Area FP-6 includes construction activities previously described in Site 4. Additional floodplain impacts include the following: to the west, temporary impacts due to milling and overlay of the Norwalk Parking Authority (4 North Water Street) lot; a portion of maintenance dredging within the navigation channel; and to the east, temporary impacts due to use of the Goldstein Place construction yard (multiple parcels) and roadway milling and overlay of Goldstein Place/Route 136 following project completion.

Table 40 – Floodplain Impacts: From Vessel Dock Area to Goldstein Place

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	11,400	40,400	51,800
Permanent	14,000	22,300	36,300

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.6 FLOODPLAIN IMPACT AREA FP-7: Marine Staging Yard

Permit Plates: FP-7

Floodplain Impact Area FP-7 includes construction activities previously described in Site 5. Additional floodplain impacts include development of a laydown area through site clearing and grading to approximately Elevation 8 (NAVD88) to allow site drainage. As presented in Section 5.1, the Marine Staging Yard will be used to store materials and equipment and to construct large bridge components, including the two lift spans.

Table 41 – Floodplain Impacts: Marine Staging Yard

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	0	0
Permanent	18,500	70,800	89,300

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.7 FLOODPLAIN IMPACT AREA FP-8: Barge Mooring Site 7

Permit Plates: FP-8

Floodplain Impact Area FP-8 includes construction activities previously described in Site 7.

Table 40 – Floodplain Impacts: Barge Mooring Site 7

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	0	0
Permanent	100	0	100

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.8 FLOODPLAIN IMPACT AREA FP-9: Barge Mooring Site 8

Permit Plates: FP-9

Floodplain Impact Area FP-9 includes construction activities previously described in Site 8.

Table 40 – Floodplain Impacts: Barge Mooring Site 8

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	0	0
Permanent	300	0	300

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

8.9 FLOODPLAIN IMPACT AREA FP-9: Barge Mooring Site 9

Permit Plates: FP-10

Floodplain Impact Area FP-10 includes construction activities previously described in Site 9.

Table 41 – Floodplain Impacts: Barge Mooring Site 9

Impacts	Below CJL (sf)	100-year Floodplain* (sf)	Total Below 100-Year Floodplain
Temporary	0	0	0
Permanent	400	0	400

*Impacts below the 100-Year Floodplain include areas below the 100—Year Floodplain that are not included as impacts below the CJL elevation.

2b. Describe any erosion and sedimentation or turbidity control installation and maintenance schedule and plans in detail.

Where demolition and removal activities do not take place over a barge or within a marine enclosure, debris shields will be installed prior to performing the removal operations to prevent debris from falling into the waterway. The debris shields will be installed beneath the temporary work platforms between the low chord elevation of the bridge and elevation 6.95 to maintain at least 1 foot of freeboard above the 2-year tidal elevation, except above the navigation channel where the debris shields must be located as close to the low chord as practical. The contract specifications will require any debris that accidentally falls into the waterway to be immediately removed.

Marine enclosures will be installed prior to the start of certain construction activities as indicated in the response to **Question 2a** and shown in **Attachment I**. Marine enclosures are steel sheet pile structures that are not to be considered as being water-tight. The sheeting allows low velocity flow between the enclosure and the outer tidal waters; the elevation of water inside the enclosure is isolated from tidal waters and therefore lags the tide. The marine enclosures will be installed so that the top of the enclosure is at, or

above, Elevation 6.2 (1 foot above the high tide line). To further prevent siltation outside of the marine enclosure, a turbidity curtain will be deployed around its exterior perimeter.

Turbidity curtains (Type III Department of Transportation CTDOT Specification Item #0210306A, Turbidity Control Curtains) will be installed prior to the start of the following activities: Marine enclosure installation

- Pier construction (with marine enclosure)
- Pier removal (with marine enclosure)
- Duct bank and submarine cable installation (with marine enclosure)
- Existing submarine cable removal
- Slide rail installation and removal for swing span removal
- Fender pile installation and existing fender removal
- Dredging
- Construction platform pile driving
- Pile installation and removal at the vessel docks
- Bulkhead installation and removal (with marine enclosure) at Marine Staging Yard
- Sheet pile installation and outfall reconstruction at the IMAX
- IMAX Theater removal
- Wetland restoration

The turbidity curtains will remain in place until that portion of the project is complete and the turbidity has settled to no more than pre-construction conditions.

The project area will incorporate soil erosion and sediment control (SESC) measures consistent with the CTDEEP 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Standard erosion control measures such as hay bales, silt fence, turbidity curtains, and inlet filters will be implemented during construction. In addition, confined in-water work will occur within turbidity curtains and marine enclosures to isolate the sediment-generating work zones from the river. Since the temporary staging and material storage yards consist primarily of asphalt surfacing with some locations of stone aggregate, stabilized construction access will only be used at the temporary staging and material storage yards where soils will be exposed. All SESC measures will be installed prior to construction activities that will result in soil disturbance. In accordance with the contract specifications, the marine enclosures, turbidity curtains, and SESC measures will be inspected and maintained throughout the project construction period [Section 1.10 Environmental Compliance; Section 2.10 Water Pollution Control (Soil Erosion)].

CTDOT will implement water quality monitoring for all in-water work during the project. Water quality monitoring will consist of monitoring for turbidity on a continuous basis in the vicinity of each turbidity producing activity. Additionally, CTDOT will monitor for specific conductivity, salinity, dissolved oxygen, pH, temperature and water level (at one location) to determine if marine life and other natural conditions may be contributing to turbidity levels. and contaminants. Monitoring will be conducted for turbidity and contaminants, as required by CTDEEP (CTDOT Specification Item #0101139 A Water Monitoring Equipment).

CTDOT currently is conducting baseline monitoring at three locations within the proposed project area (Walk Bridge, Stroffolino, and the Police Dock) to establish baseline conditions. The baseline monitoring will be utilized to establish trends and background levels that will assist in the exceedance reporting and investigations during construction monitoring. Turbidity monitoring during construction will be conducted

on a continuous basis in the vicinity of each turbidity producing activity. Monitoring will be conducted upstream via two fixed monitors to act as a baseline and two floating monitoring locations both upstream and downstream of the marine enclosures/turbidity curtains to serve as the monitors during the ebb and flow of the river. If there is a spike in turbidity levels above the action levels, a CTDOT OEP-approved environmental inspector will investigate the cause of the exceedance to determine if the condition is due to natural conditions of the river, background traffic in the area, or from the construction activities. The results of the exceedance investigations will be coordinated with the resident engineer to adjust the BMPs implemented by the contractor, if necessary. The results of the investigations and the corrective actions implemented will be transmitted to the Norwalk Shellfish Commission and the Norwalk Harbor Management Commission on a monthly basis.

To simulate conditions during installation of the piles for the work trestles, a test pile program was planned and executed for the project. The program consisted of driving 30-inch diameter pipe piles and pairs of 40-foot long sheet piles at eight different locations across the site. The intent of the program was to measure pile capacity and pile length, for cost estimates and constructability. Additionally, as part of this program, noise and vibration levels were measured in the adjacent air and water and vibration effects on adjacent historic structures and the existing bridge were measured. Turbidity created by pile driving and extraction was measured via two sets of test piles, including a pair of sheets and pipe pile at two locations, and pile extraction at one location. Results from turbidity testing indicate that the turbidity impacts due to pile driving and removal are minimal; very little or no increase (less than 2 NTUs) was recorded at any of the test gauges during or after the pile driving activity. Per the Connecticut Water Quality Standards (effective October 10, 2013), Class SB Waters do not have a minimum turbidity threshold, "other than of natural origin except as may result from…construction activity,…dredging activity or discharge of dredged of fill materials provided all reasonable controls and Best Management Practices are used to control turbidity and none exceeding levels necessary to protect and maintain all designated uses."

2c. Indicate the length of time needed to complete the project and identify any anticipated time period restrictions.

Replacement of the Walk Bridge is anticipated to begin after regulatory approval, and will have a construction duration of approximately 54 months.

CTDOT has coordinated with the National Oceanic and Atmospheric Administration/National Marine Fisheries Service/Greater Atlantic Regional Fisheries Office (NOAA/NMFS/GARFO), CTDEEP Wildlife NDDB & Marine Fisheries, and the U.S. Army Corps of Engineers (USACE) in developing environmental protection measures for the project. Through coordination with NOAA/NMFS/GARFO, CTDEEP, and USACE, CTDOT has agreed to implement the following time period restrictions:

- All pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities conducted between April 1st and June 30th will only occur between one hour after sunrise to one hour before sunset.

- No unconfined turbidity producing activities will be allowed between February 1st and September 30th.

- A soft start, consisting of building up power slowly from a large energy start-up over a period of at least 20 minutes, will be used at the beginning of each shift that requires pile driving and extraction (including sheet piles), shaft drilling, and micro pile drilling activities between March 16th and October 31st.

- Unconfined dredging will be conducted within turbidity curtains between December 1st and January 31st.

- Dredging from February 1st through November 30th will be conducted within a marine enclosure enclosed by a turbidity curtain.

- No work will be conducted between April 1st and July 31st within 500 feet of any active peregrine falcon (*Falco peregrinus*) nest.

Additionally, CTDOT will coordinate pile driving/extraction and drilled shaft and micropile drilling activities to ensure activities are only taking place on one half (or occupy less than 50% when working in the middle of the river) of the navigation channel at a time.

Part III: Project Information (continued)

3. Describe the purpose of, the need for, and intended use of the proposed activities. (For example, private recreational boating, marina, erosion protection, public infrastructure, etc.)

   See Attachment, Part III, Question 3.

4. Identify and describe all coastal or aquatic resources on the site by checking the appropriate box and describe the expected impact on these resources. You may add addenda as necessary as Attachment M.

Coastal/Aquatic Resources	On-site	Adjacent	Describe Expected Impact
Coastal bluffs and escarpments	☐	☐	**There are no coastal bluffs or escarpments on or adjacent to the project site.**
Rocky Shorefront	☐	☐	**There are no rocky shorfronts on or adjacent the the project site.**
Beaches and Dunes	☐	☐	**There are no beaches or dunes on or adjacent to the project site.**
Intertidal Flats	☒	☒	**See Attachment, Part III, Question 4.**
Tidal Wetlands	☒	☒	**See Attachment, Part III, Question 4.**
Fresh Water Wetlands and Watercourses	☐	☐	**There are no freshwater wetlands or watercourses on or adjacent to the project site.**
Estuarine Embayments	☒	☒	**See Attachment, Part III, Question 4.**
Coastal Hazard Areas	☒	☒	**See Attachment, Part III, Question 4.**
Developed Shorefront	☒	☒	**See Attachment, Part III, Question 4.**
Islands	☐	☐	**There are no islands on or adjacent to the project site.**
Near shore Waters	☒	☒	**See Attachment, Part III, Question 4.**
Offshore Waters	☐	☐	**There are no offshore waters on on or adjacent to the project site.**
Shorelands	☐	☐	**There are no shorelands on or adjacent to the project site.**
Shellfish Concentration Areas	☒	☒	**See Attachment, Part III, Question 4.**
Wildlife Resources and Habitat	☒	☒	**See Attachment, Part III, Question 4.**
Benthic (bottom) Habitat	☒	☒	**See Attachment, Part III, Question 4.**
Indigenous aquatic life, including shellfish and finfish	☒	☒	**See Attachment, Part III, Question 4.**
Submerged Aquatic Vegetation	☐	☐	**There is no submerged aquatic vegetation on or adjacent to the project site.**

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Norwalk CT
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Part III: Project Information
(continued)
Question 3

3. Describe the purpose of, the need for, and intended use of the proposed activities (For example, private recreational boating, marina, erosion protection, public infrastructure, etc.).

3.1 Project Purpose

Walk Bridge is a critical piece of public infrastructure on the New Haven Line/Northeast Corridor (NHL/NEC). Walk Bridge carries Amtrak intercity and high-speed passenger service on the NEC, is used for Metro-North Railroad (MNR) commuter rail service, and Providence and Worcester Railroad Company (P&W) through freight service. Replacement of the existing Walk Bridge will support Amtrak, MNR and freight service. Additionally, Walk Bridge is the northern boundary of the Norwalk Harbor, rated as a small commercial port by the USACE, with over 2,300 moorings and berthing spaces, and between 2,000 to 3,000 commercial vessel trips per year to port facilities. The replacement bridge will support marine use and operations on the Norwalk River. The purpose of the project is to replace the existing deteriorated bridge with a resilient bridge structure which will enhance the safety and reliability of rail service, offer operational flexibility and ease of maintenance, and provide for increased capacity and efficiencies of rail transportation along the New Haven Line/Northeast Corridor, while maintaining or improving navigational capacity and dependability for marine traffic in the Norwalk River. Upgrades to the Walk Bridge, through replacement, are needed to increase bridge reliability, incorporate bridge redundancy, and provide a sustainable bridge for significant weather events, thereby accommodating current and future rail and marine traffic.

3.2 Need for the Project

In coordination with the FTA, CTDOT is undertaking the Walk Bridge Replacement Project to address the following needs, or deficiencies, of the existing Walk Bridge.

Structure Age and Deterioration. The existing bridge is approximately 120 years old and has deteriorated. Section loss (loss of original structural material) due to corrosion has been observed in some locations and to varying extents and indicates that the structure is nearing the limit of its design life. Cumulative fatigue damage (damage due to repetitive train loadings) of the main load carrying elements of the bridge has occurred. The electrical systems are generally obsolete. Existing and projected deterioration and wear of mechanical systems are key elements which affect the reliability of the bridge.

Decreasing Reliability. In 2011, Walk Bridge failed 12 times out of 138 openings, and in 2013, the bridge failed 16 times out of 271 openings. Failure means that the bridge fails to open or close properly in a timely manner. Failures have occurred in both the opened and closed positions. When failure occurs in the opened

position, train traffic cannot cross the bridge until the bridge is completely closed and locked. If the bridge fails in the closed position, marine traffic taller than the vertical clearance under the bridge cannot pass under the bridge. When the bridge fails by only partially opening or closing, both train and marine traffic are stopped. Without action to rehabilitate or replace the bridge, failures are expected to increase.

Closing the bridge after a failure can take up to two hours. In May and June 2014, in two separate but similar incidents within a two-week time span, Walk Bridge failed to properly close. The failures prevented trains from crossing the bridge for extended periods of time, and impacted thousands of passengers.

Lack of Resiliency. System resiliency for Walk Bridge is described as the ability to return the bridge to use, either partially or completely, in a relatively short period of time in the aftermath of a compromising event. It also refers to minimizing the vulnerability of critical elements of the bridge to facilitate its return to use.

The existing bridge is not designed to current standards for flooding events or storm events. In its current condition, the bridge is highly vulnerable to damage from a storm surge or high wind event, and it is also at risk for malfunction due to extreme temperatures. The bridge also does not meet current standards with regard to its ability to withstand the magnitude of seismic forces and frequency of seismic events for this geographic area.

Safety Standards. The existing bridge does not meet current design standards which reflect improved safety aspects compared to when the bridge was originally designed and built. Minimum requirements (loading, safety margins, etc.) for the design of railroad bridges have evolved throughout the twentieth century to reflect increases in demands on the infrastructure and advances in materials, methods, and technology. Current train loads used for design are commonly-accepted loads representing modern-day freight rail traffic in the United States. These design loads are significantly heavier than design loads used over a hundred years ago. As a result, structures designed to pre-1900 standards do not typically provide the same margin of safety as bridges designed in accordance with current practice.

Lack of Redundancy. Operational redundancy for Walk Bridge is described as the ability to maintain train service on a limited number of tracks following an event that would have otherwise rendered all tracks inoperable. A failure of the existing bridge results in all four tracks being out of service, affecting train traffic in both directions and with far reaching effects on the NEC.

Limited Operational Flexibility. Existing operational constraints include the curvature of the track on the west end, narrow track centers, and miter rails on the movable span, all of which force trains traversing Walk Bridge to reduce their speed.

Difficulty of Maintenance. Some maintenance activities require opening the structure, and therefore require the bridge to be closed and all four tracks be taken out of service which presents logistical challenges for both maintenance and rail mobility.

Reduced Rail Capacity and Efficiency. Failures of the bridge opening/closing cause reduced efficiency of train service in terms of increased delays and reduced on-time performance (OTP) of Metro-North and Amtrak passenger trains. This reduced efficiency can in turn reduce the line capacity of the rail lines.

Reduced Dependability and Capacity for Marine Traffic. As previously noted, when the bridge fails in the closed or partially opened position, some or all marine traffic cannot pass under the bridge and renders navigation unreliable and unpredictable. The existing vertical clearance also limits vessel passage in the bridge closed position, which affects navigation capacity.

Lack of Sustainability. The existing bridge is not sustainable as continued deterioration will cause bridge failures. Increased routine bridge maintenance will not extend the useful life of the bridge, so without major rehabilitation or replacement, the existing bridge will cease to function and result in more frequent train delays or even full shut-downs of the bridge, adversely affecting both rail and marine traffic. Increasing routine and major maintenance costs, combined with the cost associated with correcting a bridge failure, result in high life cycle costs to operate this bridge.

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Part III: Project Information
(continued)
Question 4

4. Identify and describe all coastal or aquatic resources on the site by checking the appropriate box and describe the expected impact on these resources. You may add addenda as necessary as Attachment M.

Drawing SUM-2 in Attachment I provides Walk Bridge Replacement Project summaries of temporary and permanent impacts to coastal resources and dredging volumes. Project impacts consist of temporary construction impacts of less than 24 months (temporary < 24 mo. impacts), temporary construction impacts of 24 months or more (temporary ≥ 24 mo. impacts), and permanent impacts. Temporary impacts of 24 months or more are permitted as permanent impacts.

4.1 Intertidal Flats

4.1.1 Description of Existing Intertidal Flats

Intertidal flats exist upstream and downstream from Walk Bridge on both sides of the river with the closest affected by construction consisting of a large intertidal flat along the eastern shoreline of the Norwalk River, north of the Walk Bridge, adjacent to the City of Norwalk's Waste Water Treatment Plant (WWTP). Figure 1 shows intertidal flats in the vicinity of Walk Bridge; Figures 2 and 3 show aerial photography of selected intertidal flat areas north and south of the bridge. Additionally, there are smaller exposed intertidal areas on both the east and west shores of the Norwalk River near the abutments of Walk Bridge. However, by definition, these areas do not qualify as mudflats; the substrate of these areas is comprised more of a coarse sand/cobble mix and the grade of these areas is not gently sloping or flat. The following describes existing intertidal flats in three quadrants of Walk Bridge. No mudflats are present in the southwest quadrant.

Northwest Quadrant. No mudflats are present in the southern portion of this quadrant. However, some cobble/shell mudflats are present directly under the Walk Bridge. Other mudflats found within this quadrant are associated with areas adjacent to Oyster Shell Park. The mudflats in this area are up to 100 feet wide adjacent to the vegetated tidal wetland areas.

Northeast Quadrant. Based on review of available aerial photography taken at low tide, the mudflats in this quadrant are from 100 feet to 150 feet wide (Figure 2). Sea lettuce was observed growing on the mudflats and rocky shoreline in this quadrant. Sea lettuce is found in waters that are nutrient rich such as those located near the WWTP outfall.

Southeast Quadrant. Based on review of available aerial photography taken at low tide, the mudflats in this quadrant are from 100 feet to 150 feet wide.

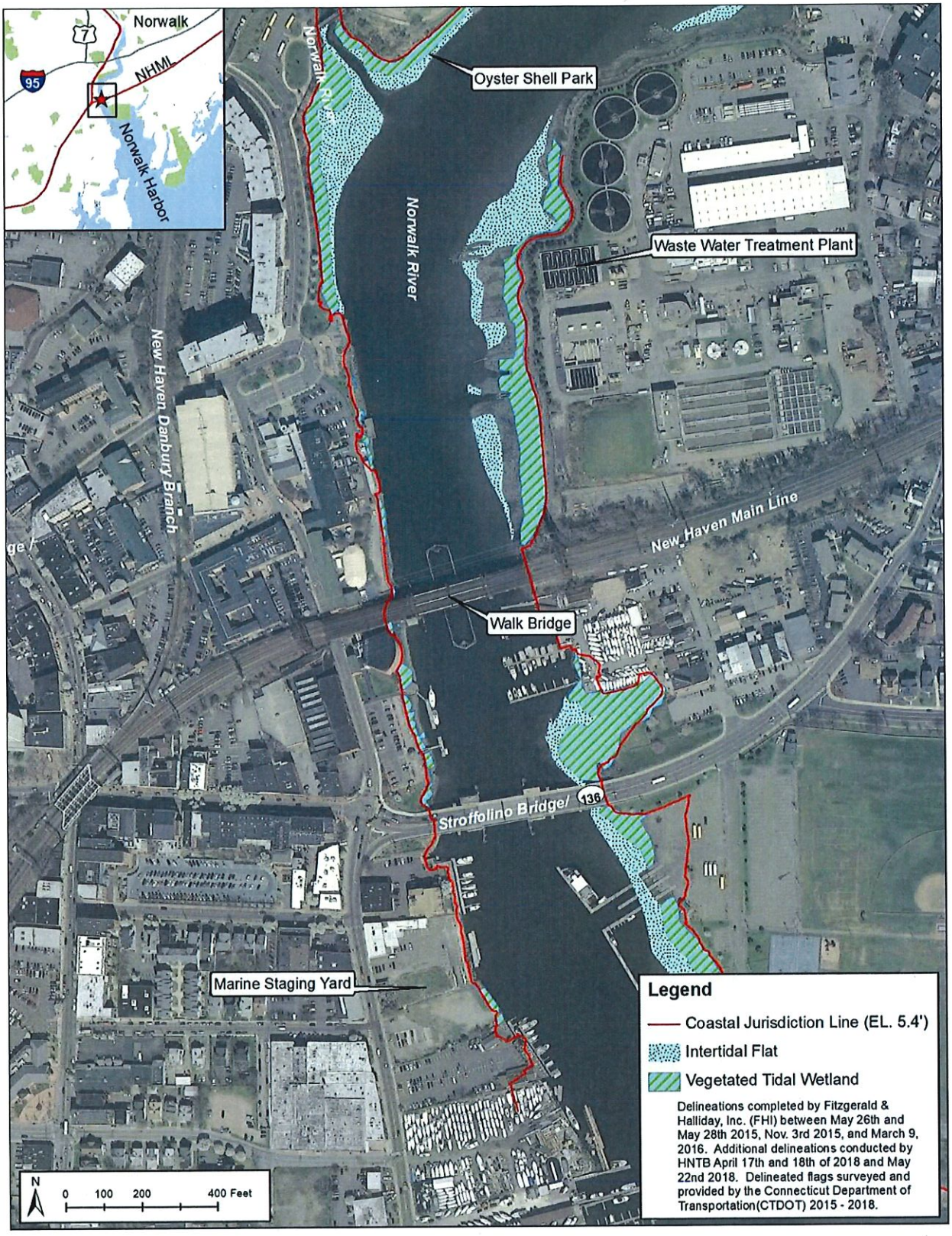

Figure 1 – Intertidal Flats and Vegetated Tidal Wetlands in the Vicinity of Walk Bridge

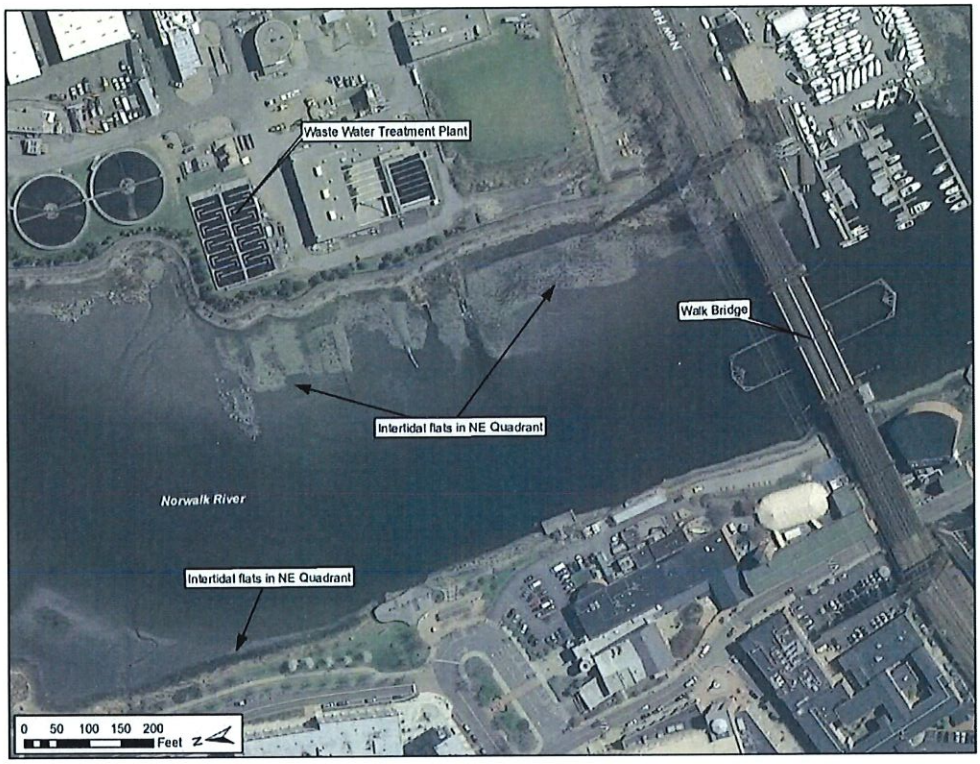

Figure 2—Aerial photo of intertidal flats north of the bridge site

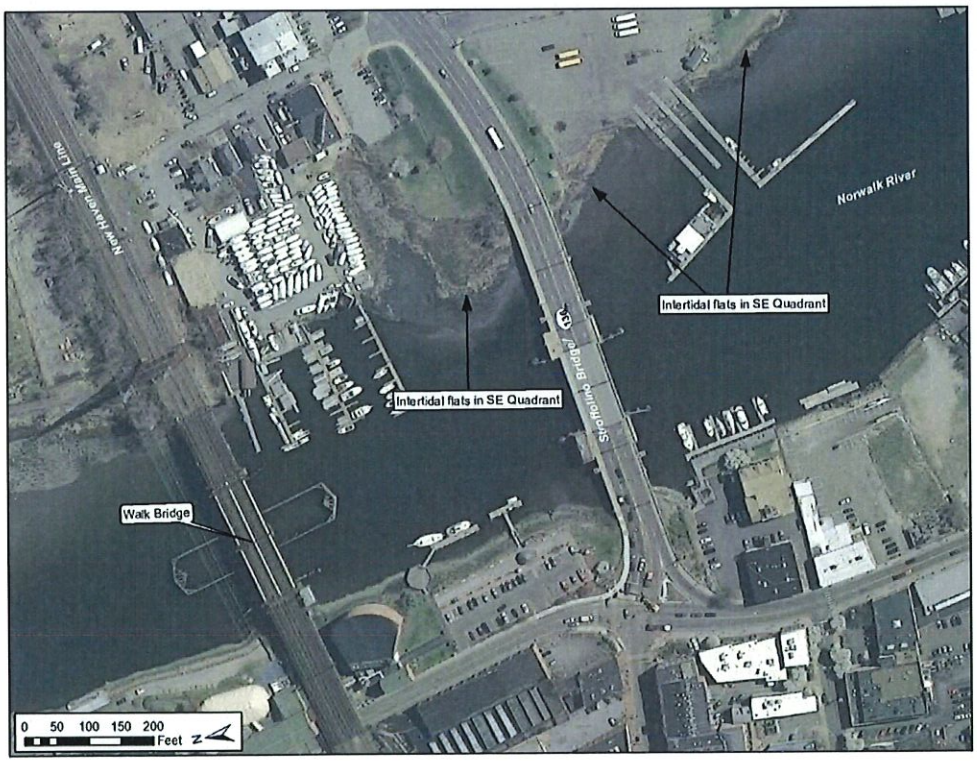

Figure 3—Aerial photo of intertidal flats south of the bridge site

4.1.2 Impacts and Compensatory Mitigation

Temporary ≥ 24 mo. (permanent) impacts to intertidal flats north of the bridge will result from piles driven for construction work platforms and temporary construction trestle piles that are in place longer than 24 months. Temporary < 24 mo. impacts to the mudflat areas will result from existing submarine cable removal. Permanent impacts to intertidal flats (mudflats) will require a 4:1 mitigation ratio; the compensatory mitigation plan, described in Section 4.2.4, accounts for impacts to intertidal flats and vegetated tidal wetlands. Temporary impacts to intertidal flats will require a 1:1 mitigation ratio. Mitigation will be in the form of replacing soil material in the same location after the submarine cable is removed.

Total amounts of impact also are provided on **Drawing SUM-2 in Attachment I** by construction site and impacts by construction activity are provided in **Question 2a**. The proposed mitigation plan is described in **Section 6.1 in Question 2a**.

4.2 Vegetated Tidal Wetlands

Vegetated tidal wetlands are located along the east and west sides of the Norwalk River, both north and south of the bridge (Figure 1). In the vicinity of the bridge, vegetated tidal wetlands are representative of estuarine vegetative communities typically deemed salt tolerant, such as smooth cordgrass [*Spartina alterniflora*, Obligate Wetland (OBL)], salt meadow grass [*Spartina patens*, Facultative Wetland (FACW)], high-tide bush (*Iva frutescens*, FACW), water hemp (*Amaranthus cannabinus*, OBL), seaside goldenrod (*Solidago sempervirens*, FACW), and marsh orach (*Atriplex patula*, FACW). The prominent species in the project vicinity is smooth cordgrass.

4.2.1 Description of Existing Wetlands

Twenty-two vegetated tidal wetlands were delineated in the surrounding areas of the project according to both the federal and State of Connecticut definitions, as shown in Figure 4. Federal wetland resources were delineated in the field according to the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual (USACE, 1987) and the USACE 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (USACE, 2012). The fieldwork to identify and delineate wetlands and watercourses in the study area initially was conducted during fall/winter of 2014, spring/fall of 2015, and spring 2016. Additional delineations were performed in the summer of 2018 to verify any changes in the distribution of invasive species and to facilitate wetlands compensation/mitigation planning. The following describes existing wetlands in the four quadrants of Walk Bridge.

Northwest Quadrant. The shoreline in the northwest quadrant of the bridge site consists of riprap, rocks, and boulders with some bulkheads and fixed docks. Eleven vegetated tidal wetland areas were delineated in this quadrant. The soils in the wetlands and uplands in this quadrant are highly disturbed and are mapped by the Natural Resources Conservation Service (NRCS) as Urban land. Nine vegetated tidal wetland areas are located adjacent to the parking areas of the Maritime Aquarium property. Two vegetated tidal wetland areas are within Oyster Shell Park that is located north of the Maritime Aquarium property. The vegetated tidal wetlands in this quadrant are vegetated with typical saltmarsh species (wetland indicator status also provided) that include smooth cordgrass (*Spartina alterniflora*, OBL), seaside goldenrod (*Solidago sempervirens*, FACW), marsh orach (*Atriplex patula*, FACW), water hemp (*Amaranthus cannabinus*, OBL) and high tide bush (*Iva frutescens*, FACW) with smooth cordgrass being the dominant species. Several of

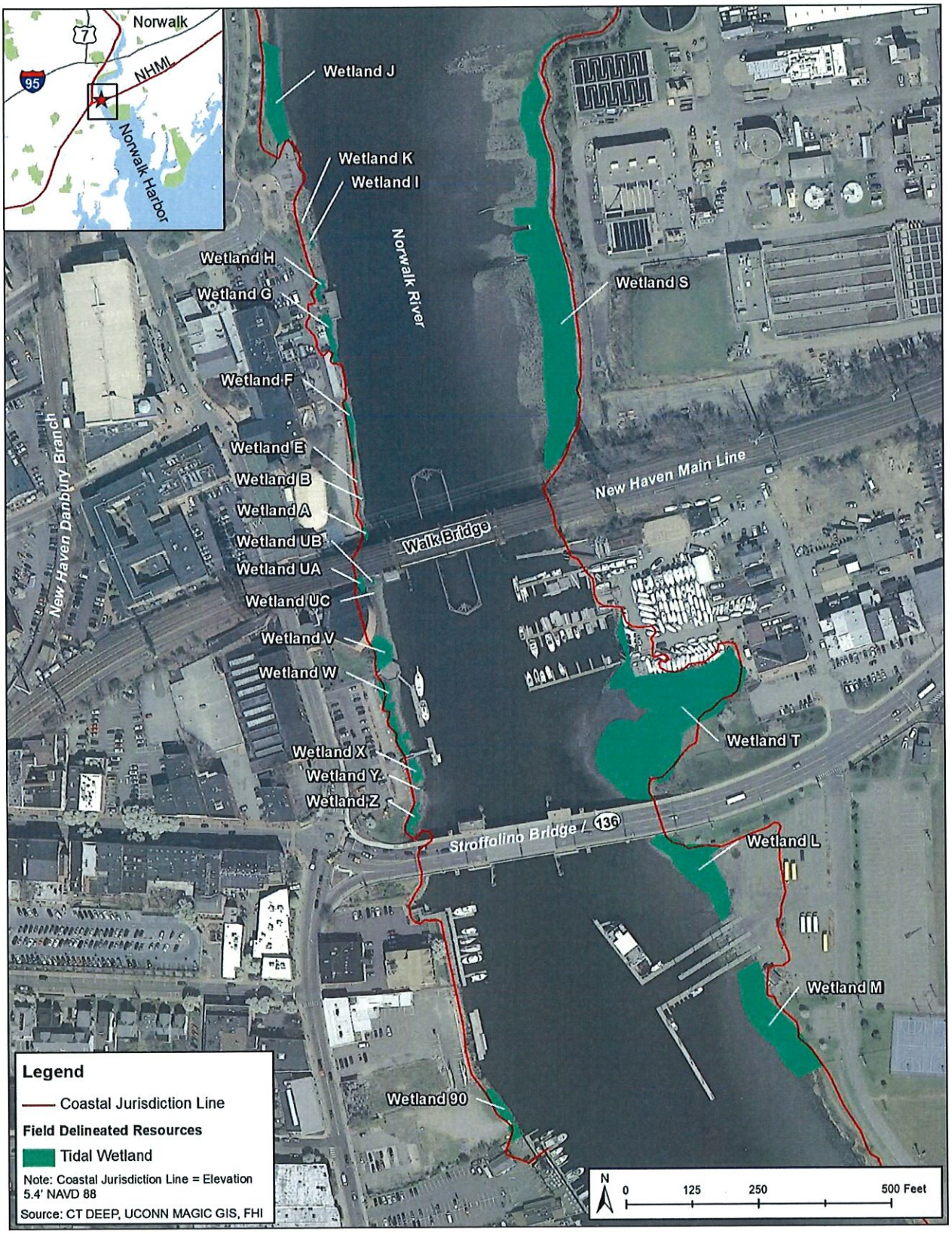

Figure 4—Delineated Wetlands in the Vicinity of Walk Bridge

the individual vegetated tidal wetlands consist of small clumps of smooth cordgrass. The largest wetland in this quadrant continues north into Oyster Shell Park. In addition to the native salt marsh species, the invasive haplotype of common reed (*Phragmites australis*, FACW) is present in areas adjacent to Oyster Shell Park. Common reed was not present in any of the other tidal wetlands south of Oyster Shell Park in the northwest quadrant. The adjacent uplands consist of buildings and paved parking lots, with lawn and landscape plantings.

Northeast Quadrant. The landward side of the shoreline in the northeast quadrant of the bridge site consists almost entirely of chain link fencing (gabion slope/Reno mattress-like) atop riprap on a relatively steep slope. The only upland that is adjacent to the vegetated tidal wetlands that does not consist of chain link fencing on riprap is a small area immediately north of the railroad bridge. Water-ward of the toe of the slope of the riprap, the shoreline consists of areas of rocks and mudflats. Also included in this quadrant are the outfalls for the City of Norwalk WWTP. A continuous band of saltmarsh vegetation extends along the entire shoreline in this quadrant. Smooth cordgrass is by far the dominant species, with seaside goldenrod and high tide bush also present. Adjacent to these areas are some areas that are sparsely vegetated with smooth cordgrass within the mudflats. There are also areas where common reed is present with the largest stand located near the WWTP outfall. The soils in the wetlands and uplands in this quadrant are highly disturbed and are mapped by the NRCS as Udorthents-Urban land complex.

Southwest Quadrant. The shoreline in the southwest quadrant of the bridge site consists of riprap, rocks, and boulders, along with fixed and floating docks. The IMAX Theater building, part of the Maritime Aquarium complex that is just south of the railroad bridge, is also located immediately adjacent to the vegetated tidal wetlands. Eight vegetated tidal wetlands were delineated in this quadrant. Additionally, one vegetated tidal wetland was delineated at the Marine Staging Yard, south of the Stroffolino Bridge. The soils in the wetlands and uplands in this quadrant are highly disturbed and are mapped by the NRCS as Urban land. Smooth cordgrass is the dominant species in the vegetated tidal wetlands with seaside goldenrod and high tide bush also being common species. Vegetated tidal wetlands located under the railroad bridge are sparsely vegetated with seaside goldenrod, smooth cordgrass, marsh orach and saltmeadow cordgrass (*Spartina patens*, FACW). The vegetated tidal wetland adjacent to the Marine Staging Yard consists of a narrow strip of smooth cordgrass and high tide bush growing on the landward side of a dilapidated bulkhead. Non-vegetated portions of the shoreline are exposed at low tide with the dominant benthic substrate observed to be shell hash. The seaweeds rockweed (*Fucus sp.*) and sea lettuce (*Ulva lactuca*) are present in the intertidal area. The adjacent uplands predominantly consist of buildings, paved parking lots along with lawn and landscaped areas.

Southeast Quadrant. The southeast quadrant of the bridge site includes naturally vegetated shoreline in Constitution Park and the site formerly occupied by a private marina, with the shoreline made up of a bulkhead north of the Washington Street Bridge. South of the Washington Street Bridge, the southeast quadrant includes the area along the Norwalk River in the vicinity of the municipal boat ramp associated with Veteran's Park. One vegetated tidal wetland was identified north of the Washington Street Bridge. Two vegetated tidal wetlands were identified south of the bridge, on either side of the municipal boat ramp. The dominant species in the southern portion of vegetated tidal wetland north of the Washington Street Bridge is smooth cordgrass, with seaside goldenrod, saltmeadow grass, poison ivy and high tide bush also common. Groundsel tree (*Baccharis halimifolia*, FACW) is also present but not common. Common reed is present around the higher elevation fringe portion of this vegetated tidal wetland. Included in the northern part of this vegetated tidal wetland is a portion of the bulkhead in the marina where a narrow, broken strip of high tide bush and smooth cordgrass is present. South of the Washington Street Bridge, the vegetation includes smooth cordgrass, saltmeadow grass, saltgrass (*Distichlis spicata*, FACW), blackgrass (*Juncus gerardii*, OBL), seaside goldenrod, poison ivy and high tide bush. There is also a small stand of common

reed present. Vegetation south of the municipal boat ramp includes smooth cordgrass, seaside goldenrod, blackgrass and some common reed. The soils in the wetlands and uplands in this quadrant are highly disturbed and are mapped by the NRCS as Udorthents-Urban land complex and Udorthents, smoothed. Mudflats are present in the southern portion of the quadrant north of the Washington Street Bridge as well as south of the bridge. The uplands adjacent to the vegetated tidal wetlands adjacent to the municipal boat ramp consist of paved parking areas or mowed grass.

4.2.2 Functions and Values

The following provides a description of the functions and values of the vegetated tidal wetland resources and the subtidal habitats of the Norwalk River. Smooth cordgrass-dominated salt marshes are one of the most valuable habitat types in the estuarine environment and perform many functions including fish, shellfish and wildlife habitat, sediment/toxicant retention, nutrient removal, shoreline stabilization and production export. Coastal salt marshes are one of the most productive ecosystems in the world. When smooth cordgrass decomposes, the resulting organic matter is fed upon by a myriad of small organisms that in turn support a broad food chain that, in turn again supports shellfish and finfish populations (Dreyer and Niering, 1995). Therefore, production export is a principal function performed by tidal marshes. The tidal wetlands and river in the study area provide fish and shellfish habitat evidenced by the presence of ribbed mussels (*Geukensia demissa*), American oyster (*Crassostrea virginica*) and hard-shelled clam (*Mercenaria mercenaria*). Fish species collected in the study area by Harbor Watch during their 2014 juvenile benthic marine trawling program include winter flounder (*Pseudopleuronectes americanus*), northern sea robin (*Prionotus carolinus*), cunner (*Tautogolabrus adspersus*), hogchoker (*Trinectes maculatus*) and northern pipefish (*Syngnathus fuscus*) (Harbor Watch, 2014). Additionally, schools of Atlantic menhaden (*Brevoortia tyrannus*) were observed in the river during the field investigation and local fisherman stated that they had caught striped bass (*Morone saxatilis*) in the study area as well. The mudflats that are adjacent to the vegetated wetlands as well as the open water areas in the river provide foraging habitat for a number of waterfowl, shore birds and long-legged waders. Great Blue Heron (*Ardea herodias*), Great Egret (*Ardea alba*) and Snowy Egret (*Egretta thula*) were observed foraging on the mud flats and unvegetated rocky shoreline while a Black-crowned Night-heron (*Nycticorax nycticorax*) was observed roosting in trees adjacent to the bridge in the Northeast Quadrant on more than one occasion. Double-crested Cormorant (*Phalacrocorax auritus*), Mallard (*Anas platyrhynchos*), Herring Gull (*Larus argentatus*), Ring-billed Gull (*Larus delawarensis*), Mute Swan (*Cygnus olor*) Osprey (*Pandion haliaetus*), and Common Tern (*Sterna hirundo*) were observed utilizing the open water areas of the river.

The root system and structure of the vegetation in the tidal wetlands can help to stabilize the shoreline as well as to retain sediments and toxicants. The City WWTP and local runoff are potential sources of nutrients in the river and the salt marsh vegetation can locally aid in nutrient removal. Although the tidal wetlands in the study area have the high potential to perform the functions discussed above most are relatively narrow fringes of vegetation along the river which somewhat limits their overall capacity to perform those functions when compared to wider, more extensive salt marshes. This is particularly true for the small, sparsely vegetated tidal wetlands that are located on the west side of the Norwalk River near the Walk Bridge.

The primary value that the tidal wetlands and river in the study area provide is the opportunity for recreation. There are City parks on the east and west sides of the river in the study area that provide public access for fishing, bird watching, walking, and boating. The Harbor Loop Trail that is adjacent to the river in the northeast quadrant also provides walking and bird watching opportunities for the public. Fishermen were

observed along the shores of the northwest quadrant while rowers and recreational boats were observed on the river. Additionally, the Maritime Aquarium educational research vessel as well as the ferry boat for Sheffield Island are docked in the southwest quadrant, providing public access to these tidal wetlands.

4.2.3 Impacts to Vegetated Tidal Wetlands

Direct impacts to vegetated tidal wetlands will be unavoidable; total amounts of impact also are provided on **Drawing SUM-2 in Attachment I** by construction site and impacts by construction activity are provided in **Question 2a**. Permanent impacts to vegetated tidal salt marsh wetland will result from fill material for new bridge piers and abutments, permanent excavation, installation of the bulkhead at the Marine Staging Yard, temporary construction trestle piles that are in place longer than 24 months, and shading from work platforms that are in place longer than 24 months. Permanent impacts to vegetated tidal salt marsh wetland will require a 4:1 mitigation ratio. No temporary impacts to vegetated tidal wetlands will occur.

4.2.4 Compensatory Mitigation

Compensation for permanent impacts to the vegetated tidal wetlands and intertidal mudflats due to construction will be provided through mitigating tidal wetland areas within the intertidal zone. The loss of vegetated tidal wetlands and intertidal flats will be mitigated through treatment and removal of invasive common reed (*Phragmites australis*) in existing tidal wetlands, by restoration of degraded vegetated tidal wetlands dominated by *Phragmites*, and by restoration of a low-functioning intertidal flat previously impacted by riprap placement. The proposed compensatory mitigation strategies were developed by CTDOT OEP biologists through site visits, meetings, and correspondence with CTDEEP and USACE. Local stakeholder representatives from the City of Norwalk and the Maritime Aquarium of Norwalk had opportunities to review the mitigation plans.

Vegetated tidal wetland mitigation activities are described in **Section 6.1 of Part III, Question 2a.** Mitigation consists of four elements in six areas as follows:

- Invasive *Phragmites* treatment;
- Invasive *Phragmites* treatment with subsequent shrub planting;
- Tidal salt marsh restoration through invasive *Phragmites* removal, living shoreline riprap sill installation, grading and topsoil placement, salt marsh restoration through vegetation planting, and establishment of a northern diamondback terrapin (*Malaclemys terrapin terrapin*) habitat area in the buffer above the high tide line ; and
- Excavation and removal of in-water rock riprap, living shoreline riprap sill installation from reused existing riprap, regrading and topsoil placement, and salt marsh restoration through vegetation planting.

The proposed mitigation areas are along the Norwalk River, proximal to, but outside of the project's immediate vicinity.

The restored vegetated tidal wetland areas will be dominated by smooth cordgrass (*Spartina alterniflora*). This type of salt marsh is one of the most valuable habitat types in the estuarine environment and performs many functions including fish and shellfish habitat, wildlife habitat, sediment/toxicant retention, nutrient removal, shoreline stabilization and production export. The root system and structure of the vegetation in the tidal wetlands can help to stabilize the shoreline, as well as to retain sediments and toxicants. The City wastewater treatment plant (WWTP) and local runoff are potential sources of nutrients in the river and the salt marsh vegetation can locally aid in nutrient removal, thereby improving water quality.

Coastal salt marshes are one of the most productive ecosystems in the world. The decomposed organic matter of the salt marsh vegetation is fed upon by several small organisms that support a broad food chain, eventually supporting shellfish and finfish populations. Essential Fish Habitat (EFH) is designated for ten species in the area inclusive of the Walk Bridge project area (and continuing further upstream). In addition to these ten species, five additional species have designated EFH reaching the Stroffolino Bridge and continuing south to include Norwalk Harbor and Long Island Sound. Since this is a regulatory boundary rather than a physical barrier, it is likely that these species also use the adjacent area in the Walk Bridge vicinity at various stages of their life cycles.

4.3 Estuarine Embayments/Nearshore Waters

Located within the tidally-influenced Norwalk River, the project is partially protected and maintains an open connection to the sea. The project site is also a small area within a much larger estuarine embayment, as shown in Figure 5, and is defined as nearshore waters. There will be a net increase in available estuarine embayment and in available nearshore water benthic habitat following this project. Construction period impacts are anticipated from construction work platforms, marine enclosures, dredging/excavation along the bottom of the Norwalk River and channel; however, these activities will not adversely impact the overall estuarine environment/nearshore waters. Adverse construction impacts to water quality will be minimized to the maximum extent practicable by employing turbidity curtains and, in some cases, marine enclosures around the work areas prior to work start. Further, water quality will be monitored during active work in the waterway.

Based on subsurface investigations in the Norwalk River conducted in June 2018, the Norwalk River is identified as a preliminary Area of Environmental Concern (AOEC). The sediment contains Extractable Total Petroleum Hydrocarbons (ETPH), Semi-Volatile Organic Compounds (SVOCs), pesticides, and/or metals (arsenic and/or chromium) at concentrations exceeding the RSR criteria; and is therefore classified as contaminated material. Any sediment removed from the Norwalk River will therefore be handled as controlled material. Sediment spoils will be dewatered/decanted on the barge or work platform and the dewatered wastewater will be filtered through silt bags and treated as necessary prior to being discharged back into the river. Excavated sediments will be managed in accordance with the General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) and the General Permit for the Discharge of Groundwater Remediation Wastewater. Appendix A provides further information about the management of project-generated controlled substances.

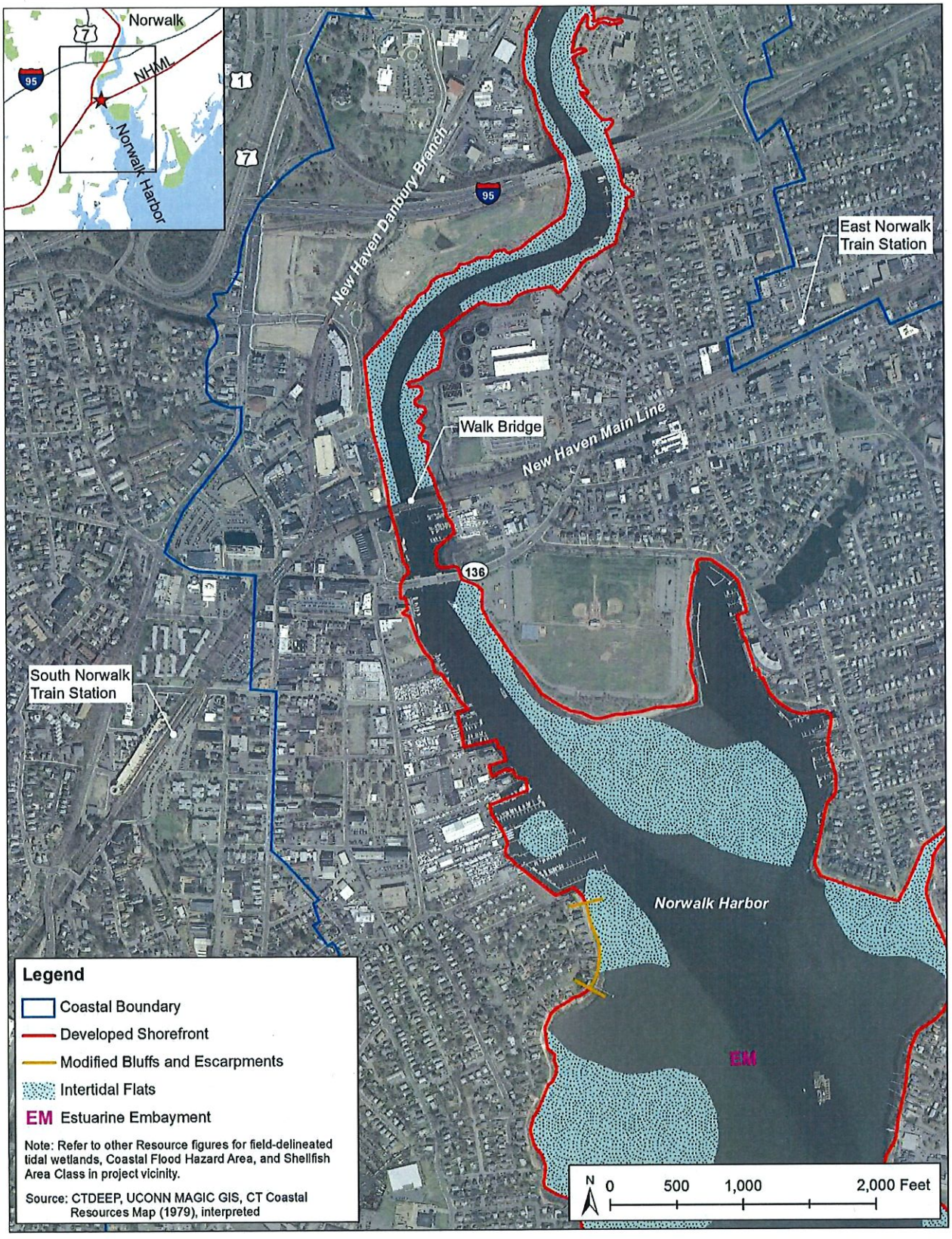

Figure 5- Coastal Resources in the Vicinity of Walk Bridge

4.4 Coastal Hazard Areas

The project site is located within the tidal reach of the Norwalk River near the river's mouth into Long Island Sound. As such, the bridge is influenced by both riverine events and coastal storm surges. Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) (July 8, 2013), Walk Bridge is located in Zone AE, defined as the 100-year floodplain or as areas subject to inundation by the 1-percent-annual-chance flood event, as shown in Figure 6. Walk Bridge is approximately 500 feet upstream of the Route 136 Bridge (Stroffolino Bridge); the boundary of Zone VE is just south of the Stroffolino Bridge. Zone VE is defined as areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Upstream of Walk Bridge, the 100-year flood elevation is Elevation 10.0 feet (NAVD88). Immediately downstream of Walk Bridge, the 100-year flood elevation is Elevation 12.0 feet (NAVD88). East of the river, immediately downstream of Walk Bridge, the 100-year flood elevation is Elevation 13.0 feet (NAVD88). Downstream of the Stroffolino Bridge, the 100-year flood elevation is Elevation 14.0 feet (NAVD88). For reference, the elevation of Walk Bridge when closed (at its lowest point) is approximately 18.0+/- feet (NAVD88).

The replacement of Walk Bridge within the 100-year and 500-year floodplains will not result in any adverse impacts to the floodplains, nor will it alter the hydraulic and erosive characteristics of the river within the project area. Hydraulic models of the existing and proposed bridges have been performed to verify that the project will not adversely impact the hydraulic characteristics of the Norwalk River, including water surface elevations and flood velocities. The results of the models indicate that the 100-year water surface elevations will be reduced throughout the study area, except at the downstream face of Walk Bridge where water surfaces will increase by 0.01 feet. Due to the removal of the large existing pivot pier, the 100-year flood velocities will decrease between 0.02 and 0.38 feet/second through the project area. Therefore, the project will reduce the risk to future damage including property and loss of human life. The Flood Management Certification (FMC) application for this project, filed on August 15, 2019 with CTDEEP, contains additional detail.

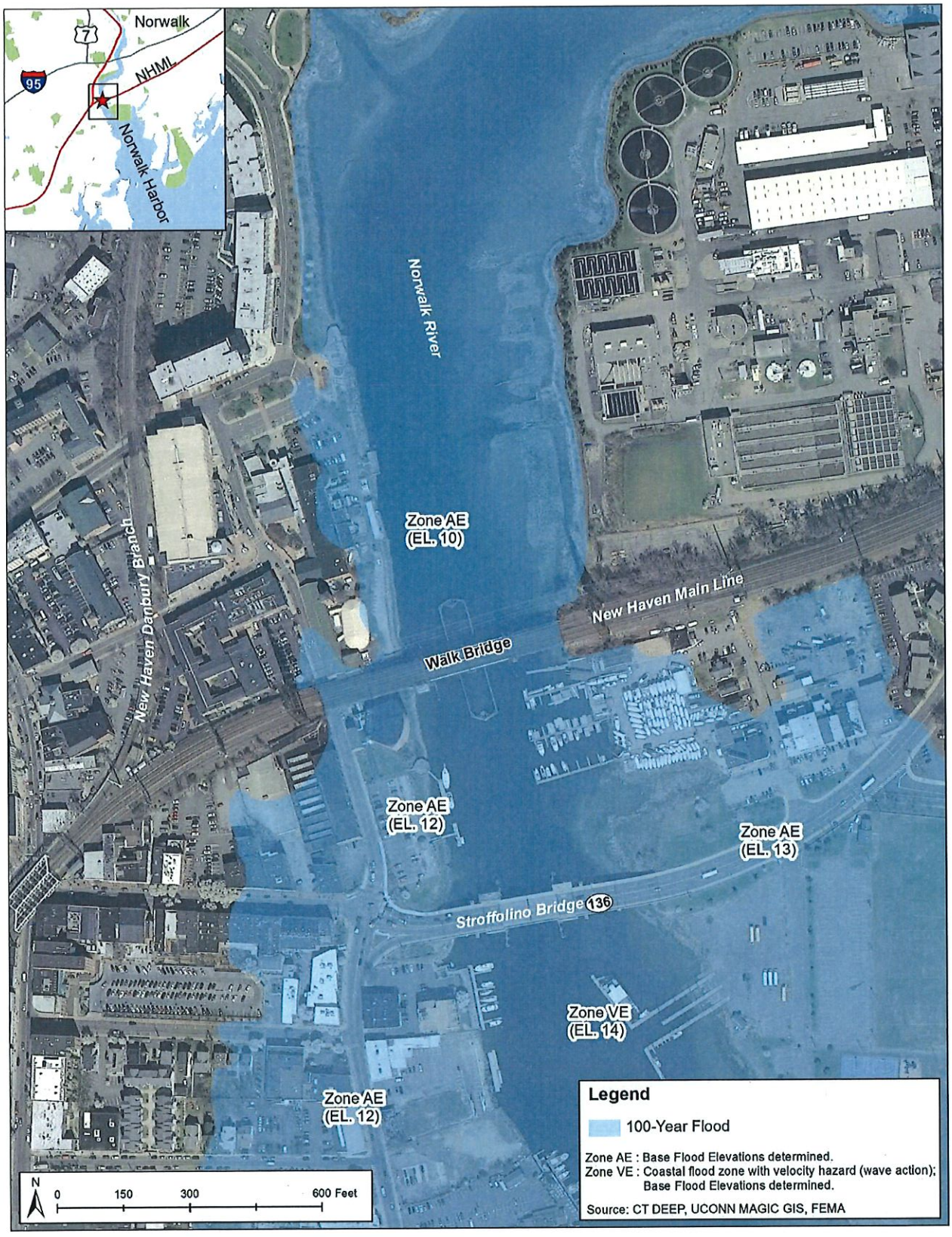

Figure 6 – Coastal Flood Hazard Areas in the Vicinity of Walk Bridge

4.5 Developed Shorefront

The surrounding river banks in the project vicinity are defined as developed shorefront, as depicted in Figure 5. During construction, this project will include unavoidable construction phase shorefront disturbances and limitations to water access, primarily due to the use of construction work platforms throughout the duration of the project and the need for construction staging, storage areas, and access at and near the bridge site. Following project completion, the Norwalk River's developed shorefront will result in overall improvements. A new waterside pedestrian/bicycle path will be constructed on the east bank of the Norwalk River, connecting to the Norwalk River Valley Trail. A new public fishing pier will be built south of the Maritime Aquarium and Sheffield Island Cruise docks on the west bank of the Norwalk River, and a new permanent bulkhead will be constructed at the Marine Staging Yard, located southwest of the Route 136/Stroffolino Bridge. Additionally, for those parcels with waterfront access that were acquired for project construction [1 Goldstein Place (Parcel 3/1/25) and 90 Water Street (Parcel 2/84/33)], upon construction completion, CTDOT will market the excess property indicating the highest priority and preference for water-dependent use of the site. Regarding the sale of the respective properties, State agencies are given first right of refusal. Thereafter, properties will be offered for sale by bid. Once the purchase price has been established, the City of Norwalk will be given the right of first refusal before they are offered to the public. Non-conforming parcels will only be offered to the abutting property owner(s). The development of waterfront parcels with water-dependent uses is a priority use per the Norwalk Harbor Plan and the Connecticut Coastal Management Act.

4.6 Shellfish Concentration Areas

The Norwalk River is a State-designated natural shellfish bed. Shellfish of economic importance are not expected to occur along the bottom of the Norwalk River/Federal Navigation Channel in the soft unconsolidated sediment, however, shellfish resources do occur in the intertidal and subtidal zones adjacent to the channel. Spatial extent and distribution of the species present in the system change with substrate conditions, which are also variable. Ribbed mussels (*Geukensia demissa*) were observed in the upper intertidal zones growing in association with stands of *Spartina alterniflora* or as separate shell beds. Lower intertidal areas may contain soft-shell clams *(Mya arenaria)*. Eastern oyster (*Crassostrea virginica*) was observed growing on boulders in the intertidal zone and on the stone bridge abutments and piers of the Walk Bridge. Despite the observed presence of shellfish in the vicinity of the project, the Norwalk River estuary has been evaluated for indicator bacteria by CTDEEP and segments of it, including the location of the project site, are deemed to be impaired for shellfishing practices per the State total maximum daily load (TMDL) for indicator bacteria. Shellfish are therefore prohibited from being harvested at the project site, as indicated in Figure 7.

Because shellfishing currently is prohibited at the site, no adverse impacts to harvestable shellfish will result from the project. Additionally, any impact to natural shellfish beds in the area of Walk Bridge will be minimized as follows: unconfined dredging/excavation will occur between December 1st and January 31st when the water temperature drops below 50 degrees F and shellfish slip into dormancy; and any in-water turbidity producing work will occur within the confines of turbidity curtains and/or marine enclosures that will be installed and maintained by the contractor. Collectively, these measures will minimize any potential for impacts to nearby and downstream resources.

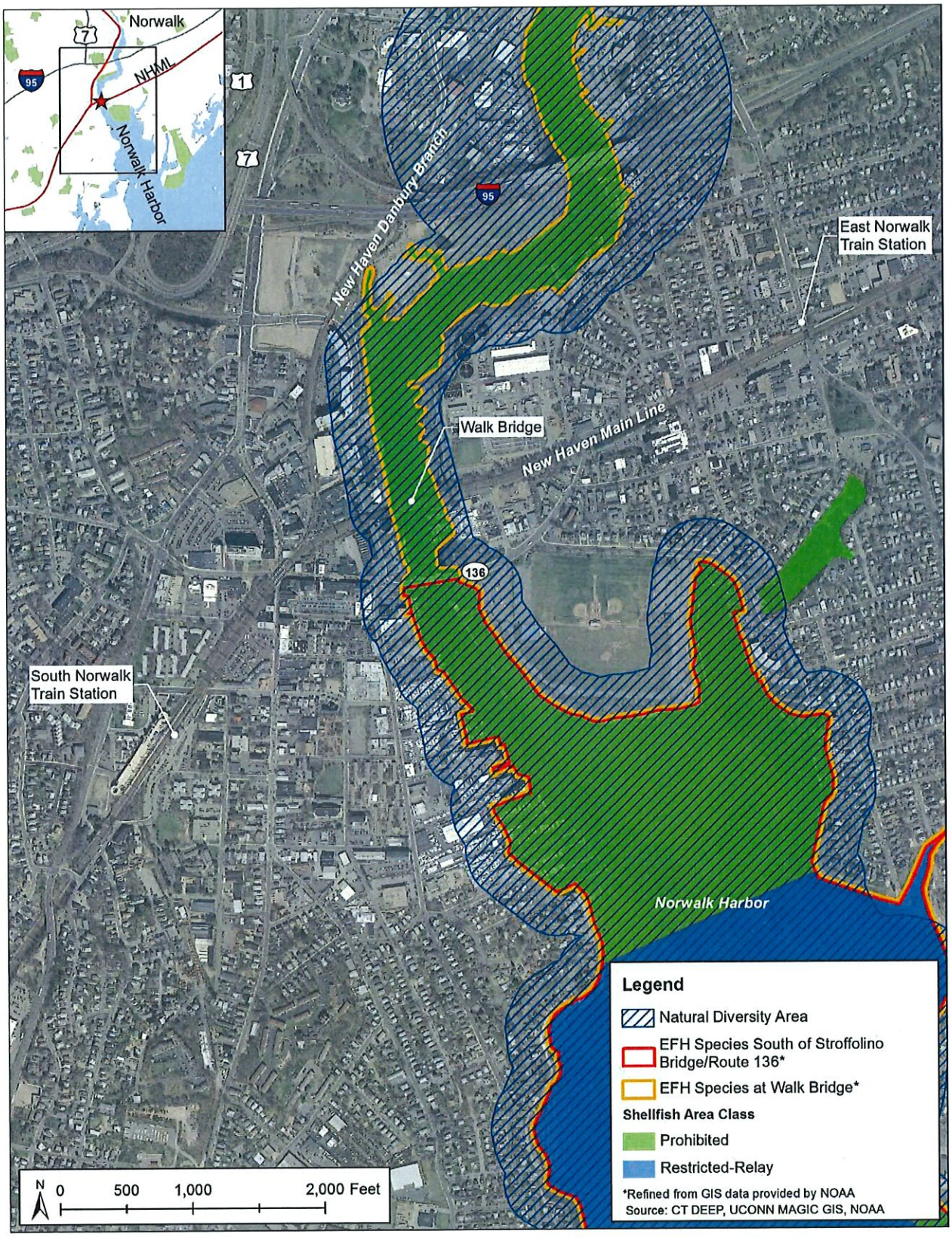

Figure 7 - Aquatic Resources in the Vicinity of Walk Bridge

4.7 Wildlife Resources and Habitat

Several species of plants, fish, birds, invertebrates, and mammals use the Norwalk River for food, shelter, and nursery grounds. Field investigations have documented the presence of schools of Atlantic menhaden (*Brevoortia tyrannus*), and local fisherman have stated that they had caught striped bass (*Morone saxatilis*) in the vicinity as well. The Norwalk River is also a known migratory route for diadromous species such alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and the American eel (*Anguilla rostrata*). The Norwalk Harbor Watch program's latest data from 2014 trawling of juvenile benthic marine fish species produced collections of winter flounder (*Pseudopleuronectes americanus*), northern sea robin (*Prionotus carolinus*), cunner (*Tautogolabrus adspersus*), hogchoker (*Trinectes maculatus*) and northern pipefish (*Syngnathus fuscus*) within the project site vicinity. Essential Fish Habitat (EFH) for eighteen species exists in the area of the Walk Bridge and includes varying life stages for each of the following species; winter skate (*Leucoraja ocellata*), little skate (*Leucoraja erinacea*), summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), longfin inshore squid (*Loligo pealeii*), Atlantic mackerel (*Scomber scombrus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), Atlantic herring (*Clupea harengus*), pollock (*Pollachius virens*), red hake (*Urophycis chuss*), winter flounder (*Pseudopleuronectes americanus*), windowpane flounder (*Scophthalmus aquosus*), ocean pout (*Macrozoarces americanus*), silver hake (*Merluccius bilineris*), sand tiger shark (*Carcharias taurus*), and smoothhound shark complex (Atlantic stock) (as depicted in Figure 7). Potential impacts to Wildlife Resources and Habitat are described in Section 4.9.

4.8 Benthic (bottom) Habitat

The waters in and around the project site, consisting of Norwalk River and Norwalk Inner Harbor, serve as habitat for multiple benthic species. The Norwalk Harbor Watch program inventoried crustacean collections and found the presence of common mud snail (*Ilyanassa obsoleta*), eastern mud snail (*Ilyanassa obsolete*), black fingered mud crab (*Panopeus herbstii*), blue crab (*Callinectes sapidus*), common slipper shell (*Crepidula fornicata*), Atlantic oyster drill (*Urosalpinx cinerea*), shore shrimp (*Palaemonetes spp.*), and sand shrimp (*Crangon septemspinosa*). In the immediate vicinity of the Walk Bridge, field observations of ribbed mussels (*Geukensia demissa*), eastern oyster (*Crassostrea virginica*) and hard-shelled clam (*Mercenaria mercenaria*) provided direct evidence of benthic habitat utilization by bivalves. Other shellfish expected to occur within the river channel include blue mussel (*Mytilus edulis*) and softshell clam (*Mya arenaria*). Various other aquatic invertebrate species observed or expected to be present in the Norwalk River proximate to the project site include various amphipods, isopods, fiddler crabs (*Uca spp.*), shore crabs, pea crabs (*Pinnotheres* [*Tumidotheres*] *maculatus*), spider crabs (*Libinia spp.*), tunicates, barnacles (*Balanus spp.*), jellyfish, and bryozoans.

Marine algae, commonly called seaweeds, are rootless macroscopic benthic plants found from intertidal to subtidal regions of coastal environments. The more common seaweeds likely found in the project vicinity include green algae (phyla *Chlorophyta*) and brown algae (phyla *Phaeophyta*), both of which occupy the shallower areas. Observed at the project area were sea lettuce (*Ulva spp.*), as well as rock weed and knotted wrack (*Ascophyllum spp.*), although several other species are likely present. The seaweeds are typically found in association with boulders or larger cobbles that may or may not be embedded in the sediment, while sea lettuce predominates in unconsolidated sediment areas between the boulder and cobble. Many of the seaweeds are only visible during limited seasonal conditions.

Based on a research and field review of the Norwalk River and surrounding waters in the vicinity of Walk Bridge, CTDOT determined that no populations of submerged aquatic vegetation (SAV), such as common eelgrass (*Zostera marina*), widgeongrass (*Ruppia maritima*), or any other non-algae submerged aquatic plant species, exist in and around the project study area.[1] Therefore, no impacts to SAV species are anticipated to occur from the construction of the replacement bridge. Potential impacts to Benthic (bottom) Habitat are described in Section 4.9.

4.9 Indigenous Aquatic life, Including Shellfish and Finfish

4.9.1 Impacts to Benthic Environment

Direct removal of the benthic substrate via dredging/excavation and drilled shaft/center support structure construction for the two lift piers will be necessary. The resulting disturbance footprints will be small when compared to the total area of existing Norwalk River benthic habitat, which has been subject to larger scale disturbances in the past such as the U.S. Army Corps of Engineers' (USACE's) maintenance dredging conducted in 2014 for the portion of the Norwalk River federal channel just south of Walk Bridge. Adverse impacts to benthic invertebrate communities and EFH from this project are therefore anticipated to be minor. These minor adverse permanent short-term impacts include the removal of benthic species inhabiting the footprints, as they will be excavated along with river bottom sediments and removed from the site for upland disposal. However, after dredging/excavation activities are completed, similar benthic species are anticipated to return and recolonize the disturbance footprint.

Recolonization of the disturbance footprints by algae and benthic organisms is expected to begin almost immediately following construction activities, especially given the proximity to colonizing biota. Larvae and other motile life stages and motile species will find the substrate available for settlement. Additionally, colonizing filter feeders will not be impeded from normal functioning and will flourish. Recruitment rates by algae and benthic fauna are tied to light penetration into the water column, water chemistry and temperature, substrate characteristics, and other factors such as wave or tidal energy, and bathymetry. The unconfined dredging activities will be scheduled to conclude in mid-winter, allowing recolonization to coincide with steadily increasing water temperatures and light penetration with the onset of the spring and summer seasons.

4.9.2 Impacts to Fish Species

Consultation with CTDEEP Marine Fisheries Division indicates that anadromous fish migration periods exist in the Norwalk River/Harbor from April 1st through June 30th, and the most sensitive period for winter flounder reproduction in the Norwalk River/Harbor is from February 1st through May 15th. Similarly, coordination with the National Oceanic and Atmospheric Administration/National Marine Fisheries Service/Greater Atlantic Regional Fisheries Office (NOAA/NMFS/GARFO) indicates that the potential for Section 7 Endangered Species Act (ESA)-listed species (Atlantic sturgeon and shortnose sturgeon) to occur within the project area is from April through November.

Overall, minor adverse short-term impacts are anticipated to indigenous fish species during periods of active construction. Fish will be hindered from using habitat in the project area when barges and other

[1] Stanton, Paul, Fitzgerald & Halliday, Inc. Summary of Research and Findings Regarding Sub-Aquatic Vegetation in the Norwalk River. June 2, 2015.

construction equipment are actively excavating/dredging, pile driving/extracting, and/or shaft and micro pile drilling. Short term conditions potentially affecting fish include increased turbidity in the water column (which will be limited or controlled with the installation of turbidity curtains, marine enclosures, and/or unconfined during the months of December and January) and increased sound pressure levels from underwater construction activity.

Impacts from underwater construction noise have been documented in the NOAA/NMFS Section 7 Informal Consultation and through consultation with NOAA/NMFS for the protection of EFH (**Attachment M 1 & 2**). The noise assessment considered underwater sound pressure levels from pile driving and extraction; clamshell and backhoe dredging/excavation; shaft and micro pile drilling; use of grinders, impact guns, jackhammers/rock breakers; from moving barges, as well as generators and compressors used on barges. As indicated in **Part III, Question 2b**, a test pile program was planned and executed for the project. As part of the test pile program, noise and vibration levels were measured in the water and assessed for impacts to fish. Based on the results of the hydro acoustic monitoring, it was determined that the use of the vibratory hammer did not generate significantly higher noise than background. For the use of impact hammers only, it was determined that the physiological threshold levels have been exceeded for the four turtle species of interest, and that the cumulative threshold levels have been exceeded for the sturgeon species. Per agreement with NOAA/NMFS/GARFO, impacts associated with underwater noise will be mitigated for by starting each shift with a soft start for all pile driving activities that are conducted outside the November 1st – March 15th timeframe.

Coordination with NOAA/NMFS/GARFO includes a recommendation for an unconfined dredging window behind turbidity curtain of December 1st through January 31st to minimize adverse impacts to EFH and Section 7 ESA-listed species. This construction window is aligned with the aforementioned CTDEEP Marine Fisheries Division time of year restriction. The timeframe allows unconfined dredging/excavation to occur during a period when water temperatures in the project area are below 50°F and shellfish are dormant. Additionally, in compliance with NOAA/NMFS/GARFO requirements, no unconfined in-water silt producing activities will be conducted from February 1st through September 30th, of any calendar year, to protect winter flounder sensitive life history stage EFH, diadromous fish passage, and shellfish resources. Note that per agreement with NOAA/NMFS/GARFO, pile driving is not considered to be silt-producing work. Additionally, per agreement, turbidity generated by activities within marine enclosures will not affect the river outside the marine enclosure, and therefore activities within marine enclosures are not bound by the time of year restriction of silt producing activities.

Further, CTDOT will conduct water quality monitoring through the duration of in-water project construction activities; water quality monitoring details are provided in **Part III, Question 2b**. **Part III, Question 1** lists the environmental protection measures to be implemented for the project, including time of year restrictions.

4.9.3 Impacts to Listed Species

Attachment C and **Attachment M 5** contains the May 23, 2019 response from CTDEEP Natural Diversity Data Base (NDDB). CTDEEP NDDB concurs with NOAA/NMFS/GARFO and CTDEEP Marine Fisheries that CTDOT will implement a restriction of no unconfined in-water work between February 1st and September 30th for the protection of blueback herring, diadromous species, sturgeon and shellfish. Per CTDEEP records, the State Threatened peregrine falcon (*Falco peregrinus*) has been known to nest up on High Tower 529 above South Norwalk, and CTDOT has developed protocols (best management practices)

for protection of this species during construction activities. Per the NDDB response, CTDEEP confirmed with CTDOT that no confirmed nesting by the peregrine falcon has occurred since 2015 in the immediate vicinity of the project. Should the species be observed in the direct work area, however, CTDEEP has directed CTDOT to implement its best management practices (BMPs) for protection of the Peregrine falcon (*Falco peregrinus*), including the stipulation that no work will occur within 500 feet of an active nest between April 1st and July 31st.[2]

Coordination with NOAA/NMFS/GARFO identified that shortnose sturgeon (*Acipenser brevirostrum*) and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) have the potential to occur in the Norwalk River from April to November. Shortnose sturgeon and the New York Bight, Chesapeake Bay, South Atlantic, and Carolina distinct population segments (DPSs) of Atlantic sturgeon are listed as federally endangered, and the Gulf of Maine DPS of Atlantic sturgeon is listed as federally threatened. CTDOT has consulted with NOAA/NMFS/GARGO under Section 7 of the ESA. **Attachment M 2** includes correspondence from NOAA/NMFS/GARFO concurring that the project is not likely to adversely affect any NMFS ESA-listed species and/or designated critical habitat in the project action area. Coordination includes initial concurrence determinations (July 17, 2018) and verification of findings due to design refinements (August 1, 2019).

The project was submitted to the United States Fish & Wildlife Service (USFWS) under the final 4 (d) streamlined consultation process for the Northern long-eared bat (*Myotis septentrionalis*) and has a not likely to adversely affect (NLLA) determination. This Project has a no effect determination for the threatened red knot (*Calidris canutus rufa*) and the endangered roseate tern (*Sterna dougallii dougallii*) based on the most current data form CTDEEP and a no suitable habitat determination. Construction will occur from barges located within the river, work platforms above the river, from the railroad tracks, or from within the right-of-way. **Attachment M 4** includes correspondence from USFWS.

[2] This BMP is included in Article 1.10.03 of Section 1.10 Environmental Compliance of CM/GC Division 1 – General Requirements and Covenants.

Part III: Project Information (continued)

5. Identify whether the proposed activities will impact the following categories. If so, describe the expected impact, adding addenda as necessary as Attachment M.

Categories	Yes	No	Describe Expected Impact
Prevention or alleviation of shoreline erosion and coastal flooding	☐	☒	**Not Applicable**
Use and development of adjoining uplands	☒	☐	**See Attachment, Part III, Question 5.**
Use and development of adjacent lands and properties	☒	☐	**See Attachment, Part III, Question 5.**
Improvement of coastal and inland navigation for all vessels, including small craft for recreational purposes	☒	☐	**See Attachment, Part III, Question 5.**
Pollution control	☐	☒	**Not Applicable**
Water quality	☒	☐	**See Attachment, Part III, Question 5.**
Water circulation and drainage	☒	☐	**See Attachment, Part III, Question 5.**
Recreational use of public water	☒	☐	**See Attachment, Part III, Question 5.**
Management of coastal resources	☐	☒	**Not Applicable**
Public health and welfare	☐	☒	**Not Applicable**
The protection of life and property from flood, hurricane and other natural disasters	☐	☒	**Not Applicable**

6. Identify and evaluate any potential beneficial and adverse impacts to:

a. navigation: (include federal and local navigation channels and distance to nearby docks)

See Attachment, Part III, Question 6a.

b. public access to, and public use of, public trust lands and waters waterward of mean high water:

See Attachment, Part III, Question 6b.

Walk Bridge Replacement Project Bridge Number 04288R
Norwalk CT
State Project Number 0301-0176

Part III: Project Information
(continued)
Questions 5 and 6

5. Identify whether the proposed activities will impact the following categories. If so, describe the expected impact, adding addenda as necessary as Attachment M.

5.1 Use and Development of Adjoining Uplands

The project will have minor impacts on adjoining upland communities/habitat. The minor impacts that will occur are associated largely with the loss of a narrow, ruderal upland habitat patch, which contains a high composition of invasive plant species, that has developed along the railway side slopes.

The project will not impact native upland soils or other valued surficial or bedrock geologic resources. The expansion of the bridge approach on the east side of the river may necessitate the import of suitable backfill material that will replace existing urban soils.

Existing upland vegetation will be lost due to clearing and grubbing during construction work along both bridge approaches. The entire area within the limit of disturbance will be cleared, resulting in the removal of existing vegetation and stumps. This removal is considered a permanent impact (i.e., loss of woody plant coverage within the project area). Although the existing trees and shrubs will be permanently removed, this is not anticipated to be a significant negative ecological impact due to the limited extent of the trees being removed, the largely non-native community composition, and the poor quality of the habitat affected (largely ruderal habitat that grew atop a filled slope).

Loss of herbaceous coverage will be temporary, since upon completion of the bridge approach widening construction activity, all exposed bare soil areas will be stabilized via re-seeding. Soil stabilization within the project area will be conducted as required to protect the water quality of the Norwalk River. Approved seed mixes for coastal locations will be used to return herbaceous cover to areas of disturbed soil. Invasive species control/removal will be provided as needed during the site stabilization.

5.2 Use and Development of Adjoining Lands and Properties

The project will require the use of lands and properties adjoining the project site for the construction and operation of the replacement bridge. The parcels will be used for temporary storage of construction equipment and supplies, assembly of large assembly components of the new bridge and staging of equipment, access to the Norwalk River and streets for transport of equipment and materials, access to the railroad ROW, dredged/excavated sediment temporary storage and management, and access to the bridge for maintenance. Figure 1 identifies parcels to be used for the project. CTDOT is acquiring parcels

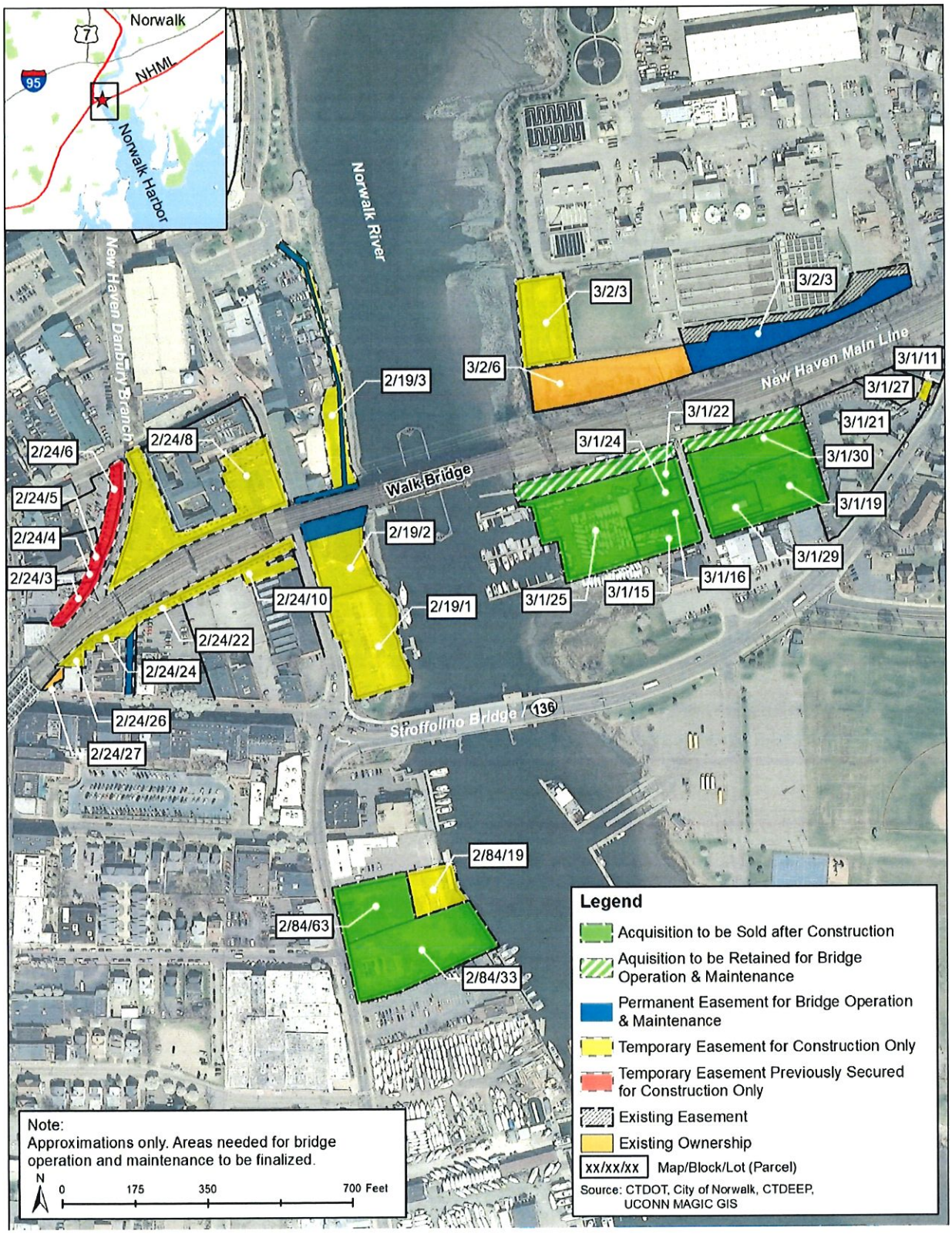

Figure 1 – Proposed Parcel Use in the Vicinity of Walk Bridge

through full and partial parcel acquisitions and full or partial parcel easements. As design progresses, CTDOT may require additional, minor right-of-way (ROW) easements for construction.

In the case of the parcels immediately adjacent to the bridge (Parcels 2/19/2, 2/19/3, and 3/1/25), CTDOT will retain permanent easements for access to the bridge for future operations and maintenance. Note that permanent access is also needed on Parcel 3/2/6, which is already owned by CTDOT. CTDOT is continuing to refine the size of the required easements for future bridge maintenance and operations. The permanent easements required on Parcels 2/19/2, 2/19/3, and 31/25 for bridge operations and maintenance may result in less available area for future development. CTDOT is finalizing the amount of areas needed for bridge operations and maintenance.

Following construction completion, the acquired parcels will be sold per CTDOT's Office of Rights of Way Property Management Division. CTDOT will provide monetary and other relocation assistance to displaced property owners in accordance with the procedures outlined in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and Connecticut's Uniform Relocation Assistance Act. For waterfront parcels (1 Goldstein Place – Parcel 3/1/25, zoned Industrial; and 90 Water Street - Parcel 2/84/33, zoned Marine Commercial), CTDOT will market the excess property indicating the highest priority and preference for water-dependent use of the site. Regarding the sale of the respective properties, State agencies are given first right of refusal. Thereafter, properties will be offered for sale by bid. Once the purchase price has been established, the City of Norwalk will be given the right of first refusal before they are offered to the public. Non-conforming parcels will only be offered to the abutting property owner(s). There are opportunities for these two parcels to be redeveloped with water-dependent uses, a priority use of waterfront parcels per the Norwalk Harbor Plan and the Connecticut Coastal Management Act.

Except for 10 North Water Street (Parcel 2/19/2, IMAX Theater), temporary easements will cease upon project completion, and properties will be restored to pre-construction conditions. The full use of Parcel 2/19/2 as a temporary easement will result in the displacement and demolition of the IMAX Theater. To mitigate impacts and compensate for the loss of the facility, CTDOT has entered into an agreement with the City of Norwalk allowing for the future development of a functional replacement facility.

5.3 Improvement of Coastal and Inland Navigation for all Vessels, Including Small Craft for Recreational Purposes

The project will improve marine traffic conditions in the Norwalk River. With the new vertical lift bridge, the reliability of bridge operations will be substantially improved. The proposed increased bridge height will reduce the frequency of bridge openings, which will benefit commercial and recreational marine users.

The elimination of the center pivot pier that divided the navigation channel at the existing Walk Bridge will result in an effective increase in the width of the navigation channel of the replacement bridge, improving passage through the replacement bridge. The widened channel at Walk Bridge via the removal of the pivot pier and fender system also will improve rowing conditions and rower (and other small boat) safety, by providing more visibility for rowers and boaters. The required channel maintenance dredging to the authorized dredge depth will straighten the alignment between Walk Bridge and the Stroffolino Bridge and

improve the navigability of the river between and through the two bridges, improving overall conditions for large and small vessel users.

A primary goal of the Walk Bridge Replacement Project design is to minimize disruptions to rail and river traffic during construction. As such, the lift span was designed and configured to allow the swing span to remain operational for boat traffic until the first of the two lift spans is ready to be installed. For most of the project duration, it is anticipated that the river will remain open to traffic by restricting construction activity to one existing channel and keeping the other channel open to marine traffic. There will be certain construction activities that will require either a vertical restriction or a complete channel closure. A vertical restriction is introduced when construction activity would prevent the safe movement of the existing swing span. CTDOT will coordinate the existing bridge removal and new bridge construction activities with the USCG Sector Long Island Sound to limit channel restrictions and outages. Aids to navigation will include Notices to Mariners, on-site signs, and lighting. Ongoing coordination with the USCG Sector Long Island Sound and the Norwalk Harbormaster will occur during the operational phase of the project

Two new developments following construction of the Walk Bridge Replacement Project will improve coastal navigation and water-dependent uses. A new bulkhead at the Marine Staging Yard (68-90 North Water Street), required to provide a mooring location for barges in support of bridge component construction, will be retained in the permanent condition. The permanent bulkhead will support navigational operations for future water-dependent uses at these parcels zoned Marine Commercial. Additionally, upon completion of the project, CTDOT is retaining a dock (waterfront of Parcel 2/19/1; 4 North Water Street) relocated for the construction-phase, for public use. The dock will be used as a permanent public fishing pier with small boat short-term docking.

5.4 Water Quality

The surface waters of the Norwalk River at the project site are identified as Class SB coastal and marine surface waters. Class SB waters have designated uses for marine fish, shellfish and wildlife habitat, recreation, industrial and other uses including navigation. Discharges into Class SB waters are restricted to those from public or private drinking water treatment systems, dredging and dewatering, and emergency and clean water discharges. This also includes cooling waters and discharges from industrial and municipal wastewater treatment facilities.

In June 2018 CTDOT conducted subsurface site investigations within the Norwalk River and at the proposed wetland mitigation areas in the vicinity of the project to determine whether dredging and other work within the river would require management of contaminated sediment. Based on the testing results, both the wetland mitigation areas and the Norwalk River are identified as a preliminary Areas of Environmental Concern (AOECs). The sediment contains Extractable Total Petroleum Hydrocarbons (ETPH), Semi-Volatile Organic Compounds (SVOCs), pesticides, and/or metals (arsenic and/or chromium) at concentrations exceeding the RSR criteria and therefore classified as contaminated material. Any sediment removed from the wetland mitigation sites and the Norwalk River is classified as contaminated material and will therefore be handled as controlled material.

The project includes specifications for the proper management and disposal of contaminated materials, including removal, handling, transporting and disposal during construction activities and for establishment of appropriate worker health and safety protocols. Excavated sediments will be managed in accordance with the CTDEEP General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) and the CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater.

As described in **Part III, Question 2b**, CTDOT will implement water quality monitoring for all in-water work during the project. Water quality monitoring will consist of monitoring for turbidity on a continuous basis in the vicinity of each turbidity producing activity. Additionally, CTDOT will monitor for specific conductivity, salinity, dissolved oxygen, pH, temperature and water level (at one location) to determine if marine life and other natural conditions may be contributing to turbidity levels and contaminants.

5.5 Water Circulation and Drainage

CTDOT is applying for individual Flood Management Certification (FMC) concurrent with this application for a Structures, Dredging & Fill, and Tidal Wetlands and 401 Water Quality Certificate. The following provides a summary of findings presented in the FMC application.

Hydraulic models were developed of the existing and proposed conditions. To ensure that the proposed bridge will not have an adverse impact to the 100-year design floodplain, the proposed conditions hydraulic model was compared to the existing conditions model. The proposed 100-year water surface elevations (WSELs) were compared to determine the proposed bridge's impact on the Norwalk River. Upstream of the project bridge, the proposed model showed no adverse impact to the 100-year floodplain, as the proposed WSELs either matched or decreased 0.01 feet compared to existing conditions. Downstream of the project bridge, WSELs increased slightly (0.01 feet) in the sections immediately downstream of the bridge. Proposed WSELs match the existing elevations further downstream. The 100-year floodplain at these sections remains within the channel. Due to the minimal variance between the existing and proposed models, the proposed 100-year floodplain limits match the existing limits. The proposed bridge exceeds the CTDOT Drainage Manual's under clearance requirement of 2 feet for large tidal structures, as it provides over 15 feet of under clearance.

During the 500-year storm event, the proposed conditions model WSELs are shown within 0.03 feet of the existing elevations. Similar to the 100-year storm event, the proposed bridge will provide over 15 feet of under clearance during the 500-year storm event. No additional properties (commercial, industrial or residential) or roadways will be impacted by the 500-year floodplain.

As described in **Part III, Question 2a**, during construction, temporary work platforms (trestles) and marine enclosures will be used within the Norwalk River, beneath and adjacent to the bridge. The proposed bridge is expected to take over four years to construct. For projects with a three year or longer construction duration, the CTDOT Drainage Manual recommends that temporary conditions be designed for the 25-year storm event. The first temporary condition (Temp 1) consists of the existing bridge, temporary work platforms, and the marine enclosures required to construct the lift piers. The second temporary condition (Temp 2) includes the existing pivot pier, existing rest piers, proposed bridge (foundation and superstructure), temporary work platforms and marine enclosures required to remove the swing span pier

and rest piers. Upstream of Walk Bridge, both temporary conditions resulted in an increase in 25-year WSELs. Temp 1 25-year WSELs were up to 0.08 feet higher than existing elevations and Temp 2 25-year WSELs were up to 0.11 feet higher than existing elevations. Downstream of the bridge, Temp 1 WSELs matched existing elevations, while Temp 2 WSELs matched existing elevations for all but for one section (0.02-foot increase). The 25-year WSELs for both temporary conditions are contained within the Norwalk River's main channel. Neither of the temporary conditions will result in adverse flooding of any commercial, residential, or industrial structures upstream of the project; nor will they impact roadways or parking lots during the 25-year temporary design event.

5.6 Recreational Use of Public Water

In the permanent condition, the project will improve the recreational use of the Norwalk River. The straightened channel alignment between Walk Bridge and the Stroffolino Bridge will greatly improve the navigability of the river between and through the two bridges, improving overall conditions for large and small vessel users. The widened channel at Walk Bridge and the removal of the pivot pier also will improve rowing conditions and rower (and other small boat) safety, by providing more visibility for rowers and boaters.

During project construction, the recreational use of the Norwalk River will be impacted. However, to the greatest extent practicable, construction activities will be coordinated to ensure activities are only taking place on one half (or occupy less than only 50% when working in the middle of the river) of the navigation channel at a time. As a result, smaller boats using the river, including rowing shells, generally will have access through the project construction area. With the exception of channel closures for specific bridge demolition and construction activities, as well as restrictions or closures due to construction equipment, one of the existing channels will be available for smaller boats without vertical clearance requirements During times of vertical restriction, taller vessels, such as sailboats or powerboats with fixed equipment extending above the vertical clearance, may be accommodated through temporary relocation to marine facilities south of Walk Bridge, or to other harbors nearby for winter storage, summer use, or both. For vessels requiring longer-term boat repairs or winter storage at upstream facilities, dropping sailboat masts downstream of Walk Bridge would facilitate passage to upstream facilities. Depending upon the mast type and boat, it may be possible for the vessel to carry the mast on-board through the construction area to its destination.

CTDOT is preparing a Marine Use Plan, a component of the project's construction coordination plans, through consultation with water-dependent users of the Norwalk River, including rowing clubs, marinas, and other commercial interests. Additionally, the construction contractor is required to prepare a Marine Safety Plan for approval by CTDOT. This plan will be developed through consultation with the USCG Long Island Sector.

6a. Identify and evaluate any potential beneficial and adverse impacts to navigation (include federal and local navigation channels and distance to nearby docks).

The project will improve marine traffic conditions in the Norwalk River. With the new vertical lift bridge, the reliability of bridge operations will be substantially improved. The proposed bridge height represents an increase from existing conditions, and will reduce the frequency of bridge openings, which will benefit commercial and recreational marine users. In the open position, the vertical clearance will match the

clearance of the governing bridge (the Yankee Doodle Bridge). With the removal of the center pivot pier, the proposed bridge will increase the effective width of the navigation channel and decrease the hazard of passage through the proposed bridge by allowing marine traffic to use the entire navigation channel. The proposed bridge will also result in a slight reduction in flood and tidal velocities due to the larger hydraulic opening. In sum, the vertical and horizontal clearances will provide for the safe, efficient passage of vessels through Walk Bridge.

The required channel maintenance dredging to the authorized dredge depth will straighten the alignment between Walk Bridge and the Stroffolino Bridge and improve the navigability of the river between and through the two bridges, improving overall conditions for large and small vessel users. The widened channel at Walk Bridge via the removal of the pivot pier will improve rowing conditions and rower (and other small boat) safety, by providing more visibility for rowers and boaters.

As cited in Section 5.3, the new permanent bulkhead at the Marine Staging Yard and the new public dock at 4 North Water Street will support navigation and water-dependent uses.

During construction, marine users will be adversely impacted at times. A primary goal of the Walk Bridge design is to minimize construction-related disruptions to rail and river traffic. As such, the swing span will remain operational for boat traffic until the first of the two lift spans is ready to be installed. For most of the project duration, it is anticipated that the river will remain open to traffic by restricting construction activity to one existing channel and keeping the other channel open to marine traffic. There will be certain construction activities that will require either a vertical restriction, a horizontal restriction or a complete channel closure. A vertical restriction is introduced when a construction activity would prevent the safe movement of the existing swing span. A horizontal restriction is introduced when temporary works being implemented for new bridge construction are temporarily placed within the limits of the navigation channel, thereby reducing the horizontal clearance. Additionally, there will be a temporary encroachment on the navigation channel from material barges at the Marine Staging Yard (although a horizontal clearance will be maintained for navigation). CTDOT will coordinate the existing bridge removal and new bridge construction activities with the USCG Sector Long Island Sound to limit channel restrictions and outages. Aids to navigation will include Notices to Mariners, on-site signs, and lighting. Ongoing coordination with the USCG Sector Long Island Sound will occur during the operational phase of the project.

An additional impact on navigation is related to the temporary relocation of the existing Maritime Aquarium and Sheffield Island Ferry vessel docks due to a conflict with bridge construction staging and access. Operations of the vessels will suspend while the temporary docks are constructed. Upon completion of the project, new docks and an observation deck for the Maritime Aquarium will be constructed in their original locations. The temporary adverse impact will ultimately result in overall improvement in navigation, however, because new docking facilities and a permanent public fishing pier will be provided.

6b. Identify and evaluate any potential beneficial and adverse impacts to public access to, and public use of, public trust lands and waters waterward of mean high water.

CTDEEP's Coastal Access Guide identifies 32 public trust lands in the city of Norwalk, many of which are located along the Norwalk River in proximity to Walk Bridge. Upriver from Walk Bridge, public trust

lands include locations at St. Ann's Club, Norwalk Rowing Club Association, Norwalk Boat Club, and Oyster Shell at Heritage Park. Downriver from Walk Bridge, public trust lands include Constitution Park, Veterans Park and public boat slips and moorings, and Calf Pasture Beach, which is located approximately 1.5 miles south of Walk Bridge. Riverfront walkways at condominiums and office developments located upriver and downriver from Walk Bridge are also considered to be public trust lands. Public trust lands adjacent to the project site include the Norwalk River Valley Trail (NRVT) on the west side of the river adjacent to the Norwalk Parking Authority (NPA)'s North Water Street parking lot; and the NRVT Harbor Loop Trail, located on the water's edge of the City's Waste Water Treatment Plant (WWTP) property on the east side of the river.

Project construction activities, including compensatory wetland mitigation, will impact portions of the NRVT on both sides of the river. Due to a construction easement on the NPA's parking lot, the portion of the NRVT adjacent to the lot may be closed to the public during construction. Access requirements to the wetland mitigation areas on the east side of the river (Areas 4 and 6) may affect public access to portions of the Harbor Loop Trail, including temporary closure of the trail. Additionally, access to Wetland Mitigation Areas 1 and 2 are proposed through Oyster Shell Park or parking areas for the park, impacting public access to portions of the park. These impacts to public trust lands will be short-term. Signage and flagging will be used during construction to minimize impacts to pedestrian and bicyclist safety. CTDOT is coordinating anticipated impacts to public trust lands and parks with the City of Norwalk.

The navigation improvements provided by this project will be a benefit for water-dependent uses, particularly for upriver commercial marine users and vessels with restricted maneuverability. This positive impact helps to mitigate the short-term effects of constrained marine passage during construction. Additionally, the City zoning and waterfront use and development policies have strong coastal use protections to provide for access to the coast and some water-dependent uses in riverfront parcels in the Inner Harbor.

The Walk Bridge Replacement Project will improve public access to and use of public trust lands near the bridge. This project will facilitate expansion of the coastal access network along the east side of the Norwalk River, providing waterfront access mitigation. CTDOT will construct an eastern path connection of the Norwalk Harbor Loop Trail via the existing and partially lowered eastern abutment of the existing bridge; the pedestrian/bicycle connection will extend south along the edge of the river, turn east, and follow the southern edge of the railroad to Goldstein Place (where the trail will join the roadway at South Washington Street). This pedestrian and bicycle connection will help facilitate the goals and vision of the Norwalk Master Plan of Conservation and Development, the Norwalk Pedestrian and Bikeway Transportation Plan (2012), the Norwalk Trail Study - Maritime Link (2014), and the Mid-Harbor Planning Study (2005). In addition to the pedestrian/bicycle connection, and as part of the project Memorandum of Agreement, CTDOT is constructing a series of interpretive panels to be located near Walk Bridge, including along the bicycle paths and in public trust areas. The interpretive panels will enhance the public use and enjoyment of public trust areas near Walk Bridge. Additionally, upon completion of the project, CTDOT is retaining a dock (waterfront of Parcels 2/19/1; 4 North Water Street) relocated for the construction-phase, for public use as a permanent public fishing pier.

Part III: Project Information (continued)

7. Describe how the proposed work will be a water-dependent use(s) of the property or will physically support water-dependent use(s) of the property, such as marinas, recreational and commercial fishing, boating facilities, shipyards and boat building facilities. Please do not include private recreation docks in this category. Include how upland facilities, such as sanitary facilities, designated parking, boat repair and sales, winter storage, etc., will support water-dependent uses on-site.

   The navigation improvements provided by this project will support water-dependent uses on the Norwalk River. With the new vertical lift bridge, the reliability of bridge operations will be substantially improved. The proposed increased bridge height of approximately 26 feet above MHW (when closed) will reduce the frequency of bridge openings, which will benefit commercial and recreational marine users. The new bridge will also offer a horizontal navigational clearance of 170 feet, with the removal of the center pivot pier, which will facilitate easier barge and tow operations through the bridge. The widened channel at Walk Bridge via the removal of the pivot pier also will improve rowing conditions and rower (and other small boat) safety, by providing more visibility for rowers and boaters. Additional dredging will straighten the alignment between Walk Bridge and the Stroffolino Bridge to improve the navigability of the river between and through the two bridges, improving overall conditions for large and small vessel users.

8. Identify and evaluate the potential adverse impacts of the proposed work upon future water-dependent development opportunities and activities.

   Following the completion of this project, the Norwalk River's water dependent development activities and opportunities in the vicinity of Walk Bridge will experience overall improvements. While project construction requirements will result in the loss of a water-dependent use at 1 Goldstein Place (Coastwise Boatworks), the project will create opportunities for expanding water-dependent uses in the city of Norwalk. In East Norwalk, CTDOT will extend the Norwalk Harbor Loop Trail along the Norwalk River, from the eastern bridge abutment to a connection at Goldstein Place. In South Norwalk, CTDOT will create a new permanent public fishing pier with small boat short term docking south of the existing Maritime Aquarium and Sheffield Island Ferry docks (waterside of Parcel 2/19/1). A new bulkhead will be constructed waterside of 68-90 Water Street, enhancing the potential for water-dependent uses at the parcel. The acquisition and resale of the waterfront parcels at 1 Goldstein Place (Parcel 3/1/25) and 90 Water Street (Parcel 2/84/33) provide opportunities to expand water-dependent uses on both sides of the Norwalk River. Following project completion, acquired parcels will be sold per CTDOT's Office of Rights of Way Property Management Division. For waterfront parcels, CTDOT will market the excess property indicating the highest priority and preference for water-dependent use of the site; CTDOT will select the highest bid that best demonstrates an integrated, quality, water-dependent use, in coordination with CTDEEP. Regarding the sale of the respective properties, State Agencies are given first right of refusal. Thereafter, properties will be offered for sale by bid. Once the purchase price has been established, the City of Norwalk will be given the right of first refusal before the properties are offered to the public. Redevelopment of these parcels with water-dependent uses is a priority use of waterfront parcels per the City of Norwalk Harbor Plan and the Connecticut Coastal Management Act. Further, the demolition of the IMAX Theater at 10 North Water Street (Parcel 2/19/2), a non-water dependent use, provides an opportunity to redevelop the parcel with water-dependent uses.

   The navigation improvements provided by the project will benefit existing and future water-dependent uses in the city, particularly for upriver commercial marine users and vessels with restricted maneuverability.

9. Discuss the alternatives to the proposed project which were considered and indicate why they were rejected.

See Attachment, Part III, Question 9.

Walk Bridge Replacement Project Bridge Number 04288R
Norwalk CT
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Part III: Project Information
(continued)
Question 9

9. Discuss the alternatives to the project which were considered and indicate why they were rejected.

Question 9 presents two alternatives analyses that were prepared for the project. Section 9.1 contains the overall project alternatives analysis, prepared in compliance with the National Environmental Policy Act/Connecticut Environmental Policy Act (NEPA/CEPA). Section 9.2 contains an analysis of the under-cable crossing for Construction Activity (CA)2, prepared to determine the least environmental impact to resources.

9.1 Walk Bridge Replacement Project Alternatives Analysis

CTDOT conducted a thorough alternatives analysis for the Walk Bridge Replacement Project, which was presented in the Environmental Assessment and Section 4(f) Evaluation/Environmental Impact Evaluation (EA/EIE), August 2016; and the Finding of No Significant Impact/Record of Decision (FONSI/ROD), issued in July 2017.

9.1.1 Initial Range of Alternatives

CTDOT identified a range of alternatives for project and grouped them into four general categories:

1. No Build (No Action) Alternative: continuing the existing operations and maintenance of the historic swing (movable) bridge;
2. Rehabilitation Alternative: rehabilitating the existing bridge to extend its useful life by 100 years, a timeframe comparable to the useful life of a new bridge;
3. Replacement Alternative – Movable Bridge: constructing a new movable bridge, of either the bascule type or vertical lift type, on the same general alignment, and demolishing the existing bridge;
4. Replacement Alternative – Fixed Bridge: constructing a new fixed (non-movable) bridge on the same or a different general alignment and demolishing the existing bridge.

More than 70 different design variations within the four groups of alternatives were initially investigated to identify representative options that consider these parameters and meet the project purpose and need. CTDOT identified and developed concepts to replace the existing Walk Bridge with dual, double-track movable spans in accordance with the design objectives for resiliency and redundancy. For a bascule movable bridge, design options included deck girder, through girder and through truss bascule bridges of both the trunnion and rolling lift genre. For a vertical lift movable bridge, design options included deck girder, through girder, or through truss vertical lift bridges with span-drive or tower-drive lift span operating systems.

CTDOT held multiple meetings with public agencies and project stakeholders, including the USACE, USCG, the City of Norwalk, Metro-North Railroad, property owners, and waterway users to ascertain concerns and requirements for the replacement bridge design and to obtain public and agency input. CTDOT also held a public scoping meeting on February 24, 2015, an agency scoping meeting on March 5, 2015, and a public information meeting on May 11, 2016. With input from these meetings, CTDOT concluded that the evaluation of alternatives would focus on a replacement of the bridge and would include consideration of a bascule movable bridge type, a through truss vertical lift movable bridge type, as well as a fixed bridge (non-movable) type with three design options of varied vertical clearances over the Norwalk River: a low-level, a mid-level, and a high-level bridge.

9.1.2 Alternatives Not Advanced for Further Evaluation

The following presents a description of the three alternatives not advanced for further evaluation.

Rehabilitation Alternative

The Rehabilitation Alternative would require rehabilitation or replacement of the existing Walk Bridge elements that would extend the bridge's design life by an additional 100 years, which is comparable to a new bridge's design life.

The Rehabilitation Alternative would include measures to increase the structural and seismic capacity of the existing bridge, portions of the existing retaining walls, and high tower structures. To remedy corrosion, section loss and insufficient load ratings of the bridge superstructure, all elements exhibiting minor section loss would be strengthened, and all elements exhibiting major section loss would be replaced. Existing rivets would be replaced with high-strength bolts. All structural steel would be cleaned and coated. To address fatigue concerns, stringers and floor beams would be replaced. All tension diagonals and truss chords would be replaced, as would gusset plates and connections. Other structural elements would be strengthened or replaced as required for increased live load capacity and seismic resistance. A combination of micropile and drilled shafts would be required to improve the stability and load carrying capacity of the existing foundations.

Although some swing span machinery has been replaced, the amount of current and predicted deterioration and wear is an issue that can only be eliminated by replacement of all operation machinery. Additionally, a complete replacement of the obsolete electrical service would be necessary to improve its electrical rating.

Repairs or partial replacements have been accomplished over the past 10 years on fender systems as well as on some track, signal and communication systems. However, to extend their functionality in the long term, full replacement of the fenders and track, signal, and communication systems is warranted.

Construction of a temporary, two-track bridge placed on an alignment immediately north of the existing bridge would be needed to allow for access to strengthen the existing masonry piers and to perform repairs on the existing structural, mechanical and electrical systems. Once this temporary bridge, or "runaround," becomes functional, train operations would shift from the existing bridge to the runaround bridge. This enables many rehabilitation measures to be completed while still accommodating rail service on the runaround. However, since the temporary runaround structure would not include a movable span and would also have a fixed bottom of structure elevation above Mean High Water, marine traffic would be limited to only those vessels that would fit under the runaround track structure. Replacement of the drive system and associated components also would require a complete channel outage.

The initial program cost of the Rehabilitation Alternative was estimated to range between $425 and $475 million in year 2020 dollars. Holistic life cycle costs, which include the operator cost, annual inspection, maintenance, and supply costs, structural repair/replacement costs, electrical repair/replacement costs, and mechanical repair/replacement costs, were determined to be approximately $9.2 million per year (annualized over the 100-year life of the bridge). Major structural repair work was estimated to be needed every 25 years, major replacement work was estimated to be needed every 30 years, and minor structural work was estimated to be needed every 15 years. Cost and schedule estimates were based on NEPA and CEPA conceptual-level designs, prevailing material costs, and estimated construction activity durations. Estimates also included preliminary assessments of operational and construction-related risks commensurate with the level of design development.

CTDOT dismissed the Rehabilitation Alternative from further evaluation because it would not meet the project needs, or existing bridge deficiencies as defined in the project Purpose and Need. Table 1 provides a summary of the Rehabilitation Alternative with respect to the project needs.

Table 1 - Project Needs Evaluation of the Rehabilitation Alternative

Project Needs	Rehabilitation Alternative
Structure age and deterioration	Many structural elements require replacement. Extended construction schedule would be required for rehabilitation. Full track closures would be required for some improvements. Unknown potential problems in installation and fit-up with rehabilitating an old structure could extend schedule and costs beyond what is forecast. This need would not be fully met.
Decreasing reliability	Initial improvement in reliability due to replacement of key components, but systems would revert to current conditions resulting in unreliability. This need would not be met.
Lack of resiliency	Key mechanical and electrical systems would remain vulnerable to coastal storm events and temperature extremes. Provision of an emergency generator could improve reliability in some circumstances. This need would not be fully met.
Safety standards	The bridge does not meet current design standards which reflect improved safety aspects. This need would not be met.
Lack of redundancy	Overall system redundancy would not be enhanced. This need would not be met.
Limited operational flexibility	The operational limitations of the existing bridge would not be improved. This need would not be met.
Difficulty of maintenance	Certain maintenance would require a full bridge closure, presenting logistical problems for train and marine traffic. This need would not be met.
Reduced rail capacity and efficiency	Long term reliability would not be improved thereby resulting in potentially reduced capacity on the NHL. This need would not be met.
Reduced dependability and capacity for marine traffic	Long term reliability would not be improved thereby resulting in continued dependability and capacity issues for marine traffic. This need would not be met.
Lack of sustainability	Although bridge rehabilitation would improve conditions in the near-term, rehabilitation would not result in a sustainable bridge in the long term. This need would not be met.

Fixed-Bridge Replacement Alternative

CTDOT developed three fixed span bridge replacement options: a low-level option, a mid-level option, and a high-level option. All three of these options lock in the vertical clearance at sixteen feet above MHW. This would limit passage for upriver businesses and recreational user's permanently. An additional scenario within the low-level fixed bridge option also was considered: a low-level fixed bridge rehabilitation option.

Low-Level Fixed Bridge Option. The low-level option would be a fixed bridge generally located on the existing horizontal and vertical alignments. Two scenarios within the low-level fixed bridge replacement option were assessed: a low-level fixed bridge replacement option and a low-level fixed bridge rehabilitation option.

The low-level fixed bridge replacement option would involve constructing a new replacement bridge on the existing horizontal and vertical alignments. New foundations (substructure) would be required, and the new bridge would extend approximately 30 feet beyond the existing east abutment and approximately 100 feet beyond the existing west abutment. To keep the depth of the new bridge substructure as shallow as possible, new bridge span lengths of approximately 100 feet or less were included as part of the conceptual design of the low-level replacement option. In this option, the railroad tracks of the replacement bridge would be elevated by four feet over existing conditions, providing a vertical clearance of 20 feet over mean high water (MHW). This option would not require the replacement of Fort Point Street Bridge, but it would require the construction of retaining walls totaling approximately 300 feet west of the bridge and approximately 500 feet southeast of the bridge.

The low-level fixed bridge rehabilitation option would involve converting the existing swing span to a fixed structure and rehabilitating the existing bridge to promote the extended service life and reliability of the structure as a non-movable bridge. A rehabilitated low-level fixed bridge would provide the same vertical clearance as the existing bridge - 16 feet over MHW. This option would use the existing bridge foundations, and except for the mechanical and electrical requirements of the swing span, it would have the same requirements as the Rehabilitation Alternative.

CTDOT estimated the construction and program cost of the low-level fixed bridge replacement option to range between $290 and $340 million in 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $5.6 and $6.1 million per year. CTDOT estimated the construction and program cost of the low-level fixed bridge rehabilitation option to range between $410 and $460 million in 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $6.0 and $6.5 million per year. Cost and schedule estimates were based on NEPA and CEPA conceptual-level designs, prevailing material costs, and estimated construction activity durations. Estimates also include preliminary assessments of operational and construction-related risks commensurate with the level of design development.

Mid-Level Fixed Bridge Option. The mid-level option would be a fixed bridge with a top of track profile approximately 7 feet higher than the existing bridge. For this option, the Norwalk River would be crossed by two deck plate girder spans to the west and two deck plate girder spans to the east of a 170-foot through plate girder navigation span. This bridge option would provide 34 feet of vertical clearance over Mean High Water, an increase of 18 feet over existing conditions. This span arrangement would place three piers in the river with a horizontal navigation clearance of approximately140 feet. The through plate girder, while minimizing structure depth, would change the horizontal railroad track alignment, because it would require more space between Tracks 1 and 2 than currently exists (approximately 25 feet as compared to the

existing 12.5 feet). Similar to the low-level bridge option, the total bridge length of the mid-level option would be 865 feet. It would extend approximately 270 feet to the west of the existing bridge's west abutment, and approximately 30 feet to the east of the existing bridges east abutment. Rail work would be required to accommodate the grade raise and change in horizontal alignment. Similar to the low-level option, this option would require retaining walls. Retaining wall lengths of 120 feet to the west and 1,000 feet to the east would be required. The rail work required to accommodate the grade raise would impact approximately 1,400 linear feet along the tracks (not including cross over track, high tower and OCS work).

CTDOT estimated the construction and program cost of the mid-level option to range between $320 and $370 million in year 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $4.3 and $4.8 million per year. Cost and schedule estimates were based on NEPA and CEPA conceptual-level designs, prevailing material costs, and estimated construction activity durations. Estimates also include preliminary assessments of operational and construction-related risks commensurate with the level of design development.

High-Level Fixed Bridge Option. The high-level option would be a fixed bridge with a top of track profile approximately 35 feet higher than the existing bridge. The horizontal alignment would be similar to that of the mid-level bridge option. For this option, the navigational channel of the Norwalk River would be crossed by a 170-foot through plate girder span resulting in a 140-foot horizontal navigational clearance. This bridge option would provide 60 feet of vertical clearance, matching the vertical clearance of the upstream I-95 bridge. The through plate girder, while minimizing structure depth, would require more space between Tracks 1 and 2 than currently exists. The total bridge length is estimated to be 4,300 feet bridge and an additional 1,600 feet of rail work would be required to accommodate the substantial increase in grade. This additional rail work would extend approximately from the South Norwalk Station on the west to 600 feet beyond Osborne Avenue on the east. Approximately 1,000 feet of the Danbury Branch would require reconstruction to accommodate the re-connection to the main line tracks.

CTDOT estimated the construction and program cost of the high-level option to be more than $1 billion in year 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $3.8 and $4.3 million per year. Cost and schedule estimates were based on NEPA and CEPA conceptual-level designs, prevailing material costs, and estimated construction activity durations. Estimates also include preliminary assessments of operational and construction-related risks commensurate with the level of design development.

Summary Evaluation. CTDOT dismissed the three options for the Fixed Bridge Replacement Alternative. Table 2 presents an evaluation of the three options of the Fixed Bridge Replacement Alternative relative to the project needs, or deficiencies of the existing bridge as stated in the project Purpose and Need. The low-level fixed bridge option would reduce the capacity for marine traffic passing beneath the bridge and therefore would not meet this part of the project Purpose and Need. The high-level fixed bridge option would meet all aspects of the project Purpose and Need, but it would result in a high level of environmental impact because the bridge and approaches would be on a much higher vertical alignment and it would be more than three times as expensive as the other fixed bridge options. Similar to the low-level fixed bridge option, the mid-level bridge option would reduce the capacity for marine traffic crossing under the bridge, albeit to a lesser extent than the low-level fixed bridge. Therefore, the mid-level bridge option would not meet this part of the project Purpose and Need.

Table 2 - Project Needs Evaluation of the Fixed Bridge Alternative Options

Project Needs	Fixed Bridge Low-Level Option	Fixed Bridge Mid-Level Option	Fixed Bridge High-Level Option
Structure age and deterioration	As a replacement bridge, this need would be met.	As a replacement bridge, this need would be met.	As a replacement bridge, this need would be met.
Decreasing reliability	As a fixed bridge, the reliability of a movable bridge would not be an issue and therefore this need would be met.	As a fixed bridge, the reliability of a movable bridge would not be an issue and therefore this need would be met.	As a fixed bridge, the reliability of a movable bridge would not be an issue and therefore this need would be met.
Lack of resiliency	As a fixed bridge, the susceptibility of movable bridge mechanical and electrical systems would not be an issue. Clearance above the 500-year flood elevation would be provided. This need would be met.	As a fixed bridge, the susceptibility of movable bridge mechanical and electrical systems would not be an issue. Clearance above the 500-year flood elevation would be provided. This need would be met.	As a fixed bridge, the susceptibility of movable bridge mechanical and electrical systems would not be an issue. Clearance above the 500-year flood elevation would be provided. This need would be met.
Safety standards	As a replacement bridge designed and built to current standards, this need would be met.	As a replacement bridge designed and built to current standards, this need would be met.	As a replacement bridge designed and built to current standards, this need would be met.
Lack of redundancy	As a fixed bridge, structural redundancy can be designed into the structure and mechanical and electrical systems redundancy is not an issue. This need would be met.	As a fixed bridge, structural redundancy can be designed into the structure and mechanical and electrical systems redundancy is not an issue. This need would be met.	As a fixed bridge, structural redundancy can be designed into the structure and mechanical and electrical systems redundancy is not an issue. This need would be met.
Limited operational flexibility	As a replacement bridge designed and built to current standards, this need would be met.	As a replacement bridge designed and built to current standards, this need would be met.	As a replacement bridge designed and built to current standards, this need would be met.
Difficulty of maintenance	As a replacement bridge, designed and built to current standards, this need would be met.	As a replacement bridge, designed and built to current standards, this need would be met.	As a replacement bridge, designed and built to current standards, this need would be met.

Project Needs	Fixed Bridge Low-Level Option	Fixed Bridge Mid-Level Option	Fixed Bridge High-Level Option
Reduced rail capacity and efficiency	As a replacement bridge designed and built to current standards, reliability and other factors affecting rail capacity and efficiency are not issues. Therefore, this need would be met.	As a replacement bridge designed and built to current standards, reliability and other factors affecting rail capacity and efficiency are not issues. Therefore, this need would be met.	As a replacement bridge designed and built to current standards, reliability and other factors affecting rail capacity and efficiency are not issues. Therefore, this need would be met.
Reduced dependability and capacity for marine traffic	As a fixed bridge, the vertical clearance cannot be increased by opening the bridge. The vertical clearance is increased by 4 feet over the existing vertical clearance when closed but some boats will no longer be able to pass upstream of the Walk Bridge. This need would not be met.	As a fixed bridge, the vertical clearance cannot be increased by opening the bridge. The vertical clearance is increased by 18 feet over the existing vertical clearance when closed but some boats will no longer be able to pass upstream of the Walk Bridge. This need would not be met.	The vertical clearance would be the same as that provided under the upstream I-95 bridge. This need would be met.
Lack of sustainability	As a replacement bridge designed and built to current standards, this need would be met.	As a replacement bridge designed and built to current standards, this need would be met.	As a replacement bridge designed and built to current standards, this need would be met.

9.1.3 Alternatives Advanced for Further Evaluation

No Build Alternative

The No Build (No-Action) Alternative would retain the existing bridge and provide for normal maintenance activities during the life of the bridge. There would not be any major rehabilitation or replacement of structural elements, foundation elements, mechanical components, or electrical systems. The existing high towers would be retained and undergo normal maintenance by the owner.

In compliance with the National Environmental Act/Connecticut Environmental Policy Act (NEPA/CEPA), CTDOT evaluated the No Build Alternative in the EA/EIE to describe the transportation conditions that would occur if no actions other than normal maintenance were conducted, and for comparison to the Build Alternative. However, the No Build Alternative would not meet the project needs, or existing bridge deficiencies, as summarized in Table 3. CTDOT determined that the No Build Alternative was not a viable alternative.

Table 3 - Project Needs Evaluation of the No Build Alternative

Project Needs	No Build Alternative
Structure age and deterioration	Normal maintenance would not prolong the structure's useful life. This need would not be met.
Decreasing reliability	Bridge failures would likely increase and worsen. This need would not be met.
Lack of resiliency	Key mechanical and electrical systems would continue to be vulnerable to storm surges and other weather events. This need would not be met.
Safety standards	Current design standards for safety, which are currently not met, would remain unmet. This need would not be met.
Lack of redundancy	Single structure causes closure of all tracks if bridge fails and for some maintenance activities. This need would not be met.
Limited operational flexibility	This need would not be met.
Difficulty of maintenance	Full closure of all tracks would be required for some maintenance activities. This need would not be met.
Reduced rail capacity and efficiency	The unreliable nature of the bridge would reduce capacity on the NHL. This need would not be met.
Reduced dependability and capacity for marine traffic	Bridge failures would obstruct marine traffic. This need would not be met.
Lack of sustainability	Increased maintenance would be required and the bridge could eventually fail to operate, causing stoppages of rail and marine traffic. This need would not be met.

Movable Bridge Replacement Alternative

CTDOT retained and advanced the Movable Bridge Replacement Alternative for further evaluation as the Build Alternative in the EA/EIE. Two types of bridges were considered and advanced: a rolling lift bascule bridge (Option 4S) and a through truss vertical lift bridge (Option 8A). A variation of the vertical lift bridge type with a longer span also was advanced (Option 11C). CTDOT determined that the three movable bridge options represented bascule and vertical lift bridge types as a balance of user needs, engineering, environmental, cost, and constructability needs and constraints. CTDOT further determined that as design progressed on a bridge type, design refinements such as modifying final span lengths and other dimensional attributes would be possible.

Bascule Bridge Movable Bridge Option (Option 4S). The bascule bridge movable bridge option (Option 4S) would provide two side by side single-leaf rolling lift bascule spans across the Norwalk River, each with separate mechanical and electrical equipment and controls so that each span can work independently

of the other, or in unison with the other. It would provide a vertical clearance of approximately 27 feet above mean high water (MHW) when the movable span is in the closed position, and a vertical clearance of at least 60 feet when the movable span is in the opened position. When closed, the vertical clearance of the Bascule Bridge is increased by approximately 11 feet over the existing vertical clearance of 16 feet due to the design of the structure. However, the top of rail elevations on the new bridge would be approximately the same as the top of rail elevations on the existing bridge. A horizontal clearance of at least 120 feet would be provided for navigation, and the alignment of the navigation channel under the new bridge with the alignment of the navigation channel under the Stroffolino Bridge would be improved.

The rolling bascule spans would be comprised of 170-foot movable truss spans with overhead counterweights. As the span moves, the structure would be supported by curved segmental girders that are connected to the bascule span and the counterweight. As the span rotates during movements, it would also translate, or roll, horizontally, with the movements guided by the curved segmental girder. The overhead counterweights would be configured to permit the counterweights to pass to the outside of the adjacent fixed approach spans. The drive machinery, electrical components, and controls for operating the span would be located above track level, improving the resiliency of the systems by offering protection from high water events. The new movable spans would each carry two tracks: Tracks 1 and 3 on the northern span and Tracks 2 and 4 on the southern span. The tracks would be on a non-parallel alignment with adequate spacing between the two center tracks (Tracks 1 and 2) to accommodate structural and mechanical clearances. With this non-parallel alignment, the total width of the two bridge structures would vary from approximately 50 feet at the western abutment to 95 feet at the eastern abutment. The movable spans would be flanked by four spans on the western side and two spans on the eastern side. These approach spans would be fixed spans and would not move. Including the approach spans, the total length of Walk Bridge would be approximately 650 feet from bridge abutment to bridge abutment.

The bascule bridge would be supported by new abutments at each end and by six intermediate bridge piers, including the bascule pier and the bascule rest pier. The foundations for the bascule piers, rest pier, and intermediate pier supporting the new control house (to be located on the southern end of the intermediate pier) would be in the Norwalk River and would be comprised of drilled shafts installed into bedrock with a cap beam connecting the drilled shafts. The bascule pier would consist of two adjacent, open piers that support the rolling bascule span structural elements. A new fender system would be constructed approximately 10 feet from the new bascule and rest piers to protect them, providing at least 120 feet of horizontal clearance in the navigation channel. The fenders would be supported by concrete or steel piles. Navigational lighting in accordance with USCG standards would be installed.

The existing Walk Bridge and fender system would be dismantled and removed. This would include removal of the foundations and fender supports in the river to a depth to be determined in consultation with USACE and USCG. The existing western bridge abutment would be removed in its entirety, while the eastern abutment would be retained and partially lowered so that the remaining portions of the abutment can be used as a retaining wall to support an extension of the bike/pedestrian trail north of the bridge to areas south of the bridge.

The construction cost of the bascule bridge movable bridge option was estimated to range between $330 and $365 million in year 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $3.4 and $3.9 million per year.

Short Span Vertical Lift Movable Bridge Option (Option 8A). The short span vertical lift bridge option (Option 8A) would provide two side-by-side vertical lift spans across the Norwalk River, each with separate

mechanical and electrical equipment and controls so that each span can work independently of the other, or in unison with the other. A span-drive vertical lift bridge with a 170-foot open-deck through-truss lift span would provide a minimum of 120 feet of horizontal navigational clearance and 60 feet of vertical clearance when the span is fully raised. There would be two separate lift spans, one through-truss span for Tracks 1 and 3 and one through-truss span for Tracks 2 and 4, providing system redundancy. The tracks would be on a parallel alignment across the Norwalk River, resulting in the two movable spans being parallel with one another. Track spacing between Tracks 1 and 2 would be 25 feet to allow for structural and mechanical system clearance between the adjacent lift spans. The alignment of Tracks 1 and 3 would remain close to the current alignment, while the alignment of Tracks 2 and 4 would be shifted to the south to accommodate the increase in center track spacing. The total width of the bridge would be approximately 70 feet. The lift span would provide approximately 27 feet of vertical clearance above Mean High Water in the closed position, which would be approximately 11 feet more than the vertical clearance of the existing swing span. To achieve 60 feet of vertical clearance at mean high water, the lift span would be raised 35 feet above the profile of the existing bridge. The bridge tower heights would be determined during final design and would range between approximately 100 and 150 feet above the top of the support piers. The movable spans would be flanked by four spans on the western side and two spans on the eastern side. These approach spans would be fixed spans and would not move. Including the approach spans, the total length of Walk Bridge would be approximately 690 feet from bridge abutment to bridge abutment.

The bridge would be supported by new abutments at each end and by six intermediate bridge piers, including the vertical lift bridge piers. The foundations for the vertical lift span piers and one intermediate pier would be in the Norwalk River and would be comprised of drilled shafts installed into bedrock, with a cap beam connecting the drilled shafts. The western bridge abutment would be located approximately 100 feet further west than the existing abutment to avoid construction conflicts with the existing abutment, high tower foundations, and retaining walls. A new control house would be located on the southern end of the east vertical lift span pier. A new fender system would be constructed approximately 10 feet from the new vertical lift span piers to protect them, providing at least 120 feet of horizontal clearance in the navigation channel. The fenders would be supported by concrete, steel or composite material piles. Navigational lighting in accordance with USCG standards would be installed.

The existing Walk Bridge and fender system would be dismantled and removed. This would include removal of the foundations and fender supports in the river to a depth to be determined in consultation with USACE and USCG. The existing western bridge abutment would be removed in its entirety, while the eastern abutment would be retained and partially lowered so that the remaining portions of the abutment can be used as a retaining wall to support an extension of the bike/pedestrian trail north of the bridge to areas south of the bridge.

The construction cost of the short span vertical lift movable bridge option was estimated to range between $380 and $415 million in year 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $3.4 and $3.9 million per year.

Long Span Vertical Lift Movable Bridge Option (Option 11C). Like the short span vertical lift bridge option, a long-span vertical lift movable bridge option (Option 11C) would provide two side-by-side vertical lift spans across the Norwalk River, each with separate mechanical and electrical equipment and controls so that each span can work independently of the other, or in unison with the other. A vertical lift bridge with a 240-foot open-deck through-truss lift span would provide a minimum of 200 feet of horizontal navigational clearance and 60 feet of vertical clearance when the span is fully raised. There would be two

separate lift spans, one through-truss for Tracks 1 and 3 and one through-truss for Tracks 2 and 4, providing system redundancy. The tracks would be on a parallel alignment across the Norwalk River, resulting in the two movable spans being parallel with one another. Track spacing between Tracks 1 and 2 would be 25 feet to allow for structural and mechanical clearance between the lift spans. The alignment of Tracks 1 and 3 would remain close to the current alignment, while the alignment of Tracks 2 and 4 would be shifted to the south to accommodate the increase in center track spacing. The total width of the bridge would be approximately 70 feet. The lift span would provide approximately 27 feet of vertical clearance in the closed position, which would be approximately 11 feet more than the vertical clearance of the existing swing span. To achieve 60 feet of vertical clearance at mean high water, the lift span would be raised 35 feet above the profile of the existing bridge. Like the short-span vertical lift bridge option, the bridge tower heights of the long-span vertical lift bridge option would be determined during final design and would range between approximately 100 and 150 feet above the top of the support piers. The movable spans would be flanked by four spans on the western side and one span on the eastern side. These approach spans would be fixed spans and would not move. Including the approach spans, the total length of the Walk Bridge would be approximately 690 feet from bridge abutment to bridge abutment.

The bridge would be supported by new abutments at each end and by five intermediate bridge piers, including the vertical lift bridge piers. The eastern lift pier would be located further east than the eastern lift pier for the short-span vertical lift bridge (Option 8A), thus increasing the span length and the horizontal clearance between the vertical lift bridge piers. Both piers supporting the vertical lift span towers would be placed outside of the limits of the existing swing span, with no new foundation construction occurring in either the west or east navigation channels, as currently defined by the existing swing span. The foundations for the vertical lift span piers would be in the Norwalk River and would be comprised of drilled shafts installed into bedrock, with a cap beam connecting the drilled shafts. The western bridge abutment would be located approximately 100 feet further west than the existing abutment to avoid construction conflicts with the existing abutment, high tower foundations, and retaining walls. Although not the intent of the abutment relocation, this action would result in a more open environment on the west side of North Water Street under the bridge. A new control house would be located on the southern end of the east vertical lift span pier.

A new fender system would be constructed approximately 10 feet from the new vertical lift span piers to protect them, providing at least 200 feet of horizontal clearance in the navigation channel. The fenders would be supported by concrete, steel, or composite piles. Navigational lighting in accordance with USCG standards would be installed.

The differences between the short-span and long-span vertical lift bridge options lie in the pier placement and span length between the east and west bridge abutments of the Walk Bridge. Beyond these abutments, the improvements to the corridor approaching the Walk Bridge would be the same for the short span or long span options of the vertical lift bridge. The railroad corridor approaching the bridge from the west would be on retained fill. The existing retaining walls would be replaced with new retaining walls along both sides of the corridor for approximately 350 feet. These two new retaining walls would be constructed within the railroad right-of-way in the same general location as the existing retaining walls. The work would not extend to the Danbury Branch interlocking but would end approximately 100 feet east of this interlocking, which is approximately 250 feet east of the existing Washington Street Bridge.

The existing Walk Bridge and fender system would be dismantled and removed. This would include removal of the foundations and fender supports in the river to a depth to be determined in consultation with

USACE and USCG. The existing western bridge abutment would be removed in its entirety, while the eastern abutment would be retained and partially lowered so that the remaining portions of the abutment can be used as a retaining wall to support an extension of the bike/pedestrian trail north of the bridge to areas south of the bridge.

The construction cost of the long-span vertical lift movable bridge option was estimated to range between $425 and $460 million in year 2020 dollars. Life cycle costs, equalized to present worth of 100-year life, were estimated to range between $3.7 and $4.2 million per year.

Non-Bridge Project Elements. In addition to replacement of Walk Bridge, the Walk Bridge Replacement Project would include other improvement elements that would apply in all three options. The railroad corridor approaching the bridge from the west would be on retained fill. The existing retaining walls would be replaced with new retaining walls along both sides of the corridor for approximately 350 feet. These two new retaining walls would be constructed within the railroad right-of-way in the same general location as the existing retaining walls. The work would not extend to the Danbury Branch interlocking but would end approximately 100 feet east of this interlocking, which is approximately 250 feet east of the existing Washington Street Bridge.

East of Walk Bridge, the project would continue on the existing railroad corridor location with construction of a new retaining wall within the existing right-of-way on the southern side of the corridor. A retaining wall would not be necessary on the north side of the corridor in the area from the Walk Bridge to Fort Point Street. The project would extend east to a point approximately 300 feet east of the Fort Point Street Bridge. The railroad bridge over Fort Point Street would be replaced.

Track, catenary, and signal work would be performed in addition to the work to replace Walk Bridge. Track work would include replacing about one-half-mile of tracks and ballast within the existing railroad right-of-way from approximately the Washington Street Bridge to approximately 300 feet east of the Fort Point Street Bridge. Overhead catenary and supports would be replaced within the limits of the project, generally from the Washington Street Bridge to a point approximately 300 feet east of the Fort Point Street Bridge. All approach track, catenary and signal work for the project would be within the existing state right-of-way.

The project would require the removal of the two existing high towers which carry Eversource Energy high voltage power and Metro-North Railroad communications over the Norwalk River. These towers do not meet current structural design standards and would conflict with the replacement bridge and associated track alignments. CTDOT would be responsible for removing the existing high towers as part of the Walk Bridge Replacement Project. Several options for replacement of the utility functions that exist on the high towers are under consideration from engineering, cost, environmental, and historical perspectives. Metro-North communication functions will potentially be carried on the new bridge on either side of the movable span, transitioning to a placement beneath the Norwalk River at the navigation channel. Eversource Energy would be responsible for relocating its lines and securing the associated environmental reviews and permits.

The project would require dredging those portions of the river under the bridge that are not currently maintained as part of the federal navigation channel. The depth of dredging would match the federal channel depth of ten feet and tie into the existing 125-foot navigation channel that exists upstream of the bridge and the 100-foot navigation channel that exists downstream of the bridge.

Summary Evaluation. Table 4 presents an evaluation of the Movable Bridge Replacement (Build) Alternative relative to the project needs, or deficiencies of the existing bridge as stated in the project Purpose

and Need. CTDOT determined that the Build Alternative is the only alternative that satisfies the project Purpose and Need.

Table 4 - Project Needs Evaluation of the Movable Bridge Replacement (Build) Alternative

Project Needs	Movable Bridge Alternative
Structure age and deterioration	The project will fully replace the existing bridge with a new structure with an estimated 100-year life span. This need will be met.
Decreasing reliability	The project will replace all mechanical and electrical components, providing for a reliable bridge structure. This need will be met.
Lack of resiliency	The project will substantially improve the bridge's resistance to severe weather events. The replacement bridge will be located above the required elevation for critical actions (mechanical systems). Key structural elements of the replacement bridge will withstand inundation levels of a Category 3 and Category 4 hurricane, in comparison to the existing bridge's ability to withstand inundation levels of a Category 1 and Category 2 hurricane. The replacement bridge will allow storms to flow through the bridge without inundating or impacting the bridge's main span, including beams, deck, ballast, and rails. In all category storm events, storms will not impact critical mechanical and electrical elements in the control house or machine room. This need will be met.
Safety standards	The project will be designed to current design standards. The existing bridge does not meet current design standards which reflect improved safety aspects compared to when the bridge was originally designed and built. Minimum requirements (loading, safety margins, etc.) for the design of railroad bridges have evolved throughout the twentieth century to reflect increases in demands on the infrastructure and advances in materials, methods, and technology. The project will incorporate safety and security measures, including a CCTV system, exterior lighting located along the bridge structure, and navigation lighting to meet USCG requirements. The CCTV system will provide for increased security relative to operations (bridge, navigation channel, and boat traffic) and surveillance (pedestrian and vehicular activity, control house and exit and entrance points, and anchorage and pier points). This need will be met.
Lack of redundancy	The project will provide operational redundancy through the construction of two independent bridge spans, each with separate mechanical and electrical equipment and controls, which will minimize the potential for rail operation disruptions. This need will be met.
Limited operational flexibility	The project will maximize operational flexibility through construction of two independent bridge spans. Dual mechanical and electrical systems will be

Project Needs	Movable Bridge Alternative
	provided for each movable span, so that if the selected main drive system is inoperable, the alternative system can be used. This need will be met.
Difficulty of maintenance	The project will facilitate ease of regular maintenance, including in-water maintenance, by allowing for a closure of one span while the second span remains available for rail traffic operations. This need will be met.
Reduced rail capacity and efficiency	The project will correct existing deficiencies which directly impact Metro-North and Amtrak daily train service, particularly on-time performance (OTP). Combined with the CTDOT's planned improvements to the New Haven Line, the project will increase rail efficiencies, contribute to Metro-North's and Amtrak's passenger ridership and OTP goals, and accommodate Providence and Worcester Railroad Company's freight service needs, including weight standards. This need will be met.
Reduced dependability and capacity for marine traffic	The project's increased vertical clearance will reduce the frequency of bridge openings, which will benefit commercial and recreational marine users. The additional horizontal clearance will facilitate easier barge and tow operations. The required dredging will enhance the federal navigation channel by straightening the alignment between Walk Bridge and the Stroffolino Bridge and improving the navigability of the river between and through the two bridges. This need will be met.
Lack of sustainability	The project will incorporate sustainable materials to provide protection from accelerated corrosion due to condensation, cold weather conditions, and the marine environment. Project elements will be located to facilitate access and ease of maintenance. This need will be met.

9.1.4 Determination of Preferred Alternative

CTDOT considered the project purpose and need, engineering, constructability, potential impacts to rail and navigation traffic, estimated costs, and potential environmental impacts of the alternatives and options. With public input, CTDOT determined that the Build Alternative, specifically the Replacement Alternative – Movable Bridge, Long Span Vertical Lift Bridge (Option 11C), is the Preferred Alternative. Each of the three design options for the Build Alternative would have similar environmental impacts. However, construction requirements and the associated impact to rail and navigation traffic, as well as the costs of the three design options, would be different.

The existing bridge, in whole or in part, is expected to remain in service throughout a major portion of the construction duration. Maintaining the integrity of the existing bridge, in particular the foundations, is imperative to minimizing disruptions to rail and navigation traffic. Therefore, bridge replacement options requiring activities that limit proximity exposure of the existing bridge during construction are viewed

favorably. For example, designs with foundations located near the existing supports, specifically the pivot pier, exhibit more risk than other designs. The long span vertical lift option (Option 11C) is the only alternative for which all foundations are located beyond the limits of the existing swing span.

Superstructure erection for all options will require a two-track outage. However, the amount of substructure work that can be completed without service disruptions (from a four-track operation to a two-track operation) would vary among the options. The design concept that allows for conducting the largest portion of substructure work in advance of an outage, along with the shortest period of superstructure construction, is expected to require the shortest overall construction duration. The shortest construction duration generally corresponds with the least disruptions to rail, maritime, and other users. Option 11C offers the greatest opportunity for maximum substructure construction prior to imposing a two-track outage, thereby minimizing the remaining duration of construction once the outage takes effect.

Designs that present fewer challenges during scheduled outages will have less risk of extending those outages and prolonging the disruptions to commuters and waterway users. The east movable span foundations for the bascule bridge option (Option 4S) and the short span vertical lift bridge (Option 8A) would be in the existing east navigation channel. Equipment access for float-in installation of the new lift spans is, therefore, obstructed by the existing pivot pier and limited to the west channel unless the pier is removed in advance of the span installation, indicating that additional temporary support is required for the tracks remaining in service. Option 4S also exhibits a highly asymmetric and unbalanced lift span configuration, further complicating a float-in installation. Symmetry and balance are favorable characteristics of Option 8A and Option 11C. Additionally, access to both channels would mitigate the pivot pier obstruction, presenting a potential advantage for Option 11C over Option 8A.

Work in the river is inherently riskier than work that is not in the water. For Option 11C, the elimination of the eastern intermediate approach span pier and the location of the east lift span tower foundation closer to shore, outside the navigation channel, and in shallower water (compared to Option 4S and Option 8A), introduce clear advantages regarding risks associated with in-water construction.

Option 11C exhibits navigation advantages over Option 4S and Option 8A by not blocking the east channel and thereby delaying immobilization of the swing span. Construction equipment can be operated on one side of the existing pivot pier while maintaining safe vessel transit through the bridge on the opposite side. Since the swing span would be operational until it is removed, over-height vessels could pass through the bridge, albeit on a restricted schedule that balances construction efficiency with the reasonable needs of safe, efficient navigation. Based on the configuration of the new movable spans and the associated track alignment, Option 11C does not require the use of a temporary runaround bridge during construction.

Option 8A introduces a vertical navigation restriction prior to completion of the lift span towers due to locking down the swing span for partial demolition or replacement with a non-movable temporary span. Option 4S requires removal of the existing bridge in the east channel to install the bascule pier foundations, thereby imposing a vertical restriction with temporary spans for drilled shaft installation, which is earlier in the construction sequence than Option 8A.

The environmental impacts of the three design options are comparable. All options would require that the historic Walk Bridge and high towers be demolished. Fort Point Street Bridge also would be replaced in all options. In general, all other environmental impacts would be similar. The bascule bridge option (Option 4S) would require a wider bridge and project footprint on the east side of the Norwalk River than the two vertical lift bridge options. The footprint impacts of the options to natural resources would be comparable;

however, the impacts of the bascule bridge to tidal wetlands and subtidal habitat would be slightly higher than the vertical lift bridge options. When the impacts associated with a temporary runaround bridge are considered, some impacts would be further increased. In all cases, the long span vertical lift bridge option (Option 11C) would have the same or slightly less impact to natural resources than the short span vertical lift option (Option 8A).

The existing high towers present prominent vertical elements at the site and they contribute to the overall historic character of the project area. As previously noted, these latticed high towers must be removed. A potential advantage of the vertical lift bridge options (Option 8A and 11C) is that these options will reintroduce a prominent vertical element to the site and will offer flexibility, as the design advances, to retain this vertical element and continue to contribute to the character of the project area.

Option 11C will require the shortest overall time from commencement of Walk Bridge construction to restoration of four-track service and full operation capability for marine traffic. More construction activities can be undertaken while the existing swing span is operational with Option 11C, thereby reducing the vertical navigation restrictions during construction compared to the other two options. Two-track rail operation with Option 11C is shorter than Option 8A and Option 4S, thus minimizing the duration of rail restrictions during construction. Construction of Option 11C will result in less disruption to rail service and navigational traffic during construction. Temporary track outages, temporary channel restrictions or closures, and temporary street detours could potentially affect business operations around construction. Selection of Option 11C minimizes this temporary disruption by minimizing the duration of construction activities, restrictions, or closures. As a result, this Option 11C corresponds with the least social and economic risks and impacts to the City of Norwalk and the larger region. While the estimated costs of Option 11C are higher than the other two design options, CTDOT determined that Option 11C's shorter construction duration and reduced disruption to rail traffic along the Northeast Corridor and navigation traffic on the Norwalk River, along with lower environmental impacts, outweighs its additional costs. Therefore, Option 11C, the long span vertical lift movable bridge option is the Preferred Alternative for the Walk Bridge Replacement Project.

9.2 Under-Channel Cable Crossing Alternatives Evaluation

Construction Activity (CA) 2 presents plans for the routing of Metro-North Railroad (MNR) traction power cables and communication and signal cables, as well as bridge power and controls, across the channel of the Norwalk River. The cables for the north half of the bridge and the south half of the bridge will be separated into two separate 42-inch diameter pipes, contained in individual fusible polyvinyl chloride (PVC) conduits inside the fully-grouted high-density polyethylene (HDPE) pipes, and routed across the channel. CTDOT conducted an evaluation of two options for crossing the Norwalk River: 1) cut and cover (CAC) installation method and 2) horizontal directional drilling (HDD). The two construction methods for the under-channel cable crossing were evaluated based on constructability, schedule, environmental impacts, local impacts, costs, and the risks associated with each category.

The CAC installation method is a traditional construction method of placing the pipe at the desired elevation by excavating and removing material to create a trench, placing the pipes and then backfilling the trench. The CAC route would be constrained by obstacles in the channel that cannot be removed, construction activities, and available space for the tie-in and pipe laydown area.

HDD is a construction method that uses guided drill rigs to install pipe underground. This method reduces excavation and backfill and can potentially avoid obstacles by drilling beneath the obstacle. The HDD route would be constrained by available staging and pipe laydown area, adjacent construction activities, soil density and stratification, soil cover above the pipe path, reasonable entry angles, distance to existing obstructions (including utilities), minimum drill and pipe bend radius, and existing soil fissures such as boring holes or removed piles. If the soil is too soft or there isn't enough confining overburden pressure, then it is harder to steer the drill and the risk for leaking drilling fluid also increases. This is referred to as frac-out. Soil layers with cobbles and boulders are more difficult to drill through.

CTDOT determined that the CAC option has more advantages than the HDD option, including lower cost and lower risk. The HDD option would be limited in the horizontal and vertical layout due to soil layers, geometric constraints of the drill rig, existing building and infrastructure, obstructions in the channel, and available staging areas. In addition, the HDD option would adversely impact the businesses and residents on North Water Street. The CAC option will have environmental impacts; however, impacts are temporary and similar to the channel dredging impacts, which is allowed during the USACE mandated window. Frac-out, a risk of the HDD method, is a more serious environmental concern. The CAC option does not have any risk of frac-out and has a lower schedule risk than the HDD option.

Due to the complexities of the HDD route and the significant impacts on North Water Street, CTDOT determined that the CAC option is the preferred option for the under-channel cable crossing. CTDOT determined that the CAC process has lower cost and lower risk than the HDD option. While the HDD option would not disturb the river bottom or water quality of the Norwalk River habitat, the HDD method was abandoned due to risks associated with obstructions and the potential for leakage of drilling fluid, presenting a serious environmental concern. Further, the temporary environmental impacts of the CAC process primarily occur in proposed channel maintenance dredging areas, with an additional minimal footprint of disturbance restricted to the intertidal zone, and with no additional impact to mudflats or vegetated tidal wetland.

Part III: Project Information (continued)

10. After all measures to eliminate or minimize adverse impacts have been incorporated in the proposed project, describe why any adverse impacts that remain should be deemed acceptable by OLISP.

CTDOT has implemented extensive measures to eliminate or minimize adverse impacts to the maximum extent practicable. Adverse impacts from the project will be mitigated; the proposed mitigation far exceeds required ratios. Permanent impacts to resources below the CT Coastal Jurisdiction Line are unavoidable and will be compensated for via riverbed footprint/water column regain resulting from the removal of the existing pivot pier and rest piers and from tidal wetland mitigation. Vegetated tidal wetland mitigation will include the following: invasive Phragmites treatment; invasive Phragmites treatment with subsequent shrub planting; tidal salt marsh restoration through invasive Phragmites removal, living shoreline riprap sill installation with oyster cultch, grading and topsoil placement, salt marsh restoration through vegetation planting, and establishment of a northern diamondback terrapin (Malaclemys terrapin terrapin) habitat area in the buffer above the tidal wetland boundary; and excavation and removal of in-water rock riprap, living shoreline riprap sill installation from reused existing riprap, regrading and topsoil placement, and salt marsh restoration through vegetation planting. In addition to listed species enhancements, the mitigation will include improvements to the overall water quality of the Norwalk River. The proposed compensatory mitigation strategies and design were developed through site visits, meetings, and correspondence with CTDEEP and USACE. Additionally, local stakeholder representatives from the City and the Maritime Aquarium were given opportunities to review the mitigation plans.

11. **a.** Is any portion of the work for which authorization is being sought now complete or under construction?

☐ Yes ☒ No ***If No, skip to question #12.***

b. Specify what parts of the proposed work have been completed or are under construction.

Not Applicable. No parts of the proposed work have been completed or are under construction.

c. Indicate when such work was undertaken or completed. Identify completed portions on the plans submitted.

Not Applicable

d. When did you acquire interest in this property? **Not Applicable**

e. Were you responsible for the unauthorized activity as a result of actions taken before the acquisition of the property? ☐ Yes ☐ No If Yes, explain.

Not Applicable

Part III: Project Information (continued)

f. Did you know or have reason to know of the unauthorized activity? ☐ Yes ☐ No If Yes, explain.

Not Applicable

g. Is this application associated with an enforcement action pending with DEEP? ☐ Yes ☒ No

If Yes, explain:

12. Is there or will there be any federal and/or state funding of this project? ☒ Yes ☐ No If Yes, explain.

The Walk Bridge Replacement Project will be funded via State of Connecticut and federal funding. FTA will provide funding through the Hurricane Sandy Emergency Relief Program (Disaster Relief Appropriations Act) and the Public Transportation Emergency Relief Program.

☐ Check here if additional Project Information sheets are necessary, and label and attach them to this sheet.

Part IV: Site and Resource Information

1. **SITE NAME AND LOCATION**

Name of Site : **Walk Bridge**

Street Address or Location Description: **Railroad Bridge No. 04288R Over the Norwalk River**

City/Town: **Norwalk** State: **CT** Zip Code: **06855**

Tax Assessor's Reference: Map Block Lot

Latitude and longitude of the exact location of the proposed activity in degrees, minutes, and seconds or in decimal degrees: Latitude: **41° 06' 02" N** Longitude: **73° 24' 55" W**

Method of determination (check one):

☐ GPS ☐ USGS Map ☒ Other (please specify):

If a USGS Map was used, provide the quadrangle name: **Google Earth**

2. **INDIAN LANDS:** Will the activity which is the subject of this application be located on federally recognized Indian lands? ☐ Yes ☒ No

3. **COASTAL AREA:** Is the project site located in a municipality within the coastal area? (check town list in the instructions) ☒ Yes ☐ No

4. **ENDANGERED OR THREATENED SPECIES:** According to the most current "State and Federal Listed Species and Natural Communities Map", will the activity which is the subject of this application, including all impacted areas, be located within an area identified as a habitat for endangered, threatened or special concern species?

☒ Yes ☐ No Date of Map: **June 2019**

Part IV: Site Information (continued)

If yes, complete and submit a *Request for NDDB State Listed Species Review Form* (DEEP-APP-007) to the address specified on the form, **prior** to submitting this application. **Please note NDDB review generally takes 4 to 6 weeks and may require additional documentation from the applicant.** A **copy** of the completed *Request for NDDB State Listed Species Review Form* **and** the CT NDDB response ***must*** be submitted with this completed application as Attachment C.

For more information visit the DEEP website at www.ct.gov/deep/nddbrequest or call the NDDB at 860-424-3011.

5. **AQUIFER PROTECTION AREAS:** Is the site located within a mapped Level A or Level B Aquifer Protection Area, as defined in CGS section 22a-354a through 22a-354bb?

☐ Yes ☒ No If **yes**, check one: ☐ Level A **or** ☐ Level B

If **Level A**, are any of the regulated activities, as defined in RCSA section 22a-354i-1(34), conducted on this site? ☐ Yes ☐ No

If **yes**, and your business is **not** already registered with the Aquifer Protection Program, contact the local aquifer protection agent or DEEP to take appropriate actions.

For more information on the Aquifer Protection Area Program visit the DEEP website at www.ct.gov/deep/aquiferprotection or contact the program at 860-424-3020.

6. **SHELLFISH COMMISSION:** Does your town have a shellfish commission? ☒ Yes ☐ No

If yes, you must submit a completed *Shellfish Commission Consultation Form* (DEEP-OLISP-APP-101D) with this application as Attachment D.

7. **HARBOR MANAGEMENT COMMISSION:** Does your town have a Harbor Management Commission?

☒ Yes ☐ No

If yes, you must submit a completed *Harbor Management Commission Consultation Form* (DEEP-OLISP-APP-101E) with this application as Attachment E.

8. **DEPARTMENT OF AGRICULTURE/BUREAU OF AQUACULTURE:** If the subject site is located in a specific area as explained in Part IV, item 8 of the application instructions (DEEP-OLISP-INST-100), you must submit a completed *Department of Agriculture/Bureau of Aquaculture Consultation Form* (DEEP-OLIS-APP-101F) as Attachment F.

9. **CONSERVATION OR PRESERVATION RESTRICTION:** Will the activity which is the subject of this application be located within a conservation or preservation restriction area? ☐ Yes ☒ No

If Yes, proof of written notice of this application to the holder of such restriction or a letter from the holder of such restriction verifying that this application is in compliance with the terms of the restriction, must be submitted as Attachment G.

10. Indicate the number and date of issuance of any previous state coastal permits or certificates issued by DEEP authorizing work at the site and the names to whom they were issued.

Permit/COP Number	*Date Issued*	*Name of Permittee/Certificate Holder*

See Attachment, Part IV, Question 10.

Part IV: Site Information (continued)

11. Identify any changes in conditions of the site (including ownership, development, use, or natural resources) since the issuance of the most recent state permit or certificate authorizing work at the site.

There have been no changes to the site since the work approved in the most recent state permit.

12. a. Identify and describe the existing municipal zoning classification of the site.

See Attachment, Part IV, Question 12a.

b. Identify and describe the existing land use(s) on and adjacent to the site.

See Attachment, Part IV, Question 12b.

13. Provide the name of the waterbody at the site of proposed work: **Norwalk River**

14. Provide the elevation of the applicable regulatory limit for your project referenced to NAVD88. Refer to the instructions for more information.

☒ Tidal Wetlands Limit = **6.4'** ☒ Coastal Jurisdiction Limit = **5.4'**

15. How was the regulatory limit identified above determined? Please check one of the following:

☒ **DEEP-calculated elevation**

☐ **Self-calculated elevation** (If a self-calculated elevation is used, please provide the additional information and calculations per the instructions.)

☐ **Mean High Water elevation** (use only if project is upstream of a tide gate, dam or weir) (If a MHW elevation is used, provide a discussion of the location of the tide gate, dam or weir.)

If other than a DEEP calculated elevation was used to calculate the CJL, please provide the additional information and calculations per the instructions and label and attach them as Attachment M.

16. Provide the elevations of the mean high water and mean low water at the site and the reference datum used. Refer to the instructions regarding elevation datum.

MHW = **3.35** MLW = **-3.72** Datum = **NAVD88**

☐ Check here If NAVD88 is not referenced, and provide an orthometric conversion table in Attachment M.

Walk Bridge Replacement Project Bridge Number 04288R
Norwalk CT
State Project Number 0301-0176

Part IV: Project Information
(continued)
Questions 10 and 12

10. Indicate the number and date of issuance of any previous state coastal permits or certificates issued by DEEP authorizing work at the site and the names to whom they were issued.

Permit/COP Number	Date Issued	Name of Permittee/Certificate Holder
Certificate of Permission/201807462	6/14/2018	Connecticut Department of Transportation
Structures, Dredging and Fill/Section 401 Water Quality Certification/CAM Review/201708100	5/7/2018	Connecticut Department of Transportation
Flood Management General Certification/201801456-FM	3/16/2018	Connecticut Department of Transportation
General Permit for Water Resource Construction Activities	6/26/2017 (submittal date)	Connecticut Department of Transportation
General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities/GSN003179	6/13/2017	Connecticut Department of Transportation
Coastal Management Consistency Review/NA	8/2/2016 & 3/8/2017	Connecticut Department of Transportation
Section 401 Water Quality Certification/TBD	11/21/2016	Connecticut Department of Transportation
Certificate of Permission/2016033772-MG	4/4/2016	Connecticut Department of Transportation
Certificate of Permission/201207773-SJ	3/11/2013	Connecticut Department of Transportation
Flood Management General Certification/ FM-201200688C	3/21/2012	Connecticut Department of Transportation
Certificate of Permission/2004-059-KZ	5/10/2004	Connecticut Department of Transportation

12.a. Identify and describe the existing municipal zoning classification of the site.

Walk Bridge is located within the Connecticut Coastal Area Boundary. The state-designation is intended to ensure that any development within the coastal area is conducted in a context sensitive manner without significantly disrupting either the natural environment or sound economic growth. The following City of Norwalk zoning districts are in the immediate vicinity of Walk Bridge at the four quadrants of the bridge:

- The northeast quadrant is zoned Industrial 1(I1). According to the Norwalk regulations, "the district is intended to provide low-scale industrial facilities interspersed with other uses and with the utilities and infrastructure necessary to support such industrial operations. The provisions of this zone are designed to recognize the need for manufacturing space while ensuring that these areas are compatible with adjacent residential neighborhoods and with the capacity of available infrastructure."

- The southeast quadrant is zoned Neighborhood Business (NB) directly adjacent to the bridge and AAA Conservation Land at Veterans Memorial Park. The intention of the AAA Conservation Land is to preserve land for park and recreation purposes. The Neighborhood Business Zone is intended to encourage mixed-use development in neighborhood commercial areas and water-dependent uses are encouraged on those lots which are adjacent to the waterfront.

- The northwest quadrant is zoned Reed Putnam Design District – Subarea D (RPDD) along the river and Reed Putnam Design District – Subarea E (RPDE) west of the NHL Danbury Branch. The districts were created to encourage development in accordance with the Reed Putnam Urban Renewal Plan, including creating opportunities for mixed-use development and enhancing public access to the Norwalk waterfront. There are five different subareas within the Reed Putnam districts, reflecting differences in use, height, and bulk of buildings.

- The southwest quadrant is zoned Washington Street Design District (WSDD). According to Article 50 of the Building Zone Regulations: "The purpose of this regulation is to preserve and enhance the unique character of the Washington Street Historic District and environs by encouraging the preservation of existing buildings, by encouraging the mixed-use of properties and by ensuring that all uses and structures will be compatible with one another and with the established character of the area."

  There are two areas of designated properties (also known as overlay districts) located west of the bridge. The first overlay district, "Designated Properties for Fees in lieu of Parking in South Norwalk," includes most of SoNo and allows for flexibility in parking requirements for uses located within its boundary. The second overlay district, "Designated Properties for Transit-Oriented Development (TOD) at South Norwalk Railroad Station," specifies TOD provisions for properties within its boundary. A third overlay district has been proposed to the east of the project area; the "Designated Properties for Transit Oriented Development at the East Norwalk Railroad Station," also specifies TOD provisions for properties within its boundary.

The parcels designated for use as the Marine Staging Yard (68 (portion), 70, and 90 Water Street) are located less than 0.20 miles southwest of the bridge site. The parcels are zoned as Marine Commercial

(MC). Water-dependent uses are allowed in the Marine Commercial Zone including marinas, water-based recreational uses, parks and public recreational facilities and marine research labs and related facilities.

12.b. Identify and describe the existing land uses(s) on and adjacent to the site.

Walk Bridge and the railroad corridor in South Norwalk and East Norwalk are designated as a transportation land use.

The SoNo neighborhood, located west of the bridge, is a dense mixed-use area with restaurants, bars, retail, office, light industrial, and residential units served by municipal bus service. Recently, this area has seen substantial publicly and privately funded revitalization. There are several mixed-use Transit Oriented Development (TOD) projects under construction or planned in the SoNo neighborhood. The neighborhood is also home to two parks and the Norwalk Police Headquarters. In addition to the South Norwalk Train Station that services the New Haven Line, the neighborhood is served by five city bus routes. In the Norwalk Plan of Conservation and Development, the neighborhood is highlighted as a regional center with numerous development areas, some of which have already taken place.

The Maritime Aquarium at Norwalk is located directly adjacent to Walk Bridge between the Norwalk River and North Water Street. The Aquarium complex occupies the western bank of the Norwalk River on both the north side and south sides of the bridge; the two areas are connected by a pedestrian walkway running underneath the bridge. Across North Water Street from the aquarium on the north side of the rail corridor is the Norwalk Lock Building, a historic industrial building converted to commercial office space that abuts the retaining wall along the rail corridor, separated by a 10-foot access driveway. Further north, the SoNo Collection, a mixed used retail shopping center with over 1 million square feet of development, currently is under construction and slated for completion in 2019. To the west along the north side of the rail corridor to the bridge over Washington Street, the land use is comprised of three and four-story mixed-use buildings with commercial uses on the lower floors and residential uses on the upper floors. The land use along the south side of the rail corridor west of the river is a similar make up, consisting of historic warehouse buildings rebuilt for new mixed use including the Ironworks SoNo building, converted to incorporate over 100 residences, located across North Water Street from the aquarium's IMAX Theater. South of the theater along the riverbank, additional uses include the Maritime Aquarium and Sheffield Island ferry docks and an NPA public parking lot. Portions of the Norwalk River Valley Trail exist along the waterfront north of the SoNo neighborhood and at the NPA parking lot.

Further south along Water Street, at 68-90 Water Street, is the location of the proposed Marine Staging Yard. Land uses include office, warehouse and parking.

The east bank of the river directly adjacent to Walk Bridge is less densely developed than the west bank. The East Norwalk neighborhood is centered around the East Norwalk Train Station, which is located approximately one-half-mile east of the bridge. The Norwalk Water Pollution Control Authority (WPCA) Wastewater Treatment Plant (WWTP) is located approximately 750 feet to the northeast of Walk Bridge. The bridge and the WWTP are separated by a vacant CTDOT-owned lot primarily used for materials storage and access to the railroad and bridge for operations and maintenance. The WWTP Waterfront Walkway section of the Norwalk Harbor Loop Trail runs north along the river from Walk Bridge. The Liberty Square

area, located southeast of Walk Bridge, consists of mixed land uses, including commercial uses (an auto body repair shop, contractor storage yard, plastic fabrication company) and single and multi-family residential uses.

Part V: Supporting Documents

The supporting documents listed below must be submitted with the application and labeled as indicated. The specific information required in each attachment is described in the *Instructions for Completing a Permit Application for Programs Administered by the Office of Long Island Sound Programs* (DEEP-OLIS-INST-100). Check the box by the attachments listed to indicate that they have been submitted.

☒	Attachment AA:	a copy of the published notice of permit application, as described in the instructions, attached to a completed "Certification of Notice Form (DEEP-APP-005A
☒	Attachment A:	Executive Summary; summarize the information contained in the complete application which must include a description of the proposed regulated activities and a synopsis of the environmental and engineering analyses of the impact of such activities. Include a list of the titles of all plans, drawings, reports, studies, appendices, or other documentation which are attached as part of the application.
☐	Attachment B:	If the applicant is not the owner, submit written permission from the owner as Attachment B.
☒	Attachment C:	**Copy** of the completed *Request for NDDB State Listed Species Review Form* (DEEP-APP-007) **and** the NDDB response, if applicable.
☒	Attachment D:	*Shellfish Commission Consultation Form* (DEEP-OLIS-APP-101D), if applicable.
☒	Attachment E:	*Harbor Management Commission Consultation Form* (DEEP-OLIS-APP-101E), if applicable.
☒	Attachment F:	*Department of Agriculture/Bureau of Aquaculture Consultation Form* (DEEP-OLIS-APP-101F), if applicable.
☐	Attachment G:	Conservation or Preservation Restriction Information, if applicable.
☐	Attachment H:	*Applicant Compliance Information Form* (DEEP-APP-002).
☒	Attachment I:	Provide plans of the project as Attachment I. They must be 8 1/2" x 11" scaled plans of the site and proposed work, with the datum of the measurements noted, including: a. A Vicinity Map; b. A Tax Assessor's Map showing the Map, Block and Lot #, subject property and immediately adjacent properties; c. Plan Views showing existing and proposed conditions, including vessel berthing arrangement, based on a site survey prepared by a licensed surveyor; and d. An Elevation or Cross-Section View showing existing and proposed conditions, including vessel berthing arrangement, based on a site survey prepared by a licensed surveyor. **Please refer to Attachment I of the instructions for identification and discussion of required plan components.**
☒	Attachment J:	Photographs showing existing conditions of the site.
☒	Attachment K:	Land owner information, including names and mailing addresses, for all land owners of record for any property located five hundred feet (500) or less from the property lines of the subject property, certification that a copy of the Notice of Application was sent to each identified property owner and names and addresses of any known claimants of water rights adjacent to the project and owners or lessees of shellfish grounds or franchises within the area which work is proposed.
☐	Attachment L:	*Applicant Background Information Form* (DEEP-APP-008) (if applicable).
☒	Attachment M:	Other Information: Any other information the applicant deems relevant or is required by DEEP.
☒	Attachment N:	*US. Army Corps of Engineers Consultation Form* (DEEP-OLISP-APP-101N)

Part VI: Applicant Certification

The applicant(s) *and* the individual(s) responsible for actually preparing the application must sign this part. An application will be considered insufficient unless *all* required signatures are provided.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I understand that a false statement in the submitted information may be punishable as a criminal offense, in accordance with section 22a-6 of the General Statutes, pursuant to section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

I certify that this application is on complete and accurate forms as prescribed by the commissioner without alteration of the text.

I certify that I have complied with all notice requirements as listed in section 22a-6g of the General Statutes."

Thomas J Maziarz	9-3-19
Signature of Applicant	Date
Thomas J. Maziarz	**Bureau Chief, Office of Policy & Planning**
Name of Applicant (print or type)	Title (if applicable)
	09.03.19
Signature of Preparer (if different than above)	Date
Christian J. Brown	**Project Manager**
Name of Preparer (print or type)	Title (if applicable)

☐ Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet. You must include signatures of any person preparing any report or parts thereof required in this application (i.e., professional engineers, surveyors, soil scientists, consultants, etc.)

Note: Please submit the completed Application Form, Fee, and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Please remember to publish notice of the permit application **prior** to submitting your completed application to DEEP. Send a copy of the published notice to the chief elected official of the municipality in which the regulated activity is proposed and provide DEEP with a copy of the published notice, as described in the instructions, attached to a completed *Certification of Notice Form* (DEEP-APP-005A) as Attachment AA to this application.

Also send a copy of the notice to the Chairman of the Shellfish Commission and to the Chairman of the Harbor Management Commission in the municipality in which the regulated activity is proposed, where applicable. Refer to the Shellfish Commission and Harbor Management Commission lists for contact information.

Submit one complete application copy to the U.S. Army Corps of Engineers, Regulatory Division, 696 Virginia Road, Concord, MA, 01742.

If you are submitting a tidal wetlands application, mail complete application copies to the municipal CEO, Shellfish Commission and Conservation Commission.