CAPE COD CANAL HIGHWAY BRIDGES
BOURNE, MASSACHUSETTS

MAJOR REHABILITATION EVALUATION REPORT

APPENDIX G
NATURAL RESOURCES CONSERVATION SERVICE
SOIL CLASSIFICATION DATA
FOR CANAL BRIDGES AREAS

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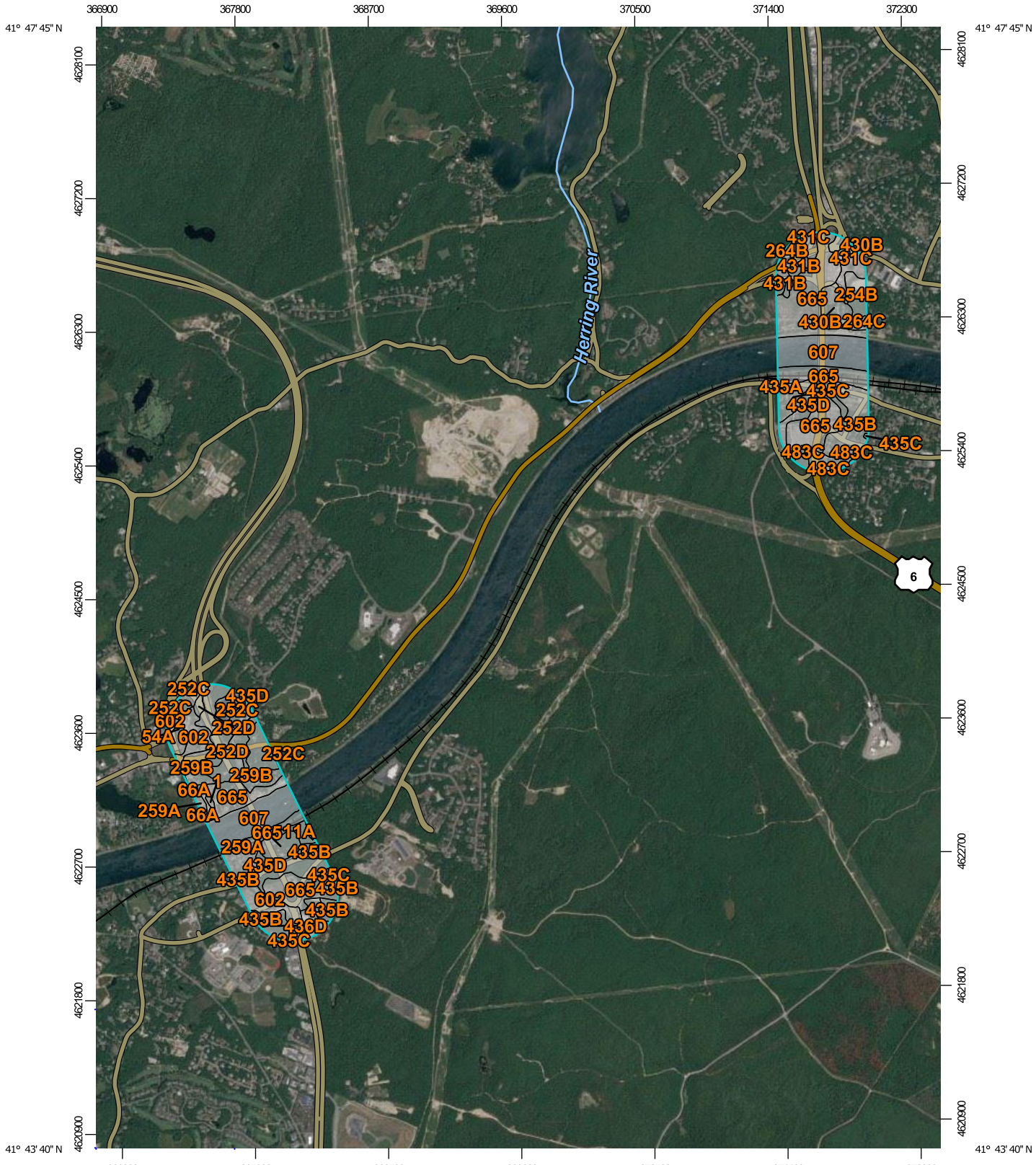
All Ecological Sites -- Rangeland—Barnstable County, Massachusetts
(Cape Cod Canal Bridges Soils)



Map Scale: 1:36,800 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

R144AY001CT

Not rated or not available

Soil Rating Lines

R144AY001CT

Not rated or not available

Soil Rating Points

R144AY001CT

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Barnstable County, Massachusetts
Survey Area Data: Version 15, Sep 5, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2018—Nov 17, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

G-2

All Ecological Sites — Rangeland

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
1	Water	Water (100%)		7.6	1.6%
11A	Berryland mucky loamy coarse sand, 0 to 2 percent slopes	Berryland (70%)		4.1	0.8%
		Freetown (10%)			
		Maybid (5%)			
		Pipestone (5%)			
		Swansea (5%)			
		Walpole Variant, LOAMY SUBSTRATUM (5%)			
54A	Freetown and Swansea mucks, coastal lowland, 0 to 1 percent slopes	Freetown, coastal lowland (45%)		8.0	1.7%
		Swansea, coastal lowland (45%)			
		Rainberry, coastal lowland (10%)			
66A	Ipswich - Pawcatuck - Matunuck complex, 0 to 2 percent slopes, very frequently flooded	Ipswich (50%)	R144AY001CT — Tidal Salt Low Marsh mesic very frequently flooded	0.5	0.1%
			R144AY002CT — Tidal Salt High Marsh mesic very frequently flooded		
		Pawcatuck (25%)	R144AY001CT — Tidal Salt Low Marsh mesic very frequently flooded		
			R144AY002CT — Tidal Salt High Marsh mesic very frequently flooded		
		Matunuck (15%)	R144AY001CT — Tidal Salt Low Marsh mesic very frequently flooded		
			R144AY002CT — Tidal Salt High Marsh mesic very frequently flooded		
		Hooksan (5%)			
		Succotash (5%)			

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
252C	Carver coarse sand, 8 to 15 percent slopes	Carver (75%)		24.1	5.0%
		Merrimac (9%)			
		Hinckley (8%)			
		Eastchop (4%)			
		Plymouth (4%)			
252D	Carver coarse sand, 15 to 35 percent slopes	Carver (65%)		22.6	4.7%
		Eastchop (10%)			
		Hinckley (10%)			
		Plymouth (10%)			
		Freetown (3%)			
		Swansea (2%)			
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	Merrimac (85%)		8.6	1.8%
		Hinckley (5%)			
		Sudbury (5%)			
		Windsor (3%)			
		Agawam (2%)			
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	Deerfield (85%)		2.0	0.4%
		Windsor (7%)			
		Wareham (5%)			
		Sudbury (2%)			
		Ninigret (1%)			
259A	Carver loamy coarse sand, 0 to 3 percent slopes	Carver (80%)		19.2	4.0%
		Hinckley (6%)			
		Merrimac (6%)			
		Eastchop (4%)			
		Enfield (4%)			
259B	Carver loamy coarse sand, 3 to 8 percent slopes	Carver (80%)		21.7	4.5%
		Hinckley (6%)			
		Merrimac (6%)			
		Eastchop (4%)			
		Enfield (4%)			
264A	Eastchop loamy fine sand, 0 to 3 percent slopes	Eastchop (75%)		2.5	0.5%
		Hinckley (8%)			
		Merrimac (7%)			
		Carver (5%)			
		Enfield (5%)			
264B	Eastchop loamy fine sand, 3 to 8 percent slopes	Eastchop (75%)		0.2	0.0%
		Hinckley (8%)			

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
		Merrimac (7%)			
		Carver (5%)			
		Enfield (5%)			
264C	Eastchop loamy fine sand, 8 to 15 percent slopes	Eastchop (70%)		0.6	0.1%
		Carver (10%)			
		Hinckley (10%)			
		Merrimac (5%)			
		Plymouth (5%)			
430B	Barnstable sandy loam, 3 to 8 percent slopes	Barnstable (75%)		14.0	2.9%
		Plymouth (8%)			
		Nantucket (7%)			
		Carver (5%)			
		Merrimac (5%)			
431B	Barnstable sandy loam, 3 to 8 percent slopes, very stony	Barnstable (75%)		6.7	1.4%
		Plymouth (10%)			
		Nantucket (8%)			
		Carver (7%)			
431C	Barnstable sandy loam, 8 to 15 percent slopes, very stony	Barnstable (70%)		14.2	2.9%
		Carver (10%)			
		Nantucket (10%)			
		Plymouth (10%)			
431D	Barnstable sandy loam, 15 to 25 percent slopes, very stony	Barnstable (65%)		3.8	0.8%
		Plymouth (10%)			
		Nantucket (9%)			
		Carver (8%)			
		Hinckley (8%)			
435A	Plymouth loamy coarse sand, 0 to 3 percent slopes	Plymouth (70%)		0.3	0.1%
		Barnstable (9%)			
		Carver (9%)			
		Hinckley (9%)			
		Merrimac (3%)			
435B	Plymouth loamy coarse sand, 3 to 8 percent slopes	Plymouth (70%)		35.1	7.2%
		Carver (8%)			
		Hinckley (8%)			
		Barnstable (6%)			
		Nantucket (6%)			
		Merrimac (2%)			
435C	Plymouth loamy coarse sand, 8 to	Plymouth (65%)		12.7	2.6%

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
	15 percent slopes	Carver (15%)			
		Hinckley (8%)			
		Barnstable (6%)			
		Nantucket (6%)			
435D	Plymouth loamy coarse sand, 15 to 35 percent slopes	Plymouth (65%)		25.0	5.1%
		Carver (15%)			
		Hinckley (10%)			
		Barnstable (5%)			
		Nantucket (5%)			
436D	Plymouth loamy coarse sand, 15 to 35 percent slopes, very stony	Plymouth (65%)		6.1	1.3%
		Carver (15%)			
		Hinckley (10%)			
		Barnstable (5%)			
		Nantucket (5%)			
483C	Plymouth-Barnstable complex, rolling, very bouldery	Plymouth (55%)		3.1	0.6%
		Barnstable (20%)			
		Carver (10%)			
		Hinckley (10%)			
		Nantucket (5%)			
484D	Plymouth-Barnstable complex, hilly, extremely bouldery	Plymouth (55%)		9.4	1.9%
		Barnstable (20%)			
		Nantucket (10%)			
		Carver (5%)			
		Hinckley (5%)			
		Merrimac (5%)			
600	Pits, sand and gravel	Pits (100%)		7.3	1.5%
602	Urban land	Urban land (85%)		28.9	6.0%
		Udipsamments (15%)			
607	Water, saline	Water, saline (100%)		62.4	12.9%
665	Udipsamments, smoothed	Udipsamments (100%)		134.0	27.6%
Totals for Area of Interest				**484.9**	**100.0%**

CAPE COD CANAL HIGHWAY BRIDGES
BOURNE, MASSACHUSETTS

MAJOR REHABILITATION EVALUATION REPORT

APPENDIX H
PRELIMINARY COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION

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DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

July 1, 2019

Programs & Project Management Division
Civil Works/IIS Project Management Branch

Mr. Robert Boeri
Project Review Coordinator
Massachusetts Office of Coastal Zone Management
251 Causeway Street, Suite 800
Boston, Massachusetts 02114-2138

Dear Mr. Boeri:

I am writing to inform you that the U.S. Army Corps of Engineers (Corps), New England District is proposing to either rehabilitate or replace the Bourne and Sagamore Bridges (Attachments 1-3). The purpose of the Cape Cod Canal Bourne and Sagamore Bridges Phase I Major Rehabilitation Evaluation Study and resultant decision document is to determine whether restoring or replacing the existing deteriorated bridges will provide more efficient and effective structures which will maintain reliability of service, improve safety and ease of maintenance, and provide safe, secure, and cost effective access across the Cape Cod Canal.

The existing bridges were designed and built in the 1930s and do not meet current highway safety standards or adequately reflect modern-day traffic conditions. Traffic volumes have increased since the bridges were originally constructed, leading to significant increased loading and demands on the bridges' infrastructure. Routine maintenance will not be able to keep pace with current traffic and loading demands.

Pursuant to the Coastal Zone Management Act, I am requesting that your office review Phase I of the proposed project for preliminary consistency with the Massachusetts Coastal Zone Management Program. It is the Corps' determination that the proposed Phase I work is consistent to the maximum extent practicable with the enforceable policies of the approved Massachusetts Coastal Zone Management Program and will be undertaken in a manner consistent with those policies. A Determination of Federal Consistency forming the basis of our determination is attached for your review.

Please provide your concurrence with our preliminary consistency determination within 60 days of receipt of this letter. If you or your staff have any questions or require

additional information, please feel free to contact myself at (978) 318-8638 or Rosemarie Bradley, Environmental Resources Team Member at (978) 318-8127.

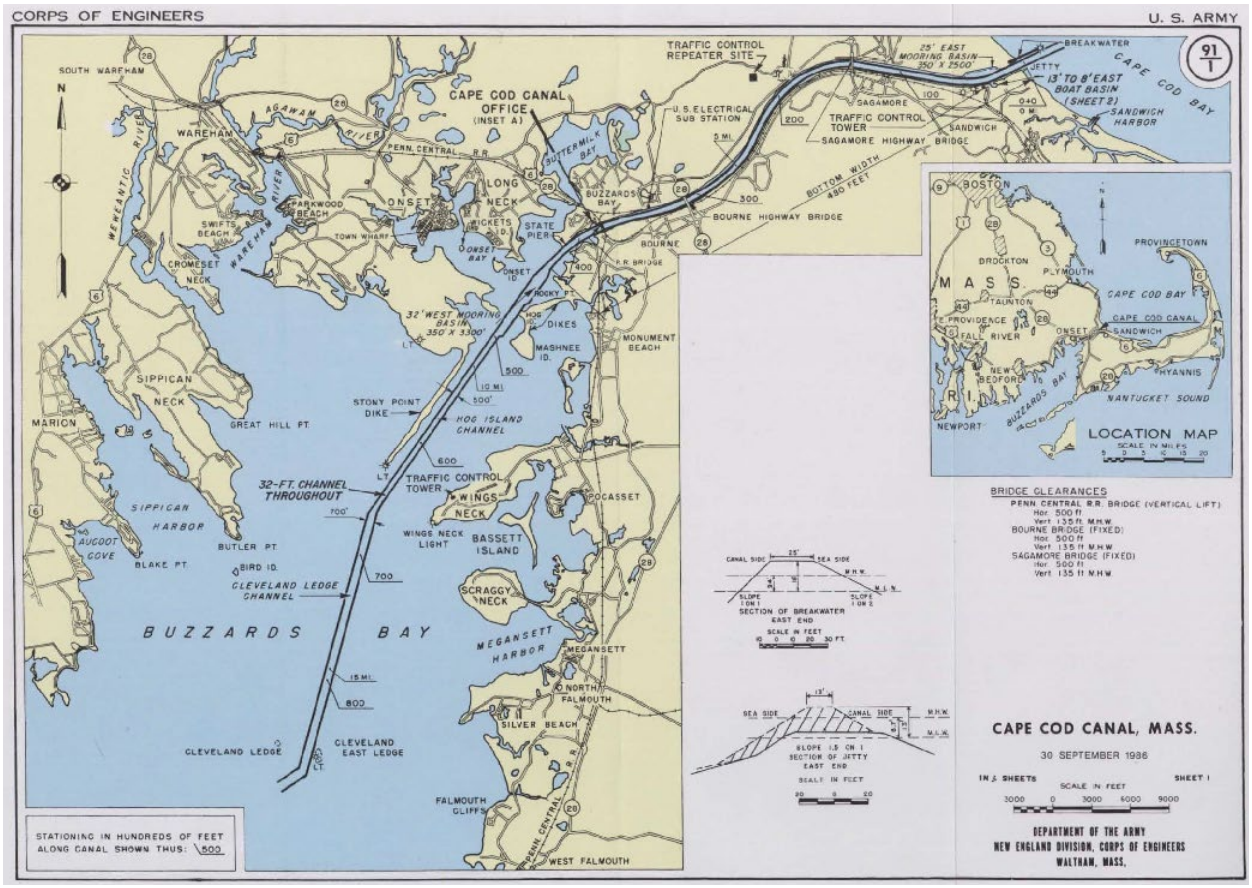
Sincerely,

Craig Martin
Project Manager
Navigation Section

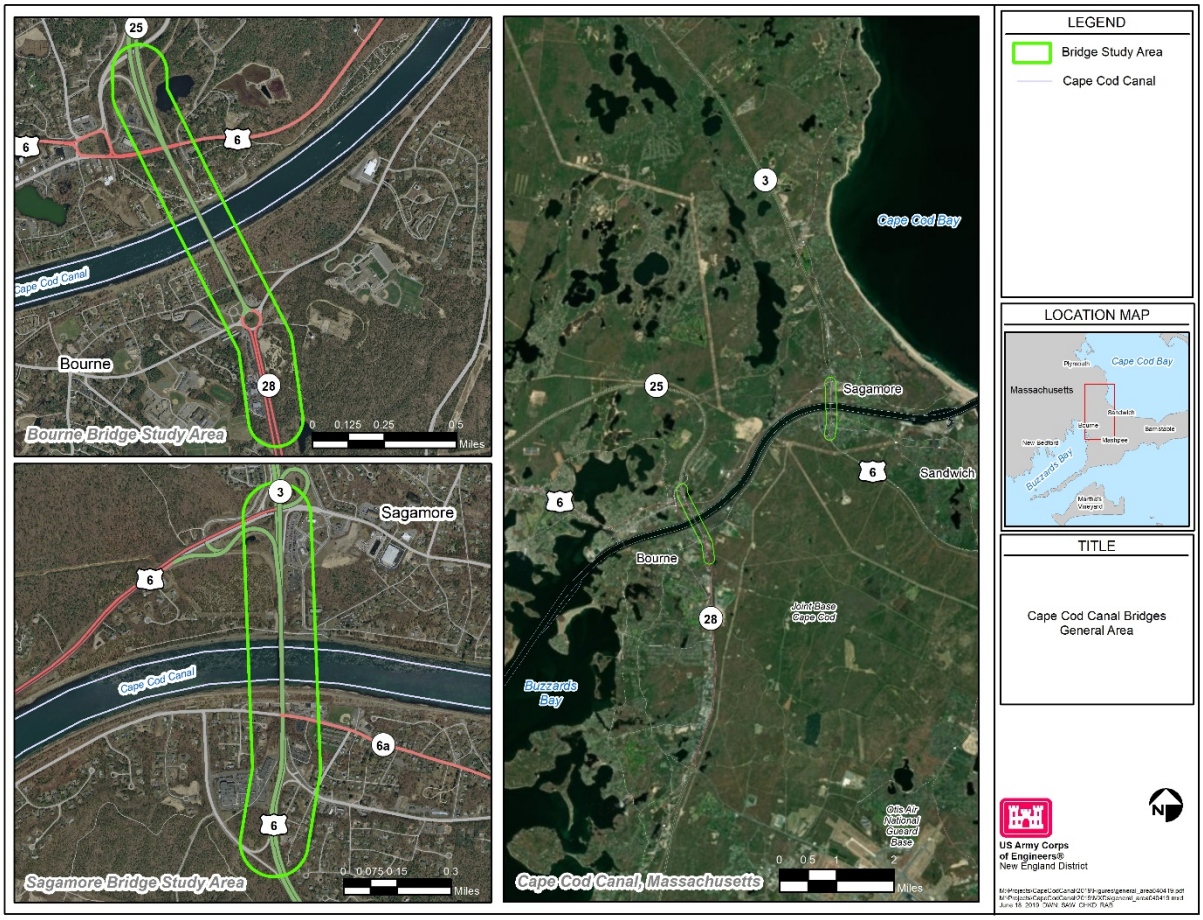
Encl.
Determination of Federal Consistency

CC:
Mr. Stephen McKenna
CZM Cape Cod and Islands Regional Coordinator
P.O. Box 220
Barnstable, MA 02630-0220

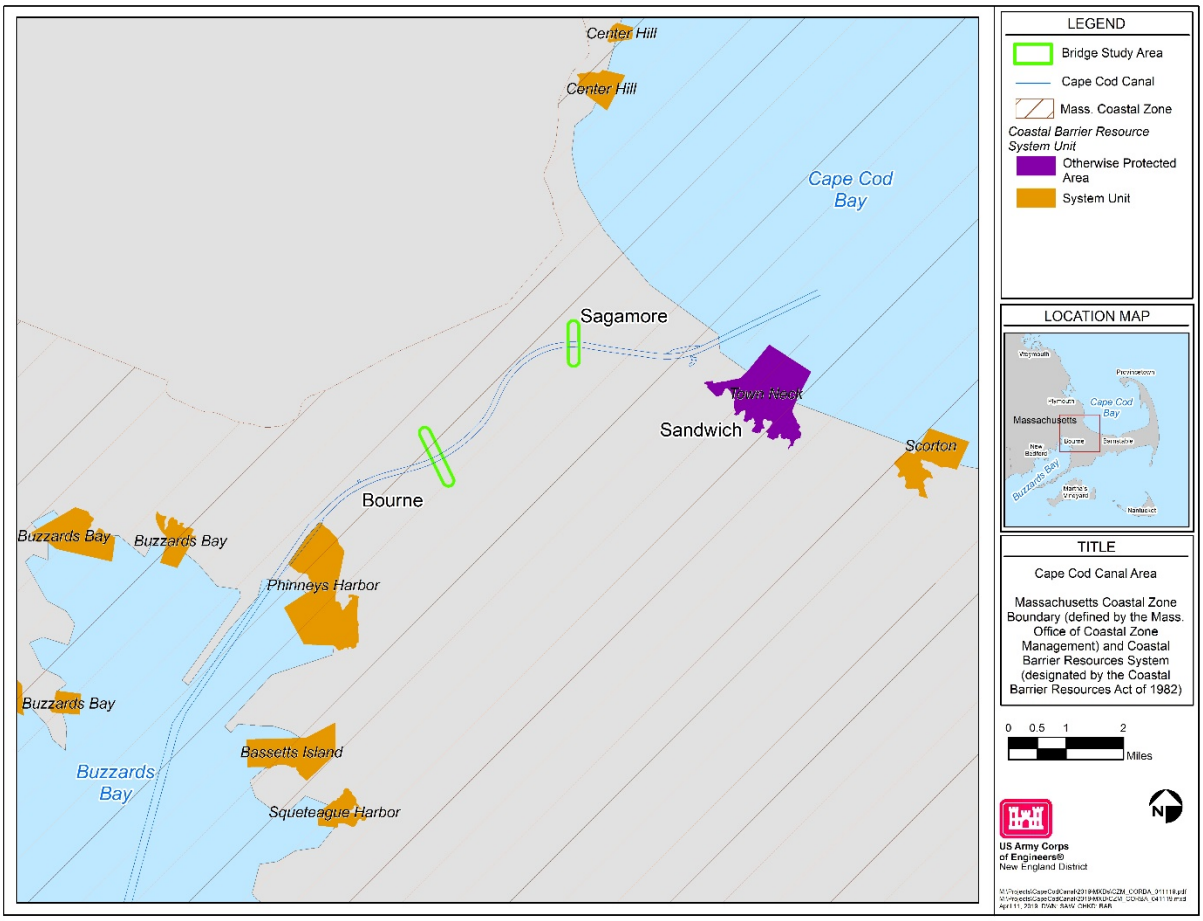
ATTACHMENT 1 – Location of the Cape Cod Canal



ATTACHMENT 2 – General Project Study Area



ATTACHMENT 3 – Coastal Zones and Coastal Barrier Resources System



Coastal Zone Management Preliminary Consistency Determination
Cape Cod Canal Bridges Project
August 2019

COASTAL HAZARD POLICY #1 - Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean.

CONSISTENCY Both the Sagamore and Bourne bridges are located within Zones X (0.2% annual chance of flooding) and AE (1% annual chance of flooding, with BFE). Maintenance of these existing bridges will have no impact on existing floodplain functions. Should replacement of the existing bridges be the recommended alternative all efforts will be made to incorporate features that will serve to avoid and minimize impacts to existing floodplain functions.

COASTAL HAZARD POLICY #2 - Ensure construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Approve permits for flood or erosion control projects only when it has been determined that there will be no significant adverse effects on the project site or adjacent or down coast areas.

CONSISTENCY Any future repair or maintenance activities will be coordinated with affected resource agencies to ensure minimization of impacts to water circulation and sediment transport. All actions supporting a bridge replacement alternative will be fully coordinated with affected resource agencies during the design phase to ensure minimization of impacts in addition to incorporating Best Management Practices (BMPs) during construction. Any temporary or permanent features of the new bridges will likely have minimal impacts to canal flow. A Stormwater Management plan will be developed and BMPs will be employed to minimize and contain any sediment runoff during Phase II of the project (Design and Construction Phase).

COASTAL HAZARD POLICY #3 - Ensure that state and federally funded public works projects proposed for location within the coastal zone will:

• not exacerbate existing hazards or damage natural buffers or other natural resources,
• be reasonably safe from flood and erosion related damage, and
• not promote growth and development in hazard-prone or buffer areas, especially in Velocity zones and ACECs, and
• not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource/Improvement Acts.

CONSISTENCY Activities related to either the repair or replacement of the existing bridges will not exacerbate existing hazards and appropriate measures will be incorporated into the design to ensure that the project will be safe from flood and erosion related damage. Bridge rehabilitation or replacement will not promote development in hazard-prone areas and are not located within Coastal Barrier Resource Units.

COASTAL HAZARD POLICY #4 - Prioritize public funds for acquisition of hazardous coastal areas for conservation or recreation use, and relocation of structures out of coastal high hazard areas, giving due consideration to the effects of coastal hazards at the location to the use and manageability of the area.

CONSISTENCY This policy is not applicable.

ENERGY POLICY #1 - For coastally dependent energy facilities, consider siting in alternative coastal locations. For non-coastally dependent energy facilities, consider siting in areas outside of the coastal zone. Weigh the environmental and safety impacts of locating proposed energy facilities at alternative sites.

CONSISTENCY This policy is not applicable.

ENERGY POLICY #2 - Encourage energy conservation and the use of alternative sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.

CONSISTENCY This policy is not applicable.

GROWTH MANAGEMENT POLICY #1 – Encourage sustainable development that is consistent with state, regional, and local plans and supports the quality and character of the community.

CONSISTENCY The MassDOT Cape Cod Canal Transportation Study (2019) has identified replacement bridges as being integral to road infrastructure improvement projects. The project supports state, regional and local plans for sustainable development. The project's intent is to allow for the development and operation of a project that will not reduce the quality or character of the surrounding community. Therefore, the project is consistent with this policy.

GROWTH MANAGEMENT POLICY #2 - Ensure that state and federally funded transportation and wastewater projects primarily serve existing developed areas, assigning highest priority to projects that meet the needs of urban and community development centers.

CONSISTENCY The project primarily serves existing developed areas and will serve to meet the needs of urban and community development centers by providing a more efficient and safe system for vehicular transport across the Cape Cod canal. The Bourne and Sagamore Bridges provide the only vehicular access to 15 towns and nearly 215,000 full time residents and millions of annual visitors to Cape Cod. The bridges also provide access to 8 offshore island municipalities through the ferry terminals located on Cape Cod. Safe replacement bridges will supply the only access for residents, commuters and visitors. Therefore, the project is consistent with this policy.

GROWTH MANAGEMENT POLICY #3 - Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and federal and state financial support for residential, commercial and industrial development.

CONSISTENCY This policy is not applicable.

HABITAT POLICY #1 - Protect coastal, estuarine, and marine habitats—including salt marshes, shellfish beds, submerged aquatic vegetation, dunes, beaches, barrier beaches, banks, salt ponds, eelgrass beds, tidal flats, rocky shores, bays, sounds, and other ocean habitats—and coastal freshwater streams, ponds, and wetlands to preserve critical wildlife habitat and other important functions and services including nutrient and sediment attenuation, wave and storm damage protection, and landform movement and processes.

CONSISTENCY The purpose of this phase of the project is to determine whether repair or replacement of the existing bridges is the most economically and environmentally viable alternative to ensure vehicular transport across the Cape Cod Canal. It is not anticipated that any activities associated with repair or rehabilitation of these bridges will have negative impacts on the above-described resources given that they are existing structures and that BMP practices will be incorporated during construction activities to minimize impacts to the surrounding environment. It is anticipated that Bridge replacement will likely entail the removal and re-location of existing support structures and piers within the canal to an upland setting, reducing the overall project footprint in the Canal itself. The piers from the old bridges will also be removed from the canal waters following completion of the newly constructed bridges thus reducing the overall footprint in subtidal areas. In addition, the shoreline where the piers are currently situated are shallow areas hardened with rip-rap for operation and maintenance of the Canal. Impacts during removal activities will be temporary and localized in nature, and actually reduce the in-water footprint of the bridges structures. BMPs will be used during the entire removal process to avoid and minimize impacts to the surrounding environment. Therefore, the project is consistent with the policy.

HABITAT POLICY #2 - Advance the restoration of degraded or former habitats in coastal and marine areas.

CONSISTENCY Not applicable. Project is for the either the repair or replacement of existing bridges.

OCEAN RESOURCES POLICY #1 - Support the development of sustainable aquaculture, both for commercial and enhancement (public shellfish stocking) purposes. Ensure that the review process regulating aquaculture facility sites (and access routes to those areas) protects significant ecological resources (salt marshes, dunes, beaches, barrier beaches, and salt ponds) and minimizes adverse effects on the coastal and marine environment and other water-dependent uses.

CONSISTENCY The policy is not applicable.

OCEAN RESOURCES POLICY #2 - Except where such activity is prohibited by the Ocean Sanctuaries Act, the Massachusetts Ocean Management Plan, or other applicable provision of law, the extraction of oil, natural gas, or marine minerals (other than sand and gravel) in or affecting the coastal zone must protect marine resources, marine water quality, fisheries, and navigational, recreational and other uses.

CONSISTENCY The policy is not applicable.

OCEAN RESOURCES POLICY #3 - Accommodate offshore sand and gravel mining needs in areas and in ways that will not adversely affect shoreline areas due to alteration of wave direction and dynamics, marine resources and navigation. Mining of sand and gravel, when and where permitted, will be primarily for the purpose of beach nourishment.

CONSISTENCY The policy is not applicable.

PORTS AND HARBORS POLICY #1 - Ensure that dredging and disposal of dredged material minimize adverse effects on water quality, physical processes, marine productivity, and public health and take full advantage of opportunities for beneficial re-use.

CONSISTENCY This policy is not applicable. It is not anticipated that any dredging will be required for either the repair or replacement of bridges.

PORTS AND HARBORS POLICY #2 - Obtain the widest possible public benefit from channel dredging and ensure that Designated Port Areas and developed harbors are given highest priority in the allocation of resources.

CONSISTENCY The policy is not applicable. No dredging will be required for replacement of bridges.

PORTS AND HARBORS POLICY #3 - Preserve and enhance the capacity of Designated Port Areas to accommodate water-dependent industrial uses and prevent the exclusion of such uses from tidelands and any other DPA lands over which an EEA agency exerts control by virtue of ownership or other legal authority.

CONSISTENCY This policy is not applicable.

PORTS AND HARBORS POLICY #4 - For development on tidelands and other coastal waterways, preserve and enhance the immediate waterfront for vessel-related activities that require sufficient space and suitable facilities along the water's edge for operational purposes.

CONSISTENCY The project will preserve the immediate waterfront for vessel-related activities and is therefore consistent with this policy. This project involves replacement of two existing bridges.

PORTS AND HARBORS POLICY #5 - Encourage, through technical and financial assistance, expansion of water-dependent uses in Designated Port Areas and developed harbors, re-development of urban waterfronts, and expansion of physical and visual access.

CONSISTENCY This policy is not applicable.

PROTECTED AREAS POLICY #1 - Preserve, restore, and enhance coastal Areas of Critical Environmental Concern, which are complexes of natural and cultural resources of regional or statewide significance.

CONSISTENCY: Repair and Rehabilitation Alternative: No impacts will be realized to Areas of Critical Environmental Concern from the repair or rehabilitation of the existing Bridge structures. Incorporation of BMPs will ensure minimization and avoidance of impacts to the surrounding environment.

Replacement: The Herring River ACEC abuts the northwestern corner of the project footprint of the Sagamore replacement bridge. USACE will make every effort to ensure no impact to the ACEC during design phase of the Project.

PROTECTED AREAS POLICY #2 - Protect state and locally designated scenic rivers and state classified scenic rivers in the coastal zone.

CONSISTENCY No scenic rivers will be impacted by this project; thus, the policy is not applicable.

PROTECTED AREAS POLICY #3 - Ensure that proposed developments in or near designated or registered historic districts or sites respect the preservation intent of the designation and that potential adverse effects are minimized.

CONSISTENCY Coordination with the State Historic Preservation Office is ongoing to ensure compliance with applicable regulations.

PUBLIC ACCESS POLICY #1 - Ensure that development (both water-dependent and nonwater-dependent) of coastal sites subject to state waterways regulation will promote general public use and enjoyment of the water's edge, to an extent commensurate with the Commonwealth's interests in flowed and filled tidelands under the Public Trust Doctrine.

CONSISTENCY There will be temporary impacts to recreational areas along the Canal from either the repair, rehabilitation or replacement of the bridges during certain project phases. All activities will be appropriately coordinated with state, local and Federal entities to minimize impacts during construction activities and to maintain a safe environment. However, upon, completion, the project will promote public use and enjoyment of the water's edge by providing multimodal recreational paths created by installation of replacement bridges and is therefore consistent with this policy. Walking/biking paths are being considered as part of project development plans, which would enhance the public's use and enjoyment of the Cape Cod Canal.

PUBLIC ACCESS POLICY #2 - Improve public access to existing coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation and trail links (land- or water-based) to other nearby facilities. Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Ensure that the adverse impacts of developments proposed near existing public access and recreation sites are minimized.

CONSISTENCY There will be temporary impacts to recreational areas along the Canal from either the repair, rehabilitation or replacement of the bridges during certain project phases. The proposed project would have no permanent impacts on recreation except to promote access to other recreation areas on Cape Cod and Massachusetts Islands and

alleviate auto traffic problems through improvements in public transportation. It is therefore consistent with this policy. Walking/biking paths are being considered as part of project development plans, which would enhance the public's use and enjoyment of the Cape Cod Canal across the replacement bridges.

PUBLIC ACCESS POLICY #3 - Expand existing recreation facilities and acquire and develop new public areas for coastal recreational activities, giving highest priority to regions of high need or limited site availability. Provide technical assistance to developers of both public and private recreation facilities and sites that increase public access to the shoreline to ensure that both transportation access and the recreation facilities are compatible with social and environmental characteristics of surrounding communities.

CONSISTENCY There will be minor temporary impacts to recreational areas along the Canal from this project. However, it expands recreational areas by adding walking/biking lanes on both the Sagamore and Bourne bridges and is therefore consistent with this policy.

WATER QUALITY POLICY #1 - Ensure that point-source discharges and withdrawals in or affecting the coastal zone do not compromise water quality standards and protect designated uses and other interests.

CONSISTENCY A Stormwater Management Plan will be developed during the design and construction phase (Phase II) in conformance with USACE policy and goals/design standards with those established by MA DEP Stormwater Management Regulations (310 CMR 10.05K).

WATER QUALITY POLICY #2 - Ensure the implementation of nonpoint source pollution controls to promote the attainment of water quality standards and protect designated uses and other interests.

CONSISTENCY The construction of the proposed project will be performed using BMPs to control non-point pollution sources. Therefore, the project is consistent with the policy.

WATER QUALITY POLICY #3 - Ensure that subsurface waste discharges conform to applicable standards, including the siting, construction, and maintenance requirements for on-site wastewater disposal systems, water quality standards, established Total Maximum Daily Load limits, and prohibitions on facilities in high-hazard areas.

CONSISTENCY This policy is not applicable.

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CAPE COD CANAL HIGHWAY BRIDGES
BOURNE, MASSACHUSETTS

MAJOR REHABILITATION EVALUATION REPORT

APPENDIX I
U.S. FISH AND WILDLIFE SERVICE
THREATENED AND ENDANGERED SPECIES
SPECIES LIST

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: February 08, 2019
Consultation Code: 05E1NE00-2019-SLI-0855
Event Code: 05E1NE00-2019-E-01963
Project Name: Cape Cod Canal Bridges MRER

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2019-SLI-0855

Event Code: 05E1NE00-2019-E-01963

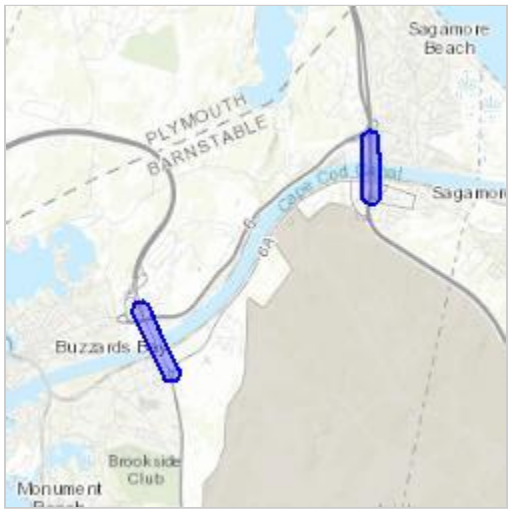
Project Name: Cape Cod Canal Bridges MRER

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Evaluation to see whether major rehabilitation or replacement is needed for Cape Cod Canal Bridges.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.748195406606555N70.58981170119783W



Counties: Barnstable, MA

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern *Sterna dougallii dougallii* Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Reptiles

NAME	STATUS
Plymouth Redbelly Turtle *Pseudemys rubriventris bangsi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/451	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

CAPE COD CANAL HIGHWAY BRIDGES

BOURNE, MASSACHUSETTS

MAJOR REHABILITATION EVALUATION REPORT

APPENDIX J

REAL ESTATE

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DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
New England District
696 Virginia Road
Concord, MA 01742-2751

CENAE-RE-A

MEMORANDUM OF RECORD
Cape Cod Bridge Project Real Estate Planning Report

DATE: 15 February 2020 (Prior Update 15 January 2020, 5 August 2019)

FROM: Department of the Army
United States Army Corps of
Engineers New England
District NAE
Real Estate Division
696 Virginia Road, Concord, MA 01742-2751

TO: Department of the Army
United States Army Corps of
Engineers New England
District NAE
CCC Bridges Replacement Bridge Plan Team
696 Virginia Road, Concord, MA 1742-2751

SUBJECT: Bridge Project Real Estate Plan Report Real Estate Cost Estimate, dated 15 January 2020. Request and Scope of this assignment is to perform a preliminary cost estimate on the "Bourne Bridge and Sagamore Bridge Replacement Project," based on land area estimates, from the August 2019, Bourne Bridge and Sagamore Bridge Replacement Plan, attached, along with Google Earth**.** The "Utility Relocation" cost, which is not included will be provided as a separate Cost Estimate with Design and Construction costs. It should be recognized all utilities have cancellable easement or license instruments, as listed in the Addenda. The "Rough Order of Magnitude" is considered reasonable at this stage of conceptual design, with acreage estimated for an easement and acquisition estimate. The twenty-One Points as outlined in a REPR was considered with no adverse comments regarding the categories involved. This MOR has emphasis on the Cost Estimate for this stage of feasibility planning purposes.

1) Project Data:
Effective date 15 January 2020 prior site inspection on 25 May 2016 (photographs on shared drive), review of the Bourne Bridge and Sagamore Bridge Replacement Plan, Google Map review and GIS Parcel overview for estimating locations at time of inspection.

A) Project Name: Bourne Bridge and Sagamore Bridge Replacement Plan Project, as referenced for this preliminary real estate cost estimate.
B) Tract Number: Referenced as Bourne Bridge, Map 24 Parcels 7, 13-17, 19, 22, 23, 25, and 42-44. Sagamore Bridge, Map 11.4 Parcels 6, 46, 47, 52 and 55, other ancillary sites have nominal impact and off-set by project benefits. A definitive engineering plan may change the impact areas.
C) Assignment Conditions: The areas provided in this report have been established by estimating measures from Google Earth and Assessor maps. The measurements are based on estimates and considered a test of reasonableness.
D) The engineered measurements of the Parcels will be provided for specific easement areas and the cost estimate adjusted at that time, when engineered areas of the Parcels become available. Relocation for Dunkin Donuts, retail center and the Market Basket center, is considered in this analysis. The “Rough Order of Magnitude” is considered reasonable at this stage of conceptual design, with acreage estimated for an easement and acquisition estimate.

2) Ownership Data:

The properties along the approaches based on this plan shown below and throughout this report, suggests some significant impacts on property on the Cape side of both bridges, as cited by the Bridge Modifications & Approaches Outline in the Addenda. The location has varied commercial and/or institutional property and would be delineated for individual Parcel valuations at time of the appraisal and valuation process.

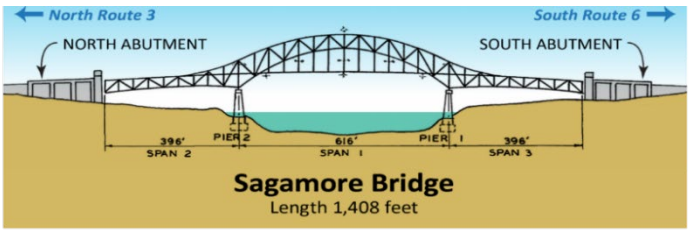
3) Property Data:

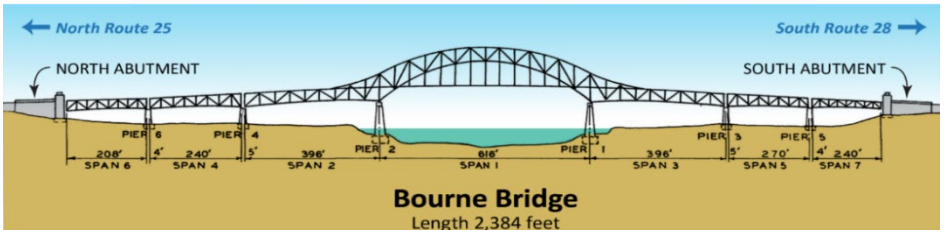
Property Location: The property is composed of varied parcel ownerships and sizes. The concept of the summation of the areas, delineated by use, involves property along the approaches of both bridges. The subject is located around mostly commercial and institutional type properties.

4) Project Description:

The subject property is a portion of land holdings owned by USACE Cape Cod Canal District, located at the USACE Cape Cod Canal District, Bourne, MA. The Army Corps of Engineers owns the Canal, and continuous sections of land on both the east and west sides.

EXISTING SPANS





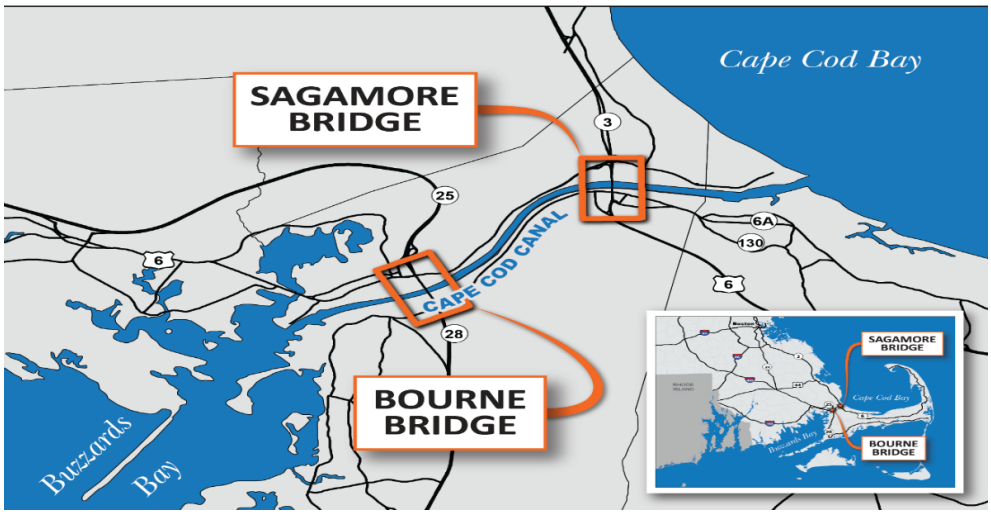
The upland portions are designated as tracts, with boundaries corresponding to the property lines of lots taken by condemnation in the 1930's for creation of the canal, as result the owner of title is the United States of America. The utility out-grant will only convey rights to cross the Cape Cod Canal, there are access rights existing, with short term termination declarations. Purpose: Permission to traverse across, over, under or within the Cape Cod Canal USACE property (utility easements and or license).

5) Project History

The proposed USACE out-grant (utility license/easement) crosses the Cape Cod Canal, which is adjoined by three small tracts of U.S. Government owned land (Cape Cod Canal District); identified on the exhibit on the succeeding pages. The referenced tracts of land support Canal operational requirements.

There is currently and existing Verizon/Comcast conduit for the operation of the telecommunication transmission, electric cables and gas lines over the Cape Cod, which has no adverse impact on the Canal operations.

SAGAMORE & BOURNE BRIDGES CAPE COD CANAL

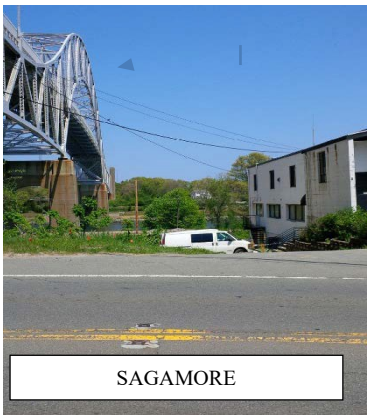


Area and Neighborhood Analysis

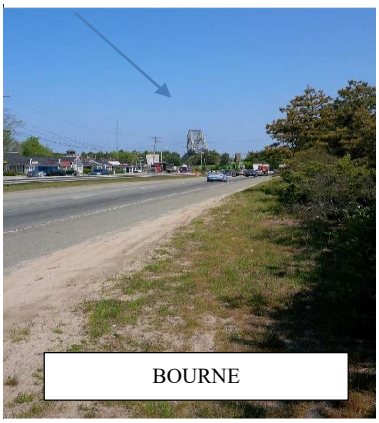
Massachusetts experienced significant growth during the late 1990's until both the National and regional economies faltered. A recent review of U.S. Bureau of Statistical data indicates a continued decline in manufacturing, with information sector services and professional services reporting nominal gains.

A) Neighborhood Description: Mixed uses within the neighborhood with a variety of property types, with the subject property typical and customary to the area, along the bridge positioning and road access.

B) Property Description: The property consists of a series of property along the defined areas described on the bridge replacement maps attached and indicated Parcels addressed. The subject property is considered free of any hazardous material or environmental stigma. The subject property is considered unimproved land with the photos representing the Sagamore Bridge in the first two captions below and the Bourne Bridge in the third caption, respectively, as shown below:


SAGAMORE


SAGAMORE


BOURNE

6) Estate owned / Estimated:

The estate being analyzed herein is the fee simple estate. The cost estimate assumes no encumbrances, hazardous or stigma considered with the various subject property, if acquired. Ancillary sites of government property is considered, which could change with

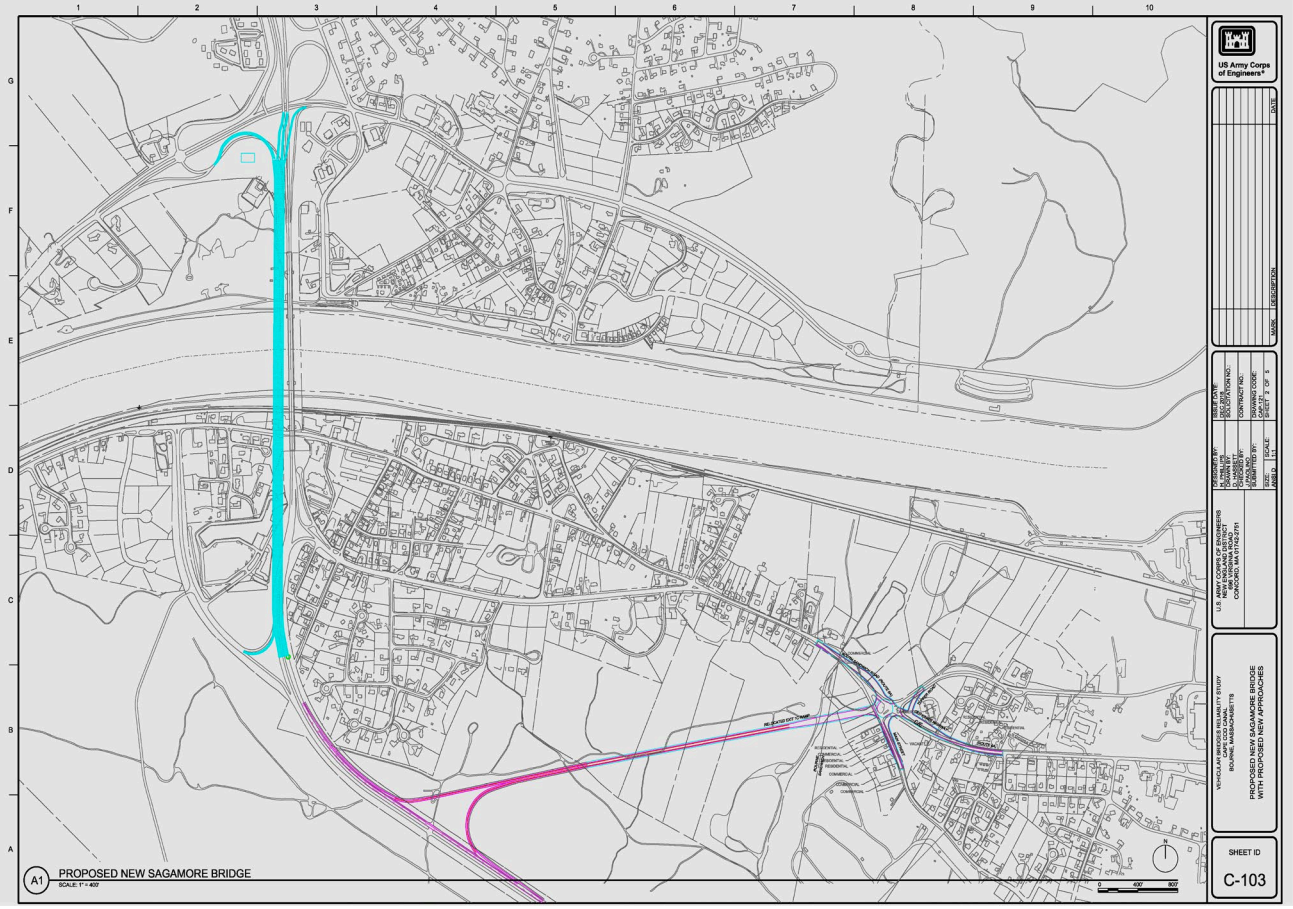
alternative plans or more definitive engineering detail. The extended abutments added to the amount of government land requirements for approaches to the bridges. Private land detail would be based on actual site survey and construction design requirements.

The greatest impact is represented above with the first three pictures of the Market Basket retail plaza at the Sagamore Bridge and the Dunkin Donut site at the Bourne Bridge, both relocations were based on 25% of the real estate loss from the areas considered in the permanent easement line represented on the referenced map below.

7) Basis / Support for Cost Estimate of Subject Property

Comparable vacant land sales and listings in the neighborhood and general area, which represent similar uses and similar potential highest and best use indications. Information used is retained in Cost Estimate “CCC Bridges file”. The greatest impacts are the north side of the Bourne and the south side of the Sagamore on the Cape side of both bridge replacements. A Gross Appraisal at this time is considered premature and would be required at the time of completion of the Design Phase.

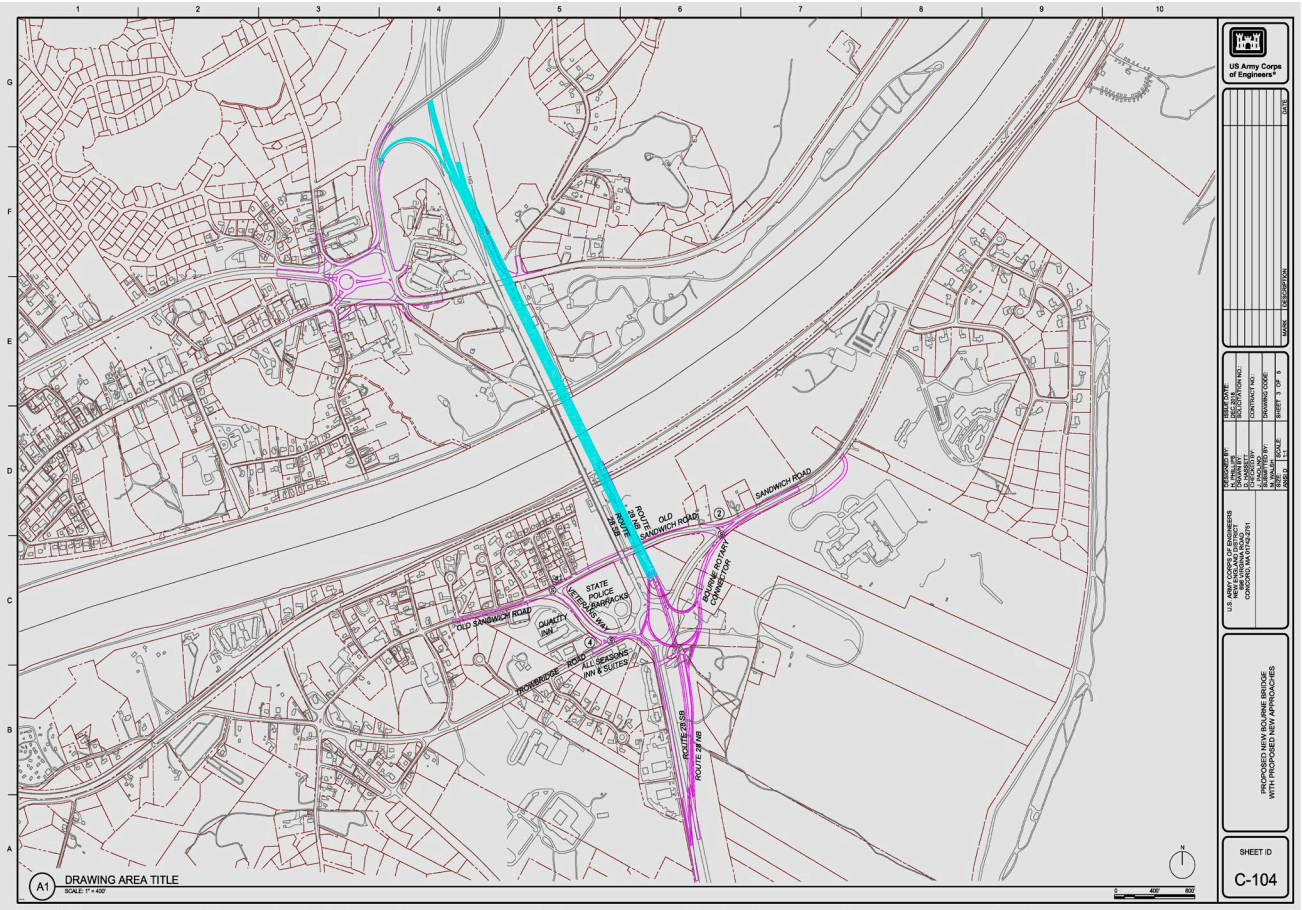
PROPOSED SAGAMORE BRIDGE PLAN



The subject property was estimated from unimproved sales in the Cape area from Loop net, Realtor.com, *CoreLogic* and the local Assessor and other sources.

The commercial sales ranged from $350,000/Ac to $650,000/Ac for similar land rea, suggesting the commercial land currently is at ±$500,000/Ac or ±$10/SF, for the unimproved commercial/retail land.

PROPOSED BOURNE BRIDGE PLAN



The improvements were viewed and there were no apparent encroachments into the improved areas. Having observed only vacant land other than the Market Basket (Sagamore) property and the Dunkin Donut (Bourne) sites.

8) Remarks or Additional Explanation:

No stigma hazardous material, or encumbrances considered for this estimate. The ±90% of the bundle of rights taken is based on current use and the unbalanced use of owner and easement holder. List described below is the current easement and License list for the two CCC Bridges

BOURNE BRIDGE	Grantee	Document No.	Expiration Date	Granted Purpose
	Canal Sportsman Club	DACW33-3-99016	6-Feb-19	water supply pipeline
	Colonial Gas	DACW33-2-20-003	4-Nov-24	gas pipe line
	Comcast	DACW33-3-19-008	30-Apr-23	fiber optic cables
	Algonquin Gas	DACW33-2-03-11	28-Apr-52	natural gas metering station
	Town of Bourne	DACW33-2-83-61	1-Jun-33	water supply pipeline
	NSTAR	DACW33-3-97-14	31-Oct-21	transmission of electricity
	Verizon	DACW33-2-08-066	30-Sep-28	Verizon Network Facilities
	MA DOT	DACW33-3-85-12	Expired	Easement not issued for drainage pipeline

SAGAMORE BRIDGE	Grantee	Document No.	Expiration Date	Granted Purpose
	Verizon	DACW33-2-08-065	30-Sep-28	Verion Network Facilities
	MA DOT	DACW33-2-16-003	28-Feb-20	drainage pipe
	Algonquin Gas	DACW33-2-95-12	31-May-25	gas pipe line
	Algonquin Gas	DACW33-2-71-43	31-May-21	rectifier & anode bed
	Algonquin Gas	DACW33-2-19-027	29-Apr-24	gas pipe line
	Colonial Gas	DACW33-2-19-001	29-Apr-24	gas pipe line
	Open Cape	DACW33-2-12-071	14-Jun-32	Verion sub-license - optic cables
	Colonial Gas	DACW33-1-96-59	14-Nov-24	subsurface electric transmission wires
	North Sagamore Water District	DACW33-2-79-129	23-Sep-29	water pipe line
	Comcast	DACW33-3-19-008	30-Apr-23	fiber optic cables

*Some outgrants are in the footprint of the MRER Survey Area Sagamore and Bourne Bridge

9) **The ±10% remaining value of the property is based on quiet enjoyment and buffer, which is limited.**

10) **Cost Estimate**

Land sales included both institutional and commercial. Several properties in Bourne were considered for commercial costs, mostly in Bourne and others in surrounding Cape Cod communities. There was no supporting evidence suggesting an increase or decrease in the prior cost estimate.

Easement Valuation Matrix

Percentage of Fee	Comments	Potential Types of Easements
90% - 100%	• Severe impact on surface use • Conveyance of future uses	Overhead electric, flowage easements, railroad right of way, irrigation canals, exclusive access easements
75% - 89%	• Major impact on surface use • Conveyance of future uses	Overhead electric, pipelines, drainage easements, railroad right of way, flowage easements
51% - 74%	• Some impact on surface use • Conveyance of ingress/egress rights	Pipelines, scenic easements
50%	• Balanced use by both owner and easement holder	Water or sewer lines, cable lines, telecommunications
26% - 49%	• Location along a property line location across non-usable land area	Water or sewer line, cable lines
11% - 25%	• Subsurface or air rights with minimal effect on use and utility • Location with a setback	Air rights, water or sewer line
0% - 10%	• Nominal effect on use and utility	Small subsurface easement

Commercial/Retail land cost $500,000/Ac (based on ±90% interest = $450,000/Ac or ±$10.35/SF)	
Approximate Estimated Measurements of Private Land Area:	
Permanent Bourne	Permanent Sagamore
479,160 SF (estimated) 11AC	196,020 SF (estimated) 4.5 AC
Cost Analysis	
Areas of impact 100% institutional, commercial, industrial and retail influence	
Total Permanent Easement Cost	
Bourne: 11 AC * $450,000 = $4,950,000.00 Plus improved site.	Sagamore: 4.5 AC * $450,000 = @2,025,000 Plus improved site
Physical Losses/ non consequential/non-incidental damages	Physical Losses/ non consequential/non-incidental damages
Improvements $1,000,000 (2000 SF small retail $500/sf	Improvements $4,500,000 ($15,000 SF large retail $300/SF
Business relocation 20% $1,000,000 Non-Compensable	Business relocation 20% $400,000 Non-Compensable
Total Estimated Cost	
Bourne: $5,950,000	Sagamore: $6,525,000
Total Real Estate Damages including Non-Compensable (Consequential) Cost /Damages: $13,875,000 Rounded Cost: $14,000,000	

11) Conclusion:

The cost opinion of the subject property is based on file information and research based on a physical inspection. This report is classified as a Cost Estimate and not an appraisal, as requested during planning stages of the project, as of the 5th day of August 2019, update 15 January 2020 the estimate of $12,475,000, considered reasonable and supportable with a range of $12,000,000 to $14,000,000, including chattel and is evidenced by area land sales, within the market area of Bourne, MA Cape Cod Project-- no Utility Relocation considered. All public land not considered compensable items for this analysis. The "Rough Order of Magnitude" is considered reasonable at this stage of conceptual design, with acreage estimated for an easement and acquisition estimate. There was no supporting evidence suggesting an increase or decrease in the prior cost estimate.

Total Real Estate Cost includes Acquisitions, Permanent and Temporary Easements:

Twelve Million Five Hundred Thousand Dollars ($12,500,000) rounded (Real Estate Cost Estimate does not consider Contingencies & Non-Compensable Items)

4.6.2.3. Non-Compensable (Consequential) Damages. *Because the compensability of a particular aspect of damage stems from its treatment in the open market between willing buyers and sellers, losses that are not reflected in sales prices in the private market cannot be considered in federal acquisitions. Applying this principle, federal courts have determined that the following losses are not compensable under the Fifth Amendment: loss of business value or going concern value;783 loss of or damage to goodwill;784 future loss of profits;785 frustration of plans;786 frustration of contract or contractual expectations;787 loss of opportunity or business prospect;788 frustration of an enterprise;789 loss of customers;790 expenses of moving removable fixtures and personal property;791 depreciation in value of furniture and removable equipment;792 increased production or management costs;793 damage to inventory or equipment;794 expense of adjusting or restructuring manufacturing operations;795 incurrence of removal or relocation costs;796 loss or cancellation of revocable permits or licenses;797 loss of ability to collect assessments;798 uncertainty premium due to tenant's status as a government entity;799 and interference* with development.

785 *Id.*; *United States ex rel. Tenn. Valley Auth. v. Powelson,* 319 U.S. 266, 283 (1943); *Yuba Nat. Res., Inc. v. United States,* 904 F.2d 1577, 1581-82 (Fed. Cir. 1990); *Ga.-Pac. Corp. v. United States,* 640 F.2d 328, 360-61 (Ct. Cl. 1980) (per curiam).

786 *1735 N. Lynn St.*, 676 F. Supp. at 701 (citing *Powelson*, 319 U.S. at 281-82 & n.12, and *Omnia Commercial Co. v. United States*, 261 U.S. 502, 513 (1923)).

787 *Omnia*, 261 U.S. at 513; *United States v. 57.09 Acres of Land in Skamania Cty.* (*Peterson II*), 757 F.2d 1025, 1027 (9th Cir. 1985); *United States v. 677.50 Acres of Land*, 420 F.2d 1136, 1138-39 (10th Cir. 1970); *Hooten v. United States*, 405 F.2d 1167, 1168 (5th Cir. 1969); *United States v. 1.604 Acres of Land* (*Granby I*), 844 F. Supp. 2d 668, 681-82 (E.D. Va. 2011); *United States v. Gossler*, 60 F. Supp. 971, 976-77 (D. Or. 1945).

788 *Omnia*, 261 U.S. at 513; *United States v. Grand River Dam Auth.*, 363 U.S. 229, 236 (1960); *Powelson*, 319 U.S. at 283.

789 *Omnia*, 261 U.S. at 513; *Grand River*, 363 U.S. at 236.

790 *S. Ctys. Gas Co. of Cal. v. United States*, 157 F. Supp. 934, 935-36 (Ct. Cl. 1958), *cert. denied*, 358 U.S. 815 (1958); *R.J. Widen Co. v. United States*, 357 F.2d 988, 990, 993-94 (Ct. Cl. 1966); *see Stipe v. United States*, 337 F.2d 818, 819-21 & n.3 (10th Cir. 1964).

791 *United States v. Gen. Motors Corp.*, 323 U.S. 373, 378 (1945).

792 *Certain Land in City of Washington v. United States*, 355 F.2d 825, 826 (D.C. Cir. 1965); *see County of Ontonagon v. Land in Dickinson Cty.*, 902 F.2d 1568, 1990 WL 66813, *3-*4 (6th Cir. 1990) (unpubl.).

793 ***PVM Redwood Co. v. United States*****, 686 F.2d 1327, 1328-29 (9th Cir. 1982);** ***Ga.-Pac. Corp. v. United States*****, 640 F.2d 328, 360 n.44, 363-65 (Ct. Cl. 1980) (per curiam).**
794 ***Klein v. United States*****, 375 F.2d 825, 829 (Ct. Cl. 1967).**
795 ***United States v. 91.90 Acres of Land in Monroe Cty.*** **(*Cannon Dam*), 586 F.2d 79, 87-88 (8th Cir. 1978);** ***Klein*****, 375 F.2d 825 at 829.**
796 ***United States v. Westinghouse Elec. & Mfg. Co.*****, 339 U.S. 261, 264 (1950);** ***United States v. Petty Motor Co.*****, 327 U.S. 372, 377-78 (1946);** ***Intertype Corp. v. Clark-Congress Corp.*****, 240 F.2d 375 (7th Cir. 1957);** ***Ga.-Pac.*****, 640 F.2d at 361 n.44. But see exception discussed below regarding temporary acquisitions that interrupt but do not terminate a longer term.**
797 ***Acton v. United States*****, 401 F.2d 896, 897-900 (9th Cir. 1968);** ***United States v. Cox*****, 190 F.2d 293, 295-96 (10th Cir. 1951);** ***see also*** **Section 4.11.2 (Federal Grazing Permits).**
798 ***United States v. 0.073 Acres of Land*** **(*Mariner's Cove*), 705 F.3d 540, 546-49 (5th Cir. 2013);** ***but see Adaman Mut. Water Co. v. United States*****, 278 F.2d 842 (9th Cir. 1960) (regarding restrictive covenants for collection of assessments for water extracted from burdened properties).**
799 ***United States v. 131,675 Rentable Square Feet of Space (GSA-VA St. Louis I)*****, No. 4:14-cv-1077 (CEJ), 2015 WL 4430134, *4 (E.D. Mo. July 20, 2015);** ***see United States v. Gen. Motors Corp.*****, 323 U.S. 373, 379-80 (1945);** ***United States ex rel. Tenn. Valley Auth. v. Powelson*****, 319 U.S. 266, 276 (1943).**

12) The "Cost Estimate" is effective as of 15 January 2020

There was no supporting evidence suggesting an increase or decrease in the prior cost estimate.

13) The Subject Property:

Consists of land along the approaches of both the Bourne and Sagamore bridges. Comparable vacant land sales and listings in the neighborhood and general area, which represent similar uses and similar potential highest and best use indicators were compared. Information used is retained in Cost Estimate file. The greatest impacts are the north side of the Bourne and the south side of the Sagamore on the Cape side of both bridge replacements.

14) Cost Figures:

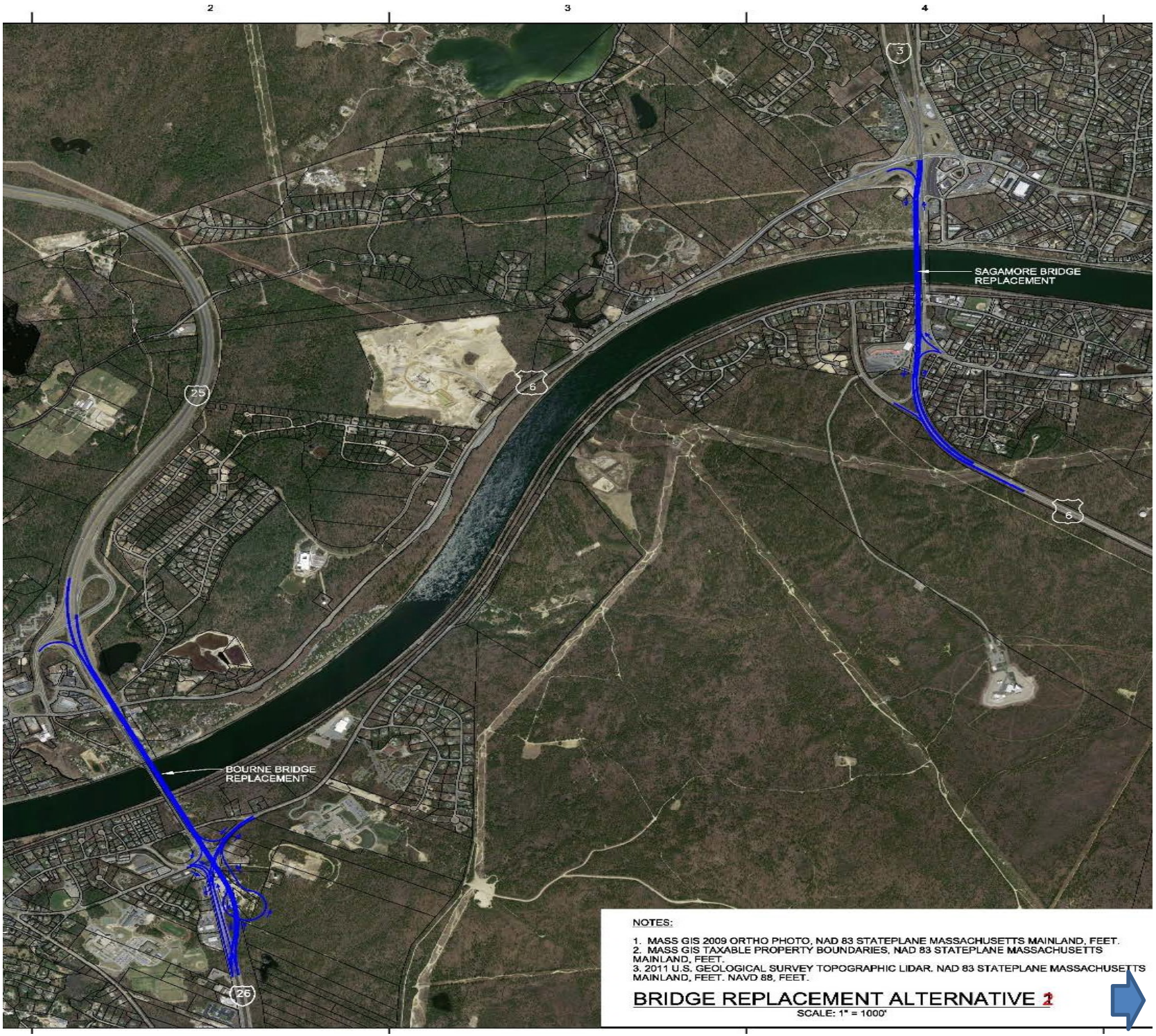
The cost figures are clear and based on acreage for the current stage of the project and preliminary plans, which suggests the best approaches to proposed entrances to the bridges and land costs. The Design Stage and Mass Dot approach plans would result in more Real Estate detail for Parcel delineation. The West side main land approaches involve municipal, State and Federal land all to be related to the project and regarded as donated public land for public use, with no anticipated land acquisition costs, subject to Mass Dot bridge approach/access detail. Prior to Bridge placement design detail Parcel delineation is premature and could be misleading at the stage of planning.

I certify that I have no personal interest, present or prospective in the property, or with the owners there of. The estimate reported represents my best, unbiased judgment. This cost report requires no additional certification and is subject to change, as alternatives are introduced or land areas calculated by engineering, adjusting the costs based on the limited construction design detail at the time of the estimate. The "Rough Order of Magnitude" is considered reasonable at this stage of conceptual design, with acreage estimated for an easement and acquisition estimate.

Daniel E. Jalbert, MAI, AI-GRS, ASA
District Review Appraiser
Department of the Army
United States Army
Corps of Engineers New
England District NAE
696 Virginia Road, Concord, MA 01742-2751
Desk Phone: 978-318-8322 | Fax: 978-318-8867
daniel.e.jalbert@usace.army.mil

Enclosures

ADDENDA



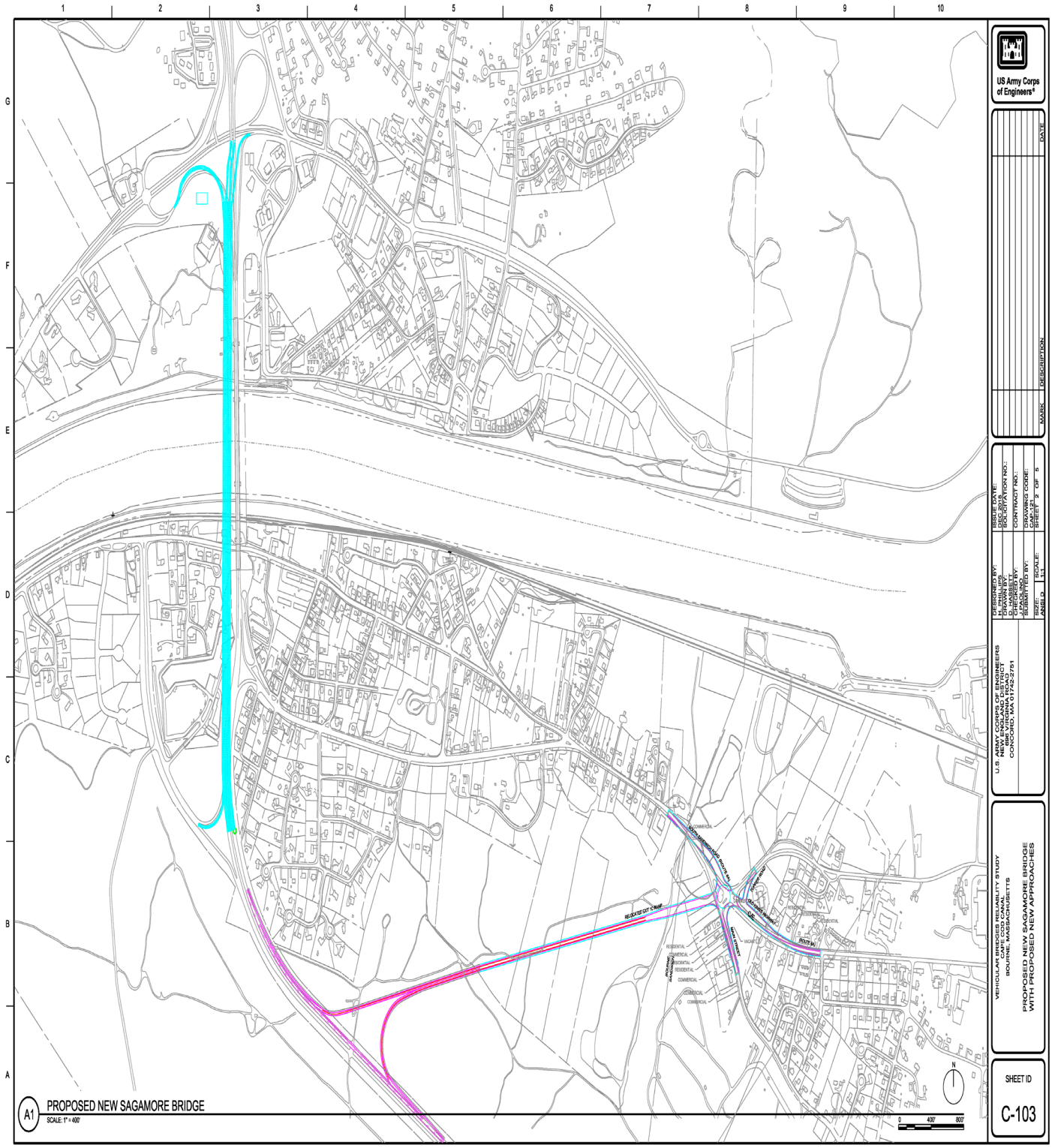
NOTES:

1. MASS GIS 2009 ORTHO PHOTO, NAD 83 STATEPLANE MASSACHUSETTS MAINLAND, FEET.
2. MASS GIS TAXABLE PROPERTY BOUNDARIES, NAD 83 STATEPLANE MASSACHUSETTS MAINLAND, FEET.
3. 2011 U.S. GEOLOGICAL SURVEY TOPOGRAPHIC LIDAR. NAD 83 STATEPLANE MASSACHUSETTS MAINLAND, FEET. NAVD 88, FEET.

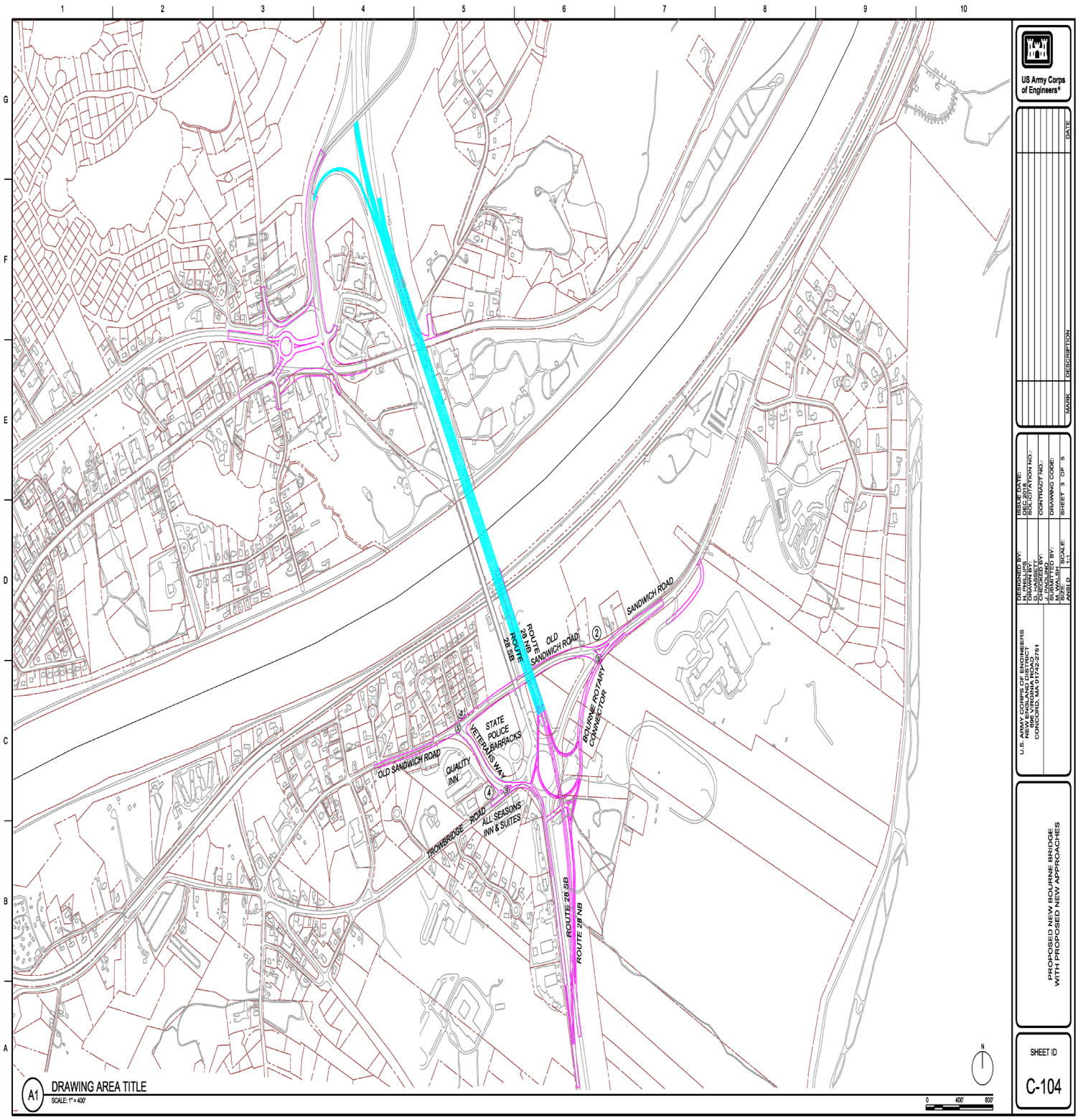
BRIDGE REPLACEMENT ALTERNATIVE 2

SCALE: 1" = 1000'

PROPOSED BRIDGE IMPACT AREAS &
PROVISIONAL APPROACHES TO THE SAGAMORE BRIDGE



BOURNE BRIDGE APPROACHES
& IMPACT AREAS



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD, MA 01742-2751

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ISSUE DATE: DEC 2018
SOLICITATION NO.:
CONTRACT NO.:
DRAWING CODE:
SCALE: 1:1
SHEET 3 OF 5

PROPOSED NEW BOURNE BRIDGE
WITH PROPOSED NEW APPROACHES

SHEET ID
C-104