ES
Executive Summary

ES.1 Introduction

The Massachusetts Port Authority (Massport) is proposing to improve the Runway Safety Area (RSA) at the end of Runway 27 at Boston Logan International Airport (Logan Airport or the Airport), adjacent to Boston Harbor (refer to **Figure ES-1)**. The proposed Runway 27 End RSA Improvements Project (the Project or the Proposed Project) is required to meet the RSA design criteria in the Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5300-13B, *Airport Design*,[1] and to enhance rescue access in the event of an emergency**. The Project would improve safety but would not extend the runway nor have any effect on normal runway operations, runway capacity, or types of aircraft that use the runway.**

ES.1.1 MEPA Process Status Summary

On August 31, 2021, Massport filed an Environmental Notification Form (ENF) with the Executive Office of Energy and Environmental Affairs (EEA) in accordance with the Massachusetts Environmental Policy Act (MEPA) and its implementing regulations specified in 301 Code of Massachusetts Regulations (CMR) 11.00. The ENF was circulated to interested parties and a Public Notice of Environmental Review was published on September 2, 2021. A virtual public consultation session on the ENF was held on September 22, 2021 to receive comments on the Project, and for the EEA and FAA to determine the scope for an Environmental Impact Report (EIR). The EEA Secretary issued a Certificate on the ENF on October 8, 2021, confirming the need to prepare an EIR and describing the Draft EIR scope elements.

1 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

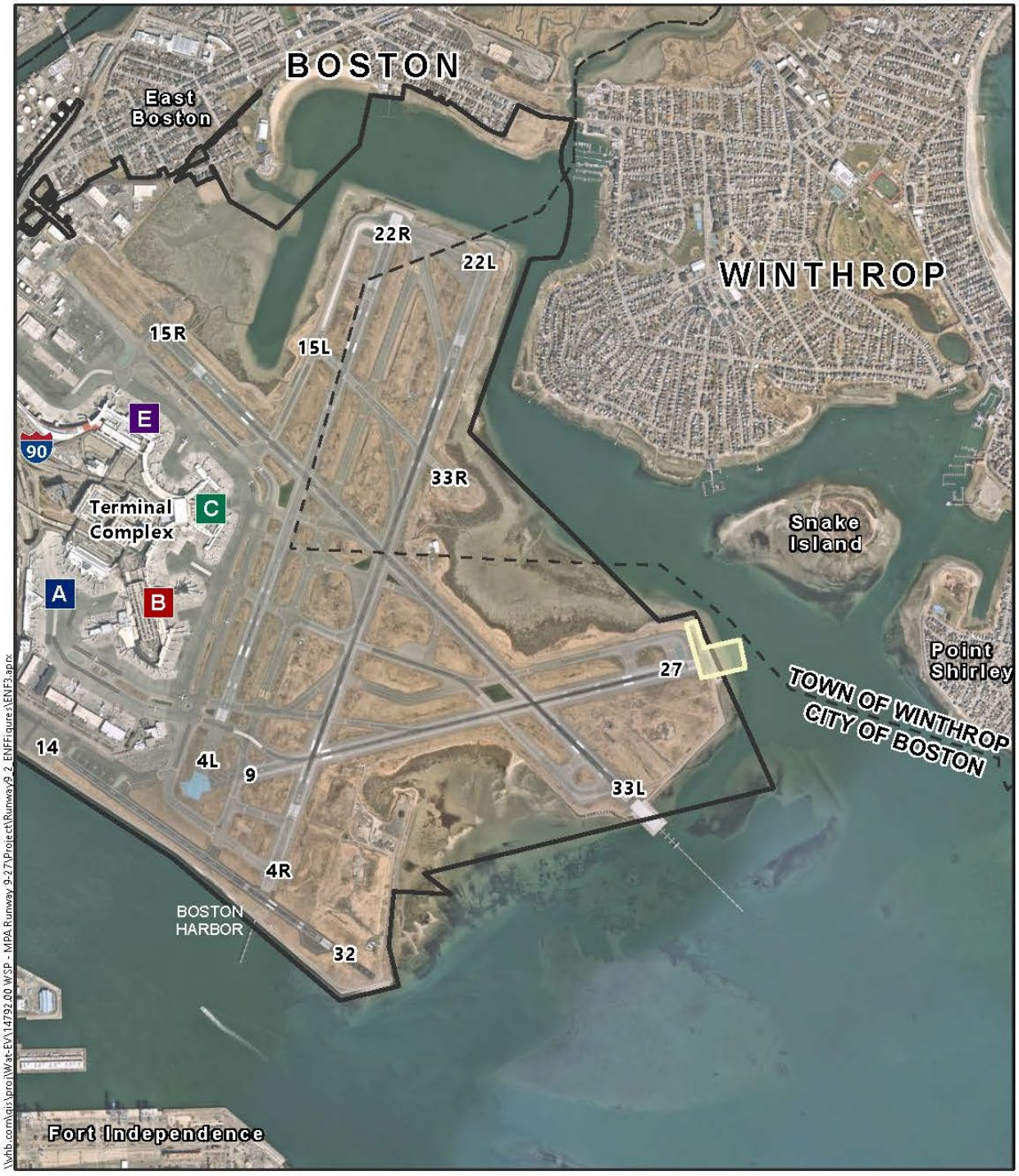


FIGURE ES-1: Logan Airport Aerial **Runway 27 End RSA Improvements Project**

Proposed Project Site
Logan Airport Property Line
Political Jurisdictions

0 1000 2000 4000 Feet

Sources: VHB 2021, ESRI, Nearmap Imagery March 2022

ES.1.2 Public and Agency Coordination

In coordination with the FAA, Massport obtained public input throughout the scoping, planning, and analysis of the Project. In the spirit of the new pending MEPA requirements for projects within 1 mile of an Environmental Justice (EJ) community, Massport voluntarily held a virtual pre-ENF filing public meeting on June 29, 2021 after reaching out to local and state elected officials, representatives in East Boston and Winthrop, the Massport Community Advisory Committee (MCAC), and community interest groups. Notice of the meeting, along with a Project summary, was placed in English and Spanish in the *East Boston Times*, *Winthrop Transcript*, *El Mundo*, and on Massport's website. The meeting was attended by representatives from State Representative Adrian Madaro's office, the City of Boston, the Town of Winthrop, and by various community interest groups and private citizens.

Since the filing of the ENF, Massport has continued to coordinate with environmental agencies interested in the Project. In addition to an agency briefing in early 2021, meetings were held in the Spring of 2022 with the U.S. Coast Guard (USCG), U.S. Environmental Protection Agency (USEPA), National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, Massachusetts Natural Heritage and Endangered Species Program (NHESP), Massachusetts Department of Environmental Protection (MassDEP), Massachusetts Division of Marine Fisheries (DMF), Massachusetts Office of Coastal Management (CZM), and the Boston Conservation Commission (BCC). Because of the Project's close proximity to the Town of Winthrop, Massport also provided a separate briefing to the Winthrop Conservation Commission.

ES.2 Project Description and Purpose

The purpose of the Project is to enhance safety for aircraft and their passengers in emergency situations by constructing improvements to the RSA at the Runway 27 End consistent with the FAA requirements. **This Project is a required FAA safety project that would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway.**

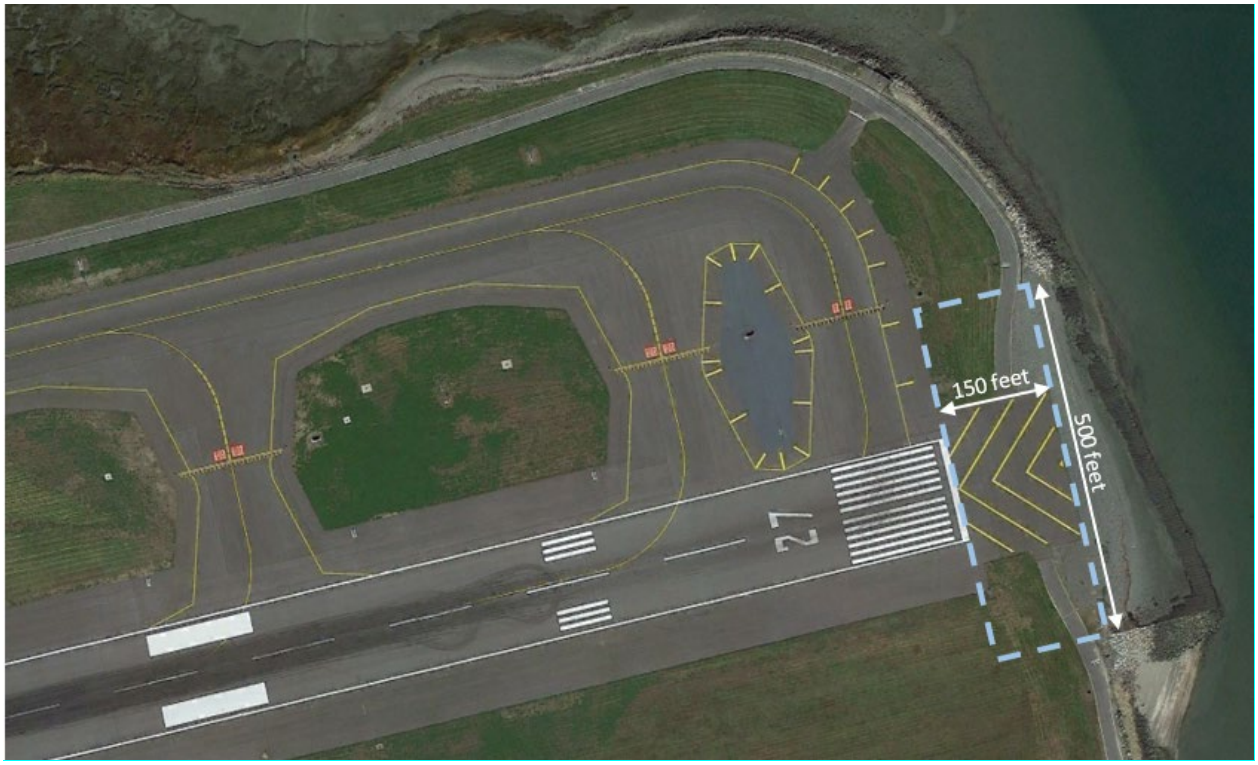
An RSA is a flat surface surrounding the runway that is clear of obstructions. The FAA requires airports to provide RSAs at runway ends and on the sides of a runway to reduce the risk of injury to persons and damage to aircraft in the event of an overrun (an arriving aircraft fails to stop before the end of the runway), an undershoot (an aircraft arriving on a runway touches down before the start of the paved runway surface), or a veer-off to one side of a runway. The proposed Runway 27 End RSA Improvements Project would advance an overriding public interest of safety consistent with Title 49 of U.S. Code Section 47101, which states "that the safe operation of the airport and airway system is the highest aviation priority."[2]

2 U.S. Code, Title 49, Subtitle VII, Part B, Chapter 471, Subchapter I, Section 47101 – Policies, (a) General (1),

In November 2005, Congress mandated that all commercial service airports (including Logan Airport) improve their RSAs to meet FAA minimum standards, to the extent feasible, by 2015.[3] On March 3, 2009, the U.S. Department of Transportation Office of Inspector General (DOT OIG) released a report[4] indicating that, while the FAA had made significant progress in improving RSAs, further action is needed. The DOT OIG report recommended that the FAA take action at 11 of the nation's largest airports, which includes Logan Airport. Logan Airport receives federal funding for airport improvement projects and is therefore federally obligated to meet the RSA design criteria.[5]

Logan Airport Runway 9-27 is 7,001 feet long and 150 feet wide. The FAA design standards require a standard RSA measuring 1,000 feet long beyond each end of the runway and 500 feet wide.[6] As shown in **Figure ES-1**, the Runway 27 End (east end of Runway 9-27) is on the northeastern edge of the airfield, adjacent to Boston Harbor. While the RSA at the west end of Runway 9-27 (Runway 9 End) meets the FAA design requirement, the RSA at the east end (Runway 27 End) is only 150 feet long and therefore does not meet the RSA length requirement of 1,000 feet for a full dimension RSA (refer to **Figure ES-2**).

Figure ES-2 Runway 27 End - Existing Runway Safety Area



3 Congressional Bill H.R. 3058: *Transportation, Treasury, Housing and Urban Development, the Judiciary, the District of Columbia, and Independent Agencies Appropriations Act, 2006*; Public Law 109–115, November 30, 2005, 119 STAT. 2401.

4 U.S. Department of Transportation, Federal Aviation Administration, *Actions Taken and Needed to Improvement FAA's Runway Safety Area Program Report*, Report Number: AV-2009-039, March 3, 2009. Available at: https://www.oig.dot.gov/sites/default/files/11WEB_FILE_RSA_Report_03-3-09_Issued.pdf.

5 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13B, *Airport Design*, March 31, 2022.

6 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, Runway Safety Area Determination, Appendix B: RSA Determination Form, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

ES.3 Alternatives Considered

In 2017, the FAA directed Massport to conduct a *Boston Logan Airport Runway Incursion Mitigation Study/ Runway 9-27 Runway Safety Area (RSA) Alternatives Study* to determine feasible and reasonable alternatives to bring the Runway 27 End RSA into compliance.[7] Six build alternatives and the No-Build Alternative were evaluated in the Tier 1 Alternatives Screening as summarized in **Table ES-1**.

Table ES-1 Tier 1 Alternatives Screening Results

	Alternative						
Screening Criteria	**1 Declared Distances[1]**	**2 Displaced Thresholds**	**3A Full RSA, Fill**	**3B Full RSA, Deck**	**4A EMAS[2] on 500' Deck**	**4B EMAS[2] on 306' Deck**	**No-Build**
Provide overrun and undershoot protection for aircraft consistent with the FAA design criteria	●	●	●	●	●	●	●
Preserve airfield utility and efficiency	●	●	●	●	●	●	●
Retain perimeter road	●	●	●	●	●	●	●
Avoid triggering runway injunction requirements	●	●	●	●	●	●	●
Avoid impacts to the navigation channel	●	●	●	●	●	●	●
Avoid and minimize environmental impacts	●	●	●	●	●	●	●

Key:
● Green indicates that the criterion is met and/or that no negative effect is anticipated; the alternative is favorable in comparison to the other alternatives.
● Orange indicates that the criterion is partially met and/or that there is some negative effect anticipated.
● Red indicates that the criterion is not met and/or that a negative effect is anticipated; the alternative is not favorable in comparison to the other alternatives.
1 Although RSA Alternative 1 scored positively against several screening criteria, it would adversely affect airfield operations and pose takeoff limitations.
2 An Engineered Materials Arresting System (EMAS) is a bed of energy-absorbing material. In an emergency, if an aircraft rolls into an EMAS, the aircraft is slowed down in a way that minimizes damage to the aircraft and potential injuries to passengers and crew members.

Based on the findings of the Study, the FAA concluded that Alternative 4B, which consists of an approximately 650-foot-long RSA with an Engineered Materials Arresting System (EMAS) on a 306-foot-wide deck, was the Preferred Alternative. An EMAS is a bed of energy-absorbing material; in an emergency, if an aircraft rolls onto the EMAS, it is slowed down in a way that minimizes damage to the aircraft and potential injuries. An EMAS is often used when a full-dimension RSA is not possible due to lack of available land or to minimize environmental impacts; an EMAS provides an FAA-approved level of safety equivalent to an RSA built to the full-length dimensions. A No-Build Alternative was also carried forward as part of the environmental review process, consistent with MEPA requirements.

7 U.S. Department of Transportation, Federal Aviation Administration, Standard Operating Procedure 8.00, *Runway Safety Area Determination*, Appendix B: *RSA Determination Form*, "Runway 27 End RSA Improvements Project, Boston Logan International Airport," signed January 2019.

A second-tier alternatives evaluation was conducted to determine the appropriate deck support structure. Two types of support structures were considered: piles and caissons/drilled shafts. Piles are long, circular or square elements made from precast concrete that would be driven into the ground using vibration or impact (pile driving). Caissons, which are circular columns typically much larger than piles, would involve drilling a hole into the bedrock into which structural steel would be placed and concrete pumped to form a column.

Four alternatives for supporting the RSA deck at the end of Runway 27 were identified and evaluated, as summarized in **Table ES-2.**

Table ES-2 Tier 2 Screening Results of Deck Support Alternatives

Screening Criteria	Deck Support Alternatives			
	Alternative 1: 416 Piles	Alternative 2: 326 Piles	Alternative 3: 160 Caissons	Alternative 4: 128 Caissons
Coastal Wetlands Resource Area Impact:				
Permanent total footprint of piles/caissons (total square feet)	1,160	910	3,140	2,510
Permanent total scour (total cubic yards)	380	340	1,060	1,120
Runway Closure/Airfield Disruption: Can construction be completed in 120 days or less?	No	Yes	No	No

The analysis found that Deck Support Alternative 2 would have the least impact on environmental resources and could be constructed with the least operational impacts to the airfield. Deck Support Alternative 2 was carried forward as the Proposed Project for further analysis, along with the No-Build Alternative.

ES.4 Summary of Proposed Improvements

As shown in **Figure ES-3**, the Project would construct a 600-foot-long RSA with an EMAS on a pile-supported deck (approximately 450 feet long by 306 feet wide). The Project would consist of the following components:

- Extending the existing Runway 27 End RSA to accommodate a steel sheet pile wall at the inshore limit of the deck to prevent settlement and erosion of the upland areas;
- Installing a transition slab spanning from the land to the pile-supported structure;
- Installing a deck structure approximately 450 feet long and 306 feet wide (an area of approximately 137,700 square feet [3.2 acres]), supported by 326 twenty-inch square concrete piles;
- Installing an EMAS approximately 500-feet long by 170-feet wide located within the RSA deck;
- Straightening and realigning the existing 20-foot-wide airport perimeter road to enhance vehicular sight lines and situational awareness;
- Installing two emergency access ramps, one on each side of the proposed deck; and
- Add life rings on the sides and end of the deck to enhance access in and out of the water in an emergency.

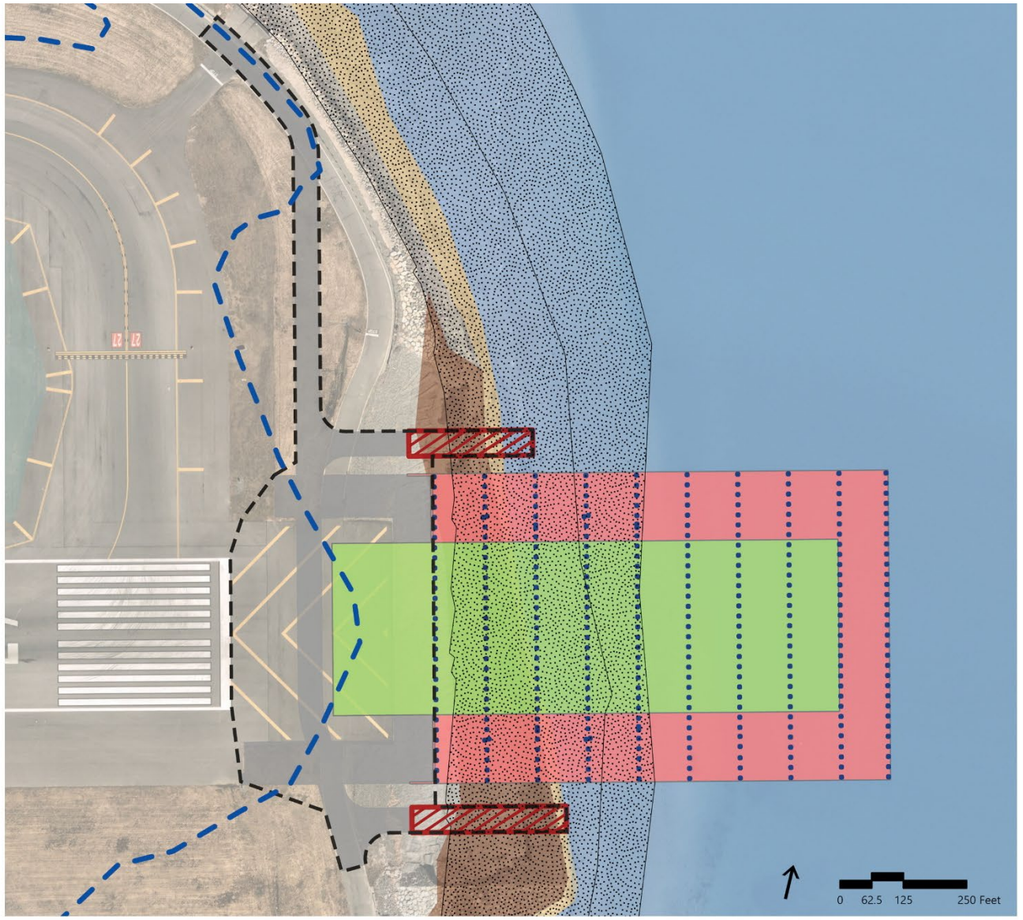
ES.5 Environmental Impacts

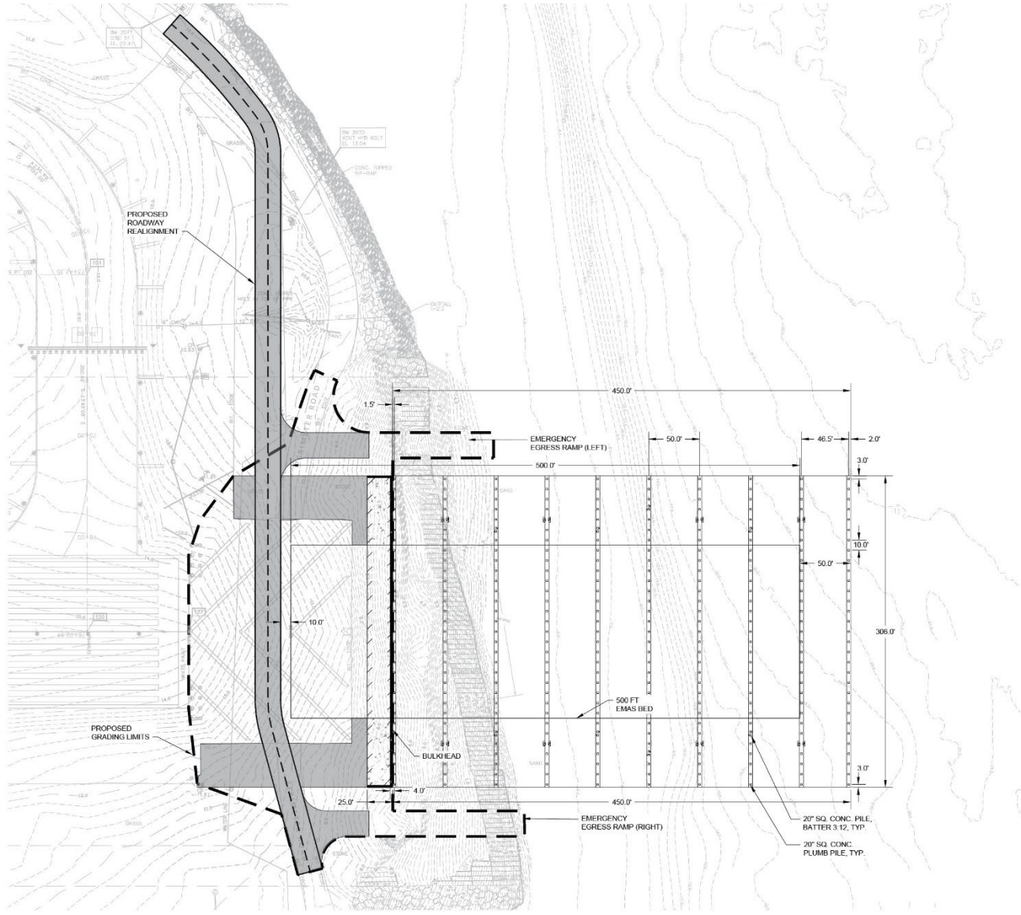
The Project would result in minimal, but direct impacts to coastal resources, habitat, and plants (refer to **Table ES-3**). Coastal resources in the footprint of the Project are shown in **Figure ES-4**. Construction would result in temporary, minor increases in noise, emissions of air pollutants, water quality effects (turbidity), and surface traffic. As previously noted, **the Project would not extend the runway or have any effect on normal runway operations, runway capacity, or types of aircraft that could use the runway**. The only alternative that would avoid impacts to environmental resources is the No-Build Alternative. However, the No-Build Alternative is not acceptable because it does not meet the FAA's RSA requirements.

Table ES-3 Summary of Potential Impacts

Category	Adverse Effect (yes/no)
Coastal Resources	**Yes.** The RSA deck pilings would alter about 880 square feet of Land Subject to Tidal Action and Land Under the Ocean, including Coastal Bank, Coastal Beach/Tidal Flats, and Land Containing Shellfish. An additional 9,460 square feet of previously disturbed coastal resources would be altered to construct the two emergency ramps. No changes are anticipated in wave direction, velocity, or erosion or deposition. Minor scour effects near each piling would be anticipated.
Air Quality	**No.** There would be no change to aircraft operations, type of aircraft, or location in which aircraft operate.
Tidelands/ Public Benefits and Navigation	**No.** The Project is within the Legislated Logan Airport Security Zone and would not limit vessel navigation outside the deck or between the deck and the navigation channel. The RSA deck would be no higher than the existing shoreline and the view is not anticipated to be noticeably different.
Finfish Resources	**No.** Some finfish habitat would be displaced by the pilings. However, the pilings would offer new hard substrate for encrusting marine animals and algae, providing additional feeding habitat for fish.
State-Listed Species	**Possible.** A portion of the Project is in priority upland habitat for two grassland bird species: the upland sandpiper (*Bartramia longicauda*) [State endangered] and Eastern meadowlark (*Sturnella magna*) [State special concern]. The NHESP is reviewing the Project to determine if any potential adverse impacts to these species are anticipated.
Federally Listed Species	**Not Likely.** No adverse impacts to federally listed species under U.S. Fish and Wildlife Service (USFWS) jurisdiction (terrestrial species) are anticipated. Consultation with NOAA Fisheries is ongoing (marine species).
Stormwater and Water Quality	**No.** There are no new stormwater conveyances or discharges of untreated stormwater. The Project is not anticipated to result in a higher pollutant load or increase in total suspended solids.
Historic and Archaeological	**No.** No historic or archaeological resources (including marine) were identified in the area of potential effect.
Hazardous Materials and Solid Waste	**No.** No sites within the Study Area are listed on the USEPA's National Priorities List or in the MassDEP's online database.
Climate Change	**No.** The Project Site is within an area of elevated risk from sea level rise/storm surges, extreme precipitation, and extreme heat. The RSA deck would be designed to withstand anticipated coastal storms and sea level rise. The Project is not anticipated to increase climate risk to other properties in the vicinity. Other than temporarily during construction, the Project would not increase greenhouse gas emissions.
Environmental Justice (EJ)	**No.** There are three census block groups within a one-mile radius of the Project Site; each contains EJ minority populations; these EJ communities in the Town of Winthrop would not be disproportionately affected by the Project. There are no vulnerable health criteria at a community level for Winthrop.

Category	Adverse Effect (yes/no)
Construction	**Yes.** Construction would result in short-term increases in noise, air emissions, turbidity, and surface traffic. Noise: Construction noise anticipated for 120 days (during two separate 60-day periods). Massport will employ noise-dampening measures during pile driving to minimize noise impacts, where possible. Air Quality: Emissions of air pollutants during construction would be below *de minimis* levels. Water Quality: Turbidity may be generated during installation of piles and could temporarily affect water quality in a localized area. A turbidity curtain would be deployed to contain sediment resuspended during pile driving. Surface Transportation: Most materials, equipment, and personnel would be transported by marine vessel and would not substantially contribute to surface traffic. Construction vehicles would be prohibited from local roads.





326 20-Inch Square Concrete Piles

The pile configuration includes:

- 326 total piles (294 vertical piles and 32 batter piles)
- 20-inch square concrete piles driven to rock in 10 bents[1] of 31 piles each
- Bents spaced 50 feet apart and piles within each bent spaced 11 feet apart

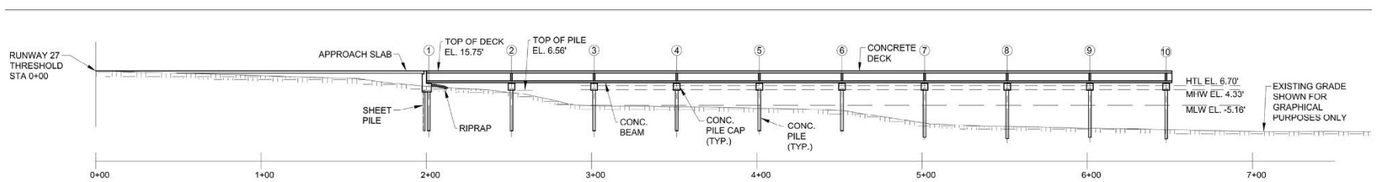


FIGURE ES-3: RSA Deck Support Alternative 2 **Runway 27 End RSA Improvements Project**

Proposed Grading Limits
Pile-Supported Deck
Proposed Engineered Materials Arresting System (EMAS) Bed
Proposed Pavement
Proposed Piles
Proposed Caissons
Proposed Approach Slab
Proposed Emergency Ramp
Coastal Beach
Land Under Ocean
Land Subject to Tidal Action
Federal Emergency Management Agency (FEMA) 100-Year Flood Level
Land Containing Shellfish

1 A bent is an array of piles in a row and fastened together at the top by a pile cap.

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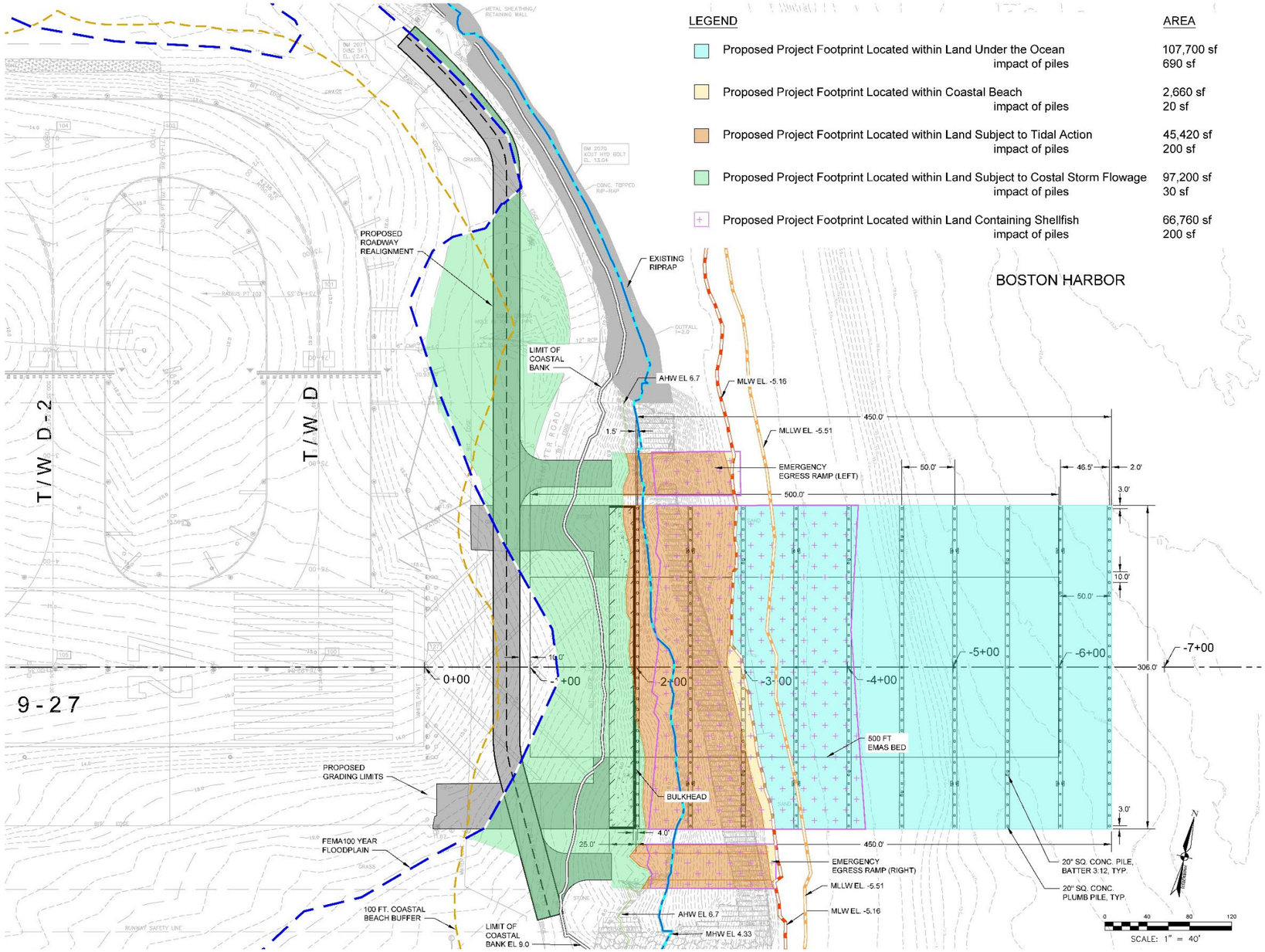
Figure ES-4 Coastal Resources within Project Site



ES.6 Mitigation Measures

Measures to mitigate potential impacts associated with the Project were identified. Construction mitigation measures would be incorporated into contract documents and specifications governing construction activities. Construction activities would comply with FAA Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports*.[8] On-site resident engineers and inspectors would monitor construction activities to ensure mitigation measures are implemented. **Table ES-4** summarizes the proposed mitigation measures.

Table ES-4 Proposed Mitigation Measures and Commitments

Environmental Categories	Mitigation Measure	Implementation Schedule
Land Containing Shellfish	Provide mitigation fee for off-site restoration.	Prior to Construction
Habitat	Replace lost upland grass habitat, where possible.	During Construction
	Implement winter flounder Time-of-Year (TOY) restriction from February 1 to June 30 for in-water construction activities.	During Construction
Coastal Wetlands	Provide in-lieu fee (U.S. Army Corps of Engineers [USACE]) for impacts to mud flat	Following Permitting
Water Quality	Develop and implement a comprehensive Soil Erosion and Sediment Control Plan in accordance with NPDESand MassDEP standards.	During Construction
	Apply water to dry soil to prevent fugitive dust.	During Construction
	Stabilize any highly erosive soils with erosion control blankets and other stabilization methods, as necessary.	During Construction
	Use sediment control methods (such as silt fences and hay bales) to prevent silt and sediment entering the stormwater system and waterways.	During Construction
	Maintain equipment to prevent oil and fuel leaks.	During Construction
	Silt curtains around pile installation and silt fencing.	During Construction
Noise	Maintain mufflers on construction equipment in accordance with Occupational Safety and Health Administration (OSHA) standards.	During Construction
	Minimize engine idling in accordance with Massachusetts anti-idling regulations.	During Construction
	Fit any air-powered equipment with pneumatic exhaust silencers.	During Construction
	Minimize nighttime construction.	During Construction
	Minimize noise during pile driving activities where possible.	During Construction
Transportation	Limit construction traffic to federal or state highways or Logan Airport roadways, prohibiting use of any East Boston roadways by construction vehicles.	During Construction
	Implement construction worker vehicle trip management techniques.	During Construction

8 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports*, December 2018.

Environmental Categories	Mitigation Measure	Implementation Schedule
Air Quality and Greenhouse Gas Emissions	Keep truck idling to a minimum in accordance with Massachusetts anti-idling regulations.	During Construction
	Retrofit appropriate diesel construction equipment with diesel oxidation catalysts and/or particulate filters.	During Construction
	Implement construction worker vehicle trip management techniques.	During Construction
Hazardous Materials and Solid Waste	Pre-characterize any materials before disposal (if any) to determine course of action for removal.	During Construction

ES.7 Permits and Approvals

The Proposed Project would require various local, state, and federal environmental permits prior to construction. Full review of the Project by regulatory and resource agencies, and the public would occur during the permitting process. The shoreline within the Project footprint consists of Land Subject to Tidal Action and Land Under the Ocean and is subject to regulation pursuant to several state regulatory programs. Boston Harbor is a Navigable Water of the U.S. and placement of a structure or filling within Boston Harbor is subject to federal regulation pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. **Table ES-5** summarizes the anticipated permits and approvals.

Table ES-5 Anticipated Project Permits and Approvals

Agency/Department	Permit/Approval/Action
Federal	
Federal Aviation Administration (FAA)	■ National Environmental Policy Act (NEPA)
U.S Army Corps of Engineers (USACE)	■ Section 10 of the Rivers and Harbors Act ■ Section 404 of the Clean Water Act
National Oceanic and Atmospheric Administration (NOAA) Fisheries Service	■ Section 7 Endangered Species Consultation
U.S Coast Guard (USCG)	■ Navigation Coordination
U.S. Environmental Protection Agency (USEPA)	■ National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP)
Commonwealth of Massachusetts	
Executive Office of Energy and Environmental Affairs (EEA)	■ MEPA Review ■ Public Benefit Determination
Massachusetts Office of Coastal Zone Management (CZM)	■ Consistency Statement with Massachusetts Coastal Zone Management Plan
Massachusetts Department of Environmental Protection (MassDEP)	■ Individual Section 401 Water Quality Certification ■ Chapter 91 Waterways Program License Modification

Agency/Department	Permit/Approval/Action
Massachusetts Natural Heritage and Endangered Species Program (NHESP)	■ Conservation and Management Permit (if required)
City of Boston	
Boston Conservation Commission (BCC)	■ Massachusetts Wetlands Protection Act (WPA) Order of Conditions

Note: This is a preliminary list of local, state and federal permits and approvals that may be sought for the Project. This list is based on current information about the Project and is subject to change as the design of the Project evolves.

ES.8 ENF Certificate Requirements

The Secretary's Certificate on the ENF required specific information to be included in the Draft Environmental Impact Report (DEIR). **Table ES-6** lists the general requirements of the Certificate and where in the DEIR that information can be found.

Table ES-6 Environmental Notification Form Certificate Requirements

Requirement	DEIR Section
Describe existing and proposed conditions, project's impacts, avoidance, minimization, and mitigation measures	Chapter 4, Chapter 5, and Chapter 7
Follow Section 11.07 of MEPA regulations and demonstrate avoidance, minimization, and mitigation to reduce damage to the environment	Entire document and Chapter 7
Identify any changes since ENF filing	Section 1.1.1
Describe federal, state, and local permitting and review requirements	Section 1.4
Provide detailed site plans for existing and post-development conditions	Chapter 3, Chapter 4, Figure 2-1, Figure 3-5, Figure 3-10, Figure 4-2, and Figure 4-3
Discuss the injunction preventing Alternative 2	Section 3.2.2.2
Describe the Alternative Analysis for selecting the preferred deck support alternative	Section 3.3
Quantify environmental impacts of each deck support alternative	Section 3.3.1
Describe criteria used and dismissed in Alternatives Analysis	Section 3.2.1 and Section 3.3.2
Describe structural sufficiency for deck support alternatives	Section 3.3.1
Design support structures for resilience for severe coastal storms and sea level rise	Section 3.3.1
Discuss construction period impacts to environmental resources as well as runway closures, airfield disruptions, surrounding neighborhoods and navigation channel	Section 3.3.2
Describe the EJ Outreach Plan	Section 6.7
Evaluate and discuss vulnerabilities faced by EJ populations	Section 6.4
Discuss any disproportionate impacts to surrounding EJ populations	Section 5.10 and Section 6.4
Describe stormwater mitigation measures	Section 7.2.1
Discuss performance standards for wetland resource areas	Section 5.2.1
Discuss hydrological modeling results	Section 5.2.2
Discuss plan for any shellfish mitigation and coordinate with DMF	Section 7.2.1

Requirement	DEIR Section
Discuss the alternatives considered and dismissed and mitigation measures proposed to protect public interests in waterways	Section 3.2, Section 3.3, and Chapter 7
Show location of and areal amount of flowed tidelands impacted	Section 5.3.1, Section 7.3.1.2, and Figure 4-2
Discuss project's consistency with public benefits and how project meets standards for non-water dependent use project	Section 5.3 and Section 7.3.1.2
Discuss impacts to state-listed species	Section 5.4 and Section 5.5
Discuss potential impacts of Climate Change	Section 5.9
Provide estimated timeline of construction	Section 3.4.4.2
Provide draft Construction Management Plan and best management practices	Appendix H
Discuss the Stormwater Pollution Prevention Plan	Chapter 7.3.1.3
Discuss stormwater management measures to be implemented during construction	Chapter 7.3.1.3 and Appendix H
Discuss proposed mitigation measures	Chapter 7
Provide responses to ENF comments	Appendix A
Provide Circulation List	Appendix B