MASSACHUSETTS PORT AUTHORITY
CAPITAL PROGRAMS AND ENVIRONMENTAL AFFAIRS DEPARTMENT

Sustainability Design Guidelines

January 2025

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OVERVIEW

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These Sustainability Design Guidelines (Guidelines) establish consistent sustainability standards for all Massachusetts Port Authority (Massport or the Authority) projects, aligning with Massport's Roadmap to Net Zero by 2031 and its commitment to environmental stewardship. They codify practices Massport already aims to achieve, facilitating sustainable and resilient outcomes.

While the Net Zero Roadmap mainly addresses operational greenhouse gas (GHG) emissions under Massport's control (Scopes 1 and 2), these Guidelines adopt a broader strategy to reduce embodied carbon emissions and other indirect (Scope 3) emissions. They take a holistic approach that benefits both people and the planet as Massport advances toward a sustainable future.

Scope 1: Direct emissions from Massport's controlled sources. For example, on-site combustion of fossil fuels in building boilers and fleet vehicles.

Scope 2: Indirect emissions from Massport's purchased electricity.

Scope 3: All other indirect emissions occurring at Massport facilities or resulting from Massport's operations. Massport does not control these emissions but can influence their reduction. For example, tenant aircraft and developer projects.

1.1 Introduction

Massport intends this document to serve architects, engineers, planners, and consultants working on Massport projects, including those by Massport Capital Programs, developers on Massport property with Massport Real Estate and Asset Management, and Tenant Alteration Application (TAA) projects. The application of these Sustainability Design Guidelines varies according to project construction costs. Chapter 2, *User Guide*, provides a detailed description of how to implement these Guidelines and includes a Decision Tree (**Figure 2-1**) that shows the appropriate paths for various project types and the applicable sustainability rating systems. These Guidelines reference key aspects of leading rating systems for sustainable and resilient design and operation.

1.2 Policy Context

These Sustainability Design Guidelines are deeply rooted in extensive state and local sustainability policies aimed at reducing environmental impacts and addressing climate change. Key policies include:

- **Massachusetts Clean Energy and Climate Plan for 2025 and 2030**: Outlines the Commonwealth's plan to meet GHG emission reduction targets set by the 2021 Climate Law. It aims for 33 percent and 50 percent reductions in emissions from 1990 levels by 2025 and 2030 percent, respectively.
- **House Bill 5060 (An Act Driving Clean Energy and Offshore Wind)**: This legislation focuses on clean energy, building decarbonization, and transportation electrification to meet

emission reduction targets set forth by the *Massachusetts Clean Energy and Climate Plan for 2025 and 2030*.

- **House Bill 5151 (An Act Relative to Massachusetts's Transportation Resources and Climate)**: Aims to enhance and modernize the Commonwealth's transportation infrastructure, such as roads, bridges, railways, and transit systems, while addressing climate resilience and mitigation.
- **Executive Order 594 (Leading by Example – Decarbonizing and Minimizing Environmental Impacts of State Government)**: Requires Executive Branch agencies to lead in decarbonizing and minimizing environmental impacts, supporting the statewide net zero GHG emissions goal by 2050.
- **City of Boston's Climate Action Plan**: Commits the City to reduce community-wide carbon emissions by 50 percent by 2030 and achieve net zero by 2050.
- **Boston Zoning Code Article 37**: Mandates that new projects meet LEED certification standards and consider future climate impacts. Starting July 1, 2025, most new projects must be built to net zero emissions standards from day one and include an embodied carbon analysis.
- **Building Emissions Reduction and Disclosure Ordinance (BERDO)**: Requires annual emissions reporting for buildings over 20,000 square feet, with phased reduction targets to net zero by 2050.

In accordance with its Enabling Act, Massport and its tenants are not generally subject to local regulations including the Boston Zoning Code or BERDO (with the exception of certain health and sanitary-related regulations). Historically, however, Massport's real estate developers have voluntarily complied with parts of the Article 80 process of the Boston Zoning Code, Large Project Review.

1.3 Sustainability at Massport

Massport's Sustainability Vision

With an unwavering commitment to a more sustainable world, Massport will maintain its role as an innovative industry leader through continuous improvement in operational efficiency, facility design and construction, and environmental stewardship while engaging passengers, employees, and the community in a sustainable manner.

In 2015, Massport released the *Boston-Logan International Airport Sustainability Management Plan* (Logan SMP) to serve as a roadmap for prioritizing initiatives and moving goals forward along the path toward a more sustainable Massport. The Logan SMP guides Massport's sustainability practices at Logan Airport and provides an initiative framework to support Massport's continued commitment to sustainability.

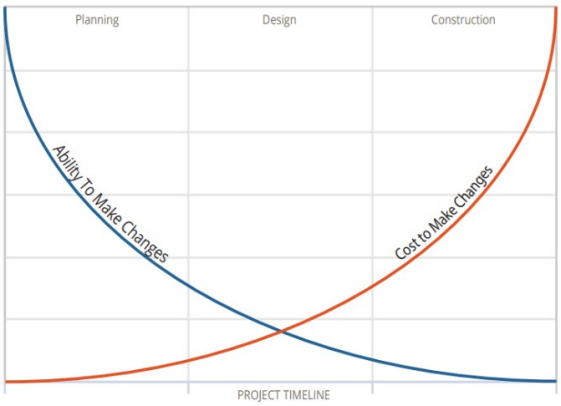
In 2018, Massport published the Sustainability Design Guidelines (SRDGs). The SDGs have been used by architects, engineers, planners, and consultants working on capital projects for Massport. This document presents the 2024 update to the 2018 SRDGs.

In 2019, Massport undertook an extensive planning effort to develop its next phase of sustainability performance goals and targets, Sustainable Massport 2.0, in consultation with stakeholders. Based on these planning efforts, Massport has continued to implement sustainability programs and initiatives, including GHG reduction, sustainable transportation, and waste management.

In 2022, Massport published its *Roadmap to Net Zero by 2031* that aims to reduce Massport-wide GHG emissions to net zero emissions levels with limited reliance on renewable energy credits (RECs), carbon offsets, or similar financial transactions by 2031 and without the use of such financial transactions by 2040. These targets specifically address operational emissions under Massport's control (i.e., Scope 1 and 2 emissions). The Net Zero Roadmap also outlines goals aimed at helping Massport's partners and users reduce the operational emissions under their control occurring at Massport's facilities or resulting from Massport's operations (i.e., Scope 3 emissions).

1.4 Integrative Design

Through these Sustainability Design Guidelines, Massport seeks to improve the sustainability performance of its physical buildings and infrastructure to minimize Massport's contribution to climate change and prepare its assets to withstand future climate hazards. Fundamental to achieving sustainable and resilient design is an early and integrated design process that engages stakeholders across departments and project phases to build consensus around the best project solution.



Source: ISI - Envision Guidance Manual (v3)

Projects are more likely to achieve sustainable outcomes when all members of the Project Team make commitments to achieve sustainability goals. Sustainability begins with the earliest stages of planning and carries through to the end of a project's useful life. As the project timeline advances, the ability to make effective changes decreases while the cost of making those changes increases. On the contrary, projects that incorporate sustainable design principles from the earliest planning stages, and assess by-product synergies across building and infrastructure systems, often find significant cost savings. As an added benefit, investing in early and regular collaboration can prevent design conflicts, reduce change orders, and result in projects that are easier, faster, and less expensive to construct and operate.

This document integrates design concepts and strategies that touch all aspects of sustainability, including energy, materials management, water use, human health, social equity, and more. It also references and incorporates aspects of the leading sustainability rating systems into one guidance document for ease of use and communication. Additionally, the process outlined in this document serves to encourage communication between all sustainability stakeholders at Massport to ensure alignment of needs.

During the "Project Definition" phase, all primary and secondary stakeholders should be identified through a stakeholder mapping process, and a proactive stakeholder engagement process shall be established and continued through construction. The engagement process shall be transparent and provide opportunities for meaningful feedback. Additional information on the stakeholder engagement approach can be found in Envision Credit LD1.3: Provide for Stakeholder Involvement.

USER GUIDE

2

This chapter guides complying with these Sustainability Design Guidelines, which replace Massport's 2018 SDGs. The 2018 document is now obsolete and should no longer be used or referenced.

2.1 Requirements for All Projects

All projects are required to adopt and adhere to the latest version of one of the following sustainability rating systems, as applicable. Further, all projects estimated to have a construction value of $5 million or more are expected to pursue and obtain the applicable certification/ verification award unless a waiver is obtained from Capital Programs (see Attachment C).

- U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) v4.1 certification – Building Design and Construction (BD+C) and Interior Design and Construction (ID+C) are referenced herein (see Chapter 3, *Vertical Project Guidelines – LEED*)[1] [2]
- Green Business Certification Inc.'s (GBCI) Parksmart certification – the 2016 Standard is referenced herein (see Chapter 4, *Vertical Project Guidelines – Parksmart*)
- Institute for Sustainable Infrastructure's (ISI) Envision verification and award – v3.0 is referenced herein (see Chapter 6, *Infrastructure Guidelines)*.

The preferred LEED and Parksmart certification level and Envision award level is **Gold**, though the final level will be determined on a project-by-project basis. The Project Team (inclusive of the Massport Project Manager [PM] and Architect and Engineer of Record [A/E]) shall remain committed to the level of achievement throughout the duration of the project. If a credit is not specifically called out in these Guidelines, or if a preferred action or level of achievement is not indicated, Project Teams are responsible for making credit-based decisions that best align with the project and enable it to meet the applicable certification/verification award level.

Projects valued at under $5 million are exempt from certification/verification award submission. Nonetheless, Project Teams for such projects shall adhere to the applicable sustainability rating systems and preferred certification/verification award levels. A/E Teams are required to consult with the Massport PM and Massport's Environmental Team to determine the necessary level of documentation to demonstrate rating system compliance.

Table 2-1 below lists typical new construction and major renovation project types within Massport's control or influence by their applicable rating system. Projects not considered either new construction or major renovation should adhere to the "Design Principles for Special Projects" provided in **Attachment A**. Special Projects are defined as projects of any monetary value falling under the categories of upgrades and retrofits (energy efficiency upgrades or technology retrofits), interior decoration, façade improvements, and restoration. If there is any question as to whether a project falls within the Special Projects category, A/E Teams should consult with the Massport PM and Massport's Environmental Team.

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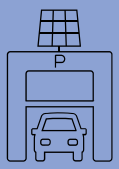
1 LEED v5 rating systems will be released throughout 2024 and 2025. There will likely be a period when projects can register for either LEED v4.1 or v5. During such time, A/E Teams should default to v4.1 but consider any advanced objectives and thresholds under v5.

2 Certain types of projects, including seafood processing facilities, may be exempt from LEED certification requirements due to program costs. However, such projects should still be able to demonstrate certifiability.

Table 2-1 Project Types by Sustainability Rating System

Vertical Buildings and Infrastructure		Horizontal Infrastructure
		
LEED	**Parksmart**	**Envision**
› Terminals (Airport, Cruiseport) › Rental Car Facilities › Office/ Administrative Space › Hotels › Interior Renovation and Building Addition Projects › Airport Hangars › Retail or Restaurant Space within a larger project seeking LEED › Residential and Mixed-Use Buildings › Life Sciences Buildings › Warehouse Spaces or Storage › Facilities (if occupied) › Conditioned Occupied Transit Station (bus or train)	› Multi-Level Parking Structures	› Roadways, Bridges, and Tunnels › Runways/Taxiways/Aprons › Marine Structures (Ports, Piers, Docks) › Surface Parking Lots › Parks/Open Space › Utility Construction and Upgrades › Stormwater Management › Other Linear Infrastructure
Refer to Chapter 3, *Vertical Project Guidelines – LEED*, and Chapter 5, *Additional Vertical Project Guidelines*	Refer to Chapter 4, *Vertical Project Guidelines – Parksmart*, and Chapter 5, *Additional Vertical Project Guidelines*	Refer to Chapter 6, *Infrastructure Guidelines*

Note that additional sustainability rating system certifications are encouraged, but not required. Project Teams should notify Massport's Environmental Team (Sustainability@Massport.com) if an additional sustainability rating system is planned to be pursued. Project Teams may be interested in researching the following options:

- BREEAM (New Construction, Renovations and Tenant Improvements, and Existing Buildings)
- Energy Star
- Green Marine
- Green Globes
- International Living Future Institute (ILFI) Zero Carbon Certification
- Passive House Institute US (PHIUS) Zero
- Sustainable Sites Initiative (SITES)
- WELL Building Standard

Further, all projects with vertical components should reference the current version of the Massachusetts Specialized Opt-in Code (the current version as of this writing is based on the International Energy Conservation Code (IECC) 2021 with Massachusetts amendments + Stretch Code amendments + Specialized Code appendices). The Specialized Code is designed to achieve Massachusetts GHG emission limits in support of the Commonwealth's plan for a net zero economy by 2050. Of the three compliance pathways available under the Specialized Code, teams should consider the "All Electric" pathway. Where discrepancies occur between LEED, Parksmart, Envision, and the Massachusetts Specialized Opt-in Code, Project Teams should review the requirements with the Massport PM and Massport's Environmental Team.

To document adherence to these Sustainability Design Guidelines, as well as to encourage formal dialogue with and reporting to Massport's Environmental Team, all projects are required to submit the appropriate "Sustainability Design Guidelines Compliance Checklist" (see **Attachment B**), which includes the net zero carbon assessment inclusive of an energy load analysis and renewable energy analysis. Teams should refer to the LEED Zero Program Guide[3] for additional guidance on preparing the Net Zero Carbon Assessment calculations; see the section related to "LEED Zero Carbon Certification." Note that transportation emissions can be omitted from the "Total Carbon Emitted" value.

2.2 Resiliency Program

These Sustainability Design Guidelines do not affect the resiliency documents that detail floodproofing measures and emergency response and life-safety procedures. Refer to the following documents for this information. Unless attached to this document, these can be obtained through Massport's Senior Resiliency Manager, who is also available to review project specifics as applicable.

- Floodproofing Design Guide
- Heavy Weather and Flood Operations Plan for Massport's Maritime Facilities
- Logan International Airport Coastal Flood Operations
- Logan International Airport Stormwater and Flood Risk Modeling Study
- Extreme Heat Resiliency Program
- Other Facility-Specific Program Definition Resiliency Studies

3 The LEED Zero Program Guide can be accessed at https://www.usgbc.org/resources/leed-zero-program-guide.

2.2.1 Additional Stormwater Requirements

The management of stormwater is critical for the continuous and safe operation of Massport facilities and for the health of the receiving water bodies that receive stormwater runoff and drainage flow from Massport facilities. Guidance is provided herein that establishes the minimum design standards to manage runoff of rainfall and pollutants from Massport property. Additional guidance is provided for designers and consultants to enhance stormwater management beyond the minimum standards.

Stormwater management (peak rate control and water quality treatment) guidance is established by the Massachusetts Stormwater Management Handbook (latest edition). All vertical and horizontal projects on Massport property should meet or exceed the guidance within this document and direction provided by Massport's Environmental Team as it pertains to each facility's respective National Pollutant Discharge Elimination System (NPDES) Permit. Additional guidance for A/E Teams to reference for stormwater management includes, but is not limited to:

- New England Stormwater Retrofit Manual (EPA Southern New England Program Network, 2022)
- Stormwater Design Guide (MassDOT, 2023)
- Massachusetts Water Resources Commission Low Impact Development (LID) guidelines
- EPA LID guidelines

These Sustainability Design Guidelines specify more robust stormwater management approaches that require design consultants to achieve certain credits through LEED, Parksmart, and Envision.

By meeting the minimum design requirements established in the Massachusetts Stormwater Management Handbook (latest edition) and the minimum performance thresholds Massport has specified in these Guidelines for specific LEED, Parksmart, and Envision credits, A/E Teams will support Massport's stormwater management objectives.

In some instances, site conditions may inhibit an A/E Team's ability to achieve the standards set by certain credits in LEED, Parksmart, or Envision. If a certain stormwater credit cannot be achieved, the designer must discuss this with the Massport PM and Massport's Environmental Team and document the reasons why during the Preliminary Design Stage. The Massport PM will work with the A/E Team to develop an approach to achieve the most robust stormwater management and treatment to the maximum extent practicable given site conditions for the project.

2.2.1.1 Logan Airport Guidance

Massport is authorized to discharge stormwater through a series of outfalls from Logan Airport into Boston Harbor, Boston Inner Harbor, and Winthrop Bay as conditioned by the NPDES Permit No. MA0000787. This permit places particular constraints on the discharge of enterococcus and fecal coliform bacteria through outfalls at North Outfall (001), West Outfall (002), Porter Street Outfall (003), and Maverick Street Outfall (004). Design consultants shall be required to implement measures for stormwater treatment that are effective for bacteria mitigation. The A/E Team shall consider potential sources of bacteria to stormwater within their project area and evaluate the inclusion of stormwater treatment into the project design. Massport's Environmental Team should be consulted for additional guidance. The guidance already included in LEED, Parksmart, and Envision are excellent starting points but Project Teams should develop specifications to meet the requirements of Logan Airport, as appropriate.

2.2.1.2 Stormwater Synergies with Flooding and Climate Resiliency

Climate change is already significantly impacting precipitation intensity and stormwater volumes in the Northeastern United States. The efficacy of specific stormwater management treatment technologies may also be impacted by precipitation extremes.

For Massport's facilities and operations at Logan Airport, large amounts of existing impervious coverage can further exacerbate precipitation-based flooding and water quality impacts on Boston Harbor.

In areas with known flooding vulnerability, the design consultant should work with the Massport PM and Massport's Environmental Team to determine if additional stormwater volume can/should be retained to mitigate localized flooding. For instance, where space allows or conditions are otherwise suitable, the design consultant should consider sizing subsurface stormwater storage systems using NOAA 14 PLUS (or "NOAA PLUS") values, as the State has proposed in Massachusetts Department of Environmental Protection's (MassDEP) updates to the Stormwater Handbook (currently under review). Refer to https://www.mass.gov/doc/massdep-noaa14-plus-summary-of-technical-review/download.

Areas with known precipitation-based flood risk – based on Massport's hydraulic model – include but are not limited to: Terminal A and B Exit Tunnels, the Air Traffic Control (ATC) Tower, Airport Road, Service Road (near the State Police and Transportation Security Administration Building), Terminal C Ramp, Taxiway A (North Cargo), roadways near the Rental Car Center, areas around Bird Island Flats, Fire-Rescue 1, and the Airfield Lighting Vault.

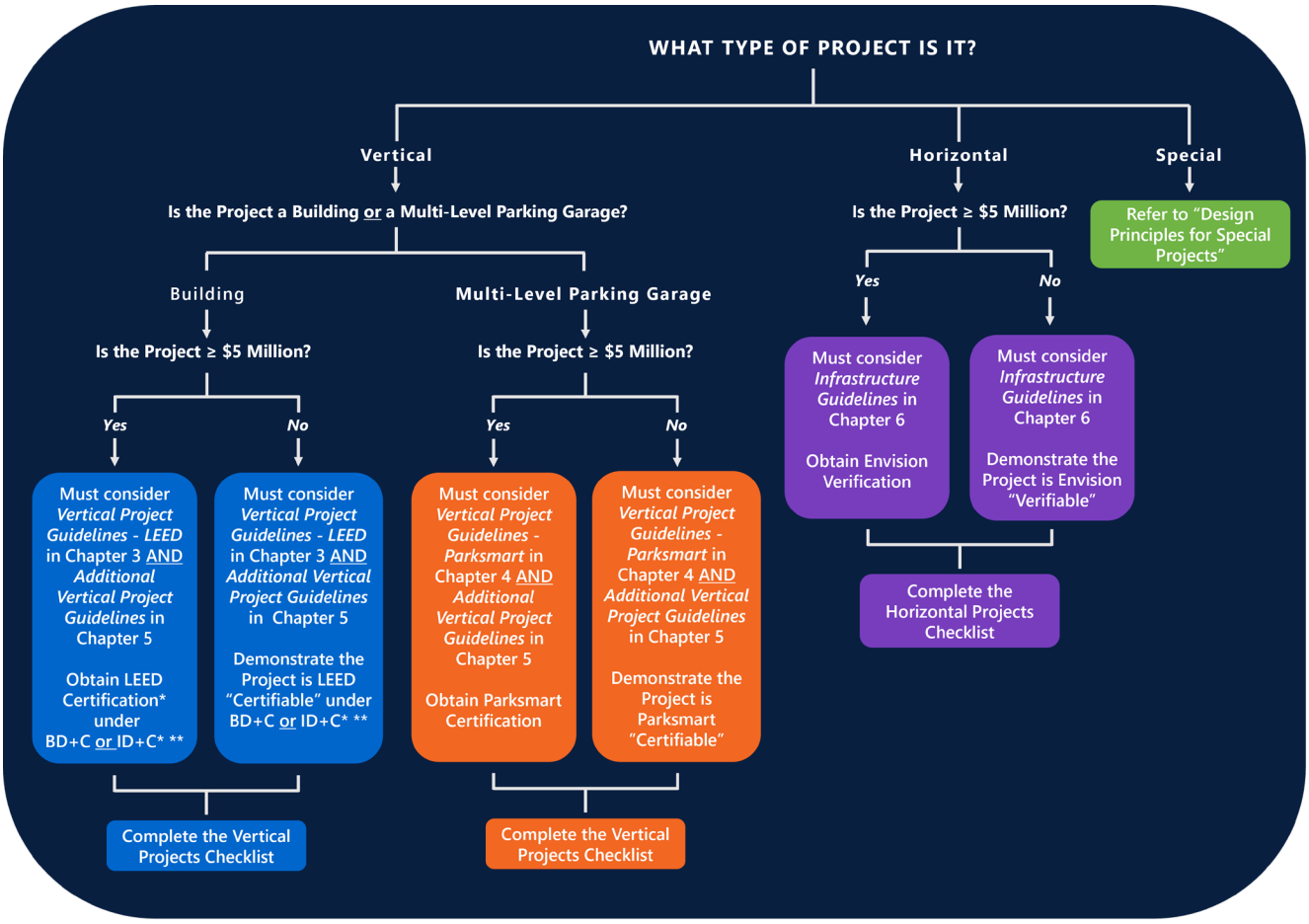
2.3 Triple Bottom Line Analyses

Project Teams are encouraged to identify alternative strategies early in project design and prepare a triple-bottom-line cost-benefit analysis relative to a baseline case to assess their individual economic and environmental value. Such analyses should be consistent with best practice sources. Financial impacts should account for capital costs as well as costs associated with operations/maintenance and replacement. At a minimum, as applicable, environmental impacts should consider reduced carbon emissions, reduced air pollution, reduced vehicle miles traveled, and flood risk mitigation. The outputs of the analyses should be taken into consideration as the project advances through conceptual design.

2.4 How to Use This Document

Figure 2-1 is provided to identify which corresponding sections and attachments of this document apply to each project type. When determining the applicable processes, Project Teams should consider the primary function of the project scope. If a rating system is appropriate for 60 percent or more of the project's gross area, then that rating system should be followed. If an appropriate rating system aligns with 40 percent to 60 percent of the project, teams should evaluate all applicable guidelines and consult with Massport's Environmental Team (Sustainability@Massport.com) to confirm their approach or address any concerns or questions.

Figure 2-1 Sustainability Design Guidelines Compliance Flowchart



* The preferred LEED and Parksmart certification level and Envision award level is Gold, though the final level will be determined on a project-by-project basis.
** On a project-by-project basis, LEED projects adhering to the LEED BD+C rating system shall also pursue LEED Zero Carbon Certification.

2.5 Roles and Responsibilities

During the project initiation, design, and execution phases of all Massport projects, there are central roles for personnel supporting the implementation of these Sustainability Design Guidelines.

- **Massport Capital Programs Assistant Director:** The Assistant Director is responsible for a team of Project Managers and reports to the Deputy Director and the Director of Capital Programs. The Assistant Director coordinates between several projects and stakeholders.
- **Massport Capital Programs Project Manager (Massport PM):** This individual is the primary contact for the project concerning project design, timeline, scope, and budget internal to Massport. The Massport PM acts as the central liaison between the Architect and Engineer of Record (A/E). A/E Teams report to the Project Manager, except for real estate development projects administered by Massport Real Estate and Asset Management (REAM), see below.
- **Massport Environmental Team in Capital Programs:** Massport's Environmental Team will facilitate appropriate coordination and implementation of the Sustainability Design

Guidelines. They are also responsible for reviewing all issuances of the applicable "Sustainability Design Guidelines Compliance Checklist" for every project.

- **A/E Team:** This team is responsible for managing and modifying the project design in coordination with the Massport PM and Massport's Environmental Team to ensure compliance with these Sustainability Design Guidelines as well as other requirements. The A/E Team may appoint and manage lead personnel to complete these responsibilities (e.g., LEED-certified professionals or sustainability specialists). For projects where an external A/E Team may not be involved, this role may be filled by the Massport PM or their designee.
- **Construction Manager/General Contractor (CM/GC):** This team is responsible for constructing the project per the A/E Team's contract documents. The CM/GC is also responsible for preparing documentation supporting sustainability rating system certification/award and providing as-builts for the project's sustainability features to the Massport PM and Environmental Team.
- **Massport Real Estate and Asset Management Project Manager (REAM PM):*** This individual is the primary contact with the development team on MPA REAM projects. The REAM PM will coordinate environmental reviews by Massport's Environmental Team.
- **Massport Capital Programs Tenant Alteration Application Project Manager (TAA PM):*** This individual is the primary contact with the Massport Aviation Business Office on projects completed by tenants in leased areas. The TAA PM will coordinate environmental reviews by Massport's Environmental Team.

** For projects falling under REAM and for tenant alterations, the REAM and TAA PMs effectively serve as the Massport PM.*

2.6 Procedures

Throughout the project life cycle, Project Teams should adhere to the processes described in this section and to the Project Delivery Guides documented in Knowledge Owl, as relayed by the Massport PM. **Table 2-2** summarizes the procedural requirements for each project phase.

The procedures described below reflect the typical capital programming process and align with Massport's design submission guidelines in Knowledge Owl. Project Teams should refer to the relevant design submission guidelines documents for additional details for the design phases. It is important to note that some projects may not perfectly align with what is outlined due to a range of factors like the specific delivery method selected. In these cases, Project Teams should coordinate with Massport's Environmental Team to ensure an alternative procedural pathway is followed.

Table 2-2 Project Delivery for Capital Programming

Project Phase	Responsible Party	Procedural Requirement(s)
Business Case Development and Capital Programming	Massport Assistant Director and Project Manager	› Integrate these Sustainability Design Guidelines into Requests for Qualifications and other project documentation

Project Phase	Responsible Party	Procedural Requirement(s)
		› Engage the Massport Environmental Team in Solicitation Development and the Consultant Selection Process
Project Definition	A/E Team	› Hold a Conditions of Satisfaction (CoS) Meeting with Massport's Environmental Team Expected outcome: Define CoS and program › Report Guidelines Compliance and Certification Status (as applicable) at monthly EMT Meeting › Update sustainability in the weekly project dashboard (as applicable) › Submit an initial Sustainability Design Guidelines Checklist and the Floodproofing Design Form
Preliminary Design	A/E Team	› Hold a Design Review Meeting with Massport's Environmental Team › Report Guidelines Compliance and Certification Status (as applicable) at monthly EMT Meeting › Update sustainability in the weekly project dashboard (as applicable) › Submit updated documents: Sustainability Design Guidelines Checklist Initial Net Zero Carbon Assessment Triple Bottom Line Analysis (if applicable) › Floodproofing Design Form (if applicable)
Design Development Submission	A/E Team	› Hold "Design Review Meetings" at each design stage (60/90/100) with Massport's Environmental Team › Report Guidelines Compliance and Certification Status (as applicable) at monthly EMT Meeting › Update sustainability in the weekly project dashboard (as applicable) › Submit updated documents with the issuance of each Design Stage Submittal: Sustainability Design Guidelines Checklist Net Zero Carbon Assessment

Project Phase	Responsible Party	Procedural Requirement(s)
		› Floodproofing Design Form (if applicable)
Construction Documents	A/E Team Construction Contractor	› Engage the Massport Environmental Team to Discuss Any Post-Design Project Changes Affecting Sustainability Guidelines Compliance › Report status at the EMT Meeting › Update sustainability in the project dashboard › Hold a Pre-Construction Meeting with the Contractor to Review Sustainability Design Guidelines and Documentation Requirements
Close-Out and Post-Occupancy	Massport PM (w/ support of A/E Team)	› Submit the final Sustainability Design Guidelines Checklist and Net Zero Carbon Assessment with Supporting Documentation › Submit sustainability feature as-builts and O&M documentation › Submit proof of sustainability rating system certification/award (if applicable) › Submit 12 months of Greenhouse Gas (GHG) emissions data (for projects pursuing LEED Zero Carbon)

Vertical Project Guidelines – LEED

3

3.1 Introduction

If meeting Minimum Program Requirements (MPRs), all vertical building projects are required to adopt and adhere to the latest version of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) – Building Design and Construction (BD+C) and Interior Design and Construction (ID+C) rating systems.[4] The preferred LEED certification level is **Gold**, though the final level will be determined on a project-by-project basis in coordination with the Massport Project Manager (PM) and Massport's Environmental Team. All projects estimated to have a construction value of $5 million or more are expected to pursue and obtain LEED certification unless a waiver is obtained from Capital Programs **(see Attachment C)**.

The MPRs that determine LEED eligibility are as follows:

- **MPR #1 –** Must be in a permanent location on existing land
- **MPR #2 –** Must use reasonable LEED boundaries (i.e., shall include all contiguous land that is associated with the project and supports its typical operations [e.g., parking, stormwater treatment, landscaping]).
- **MPR #3 –** Must comply with the following project size requirements:
  - LEED BD+C Rating Systems: a minimum of 1,000 square feet of gross floor area (GFA)
  - LEED ID+C Rating Systems: a minimum of 250 square feet of GFA

Note that multi-level parking garages shall pursue Parksmart certification, as they are not eligible for LEED (refer to Chapter 4, *Vertical Project Guidelines – Parksmart*).

In addition to the guidelines presented in this chapter, all vertical building projects shall also adhere to the guidelines presented in Chapter 5, *Additional Vertical Project Guidelines* regardless of the LEED approach.

3.2 LEED Credits and Performance Targets

Though Project Teams should always strive to achieve LEED credits at the highest level feasible, the following section presents Massport's preferred categories, credits, and compliance pathways to achieving Gold certification under LEED BD+C and ID+C. Refer to the LEED v4.1 or latest credit library[5] for additional information and a list of prerequisite credits.

Many LEED credits require measuring performance against a baseline. In many of these cases, the method of preparing the baseline is described within the applicable credit with relevant resources identified. For establishing a baseline Energy Use Intensity (EUI), Project Teams shall follow the Relative Performance or Targeted Performance (TEDI) compliance path of the Massachusetts Stretch Energy Code, which dictates how to establish the baseline model (using the American Society of Heating, Refrigerating and Air-Conditioning Engineers [ASHRAE] standard 90.1-2019 Appendix G). For renovation or expansion work of existing buildings and structures, where the proposed use type will remain the same, Project Teams should request existing utility data to establish a real-world baseline EUI.

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4 To confirm which LEED rating system is applicable to a project, refer to the LEED Rating System Guidance available at: https://www.usgbc.org/leed-tools/rating-system-selection-guidance. For vertical projects that do not meet LEED MPRs, refer to the Design Principles for Special Projects (**Attachment A**).

5 The LEED v4.1 credit library can be accessed at https://www.usgbc.org/credits.

3.3 LEED Zero Carbon Certification

Determined on a project-by-project basis, vertical building projects certified under the LEED BD+C rating system shall additionally pursue LEED Zero Carbon certification. LEED Zero Carbon complements the standard LEED rating system and verifies that projects are in alignment with Massport's net zero target using actual performance data. If pursuing, the Massport PM will be requested to submit 12 months of performance data and administer an occupant transportation survey to determine total project emissions, measured in carbon dioxide equivalents (CO_2e). This reporting should be incorporated into the Project's 12-Month Warranty Review. Refer to the LEED Zero Program Guide[6] for additional information.

"To obtain LEED Zero Carbon certification, a project shall achieve a carbon-dioxide equivalent (CO_2e) balance of zero for the past year:

CO_2e Balance = Total CO_2e Emitted - Total CO_2e Avoided

CO_2e Emitted *is calculated from delivered energy and occupant transportation.* ***CO_2e Avoided*** *includes on-site renewable energy generated and exported to the grid, off-site renewable energy procurement, and the purchase of carbon offsets. Renewable energy generated and used on-site reduces the amount of energy delivered."*

3.3.1 Renewable Energy Guidance

Project Teams shall first seek to leverage all feasible passive design strategies and optimize energy efficiency to reduce the total energy demand of the project. Renewable energy sources shall then be evaluated and selected in the following order of preference:

1. On-site generation
2. Local generation, on Massport properties
3. Offsite generation projects, such as through Power Purchase Agreements (PPAs)
4. Energy Attribute Certificates (EACs), also known as Renewable Energy Certificates (RECs)

3.3.2 Carbon Offset Guidance

Project Teams should coordinate with the Massport PM to set feasible maximum carbon offset limits per project that align with Massport's goal of reaching net zero emissions (Scope 1 and 2) without the use of offsets by 2040. Massport urges third-party developers to adopt this approach for managing their own Scope 1 and Scope 2 emissions, even though these emissions are classified as Scope 3 for Massport.

6 The LEED Zero Program Guide can be accessed at https://www.usgbc.org/resources/leed-zero-program-guide.

3.3.3 Priority LEED Credits

Integrative Process (IP) Guidelines	
IPc1	
Integrative Process	Initial project work shall include an energy-related systems analysis and establish an EUI (kBtu/sf annual site energy use) target no later than the schematic design phase. Refer to the Architecture 2030 Zero Tool to establish energy baseline and reduction targets.[7] To establish baseline EUI for new airport terminal buildings refer to "Energy Performance Benchmark Model for Airport Terminal Buildings."[8]
Energy and Atmosphere (EA) Guidelines	
EAc1	
Enhanced Commissioning	BD+C Option 1. Path 2: Enhanced and Monitoring-Based Commissioning **AND/OR** Option 2. Building Enclosure Commissioning ID+C Option 1. Enhanced Commissioning **OR** Option 2. Monitoring-Based Commissioning
EAc2	
Optimize Energy Performance	Option 1. Energy Performance Compliance/ Tenant-Level Energy Performance Compliance › Target at least 15 LEED EAc1 (Optimize Energy Performance) points. When setting performance target reductions, Project Teams should prepare a cost analysis of estimated carbon offsets necessary for LEED Zero Carbon Certification. Note that LEED Zero Carbon does not apply to the LEED ID+C rating system.

7 The Architecture 2030 Zero Tool can be accessed at http://zerotool.org/zerotool/.

8 The Energy Performance Benchmark Model for Airport Terminal Buildings can be accessed at http://www.ibpsa.org/proceedings/BS2015/p3074.pdf.

EAc4 (BD+C)	
Grid Harmonization	Case 3: Load Flexibility and Management Strategies. › Analyze the building's annual load shape and peak load based as calculated for EA Prerequisite Minimum Energy Performance. Review the regional grid load profile using the metric of peak load or peak carbon emissions. The U.S. Environmental Protection Agency's (EPA) AVoided Emissions and geneRation Tool (AVERT) provides regional grid emissions data; local utilities may also provide this data. › Implement one or more of the load flexibility and management strategies described below. All projects shall install interval recording meters and have equipment capable of accepting an external signal. Peak Load Optimization: demonstrate that strategy reduces on-peak load by at least 10 percent as compared to peak electrical demand referenced to the ASHRAE 90.1-2016 compliant case (1 point) On-site thermal and/or electricity storage: demonstrate that strategy reduces on-peak load by at least 10 percent as compared to peak electrical demand (1 point) Additionally, consider demand response program availability and participation. Such programs may be applicable outside of utility wholesale agreements.
EAc5	
Renewable Energy	Consistent with Section 3.3, *LEED Zero Carbon Certification*, use on-site renewable energy systems or procure renewable energy from offsite sources for all or a portion of the building's annual energy use. Note that all environmental attributes associated with renewable energy generation shall be retired on behalf of the LEED project to contribute to credit achievement. LEED Zero Carbon does not apply to the LEED ID+C rating system. Project Teams should strive to include the electrical load associated with electric vehicle (EV) charging; however, this load can be excluded from the above requirement if the Project Team and Massport's Environmental Team mutually agree that its inclusion is infeasible. In such cases, Project Teams should coordinate with the Environmental Team on alternative means of procuring renewable electricity to cover this energy load. For LEED BD+C projects not pursuing LEED Zero Carbon certification and LEED ID+C projects, Project Teams shall consider covering 100 percent of total site energy use with renewable electricity according to the hierarchy listed in Section 3.3.1, *Renewable Energy Guidance*. Any planned reliance on renewable energy credits (RECs) or carbon offsets shall be discussed with the Massport PM. This measure is contingent on Federal Aviation Administration (FAA) 7460 approval with a glare study.

EAc6

Enhanced Refrigerant Management

Option 1. No Use of Refrigerants or Low-Impact Refrigerants

- Low-impact refrigerants shall have an ozone depletion potential of zero and a global warming potential (GWP) of less than 50.

OR

Option 2. Calculate Refrigerant Impact

Materials and Resources (MR) Guidelines

MRc1 (BD+C) & MRc2 (ID+C)

Building/Interiors Life-Cycle Impact Reduction

BD+C

Option 1. Path 1: Building and Material Reuse

- Maintain at least 15 percent of the existing structural elements.

AND/OR (Both Pathways Recommended)

Option 1. Path 2: Maintain Interior Nonstructural Elements

- Maintain at least 30 percent of interior nonstructural elements.

AND/OR (Both Options Recommended)

Option 2. Path 4: Whole-Building Life-Cycle Assessment

- Prepare an assessment demonstrating a 20 percent GWP reduction, and a 10 percent reduction in two other impact categories when compared with baseline building.

ID+C

Option 2. Design for Flexibility and Disassembly

- Implement floor and ceiling product category strategies and one additional product category.

AND/OR (Both Options Recommended)

Option 3. Path 3: Building Interiors Life Cycle Assessment

- Incorporate reuse and/or salvage materials into the project's scope of work. Conduct a life cycle assessment of the project's interior compared to a baseline interiors project. Demonstrate reductions compared with the project baseline of at least 20 percent for GWP and at least 10 percent reduction in two additional impact categories. Refer to LEED for a list of impact categories.

MRc2 (BD+C) & MRc3 (ID+C)	
Environmental Product Declarations (EPD)	Option 1. EPD BD+C › Use at least 20 different permanently installed products sourced from at least five manufacturers that meet LEED disclosure criteria. Option 1. EPD ID+C › Use at least 10 different permanently installed products sourced from at least three manufacturers that meet LEED disclosure criteria. **AND/OR (Both Options Recommended)** Option 2. Embodied Carbon/ Life Cycle Assessment (LCA) Optimization Use products that have a compliant embodied carbon optimization report or action plan in addition to the LCA or EPD. Use at least five permanently installed products from at least three manufacturers.
MRc3 (BD+C) & MRc4 (ID+C)	
Sourcing of Raw Materials	Use products sourced from at least five different manufacturers that meet at least one of the responsible sourcing and extraction criteria (extended producer responsibility, bio-based materials, wood products, material reuse, recycled content) for at least 30 percent, by cost, of the total value of permanently installed building products in the project.
MRc4 (BD+C) & MRc5 (ID+C)	
Material Ingredients	Option 1. Material Ingredient Reporting Use at least 20 (10 for LEED ID+C) different permanently installed products from at least five (three for LEED ID+C) manufacturers that use an approved program (e.g., cradle to cradle, declare, Health Product Declaration [HPD], etc.) to demonstrate the chemical inventory of the product to at least 0.1 percent (1000 ppm). **AND** Option 2. Material Ingredient Optimization Use products that have a compliant material ingredient report or action plan. Use at least five permanently installed products sourced from at least three different manufacturers. Project Teams should coordinate with the Massport PM and Massport's Environmental Team to identify and consider qualifying materials previously incorporated into Massport projects.

MRc9 (BD+C) & MRc6 (ID+C)

Construction and Demolition Waste Management

Develop and implement a construction and demolition waste management plan.

Provide a final waste management report detailing all waste generated, including disposal and diversion rates for the project. Calculations can be by weight or volume but shall be consistent throughout. Exclude hazardous materials, excavated soil, and land-clearing debris from calculations. Include materials destined for alternative daily cover (ADC) in the calculations as waste (not diversion). Any materials sent to a commingled recycling facility for processing shall take the facility's average recycling rate and shall include any ADC as waste (not diversion).

Option 1. Diversion

- Divert at least 95 percent* of the total construction and demolition materials from landfills and incineration facilities.

* Note that the LEED threshold is 50 percent for this credit. Massport's goal is 95 percent. Teams should plan to separate major waste material streams on-site when feasible to meet the reduction target.

Indoor Environmental Quality (IEQ) Guidelines

EQc1

Enhanced Indoor Air Quality Strategies

Strategy 3 – Filtration of Outdoor Air and Strategy 4 – Filtration of Recirculated Air

- Each ventilation system that supplies outdoor or recirculated air to occupied spaces shall have filtration media of a minimum efficiency reporting value (MERV) 13 or higher.
- Replace all air filtration media after construction is complete and before occupancy.

Should a ductless mini split unit have an outside air connection, such systems shall have a MERV-13 or equivalent filtration media class of ePM1 50 percent or higher.

Strategy 9 (Carbon Dioxide Monitoring)

- Monitor CO_2 concentrations within all densely occupied spaces.

Strategy 10 (Additional Source Control and Monitoring)

- Develop and implement a materials-handling plan to reduce the likelihood of contaminant release.

Install monitoring systems with sensors designed to detect the specific contaminants. An alarm must indicate any unusual or unsafe conditions.

EQc2	
Low-Emitting Materials	Demonstrate compliance within at least four of the following interior product categories: Paint & Coatings, Adhesives & Sealants, Flooring, Wall Panels, Ceilings, Insulation, Furniture, and Composite Wood. Comply with the Massport Furniture Guidelines, approved by Massport Fire Rescue, which allows CAL 117 (CAL TB 117-2013) compliant furniture in locations equipped with sprinklers. Use materials on the building interior (everything within the waterproofing membrane) that meet the low-emitting criteria. Products shall meet the volatile organic compound (VOC) content limits outlined in the following Guidelines. › Paints & Coatings: South Coast Air Quality Management District (SCAQMD) Rule 1113 › Adhesives & Sealants: SCAQMD Rule 1113 › Composite Wood Products: Certified as ultra-low-emitting formaldehyde (ULEF) or no added formaldehyde (NAF) under the EPA Toxic Substances Control Act (TSCA) Title VI Furniture: American National Guidelines Institute/ Business and Institutional Furniture Manufacturer's Association (ANSI/BIFMA) e3-2019e Furniture Sustainability Standard
EQc3	
Construction Indoor Air Quality Management Plan	Develop and implement an indoor air quality (IAQ) management plan for the construction and pre-occupancy phases of the building. Meet or exceed Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) control measures. Protect absorptive materials (on-site and installed) from moisture damage. Permanently installed air-handling equipment shall use filtration media (minimum MERV 13) and replace all filtration media before occupancy. Prohibit smoking (including electronic smoking devices) inside the building and within 25 feet of building openings during construction.

EQc4	
Indoor Air Quality Assessment	Option 2. Air Testing Path 1: Particulate Matter (PM 10 & PM 2.5) and Inorganic Gases (Carbon Monoxide and Ozone) **AND/OR (Both Pathways Recommended)** Path 2: VOCs After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline IAQ testing in occupied spaces for the contaminants listed under Paths 1 and 2. See LEED credit language for allowable threshold limits.[9] (Credit does not apply to Core and Shell projects.)

Location and Transportation (LT) Guidelines (Not applicable to ID+C certification)	
LTc8	
Electric Vehicles	Option 1. Electric Vehicle Supply Equipment (EVSE) and Option 2. Electric Vehicle Ready Infrastructure › On a project-by-project basis, evaluate the number of dedicated/reserved spaces for EVs with EV charging stations. This number needs to be verified based on available power capacity. › The levels of EV charging provided should correspond to the needs of the facility's users, depending on their driving distances and length of stay. Charging stations should be installed in compliance with the latest version of the National Fire Protection Agency (NFPA 70), National Electrical Code – Article 625, as well as the applicable Massachusetts electrical code adopted and enforced locally. Meter the electricity supply provided to the EV charging stations separately from other building end uses. Provide clear signage promoting EVSE throughout the parking structure and reserved parking next to the chargers for exclusive use by EVs.

Sustainable Sites (SS) Guidelines (Not applicable to ID+C certification)	
SSc1	
Site Assessment	Complete a site survey documenting the following: topography, hydrology, climate, vegetation, species, soil, human use, and human health effects.

9 The LEED v4.1 Indoor Air Quality Assessment can be accessed at https://www.usgbc.org/credits/new-construction-schools-new-construction-retail-new-construction-healthcare-data-centers-17?return=/credits/New percent20Construction/v4.1/Indoor percent20environmental percent20quality.

SSc4

Rainwater Management

Refer to Section 2.2.1, *Additional Stormwater Requirements*.

Option 1. 95th Percentile

- Retain onsite runoff from the 95th percentile of local 24-hour rainfall events. Stormwater shall be retained (i.e., infiltrated, evapotranspirated, or collected and reused) using LID and green infrastructure (GI) practices.

To determine the 95th percentile amount, Project Teams should reference the EPA Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act.

The Massachusetts Water Resources Commission provides guidance on LID at https://www.mass.gov/low-impact-development.

AND

Option 2. Natural Land Cover Conditions

- Manage on site the annual increase in runoff volume from the natural land cover condition to the post-developed condition.

Additionally, do not exceed the rate or quantity of runoff for 2-, 5-, 10-, 25-, and 50-year 24-hour rainfall events relative to existing conditions.

SSc5

Heat Island Reduction

Option 1. Nonroof and Roof*

- Meet the following criterion:

$$\frac{\text{Area of Nonroof Measures}}{0.5} + \frac{\text{Area of High-Reflectance Roof}}{0.75} + \frac{\text{Area of Vegetated Roof}}{0.75} \geq \text{Total Site Paving Area} + \text{Total Roof Area}$$

A high-reflectance roof is defined as follows:

- Low-sloped roof (≤ 2:12): Initial SRI – 82; Aged SRI – 64
- Steep-Sloped roof (>2:12): Initial SRI – 39; Aged SRI – 32

* This option is the preferred option of several identified options in LEED.

SSc6

Light Pollution Reduction

Option 1. BUG Rating Method

OR

Option 2. Calculation Method

Projects may use different options for uplight and light trespass.

SSc8	
Tenant Design and Construction Guidelines	Prepare a document to support tenant fit-out alignment and coordination with core and shell sustainable design features and provide it to Massport before lease execution. Applicable to Core and Shell Projects only.

Vertical Project Guidelines – Parksmart

4

4.1 Introduction

All multi-level parking garages are required to adopt and adhere to the latest version of the Green Business Certification Inc.'s (GBCI) Parksmart rating system. The preferred Parksmart certification level is **Gold**, though the final level will be determined on a project-by-project basis in coordination with the Massport Project Manager (PM) and Massport's Environmental Team. All projects estimated to have a construction value of $5 million or more are expected to pursue and obtain Parksmart certification unless a waiver is obtained from Capital Programs **(see Attachment C)**.

Note that surface parking lots shall pursue Envision verification, as they are not eligible for Parksmart (refer to Chapter 6, *Infrastructure Guidelines*).

In addition to the guidelines presented in this chapter, all multi-level parking garages shall also adhere to the guidelines presented in Chapter 5, *Additional Vertical Project Guidelines* regardless of the Parksmart approach.

4.2 Priority Parksmart Measures

Though Project Teams should always strive to achieve Parksmart measures at the highest level feasible, the following section presents Massport's preferred elements, measures, and compliance pathways to achieving Gold certification under Parksmart. Refer to the Parksmart Certification Standard[10] for additional information on rating system measures.

Section A: Management Guidelines	
Measure 4	
Recycling Program	Install recycling bins in all areas where trash bins are located and provide proper signage indicating at least the following materials can be recycled: cardboard, paper, glass, aluminum, polyethylene terephthalate (PETE) (Number 1), and high-density polyethylene (HDPE) (Number 2) plastics.
Measure 6	
Proactive Operational Maintenance	Adhere to a maintenance manual that includes proactive measures to prolong the building's life span.

10 The Parksmart Certification Standard can be accessed at https://parksmart.gbci.org/resources.

Measure 9	
Building Systems Commissioning	LEED v4.1 Enhanced Commissioning Credit[11] Documentation supporting adherence to the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) v4.1 Enhanced Commissioning (Option 1. Path 1) for all applicable systems in the parking structure.
Measure 10	
Construction Waste Management	A construction waste management plan shall be developed that identifies materials to be diverted from disposal with a target of 95 percent* of waste materials (measured by weight or volume) being recycled or reused. Soil, land-clearing debris, and hazardous waste are not to be included in these calculations. For multiple projects within scope, the percentage is based upon the cumulative sum of the solid waste materials across all of the projects. * Note that Parksmart has a maximum point threshold of 85 percent.
Measure 11	
Regional Materials for New Construction, Rehabilitation, or Retrofit	At least 50 percent of materials or products have been extracted, harvested, recovered, and/or manufactured within 300 miles of the project site.
Measure 16	
Life Cycle Assessment	Perform a Life Cycle Assessment (LCA), before undertaking new construction or major renovations and retrofits, which validates the construction decisions. Demonstrate a 20 percent* reduction of greenhouse gas (GHG) emissions over an equivalent baseline project. * See additional guidance under Section 5.2, *Additional Vertical Project Guidelines*, for vertical project emission reduction targets.

11 The LEED v4.1; Enhanced Commissioning Credit can be accessed at https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-173?return=/credits/New percent20Construction/v4.1/Energy percent20& percent20atmosphere.

Section B: Programs Guidelines	
Measure 4	
Wayfinding Systems – Internal	Parking Guidance via Single Space Detection **OR** Parking Guidance via Electronic Level Occupancy Detection
Measure 5	
Traffic Flow Plan	Employ at least three of the following strategies that can be permanent or temporarily enabled during high-traffic periods. › Enhanced Signage › Destination Wayfinding Signage › Single Direction › Electronic Signal Control › Pay Before Exit
Measure 9	
Alternative Fuel Vehicles	Evaluate the number of dedicated/reserved spaces for EVs with EV charging stations. This number needs to be verified based on available power capacity. The levels of EV charging provided should correspond to the needs of the facility's users, depending on their driving distances and length of stay. Charging stations should be installed in compliance with the latest version of the National Fire Protection Agency (NFPA 70), National Electrical Code – Article 625, as well as the applicable Massachusetts electrical code adopted and enforced locally. Meter the electricity supply provided to the EV charging stations separately from other building end uses. Provide clear signage promoting EVSE throughout the parking structure and reserved parking next to the chargers for exclusive use by EVs.
Section C: Technology and Structure Design Guidelines	
Measure 2	
Fire Suppression Systems	All of the fire suppression equipment is documented to be free of halon.

Measure 3	
No/Low-VOC Coatings, Paints, and Sealants	The parking structure has procured and applied only no- or low-VOC materials and intends to continue utilizing these materials in the future. Refer to USGBC's LEED v4.1 VOC emissions criteria.[12]
Measure 5	
EV Charging Stations	*See Section B, Measure 9*
Measure 6	
Heating, Ventilation, And Air Conditioning (HVAC) Systems – Occupied	One or more of the following energy-efficient mechanical systems has been installed in equipment serving the occupied spaces: geothermal heat pumps (GHP), air source heat pumps (ASHP), variable-frequency drive (VFD), variable refrigerant flow (VRF), heat recovery ventilation/energy recovery ventilation (HRV/ERV). Air Quality Monitoring: Sensors capable of detecting unsafe levels of carbon monoxide (CO), nitrogen dioxide (NO_2), and VOC are installed and engage the ventilation system at appropriate power levels to maintain safe air quality at all occupied times. Programmable thermostats have been installed and programmed with temperature setbacks to reduce the system demand when the occupied spaces are vacated. HVAC systems do not use any chlorofluorocarbons (CFC) or hydrochlorofluorocarbons (HCFC) as HVAC coolants.
Measure 7	
Ventilation Systems – Parking Decks	Open-air, naturally ventilated parking decks should be prioritized whenever feasible. Where projects require mechanical ventilation, the following options should be considered: › Demand Controlled Ventilation (DCV) › Variable Air Flow System › Schedule or Occupancy Controls

12 The LEED v4.1 VOC emissions criteria can be accessed at https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-data-38?return=/credits/New percent20Construction/v4.1/Indoor percent20environmental percent20quality.

Measure 8	
Lighting Controls	Control lighting fixtures using preset programs and/or monitoring sensors to reduce the facility's energy consumption. Interior lighting: › At least 50 percent of the lighting fixtures are controlled by occupancy sensors. Exterior Lighting: At least 60 percent of the lighting fixtures are controlled by photocells or occupancy sensors.
Measure 9	
Energy Efficient Lighting	The maximum allowable lighting power density (LPD) is 0.14 watts/square foot.
Measure 10	
Stormwater Management	Refer to Section 2.2.1, *Additional Stormwater Requirements*. <u>Erosion and Sedimentation Control</u> › Implement an Erosion and Sedimentation Control Plan (ESC) that exceeds the most current version of the U.S. EPA Construction General Permit, or local equivalent, whichever is most stringent. <u>Stormwater Retention and Treatment</u> › Retain onsite runoff from the 95th percentile of local 24-hour rainfall events. Stormwater shall be retained (i.e., infiltrated, evapotranspirated, or collected and reused) using LID and GI practices.* To determine the 95th percentile amount, Project Teams should reference the EPA Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act. The Massachusetts Water Resources Commission provides guidance on LID at https://www.mass.gov/low-impact-development. * Note that Parksmart requires projects to manage on-site runoff from the 80 percent or 90 percent precipitation event using LID and GI. Massport's guideline under this Measure is aligned with the Conserving achievement level established by Envision. See credit NW2.2 Manage Stormwater under Chapter 6, *Infrastructure Guidelines*. <u>Runoff Rate and Volume Management</u> › Manage on site the annual increase in runoff volume from the natural land cover condition to the post-developed condition. › Do not exceed the rate or quantity of runoff for 2-, 5-, 10-, 25-, and 50-year 24-hour rainfall events relative to existing conditions.

Measure 13	
Indoor Water Efficiency	All faucets, toilets, and urinals within the project boundary meet the criteria outlined below: › All Private lavatory faucets are EPA WaterSense-approved or have WaterSense-approved aerators (or equivalent.) › All public lavatory faucets have a maximum flow rate of 0.4 gallons per minute. All toilets and urinals are EPA WaterSense approved (or equivalent) or waterless.
Measure 15	
Roofing systems	Project Teams should consider covering at least 50 percent of the roof area with a carport or canopy equipped with either a high solar reflectance index (SRI) coating or solar photovoltaic (PV) panels, or a combination thereof. If solar PV panels are to be integrated into the project design, this measure is contingent on FAA 7460 approval with a glare study. This measure should be aligned with Measure 16 below.
Measure 16	
Renewable Energy Generation	Strive to use on-site renewable energy systems and/or procure renewable energy from offsite sources to cover 100 percent of the project's annual electricity use.* Any planned reliance on renewable energy credits (RECs) shall be discussed with the Massport PM. See Section 3.3.1, *Renewable Energy Guidance*, for best practices. When establishing renewable energy procurement targets, the A/E Team shall consider the cost of required carbon offsets to achieve net zero emissions. A/E Teams shall consult with Massport PM for carbon offset costs per pound of CO_2e/year. Project Teams should strive to include the electrical load associated with EV charging; however, this load can be excluded from the above requirement if the Project Team and Massport's Environmental Team mutually agree that its inclusion is infeasible.[13] In such cases, Project Teams should coordinate with the Environmental Team on alternative means of procuring renewable electricity to cover this energy load. In planning and designing for on-site renewable energy generation, Project Teams should prioritize solar canopies where feasible (consistent with Measure 15 above). Benefits of solar canopies include space efficiency, provision of shade, and the possible elimination of snow removal/snow melting requirements.

13 While electric vehicle supply equipment (EVSE) is not considered part of the building load under the federal definition of zero-emission buildings and is not part of the energy balance of the building, it should be considered a key component to support reduced transportation-related emissions. The federal definition can be accessed at https://www.energy.gov/eere/buildings/national-definition-zero-emissions-building.

	This measure is contingent on Federal Aviation Administration (FAA) 7460 approval with a glare study. * Note that the preferred Parksmart threshold [12 points] requires at least 75 percent of the total energy used on-site to be created by on-site renewable energy generation or through the combination of renewable energy production and purchase (i.e., renewable energy credits).
Measure 17	
Design For Durability	Employ a precautionary design approach to increase the parking structure's lifespan and minimize the risk of premature deterioration.

Additional Vertical Project Guidelines

5

5.1 Introduction

All Project Teams working on vertical building projects should adhere to the guidelines in this chapter in addition to those relating to the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating systems and the Green Business Certification Inc.'s (GBCI) Parksmart rating system outlined above in Chapter 3, *Vertical Project Guidelines – LEED*, and Chapter 4, *Vertical Project Guidelines – Parksmart*.

Concerning Climate and Resilience, all projects shall refer to the current version of Massport's *Floodproofing Design Guide* and are responsible for submitting the Floodproofing Design Guide Submission Form to the Massport PM and Massport's Senior Resiliency Manager for approval at every phase of design (15 percent to 100 percent). The initial review may determine the facility is not critical infrastructure or at significant risk and future reviews may be limited. The most recent version of the *Floodproofing Design Guide* is available on Massport's website.

5.2 Additional Vertical Project Guidelines

Energy and Greenhouse Gas (GHG) Emissions Management Guidelines	
Electrification	On a project-by-project basis, Project Teams shall evaluate the available power capacity needed to provide new, fully electric systems and equipment. All existing systems and equipment running on fossil fuels should be evaluated to determine the end of their useful service life. If fossil fuel equipment is identified within the project boundary and has less than 3 years of service life remaining, this equipment should consider replacement with electric-powered or clean fuel alternatives. Clean fuel alternatives (renewable diesel) and battery storage should be evaluated for emergency power generation, wherever feasible. Confirm compliance with all code/regulatory minimums. See the related section on "Climate Preparedness and Adaptation Guidelines" below.

Energy Efficiency	Projects with a construction value larger than $5 million should incorporate or be integrated into an energy management system accounting for at least 90 percent of its energy consumption and conduct an initial third-party commissioning of the energy systems associated with that consumption. This includes a detailed issues log. For such projects, a plan for ongoing re-commissioning throughout the project life should be prepared. Efficient Lighting (Interior & Exterior) › Install high-efficiency lighting systems for all light uses, employing only light-emitting diode (LED) lights for all fixtures. Projects should target a minimum 25 percent reduction over a baseline lighting power density (LPD) using the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1 2007 (in alignment with the American Institute of Architects (AIA) 2030 baselines). The current code requires compliance with ASHRAE 90.1 2019, A/E teams should adhere to ASHRAE 90.1 2007 for benchmarking reduction targets to comply with this guideline. Lighting Sensors › Evaluate opportunities for daylight and/or motion/occupancy sensors as well as network lighting controls on all interior and exterior non-emergency lighting. Dimming lights may be used to maintain security and/or meet operational requirements where appropriate. Heating, Ventilation, and Air Conditioning (HVAC) Systems All pumps and fans of appropriate size shall operate on variable frequency drives (VFDs). Where VFDs are not feasible or applicable, consider electronically commutated (EC) motors. Energy Use Metering › In addition to LEED credit EAc3 *Advanced Energy Metering*,[14] install advanced real-time energy metering for all HVAC, lighting, plug loads, and process loads that exceed 5 percent of the peak connected load of the whole building, as well as all building operations and miscellaneous loads. › Comply with all current code requirements and Massport specifications.

14 United States Green Building Council. (2023). *LEED v4.1 prerequisite: Building-level energy metering; LEED v4.1 credit: Advanced energy metering; Metering best practices guide*. Retrieved from: https://www.usgbc.org/credits.

Building Envelopes	Aligned with the Massachusetts State Building Code and Stretch Energy Code, the project achieved enhanced insulation levels across all building components and includes high-performance windows with low U-values and appropriate solar heat gain coefficient (SHGC) values to maximize energy efficiency and comfort. Thermal bridging is mitigated through a continuous thermal insulation barrier and the application of thermal break materials at window and door frames, structural framing that crosses the thermal envelope, and slab edges. Air sealing is applied to all joints, seams, and penetrations. Building leakage testing has been performed demonstrating that leakage does not exceed 0.35 cfm/sf @75 Pa.
Embodied Carbon Reduction	As applicable, during the Project Definition Phase, Project Teams should evaluate if new construction is warranted, or if an existing building might be able to serve the project needs through renovation. The Carbon Avoided: Retrofit Estimator (CARE) tool (https://caretool.org/) can be used to provide a simple analysis of the total carbon impacts of renovating an existing building against replacing it with new construction. All new construction and existing building renovations shall demonstrate a 20 percent reduction in the embodied carbon (also referred to as Global Warming Potential [GWP]) of primary materials (foundation, structure, enclosure) compared to an equivalent baseline. Existing buildings may count in-situ materials against the required 20 percent. Refer to the International Living Future Institute's (ILFI) "Embodied Carbon Quick Guide,"[15] as well as the Carbon Leadership Forum website[16] for additional guidance, tools, and resources to reduce embodied carbon. All projects with new structural scope (except parking garages) shall analyze multiple structural systems and provide a comparative analysis of GWP. The findings of the embodied carbon analysis should be summarized in a report and submitted to the Environmental Team for approval with the Preliminary Design submission.

15 The ILFI Embodied Carbon Quick Guide can be accessed at https://living-future.org/wp-content/uploads/2022/07/Embodied-Carbon-Quick-Guide.pdf.

16 The Carbon Leadership Forum can be accessed at https://carbonleadershipforum.org/resource-library/.

Low Carbon Concrete

On all non-airside projects using at least 10 cubic yards of concrete, consider using low-carbon concrete provided it meets all other applicable requirements. Refer to the most current GWP baselines for the "Eastern" region and target a 20 percent reduction over these baselines. Current GWP limits (reflecting a 20 percent reduction) are posted below using baseline data published in August of 2023. These regional baselines were established by the National Ready Mix Concrete Association (NRMCA) and are listed in the Carbon Leadership Forum Material Baseline Report.[17] See **Table 5-1** below. These GWP values represent life cycle stages A1-A3, also known as "cradle-to-gate."

- Projects are encouraged to utilize performance-based concrete specifications to allow flexibility in mix design and enable suppliers to reduce embodied carbon thresholds, measured by GWP.
- The GWP of each specific concrete mix shall have a valid, product-specific Type III Environmental Product Declaration (EPD) that is third-party verified. Cradle-to-gate EPDs shall follow NSF (formerly, National Sanitation Foundation) International's product category rule for concrete.

Table 5-1 Maximum Global Warming Potential (GWP) Limits

	2500 psi	3000 psi	4000 psi	5000 psi	6000 psi	8000 psi	LW 3000 psi	LW 4000 psi	LW 5000 psi
GWP Limit*	192	212	252	303	320	378	414	459	503

* GWP ($kgCO_2/m^3$) limits reflect a 20 percent reduction over NRMCA baselines

Alternative Compliance: Project Average Carbon Budget

- Compliance can be achieved on a "per mix" basis as described above or a "project average basis."
- Total embodied carbon (ECproj) of all concrete mix designs within the same project shall not exceed the project limit (ECallowed) determined using **Table 5-1** above and Equation EC1 below.

17 The Carbon Leadership Forum regional baselines can be accessed at https://carbonleadershipforum.org/clf-material-baselines-2023/.

Equation EC1

$EC_{proj} < EC_{allowed}$

where

$EC_{proj} = \Sigma EC_n v_n$ and $EC_{allowed} = \Sigma EC_{th} v_n$

and

n = the total number of concrete mixtures for the project

EC_n = the embodied carbon for mixture n per approved EPD, GWP/m3

EC_{th} = the embodied carbon threshold for mixture n per Table C, GWP/m3

v_n = the volume of mixture n concrete to be placed, m3

Example:

Project includes the following mixes:

Type/Strength	Total Volume used (m3)	Mix-Strength GWP per approved EPD (GWP [kg CO2e/m3])
Standard mix 3000psi	5,000	275
High Early Strength mix 5000psi	4,000	550
Standard mix 4000psi	8,000	330

$EC_{allowed}$ = (5,000*306)+(4,000*500)+(8,000*346) = **6,298,000**

EC_{proj} = (5,000*275)+(4,000*550)+(8,000*330) = **6,215,000**

Confirmed. $EC_{proj} < EC_{allowed}$

Low Carbon Materials	All Project Teams shall select materials with lower than industry baseline embodied carbon emissions in product categories for which data is readily available (including carpet, ceiling tiles, insulation, and gypsum wallboard at a minimum). Refer to the Embodied Carbon in Construction Calculator (EC3) tool[18] to compare available EPD data and GWP ranges. For industry average baselines, refer to the Carbon Leadership Forum's Material Baselines Report.[19] Where feasible, utilize materials that have third-party verified EPDs or Life Cycle Assessment (LCA) reports. Focus EPD requirements on building materials used in large quantities and/or with high-impact potential for emissions reductions (i.e., aluminum, steel, wood, insulation, carpet, gypsum board). Refer to the low-carbon concrete requirements above.
Construction Stage Reporting	The A/E team shall specify the tracking of construction stage emissions. This includes transportation of materials to the job site and onsite construction and installation emissions. The Contractor shall be responsible for developing a project-specific Construction Carbon Plan (CCP), which identifies key emission sources, action plans for reduction, and roles and responsibilities for all parties. All CCPs should track emissions related to the following: › Delivery vehicles › Onsite transportation › Temporary electrical power consumption › Site demolition and clearing › Excavation › Temporary works construction (shoring systems, crane footings, etc.) › Material handling › Material waste › Testing/Commissioning The CM/GC shall report fossil-fuel use (transportation and fuel use on-site) and on-site electrical consumption every month. Refer to the Embodied Carbon Reduction Guide[20] for additional guidance for preparing and implementing a CCP. Refer to Envision credit RA2.2 under Section 6.3, *Priority Envision Credits*, for additional strategies for reducing construction energy consumption.

18 The EC3 Tool can be accessed at https://www.buildingtransparency.org/.

19 The Carbon Leadership Forum's Material Baselines Report can be accessed at https://carbonleadershipforum.org/clf-material-baselines-2023/.

20 The Embodied Carbon Reduction Guide can be accessed at https://indd.adobe.com/view/1d7fd999-5c7d-446d-98e9-590151f2b0cf.

Airport Ramp Electrification	As applicable, accommodate electric infrastructure needs for ground power units (GPU) and pre-conditioned air (PCA) on jet bridges for parked aircraft, as well as charging stations for electric ground service equipment (eGSE).
Water and Natural Resource Conservation Guidelines	
Water Use Metering	Install building-level meters and sub-meters (where appropriate) for water distribution per Massport specifications.
Water Capture and Reuse	To reduce the amount of potable water required to operate a building, Project Teams are encouraged to install rainwater capture and reuse systems and/or greywater systems. The project should aim to reduce potable water use by at least 50 percent and overall water use (potable and non-potable) by at least 20 percent.
Reduce Construction Water Consumption	The Project Team shall consider options for reducing water consumption during construction and implement at least three strategies (put into written requirements for construction). Massport recommends the following at a minimum and strongly encourages implementing as many of the other options as feasible: › High-efficient fixtures in construction trailers or offices (demonstrating a 40 percent reduction). › Monitoring and management (demonstrated ability to detect leaks and respond to inefficiencies). › Using alternatives to dust suppression such as dry agents (showing a 50 percent reduction in water use).
Sustainable Materials Management Guidelines	
State Waste Bans	Comply with 310 Code of Massachusetts Regulations (CMR) 19.017, Solid Waste Management – Waste Bans, which restrict or prohibit the disposal, or transfer for disposal, of certain components of the solid waste stream, including but not limited to yard waste; glass containers; recyclable paper; asphalt pavement, brick, and concrete; metal; wood; and clean gypsum wallboard.
Material Selection & Evaluation	The Project Team shall consider the following criteria, to the greatest extent feasible, when evaluating products for specification. This comprehensive approach creates a common framework for evaluation in alignment with the American Institute of Architects' (AIA) Materials Pledge.[21] › **Human health** by preferring products that support and foster life throughout their life cycles and seek to eliminate the use of hazardous substances

21 More information on the AIA Architecture & Design Materials Pledge can be accessed at: https://www.aia.org/design-excellence/climate-action/zero-carbon/materials-pledge.

	› **Social health and equity** by preferring products from manufacturers that secure human rights in their own operations and supply chains, positively impacting their workers and the communities where they operate › **Ecosystem health** by preferring products that support and regenerate the natural air, water, and biological cycles of life through thoughtful supply chain management and restorative company practices › **Climate health** by preferring products that reduce carbon emissions and ultimately sequester more carbon than emitted › **A circular economy** by reusing and improving buildings and by designing for resiliency, adaptability, disassembly, and reuse, aspiring to a zero-waste goal for global construction activities
Design for Waste Management – Prefabrication	Project Teams shall design out waste to the greatest extent practicable by utilizing prefabrication and other off-site construction techniques. These processes reduce waste generation through factory-controlled and more efficient construction processes.
Design for Waste Management – On-Site Earthwork	To the extent possible, on a project-by-project basis, consider limiting off-site soil disposal. Excavated material moved off-site and/or fill brought to the site shall not exceed 50 percent of total site soil handling, or 100 percent of fill/excavated materials shall be sourced or reused within 10 miles of the project site. Contaminated sites should refer to the Massachusetts Contingency Plan (the MCP, 310 CMR 40.0000) for regulations related to assessment and cleanup.[22]
Design for Waste Management – Take-Back Programs	To the extent practicable, work with suppliers that have a take-back program for unused building materials; where no take-back program exists, consider donating materials that would otherwise be disposed of upon project completion.
Design for Waste Management – Material Reuse	The Project Team shall assess opportunities for beneficial use of waste, excess resources, or capacity (such as waste materials, heating/cooling, financial capacity, land area/space, and personnel capacity). Consideration should be given to ecosystem services. Identify on-site reuse opportunities for existing or excess materials that do not pose a contamination or health risk before any demolition/deconstruction activities (for example, crushed concrete and structural steel). If such materials cannot be reused on the project, coordinate with Massport's Environmental Team for creative reuses (for example, using crushed, unreinforced concrete in swales, riprap, and drainage). Where hazardous materials are suspected

22 The Massachusetts Contingency Plan can be accessed at https://www.mass.gov/guides/the-waste-site-cleanup-program.

	to be present, a survey conducted by a certified industrial hygienist should be provided and reviewed to confirm the viability of material reuse. Refer to the "Boston Deconstruction and Material Reuse Roadmap"[23] for additional guidance and resources.
Collection, Storage, and Disposal of Waste (Reduce Operational Waste)	Ensure dedicated and appropriately sized collection, storage, and disposal areas for trash, mixed recycling, pallets, and food waste/organics as applicable that are convenient and safe to access for building occupants and waste service providers (i.e., janitorial staff and waste haulers). Comply with all Massport specification Guidelines. Areas should be sized to accommodate the co-location of streams for interior bins and exterior haul containers/compactors. Where feasible and appropriate, provide trash and recycling chutes and elevator access to exterior haul containers. Provide for the safe collection, storage, and disposal of specialized waste streams, such as universal, electronic, and hazardous wastes, as applicable.
Design for Maintainability	Consider maintenance and operations requirements for building systems and assemblies. The Massport Project Manager (PM) and A/E Team should seek input from maintenance personnel and incorporate findings into the maintainability planning and design of the project.[24] Reference the Whole Building Design Guide – Design for Maintainability resource: https://www.wbdg.org/resources/design-for-maintainability.
Design for Disassembly	The Project Team shall develop an end-of-life plan for all major components of the project throughout its projected life with consideration given to recyclability, deconstruction, and/or replacement. End-of-life environmental, social, and economic conditions are part of the assessment and include end-of-life costs and salvage values. The plan shall be included in O&M documents.
Water Bottle Refilling Stations	Where feasible and appropriate, provide water bottle refilling stations. Co-locate these stations with drinking fountains to leverage already planned domestic cold-water piping and maximize user visibility.
Sustainably Sourced Wood	When specifying exotic woods use only sustainably sourced wood such as Forest Stewardship Council (FSC)-certified products and, to the extent practicable, rapidly renewable materials such as agriboard and cotton-batting insulation in temporary and permanent construction.

23 The Boston Deconstruction and Material Reuse Roadmap can be accessed at https://www.paperturn-view.com/?pid=MjY266316&v=2.2.

24 WBDG. (2018). *Design for maintainability: The importance of operations and maintenance considerations during the design phase of construction projects*. Retrieved from: https://www.wbdg.org/resources/design-for-maintainability.

Material Composition/ Durability	Give preference to durable materials (for example, silica fume as a replacement for 5 percent to 7 percent of Portland cement or recycled wood/plastic composite lumber), which may have higher first costs but are likely to have lower long-term costs due to their longer life expectancy.
Locally Sourced Material	Source materials manufactured or prepared within Massachusetts or the larger New England region to reduce GHG emissions associated with material/product transport and support local and regional economies.
Proactive Operational Maintenance	The A/E Team shall prepare a Proactive Maintenance Plan for review, approval, and execution by Massport for projects with a construction value of $5 million or more. The intent here is to prolong the building's lifespan. The maintenance plan should include periodic surveys and/or testing of structural and mechanical, electrical, and plumbing (MEP) systems. For all projects, Maximo is required, and the Massport PM shall consult with the Massport Design Technologies Integration Group (DTIG) Team to coordinate before the A/E Team's effort on this item.
Human Health and Wellness Guidelines	
Chemicals of Concern	The following chemicals of concern should be avoided for all flooring, interior finishes, and furniture products (unless required by code): › PFAS (Per- and poly-fluoroalkyl substances) › Antimicrobials (i.e., antibacterials or biocides) › Flame Retardants Avoid the use of the following chemical classes of concern to the greatest extent feasible. Refer to https://www.sixclasses.org/ for more information. Prioritize the selection of "Red List Free" materials when possible. Refer to the International Living Future Institute (ILFI) for a comprehensive list of current "Red List" chemicals. Refer to https://living-future.org/red-list/ for more information. Use caution when specifying products made outside of the U.S., as they may contain harmful unregulated chemicals. Request material ingredient reports for foreign products. › PFAs (Per- and poly-fluoroalkyl substances) › Antimicrobials (i.e., antibacterials or biocides) › Flame Retardants › Bisphenols + Phthalates › Some Solvents (aromatic hydrocarbon solvents [toluene, xylene, benzene] and halogenated organic solvents [methylene chloride, perchloroethylene, trichloroethylene]) › Certain Metals (Mercury, arsenic, cadmium, and lead)
Fire Suppression Systems	Consult Massport Fire Rescue in fire suppression system requirements and design. All of the fire suppression equipment shall be documented to be free of halon, and PFAS.

	Fire suppression systems shall specify the use of fluorine-free firefighting foam (F3) where applicable. Please note that the Federal Aviation Administration (FAA) no longer requires firefighting foams to contain PFAS. For further guidance, refer to the MassDEP PFAS Foam Advisory available at: https://www.mass.gov/doc/pfas-foam-advisory/download and the FAA F3 Transition Plan available at: https://www.faa.gov/airports/airport_safety/aircraft_rescue_fire_fighting/f3_transition. The Department of Defense lists acceptable F3 products that meet the FAA regulatory requirements of Part 139 on the Qualified Product Database. https://qpldocs.dla.mil/search/parts.aspx?qpl=4513&param=QPL-32725&type=256.
Water Quality	Meet the preconditions established in the WELL v2 Water concept. W01 Water Quality Indicators[25] › Part 1: Verify Water Quality Indicators W02 Drinking Water Quality[26] › Part 1: Meet Chemical Thresholds › Part 2: Meet Thresholds for Organics and Pesticides W03 Basic Water Management[27] › Part 1: Monitor Chemical And Biological Water Quality › Part 2: Implement Legionella Management Plan
Indoor Environmental Quality	Daylight Access: Provide manual or automatic (with manual override) glare-control devices for all regularly occupied spaces. Design to allow daylight into occupied spaces to connect building occupants with the outdoors and reduce the use of electrical lighting. Quality Views: Give building occupants a connection to the natural outdoor environment by providing quality views. Achieve a direct line of sight to the outdoors via vision glazing for a min of 50 percent of all regularly occupied floor areas. Where natural daylight is not feasible or practical for occupied spaces, teams should consider including tunable white lights to simulate the effects of natural daylight and support occupants' circadian rhythm.

25 WELL. (2023). *Water Quality Indicators*. Retrieved from: https://v2.wellcertified.com/en/wellv2/water/feature/1.

26 WELL. (2023). *Drinking Water Quality*. Retrieved from: https://v2.wellcertified.com/en/wellv2/water/feature/2.

27 WELL. (2023). *Basic Water Management*. Retrieved from: https://v2.wellcertified.com/en/wellv2/water/feature/3.

Minimize Construction Impacts	Implement a construction management plan/policies, informed by stakeholder engagement, which addresses the following types of construction impacts (noise, safety/wayfinding, access/mobility, and lighting). The plan/policies shall also include mechanisms for feedback, monitoring, and reporting of impacts. Meet and exceed all minimum health and safety regulations, and also improve the health and/or safety of the project's immediate surroundings. Refer to Envision "Quality of Life" Guidelines included under Chapter 6, *Infrastructure Guideline*, for additional guidance.
Surrounding Site	
Wayfinding	The project shall be designed to provide clear access, safety, and wayfinding measures that accommodate emergency personnel and integrate well with surroundings through clear signage and wayfinding. The Project Team shall also follow Massport's Signage Guidelines as found here: https://www.massport.com/sites/default/files/2023-10/wayfguidsignstds_updated.pdf.
Preserve Sites of High Ecological Value	On a project-by-project basis, the Project Team shall identify any areas of high ecological value within the project boundary and implement mitigation measures (including avoidance, restoration, or offsets) for any impacts. The Massport PM shall consult with Massport's Environmental Team before undertaking this effort.
Brownfields and Contaminated Sites	If the project is located on a site with known contamination (brownfields) projects should address contamination with Massport's Environmental Team and ensure Massachusetts Contingency Plan (MCP) compliance. Projects are encouraged to work towards remediation as feasible.
Reduce Pesticide and Fertilizer Impacts	Landscaping shall be designed to include species that require fewer fertilizers and pesticides; if needed, fertilizers and pesticides with low toxicity, persistence, and/or bioavailability are specified. Operational policies shall be in place to control the application of pesticides and fertilizers, and runoff controls shall minimize contamination of groundwater/surface water.
Protect Surface and Groundwater Quality	The Project Team shall identify potential impacts to surface/groundwater quality (including temperature), have spill prevention plans, and implement measures to reduce any impacts.
Enhance Functional Habitats	On a project-by-project basis, Project Teams shall implement mitigation measures to protect habitat on or near the project site through a mitigation hierarchy (avoidance, minimization, restoration, and compensation). Measures implemented shall not attract wildlife that could pose a hazard to flight operations.

Control Invasive Species	The project shall identify any invasive species infestations on the project site and implement management plans and controls for preventing the introduction of invasives. Landscaping shall only utilize noninvasive species.
Protect Soil Health	The project shall limit the area that is disturbed by development activities and 100 percent of post-construction vegetated areas disturbed during construction shall be restored for appropriate soil type, structure, and function.
Climate Preparedness and Adaptation Guidelines	
Assess Climate Change Vulnerability & Implement Risk Management	The Project Team should work with Massport's Senior Resiliency Manager to review the project during the planning and design phases to determine climate threats/hazards to the project over its operational life, as well as potential threats to connected/related infrastructure and the broader community. Additionally, the Project Team should consider: › Utilizing vulnerability/risk assessments that have already been completed, identifying gaps, and aligning the assessment with ongoing climate resiliency work in the region. › Further assessing the specific vulnerabilities and risks associated with the critical functions and dependencies of the project and conducting a risk evaluation with a diverse set of stakeholders. › Developing risk management and resilience goals and strategies informed by stakeholder input and in alignment with local, state, and regional climate resilience goals. › Implementing resilience strategies and periodically monitoring effectiveness. Resilience strategies shall be incorporated into the operations and maintenance of the project. › Increasing critical system redundancy to reduce the risk of failures.
Passive Survivability	Ensure occupied spaces that may be at risk for power disruption are designed for thermal safety.
Backup Power	Identify backup power opportunities and equipment for all projects, ensuring that electrical engineers understand the full building system, including a one-line diagram, before making design decisions. › Select fuel source and backup power system design. › Demonstrate consideration of clean fuel alternatives and renewable energy power supply. Identify systems to be powered during power outages. › List equipment to power critical systems and their energy requirements. › Size backup power system to meet the energy requirements of equipment to be powered.

	Determine the location of the backup power system, and if a hazard (i.e., flood or wind) protection plan is required. › All emergency generators must be located above the Design Flood Elevation per *Floodproofing Design Guide*. Determine the operational duration of backup power requirements. › Backup power systems should be capable of operating for 24 hours without refueling. › Size fuel supply to meet operational duration requirements. If renewable energy with energy storage is part of the project design, duration requirements can be reduced.
Stormwater Management	On a project-by-project basis, Project Teams shall consider and document all opportunities to maximize stormwater treatment. Project Teams shall assess the opportunity for stormwater systems to mitigate stormwater from adjacent areas for water quality improvements and/or flood management. Project Teams shall calculate the pollutant load from stormwater runoff into design calculations for all site development and roadway projects. The following pollutants should be included at a minimum – total suspended solids (TSS), total phosphorous (TP), total nitrogen (TN), and bacteria. The specific bacteria indicator shall be site-specific and be chosen by Massport's Environmental Team and will likely include e. coli, enterococcus, and/or fecal coliform. The allowable pollutant loads and bacteria indicator shall be site-specific and chosen by Massport's Environmental Team. At the Preliminary Design stage (or sooner), the Project Team should CCTV inspect all sewers and drains as well as inspect all manholes within the project area to document the condition of the piping and structures. Based on the findings from these inspections, and at the discretion of Massport's Environmental Team, the design consultant may be required to perform water quality sampling of the drainage or dye testing investigations. As applicable, Project Teams shall ensure project close-out documentation includes ongoing monitoring recommendations for stormwater BMPs.

Debris Protection	Building/facility exteriors shall contain design features that protect structures from air-borne storm debris, extreme winds, and water. Materials shall resist potential damage, to the most practical extent possible. The roof shall be constructed per Intensive Behavioral Health Services (IBHS) Fortified Commercial Wind Guidelines (https://fortifiedhome.org/wp-content/uploads/Fortified_Commercial_Wind_Guidelines_2020.pdf). Roof design shall comply with building code requirements. Windows, doors, and other openings shall be water intrusion proof.
Provide Outdoor Shading	On a project-by-project basis, consider shading 50 percent of outdoor areas, particularly where workers and/or passengers are likely to congregate. Shading areas through either vegetation (tree shading) or constructed canopies (including with solar photovoltaic canopies) should be considered. If utilizing vegetation, ensure the selection of types that will not attract wildlife that may pose a threat to aircraft operations.

Infrastructure Guidelines

6

6.1 Introduction

All horizontal infrastructure projects, such as those listed below, shall adopt and adhere to the latest version of the Institute for Sustainable Infrastructure's (ISI) Envision framework and the additional guidelines described in this chapter.

- Roadways, Bridges, and Tunnels
- Runways/Taxiways/Aprons
- Marine Structures (Piers, Docks)
- Surface Parking Lots (see Chapter 5, *Additional Vertical Project Guidelines*, for garage structures)
- Parks/Open Space
- Utility Construction and Upgrades
- Other Linear Infrastructure

On a project-by-project basis, projects estimated to have a construction value of $5 million or more are expected to pursue and obtain an Envision award unless a waiver is obtained from Capital Programs **(see Attachment C)**. The preferred Envision award level is **Gold**, though the final level will be determined on a project-by-project basis in coordination with the Massport Project Manager (PM) and Massport's Environmental Team. Though Project Teams should always strive to achieve Envision credits at the highest level feasible, this chapter presents Massport's preferred categories, credits, and compliance pathways under the Envision rating system.

6.2 Envision Framework

The Envision framework includes the Envision Guidance Manual,[28] an Envision Online Scoresheet, an Envision Sustainability Professional (ENV SP) Credential, as well as independent third-party Envision Verification and Envision Awards (based on third-party verification). There is inherent flexibility within Envision to cover a range of infrastructure sizes and types.

Project Teams pursuing Envision verification shall pursue Verification Pathway A (see below) unless a waiver is obtained from Capital Programs **(see Attachment C)**. Under Pathway A, documentation is submitted for review and verification at or shortly after 95 percent design completion, and then the project completes a follow-up post-construction review to confirm and maintain the award. See **Figure 6-1** for Envision verification pathways.

28 The Envision Sustainable Infrastructure Framework v3 can be accessed at https://isi-projects-documents.s3.amazonaws.com/prod/files/static/31/aEd6djy8vMv3N3HN/ISI percent20Envision percent20Manual_v3_EN_bookmarked.pdf.

Figure 6-1 Envision Verification Pathways

6.3 Priority Envision Credits

Project Teams should aim to achieve the specified levels of achievement within the Envision framework (Improved, Enhanced, Superior, Conserving, Restorative) as indicated next to each credit number (e.g., QL1.2) below. Many credits within the Envision framework require the establishment of a baseline against which to measure project performance. Given the applicability of Envision to all types and sizes of infrastructure projects, baselines may vary from project to project. Project Teams shall determine the most appropriate baseline for their project. There are several options for identifying acceptable baselines; the following may be used as baselines for measuring performance improvement (listed in order of preference).

- Existing conditions or the existing system(s) the project will replace
- A seriously considered project alternative
- Industry "standard practice" or existing codes, guidelines, or regulatory requirements (e.g., for energy and water; greenhouse gas (GHG) and air pollution emissions)
- A project of similar scope and size operating within the same geographical area or a geographical area with similar operating conditions

Quality of Life Guidelines	
QL1.2 Enhanced	
Enhance Public Health and Safety	The project shall meet all applicable health and safety regulations. The Project Team shall pursue opportunities to go above and beyond these minimum requirements at the project site and consider how to expand health and safety improvements to the immediate surroundings (e.g., protected areas or elevated walkways for pedestrians, improved lighting, efforts to decrease violence or vandalism, etc.). Safety actions can be relative to the scale of the project, from repainting a crosswalk to preventing major chemical spills.

QL1.3 Conserving	
Improve Construction Safety	Commit to monitoring and improving safety for construction operations, including tracking health and safety performance and correcting deficiencies. Implement safety/security training for all field personnel. Establish or utilize existing Massport site and security plans (both physical and information when appropriate). Consider providing additional health/wellness programs for workers beyond minimum safety requirements (e.g., free screenings, clinics, or workshops).
QL1.4 Enhanced	
Minimize Noise and Vibration	The Project Team shall assess potential operational noise/vibration impacts, adopt target noise levels, and implement reduction strategies to stay within those targets. In adopting target noise levels, the Project Team should review municipal and Federal Aviation Association (FAA) noise regulations. Noises generated by activities induced by the project, such as aircraft movements, cars on roads, and trucks accessing facilities, apply to this credit.
QL1.5 Improved	
Minimize Light Pollution	The Model Lighting Ordinance methodology includes five lighting zones (LZ) to classify land use with appropriate lighting levels. The Project Team shall identify any areas potentially impacted by light pollution and implement reduction measures following a mitigation hierarchy (avoidance, minimization, protection, offsetting). Projects that have the potential to meet BUG rating uplight requirements with no light emitted above 90 degrees should pursue the Superior level of achievement for QL1.5.
QL1.6 Superior	
Minimize Construction Impacts	The Project Team shall implement or utilize an existing Massport construction management plan/policies. The plan shall be informed by stakeholder engagement and address at least three types of construction impacts (noise, safety/wayfinding, access/mobility, or lighting). The plan/policies shall also include mechanisms for feedback, monitoring, and reporting of impacts.

QL2.3 Enhanced	
Improve Access and Wayfinding	The project shall be designed to provide clear access, safety, and wayfinding measures that accommodate emergency personnel and integrate well with surroundings through clear signage and wayfinding. The Project Team shall also follow Massport's Signage Guidelines as found here: https://www.massport.com/massport/business/capital-improvements/important-documents/.
QL3.3 Enhanced	
Enhance Views and Local Character	The Project Team will work with the Massport Community Relations Team to identify, document, protect, and/or enhance views and local character, informed by stakeholder engagement.
Leadership Guidelines	
LD1.1 Conserving	
Provide Effective Leadership and Commitment	The Project Team shall follow Massport's commitments to social, environmental, and economic sustainability and be cognizant of these commitments at the project level. Refer to Section 1.3, *Sustainability at Massport*, for more information on Massport's sustainability commitments.
LD1.2 Superior	
Foster Collaboration and Teamwork	An interdisciplinary collaborative team shall be assembled, and a process shall be initiated, that will result in sustainability performance enhancements throughout the project. Ongoing collaboration meetings should be conducted throughout design with the interdisciplinary project team to clarify expectations, discuss potential opportunities, and identify potential barriers to integrated design. Section 1.4, *Integrative Design*, and the processes outlined in Chapter 2, *User Guide*, support the achievement of this credit.
LD1.3 Improved	
Provide for Stakeholder Involvement	Project Teams should review this credit with the Massport PM and the Massport Community Relations Team, as coordinated by the Massport PM. Primary and secondary stakeholders shall be identified through a stakeholder mapping process and a proactive stakeholder engagement process shall be established early and continued through construction. The participation process shall be transparent and provide opportunities for meaningful input and two-way communication.

LD1.4 Improved	
Pursue Byproduct Synergies	The Project Team shall assess opportunities for beneficial use of waste, excess resources, or capacity (such as waste materials, heating/cooling, financial capacity, land area/space, and personnel capacity). This can include finding a beneficial reuse for the project's waste or excess resources, or the project's beneficial reuse of external waste or excess resources. Consideration should be given to ecosystem services.
LD2.1 Conserving	
Establish a Sustainability Management Plan	Adherence to the guidelines presented in Chapter 6, *Infrastructure Guidelines* can be used in place of establishing a separate Sustainability Management Plan (SMP) for the project. The Project Team shall assign roles and responsibilities for implementing these guidelines and shall periodically revisit progress towards achieving Massport's sustainability goals and performance targets.
LD2.2 Enhanced	
Plan for Sustainable Communities	Sustainability outcomes shall be considered in project selection/identification, and an alternatives analysis (including a no-build option) shall be completed with consideration of sustainability performance.
LD2.3 Conserving	
Plan for Long-Term Monitoring and Maintenance	On a project-by-basis, include strategies to reduce maintenance impacts (e.g., better design, durable longer-lasting materials, ease of access for maintenance and repair, etc.). A monitoring and maintenance plan shall be developed with sustainability targets, identification of operations and maintenance (O&M) staff to implement the plan, and a schedule for ongoing monitoring and evaluation of the plan. The Project Team shall meet with O&M staff to explain and discuss the plan. Reference the Whole Building Design Guide – Design for Maintainability resource: https://www.wbdg.org/resources/design-for-maintainability

LD2.4 Superior	
Plan for End-of-Life	On a project-by-project basis, the Project Team shall consider developing an end-of-life plan for all major components of the project throughout its project life with consideration given to recyclability, deconstruction, and/or replacement. End-of-life environmental, social, and economic conditions are part of the assessment and include end-of-life costs and salvage values. The plan shall be included in O&M documents. In addition to the Envision guidance, reference the Whole Building Design Guide – Design for Maintainability resource: https://www.wbdg.org/resources/design-for-maintainability.
LD3.3 Superior	
Conduct a Life-Cycle Economic Evaluation	A life-cycle cost analysis (LCCA) shall be developed on a project-by-project basis for the entire project and used to compare alternatives for at least one major project component. The assessment maps social, environmental, and financial costs and benefits.
Resource Allocations Guidelines	
RA1.1 Conserving	
Support Sustainable Procurement Practices	A written sustainable procurement policy/program shall be implemented and at least 50 percent of all project materials, supplies, and equipment shall meet the policy requirements. Selection criteria shall focus on environmental practices and social responsibility. Documentation of weight, volume, or cost of materials is required.
RA1.2 Superior	
Use Recycled Materials	At least 30 percent (by weight, volume, or cost) of project materials shall be recycled content and/or reused existing materials/structures.* * Note that the Superior level of achievement states a 25 percent requirement.
RA1.4 Conserving	
Reduce Construction Waste	A construction waste management plan shall be developed that identifies materials to be diverted from disposal with a target of 95 percent of waste materials (measured by weight or volume) being recycled, reused, or salvaged. Soil, land-clearing debris, and hazardous waste are not to be included in these calculations. For multiple projects within scope, the percentage is based upon the cumulative sum of the solid waste materials across all of the projects.

RA1.5 Enhanced	
Balance Earthwork on-Site	On a project-by-project basis, evaluate the feasibility of limiting excavated material moved off-site and/or fill brought to the site. A goal should be not to exceed 50 percent of total site soil handling. **OR** 100 percent of fill/excavated materials sourced or reused within 10 miles of the project site as a goal.
RA2.1 Conserving	
Reduce Operational Energy Consumption	The Project Team shall estimate the annual energy consumption of the project and demonstrate a minimum operational energy reduction of 70 percent from baseline. Additionally, the Project Team shall consult with the Massport PM to establish performance targets to align with the Net Zero program.
RA2.2 Conserving	
Reduce Construction Energy Consumption	The Project Team shall identify options for reduced energy consumption during construction and implement at least six reduction strategies. These shall be put into written requirements. Envision guidance provides nine options. Massport recommends the following and strongly encourages implementing as many of the other options as feasible: › Reduce fuel consumption by 10 percent through improved planning/logistics (reduced deliveries, idle times, nearby staging, prefabrication, etc.) › Use Tier IV construction equipment or Tier III with Best Available Technology (BAT) for at least 75 percent of non-road equipment (greater than 50 horsepower [HP]) › Use alternative fuels in heavy equipment for at least 5 percent of fuel consumption › Use hybrid or electric project vehicles for at least 50 percent of the fleet › Use electrified equipment for at least 20 percent of equipment › Implement employee commuting programs with incentives (transit shuttles, ride-share, biking facilities)

RA2.3 Conserving	
Use Renewable Energy	Use on-site renewable energy systems and/or procure renewable energy from offsite sources for all or a portion of the project's annual energy use (electricity and fuel). * Any planned reliance on renewable energy credits (RECs) or carbon offsets shall be discussed with the Massport PM and Massport's Environmental Team. The Project Team may only count RECs that are purchased or under contract at the time of Envision assessment. See Section 3.3.1, *Renewable Energy Guidance*, for renewable electricity production/procurement best practices. When establishing renewable energy procurement targets, the A/E Team shall consider the cost of required carbon offsets to achieve net zero emissions. A/E Teams shall consult with Massport PM and Massport's Environmental Team for carbon offset costs per pound of CO_2e/year. As applicable, Project Teams should strive to include the electrical load associated with EV charging; however, this load can be excluded from the above requirement if the Project Team and Massport's Environmental Team mutually agree that its inclusion is infeasible. In such cases, Project Teams should coordinate with the Environmental Team on alternative means of procuring renewable electricity to cover this energy load. This measure is contingent on Federal Aviation Administration (FAA) 7460 approval with a glare study. * Note that the preferred Envision threshold [Conserving] requires at least 50 percent of the total energy used on-site to come from renewable energy sources.

RA2.4 Conserving	
Commission and Monitor Energy Systems	On a project-by-project basis, evaluate the project's integration into an energy management system accounting for at least 90 percent of the energy consumption; the project shall conduct an initial third-party commissioning of the energy systems for at least 90 percent of total energy consumption, including a detailed issues log; and develop a plan for ongoing re-commissioning throughout the project life.

RA3.2 Enhanced	
Reduce Operational Water Consumption	The Project Team shall identify potable water reduction strategies and consider alternatives, such as reused water, recycled water, or stormwater. The project shall reduce potable water use by at least 50 percent and overall water use (potable and non-potable) by at least 20 percent. At Logan Airport, in particular, Project Teams should aim to prioritize the capture of stormwater to meet this guideline.

RA3.3 Enhanced	
Reduce Construction Water Consumption	The Project Team shall identify options for reducing water consumption during construction and implement at least three strategies (put into written requirements for construction). Documentation of water reduction calculations is required. Envision guidance provides 10 options. Massport recommends the following at a minimum and strongly encourages implementing as many of the other options as feasible: › High-efficient fixtures in construction trailers or offices (demonstrating a 40 percent reduction). › Monitoring and management (demonstrated ability to detect leaks and respond to inefficiencies). › Using alternatives to dust suppression such as dry agents (showing a 50 percent reduction in water use).

Natural World Guidelines

NW1.1 Enhanced	
Preserve Sites of High Ecological Value	On a project-by-project basis, the Project Team shall identify any areas of high ecological value and implement mitigation measures (including avoidance, restoration, or offsets) for any impacts. The Massport PM shall consult with Massport's Environmental Team and Strategic Planning Department before undertaking this effort. If the project boundary does not include any areas of high ecological value and the Project Team can document this, the credit may be deemed "not applicable."

NW2.1 Superior	
Reclaim Brownfields	If the project is located on a site with known contamination (brownfields) projects should address contamination with Massport's Environmental Team and ensure Massachusetts Contingency Plan (MCP) compliance. Projects are encouraged to work towards remediation as feasible per Envision credit NW2.1 Reclaim Brownfields.

NW2.2 Conserving

Manage Stormwater	Refer to Section 2.2.1, *Additional Stormwater Requirements*. Erosion and Sedimentation Control › Implement an ESC that exceeds the most current version of the U.S. EPA Construction General Permit, or local equivalent, whichever is most stringent. Stormwater Retention and Treatment › Retain onsite runoff from the 95th percentile of local 24-hour rainfall events. Stormwater shall be retained (i.e., infiltrated, evapotranspirated, or collected and reused) using LID and GI practices. To determine the 95th percentile amount, Project Teams should reference the EPA Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act. The Massachusetts Water Resources Commission provides guidance on LID at https://www.mass.gov/low-impact-development. Runoff Rate and Volume Management › Manage on site the annual increase in runoff volume from the natural land cover condition to the post-developed condition. › Do not exceed the rate or quantity of runoff for 2-, 5-, 10-, 25-, and 50-year 24-hour rainfall events relative to existing conditions.

NW2.3 Superior

Reduce Pesticide and Fertilizer Impacts	Landscaping shall be designed to include species that require fewer fertilizers and pesticides; if needed, fertilizers and pesticides with low toxicity, persistence, and/or bioavailability are specified. Operational policies shall be in place to control the application of pesticides and fertilizers, and runoff controls shall minimize contamination of groundwater/surface water.

NW2.4 Conserving (Logan Airport) Enhanced (Other Massport Facilities)

Protect Surface and Groundwater Quality	The Project Team shall identify potential impacts to surface/groundwater quality (including temperature), have spill prevention plans, and implement measures to reduce any impacts. Specific to Logan Airport, Project Teams should additionally aim to find and eliminate bacteria.

NW3.1 Improved	
Enhance Functional Habitats	On a project-by-project basis, the project shall identify existing habitat types on or near the project site and implement mitigation measures to protect habitat through a mitigation hierarchy (avoidance, minimization, restoration, and compensation). Measures implemented shall not attract wildlife that could pose a hazard to flight operations.
NW3.4 Superior	
Control Invasive Species	The project shall identify any invasive species infestations on the project site and implement management plans and controls for preventing the introduction of invasives. Landscaping shall only utilize noninvasive species.
NW3.5 Enhanced	
Protect Soil Health	The project shall limit the area that is disturbed by development activities and 100 percent of post-construction vegetated areas disturbed during construction shall be restored for appropriate soil type, structure, and function.

Climate and Resilience Guidelines

CR1.1 Enhanced	
Reduce Net Embodied Carbon	On a project-by-project basis, the Project Team shall identify primary materials for the project during construction and operation which are collectively more than 80 percent contributors to net embodied carbon. The team then shall evaluate a minimum of 20 percent* reduction in embodied carbon.* * Note that the "Enhanced" threshold in Envision is a 15 percent reduction, while Massport's goal threshold is 20 percent.
CR1.2 Conserving	
Reduce Greenhouse Gas Emissions	The Project Team shall map and calculate total annual GHG emissions (direct and indirect) and consider a 100 percent reduction goal over the operational life of the project compared to a baseline. Calculations shall be shown in CO_2e.
CR1.3 Superior	
Reduce Air Pollutant Emissions	In addition to meeting all regulatory requirements for air quality and air pollutants, air pollution controls shall be within the 95th percentile (or lowest possible levels compared to similar projects). Systems shall also be in place for ongoing monitoring. Additionally, the team shall assess whether there are harmful VOCs and implement reduction strategies as needed.

CR2.2 Conserving	
Assess Climate Change Vulnerability	The Project Team should work with Massport's Senior Resiliency Manager to review the project during the planning and design phases to determine climate threats/hazards to the project over its operational life, as well as potential threats to connected/related infrastructure and the broader community. Additionally, the Project Team should consider: › Utilizing vulnerability/risk assessments that have already been completed, identifying gaps, and aligning the assessment with ongoing climate resiliency work in the region. › Further assessing the specific vulnerabilities and risks associated with the critical functions and dependencies of the project and conducting a risk evaluation with a diverse set of stakeholders. › Developing risk management and resilience goals and strategies informed by stakeholder input and in alignment with local, state, and regional climate resilience goals. › Implementing resilience strategies and periodically monitoring effectiveness. Resilience strategies shall be incorporated into the operations and maintenance of the project. › Increasing critical system redundancy to reduce the risk of failures.
CR2.3 Conserving	
Evaluate Risk and Resilience	The Project Team shall further assess the specific vulnerabilities and risks associated with the critical functions and dependencies of the project and conduct a risk evaluation with a diverse set of stakeholders.
CR2.4 Conserving	
Establish Resilience Goals and Strategies	The Project Team shall further build on CR2.2 and CR2.3, by developing risk management and resilience goals and strategies informed by stakeholder input and in alignment with local, state, and regional climate resilience goals.
CR2.5 Superior	
Maximize Resilience	The Project Team shall implement resilience strategies (based on findings of CR2.4) and periodically monitor effectiveness. Resilience strategies shall be incorporated into the operations and maintenance of the project.

CR2.6 Enhanced	
Improve Infrastructure Integration	The project shall increase system integration to improve efficiency, increase resilience, and reduce the risk of failures.

6.4 Additional Infrastructure Guidelines

The following section provides additional Guidelines to be incorporated into all infrastructure projects for more advanced sustainability performance beyond what is outlined for the Envision credits above.

Concerning Climate and Resilience, all projects shall refer to the current version of Massport's *Floodproofing Design Guide* and are responsible for submitting the Floodproofing Design Guide Submission Form to Massport for approval at every phase of design (15 percent to 100 percent). The initial review may determine the facility is not critical infrastructure or at significant risk and future reviews may be limited. The most recent version is available on Massport's website.

Energy and GHG Emissions Management Guidelines	
Energy Efficiency	Efficient Lighting (Interior & Exterior) › Install high-efficiency lighting systems for all light uses, employing only light-emitting diode (LED) lights for all fixtures. Lighting Sensors › Evaluate opportunities for daylight and/or motion/occupancy sensors as well as network lighting controls on all interior and exterior non-emergency lighting. Dimming lights may be used to maintain security and/or meet operational requirements where appropriate. Energy Use Metering › Install advanced real-time energy metering for all lighting, plug loads, and process loads that exceed 5 percent of the peak connected load of the whole project, as well as all project operations and miscellaneous loads. › Comply with all current code requirements and Massport specifications.
Electrification	On a project-by-project basis, evaluate the available power capacity needed to provide new, fully electric systems and equipment. All existing systems and equipment running on fossil fuels should be evaluated to determine the end of their useful service life. If fossil fuel equipment is identified within the project boundary and has less than 3 years of service life remaining, this equipment should consider replacement with electric-powered or clean fuel alternatives. Clean fuel alternatives (renewable diesel) and battery storage should be evaluated for emergency power generation, wherever feasible. Confirm

compliance with all code/regulatory minimums. See the related section on "Climate Preparedness and Adaptation Guidelines" below.

Low Carbon Concrete

On a non-airside project using at least 10 cubic yards of concrete, consider using low-carbon concrete provided it meets all other applicable requirements. Refer to the most current Global Warming Potential (GWP) baselines for the "Eastern" region and target a 20 percent reduction over these baselines. Current GWP limits (reflecting a 20 percent reduction) are posted below using baseline data published in April of 2023. These regional baselines were established by the National Ready Mix Concrete Association (NRMCA) and are listed in the Carbon Leadership Forum.[29] See **Table 6-1** below.

- Projects are encouraged to utilize performance-based concrete specifications to allow flexibility in mix design and enable suppliers to reduce embodied carbon thresholds, measured by GWP.
- The GWP of each specific concrete mix shall have a valid, product-specific Type III Environmental Product Declaration (EPD) that is third-party verified. Cradle-to-gate EPDs shall follow NSF (formerly, National Sanitation Foundation) International's product category rule for concrete.

Table 6-1 Maximum Global Warming Potential (GWP) Limits

	2500 psi	3000 psi	4000 psi	5000 psi	6000 psi	8000 psi	LW 3000 psi	LW 4000 psi	LW 5000 psi
GWP Limit*	192	212	252	303	320	378	414	459	503

* GWP ($kgCO_2/m^3$) limits reflect a 20 percent reduction over NRMCA baselines

Alternative Compliance: Project Average Carbon Budget

- Compliance can be achieved on a "per mix" basis as described above or a "project average basis."
- Total embodied carbon (ECproj) of all concrete mix designs within the same project shall not exceed the project limit (ECallowed) determined using **Table 6-1** above and Equation EC1 on the following page.

29 The Carbon Leadership Forum regional baselines can be accessed at https://carbonleadershipforum.org/clf-material-baselines-2023/.

Equation EC1

$EC_{proj} < EC_{allowed}$
where
$EC_{proj} = \Sigma EC_n v_n$ and $EC_{allowed} = \Sigma EC_{th} v_n$
and
n = the total number of concrete mixtures for the project
EC_n = the embodied carbon for mixture n per approved EPD, GWP/m3
EC_{th} = the embodied carbon threshold for mixture n per Table C, GWP/m3
v_n = the volume of mixture n concrete to be placed, m3
Example:
Project includes the following mixes:

Type/Strength	Total Volume used (m3)	Mix-Strength GWP per approved EPD (GWP [kg CO2e/m3])
Standard mix 3000psi	5,000	275
High Early Strength mix 5000psi	4,000	550
Standard mix 4000psi	8,000	330

$EC_{allowed}$ = (5,000*306)+(4,000*500)+(8,000*346) = **6,298,000**
EC_{proj} = (5,000*275)+(4,000*550)+(8,000*330) = **6,215,000**
Confirmed. $EC_{proj} < EC_{allowed}$

Low Carbon Materials

All Project Teams shall select materials with lower than industry baseline embodied carbon emissions (GWP) in product categories for which data is readily available. Refer to the Embodied Carbon in Construction Calculator (EC3) tool[30] to compare available EPD data and GWP ranges within similar product categories. For industry average baselines, refer to the Carbon Leadership Forum's Material Baselines Report.[31]

Where feasible, utilize materials that have EPDs or Life Cycle Assessment (LCA) reports. Focus EPD requirements on building materials with high-impact potential for emissions reductions (i.e., aluminum, steel, wood). Refer to the low-carbon concrete requirements above.

Airport Ramp Electrification

Accommodate electric infrastructure needs for:

- Ground Power Units (GPU) and pre-conditioned air (PCA) on jet bridges for parked aircraft
- Charging stations for electric Ground Service Equipment (eGSE)

30 The EC3 Tool can be accessed at Building Transparency https://www.buildingtransparency.org/.
31 The Carbon Leadership Forum industry average baselines can be accessed at https://carbonleadershipforum.org/clf-material-baselines-2023/.

Electric Vehicle Charging Infrastructure	On a project-by-project basis, evaluate the number of Electric Vehicle (EV) charging stations. The number needs to be verified based on available power capacity. Charging stations should be installed in compliance with the latest version of the National Fire Protection Association (NFPA) 70, National Electrical Code – Article 625, as well as the applicable Massachusetts electrical code adopted and enforced locally. The levels of EV charging provided should correspond to the needs of the facility's users, depending on their driving distances and length of stay. Meter the electricity supply provided to the EV charging stations separately from other building end uses. Provide clear signage promoting EVSE throughout the parking area or structure and reserved parking next to the chargers for exclusive use by EVs.
Construction Stage Reporting	The A/E team shall specify the tracking of construction stage emissions. This includes transportation of materials to the job site and onsite construction and installation emissions. The Contractor shall be responsible for developing a project-specific Construction Carbon Plan (CCP), which identifies key emission sources, action plans for reduction, and roles and responsibilities for all parties. All CCPs should track emissions related to the following: › Delivery vehicles › Onsite transportation › Temporary electrical power consumption › Site demolition and clearing › Excavation › Temporary works construction (shoring systems, crane footings, etc.) › Material handling › Material waste › Testing/Commissioning The CM/GC shall report fossil-fuel use (transportation and fuel use on-site) and on-site electrical consumption every month. Refer to the Embodied Carbon Reduction Guide[32] for additional guidance for preparing and implementing a CCP. Refer to Envision credit RA2.2 for additional strategies for reducing construction energy consumption.

32 The Embodied Carbon Reduction Guide can be accessed at https://indd.adobe.com/view/1d7fd999-5c7d-446d-98e9-590151f2b0cf.

Climate and Resilience Guidelines	
Backup Power	Identify backup power opportunities and equipment for all projects, ensuring that electrical engineers understand the full building system, including a one-line diagram, before making design decisions. › Select fuel source and backup power system design. › Demonstrate consideration of clean fuel alternatives and renewable energy power supply. Identify systems to be powered during power outages. › List equipment to power critical systems and their energy requirements. › Size backup power system to meet the energy requirements of equipment to be powered. Determine the location of the backup power system, and if a hazard (i.e., flood or wind) protection plan is required. › All emergency generators shall be located above the design flood elevation (DFE) per Floodproofing Design Guide. Determine the operational duration of backup power requirements. › Consult with the Massport Project Manager (PM) if this is to exceed code/regulatory minimums. › Size fuel supply to meet operational duration requirements. If renewable energy with energy storage is part of the project design, duration requirements can be reduced.
Stormwater Management	On a project-by-project basis, Project Teams shall consider and document all opportunities to maximize stormwater treatment. Project Teams shall assess the opportunity for stormwater systems to mitigate stormwater from adjacent areas for water quality improvements and/or flood management. Project Teams shall calculate the pollutant load from stormwater runoff into design calculations for all site development and roadway projects. The following pollutants should be included at a minimum – total suspended solids (TSS), total phosphorous (TP), total nitrogen (TN), and bacteria. The specific bacteria indicator shall be site-specific and be chosen by Massport's Environmental Team and will likely include e. coli, enterococcus, and/or fecal coliform. The allowable pollutant loads and bacteria indicator shall be site-specific and chosen by Massport's Environmental Team. At the Preliminary Design stage (or sooner), the Project Team should CCTV inspect all sewers and drains as well as inspect all manholes within the project area to document the condition of the piping and structures. Based on the findings from these inspections, and at the discretion of Massport's

	Environmental Team, the design consultant may be required to perform water quality sampling of the drainage or dye testing investigations. As applicable, Project Teams shall ensure project close-out documentation includes ongoing monitoring recommendations for stormwater BMPs.
Debris Protection	Where applicable, facility exteriors shall contain design features that protect structures from air-borne storm debris, extreme winds, and water. Materials shall resist potential damage, to the most practical extent possible. The roof shall be constructed per the Insurance Institute for Business & Home Safety (IBHS) Fortified Commercial Wind Guidelines (https://fortifiedhome.org/wp-content/uploads/Fortified_Commercial_Wind_Guidelines_2020.pdf). Windows, doors, and other openings shall be water intrusion resistant.
Heat Island Reduction	On a project-by-project basis and unless otherwise precluded by FAA regulation, use light-colored and reflective materials on exposed surface areas (e.g., parking lots) to enhance outdoor thermal comfort.
Provide Outdoor Shading	On a project-by-project basis evaluate outdoor areas where workers and/or passengers are likely to spend more than a few minutes at a time outdoors. Provide shaded areas through either vegetation (tree shading) or constructed canopies. If utilizing vegetation, ensure the selection of types that will not attract wildlife that may pose a threat to aircraft operations. All parking areas should be a minimum of 50 percent shaded. Installing and maximizing solar canopies over parking areas should be considered to satisfy this standard.
Sustainable Materials Management Guidelines	
State Waste Bans	Comply with 310 CMR 19.017, Solid Waste Management – Waste Bans, which restrict or prohibit the disposal, or transfer for disposal, of certain components of the solid waste stream, including but not limited to yard waste; glass containers; recyclable paper; asphalt pavement, brick, and concrete; metal; wood; and clean gypsum wallboard.
Material Selection & Evaluation	The A/E Team shall consider the following criteria, to the greatest extent feasible, when evaluating products for specification. This comprehensive approach creates a common framework for evaluation in alignment with the American Institute of Architects (AIA) Materials Pledge.[33]

33 More information on the AIA Architecture & Design Materials Pledge can be accessed at: https://www.aia.org/design-excellence/climate-action/zero-carbon/materials-pledge.

	› **Human health** by preferring products that support and foster life throughout their life cycles and seek to eliminate the use of hazardous substances › **Social health and equity** by preferring products from manufacturers that secure human rights in their own operations and supply chains, positively impacting their workers and the communities where they operate › **Ecosystem health** by preferring products that support and regenerate the natural air, water, and biological cycles of life through thoughtful supply chain management and restorative company practices › **Climate health** by preferring products that reduce carbon emissions and ultimately sequester more carbon than emitted › **A circular economy** by reusing and improving buildings and by designing for resiliency, adaptability, disassembly, and reuse, aspiring to a zero-waste goal for global construction activities
Collection, Storage, and Disposal	Provide and maintain dedicated and appropriately sized collection, storage, and disposal areas for trash, mixed recycling, and food waste/organics as applicable that are convenient and safe to access. › Areas should be sized to accommodate the co-location of streams for interior bins and exterior haul containers/compactors. Where feasible and appropriate, provide trash and recycling chutes and elevator access to exterior haul containers. Provide for the safe collection, storage, and disposal of specialized waste streams, such as universal, electronic, and hazardous wastes, as applicable.
Prefabrication	Design out waste by utilizing prefabrication and other off-site construction techniques to the greatest extent practicable. These processes reduce waste generation through factory-controlled and more efficient construction processes.
Human Health and Wellness Guidelines	
Chemicals of Concern	The following chemicals of concern should be avoided for all flooring, interior finishes, and furniture products (unless required by code): › PFAS (Per- and poly-fluoroalkyl substances) › Antimicrobials (i.e., antibacterials or biocides) › Flame Retardants

	Avoid the use of the following chemical classes of concern to the greatest extent feasible in all material categories. Refer to https://www.sixclasses.org/ for more information. Prioritize the selection of "Red List Free" materials when possible. Refer to the International Living and Future Institute (ILFI) for a comprehensive list of current "Red List" chemicals (https://living-future.org/red-list/). Use caution when specifying products made outside of the U.S., as they may contain harmful unregulated chemicals. Request material ingredient reports for foreign products. › PFAs (Per- and poly-fluoroalkyl substances) › Antimicrobials (i.e., antibacterials or biocides) › Flame Retardants › Bisphenols + Phthalates › Some Solvents (aromatic hydrocarbon solvents [toluene, xylene, benzene] and halogenated organic solvents [methylene chloride, perchloroethylene, trichloroethylene]) › Certain Metals (Mercury, arsenic, cadmium, and lead)
Material Ingredient Reporting & Optimization	Where feasible, utilize materials that have transparency documentation disclosing material ingredients and potential health hazards (e.g., HPDs, Cradle to Gradle certification, Declare, or similar). Prioritize building materials in high-touch areas, or where there is a greater risk of exposure to harmful chemicals. Refer to the Leadership in Energy and Environmental Design (LEED) MRc4 credit language for additional guidance on acceptable forms of documentation.

End of Sustainability Design Guidelines

Design Principles for Special Projects

Massport Capital Programs

Sustainability Design Guidelines

Design Principles for Special Projects

This document applies to Special Projects including upgrades and retrofits (e.g., energy efficiency or technology improvements), interior decoration, façade improvements, and restoration. Special Projects do not align with sustainability rating systems, namely the US. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED), Green Business Certification Inc.'s (GBCI) Parksmart certification, and Institute for Sustainable Infrastructure's (ISI) Envision. Further, projects in this category include those where full compliance with the *2024 Sustainability Design Guidelines* (the Guidelines) would be impractical for Massport Project Managers due to short project timelines (e.g., emergency repairs). Special Projects may be of any construction value.

As an alternative to full compliance, the following sustainable design principles have been established to ensure Special Projects adhere to key objectives of the Guidelines. Project Managers should review these principles during project planning and adjust their projects to align with them as appropriate and to the extent feasible.

<u>Operational Energy Efficiency</u>

- **Incorporate energy conservation and efficiency measures to optimize energy use.**

  Potential Considerations: Install LED lighting, lighting controls (e.g., daylight and motion/occupancy sensors), ENERGY STAR-rated appliances, variable frequency drives (VFDs), variable refrigerant flow (VRF), heat recovery ventilation/energy recovery ventilation (HRV/ERV), thermal storage, low-temperature hot water (for building hydronic systems), and hydronic heat recovery. Integrate the project into existing energy management systems.

- **Improve building envelopes to maintain a consistent indoor temperature while using less energy.**

  Potential Considerations: In alignment with the Massachusetts State Building Code and Stretch Energy Code, achieve enhanced insulation levels across all building components and include high-performance windows with low U-values and appropriate solar heat gain coefficient (SHGC) values to maximize energy efficiency and comfort. Mitigate thermal bridging by implementing a continuous thermal insulation barrier and by using thermal break materials at window and door frames, structural framing that crosses the thermal envelope, and slab edges. Apply air sealing to all joints, seams, and penetrations. Conduct building leakage testing to

ensure results are less than 0.35 cfm/sf @75 Pa. Install reflective roofing materials to deflect heat and reduce cooling loads.

- **Connect to or incorporate real-time energy metering to monitor and manage energy consumption.**

  Potential Considerations: Loads exceeding 5 percent of the peak connected load of the whole building should be sub-metered.

Systems Electrification

- **Prioritize fully electric building systems and equipment, except for emergency standby power systems.**

  Potential Considerations: Electric building systems should include heat pump technologies, including air-to-air, air-to-water, and ground source heat pumps. Such systems should be rated for extreme cold temperatures where applicable. If the project involves fossil fuel-based systems (i.e., powered by natural gas, fuel oil, or propane) with less than 3 years of service life remaining, then such systems should be replaced with electrified alternatives. Emergency standby power systems can be evaluated for clean fuel alternatives (i.e., renewable diesel) and electrification (i.e., battery storage).

- **Provide electric vehicle (EV) supply equipment**.

  Potential Considerations: Assess immediate and future needs for EV charging stations and "EV-Ready" parking spaces. EV-Ready is defined as providing the electrical capacity and infrastructure, such as conduits and wiring, to support future charging station installations.

- **Coordinate with Massport Facilities to ensure adequate electrical service and capacity to support systems electrification. If constraints exist, prioritize electrified building systems over electric vehicle charging infrastructure.**

Renewable Energy

- **Where the project constitutes or otherwise includes the installation of renewable energy systems, strive to maximize the percentage of the connected facility's operational annual energy use derived from renewable energy sources.**

  Potential Considerations: Evaluate opportunities for incorporating battery storage systems to store any excess energy generated by renewable energy installations and microgrid capabilities to allow the connected facility to operate independently from the main grid during outages or peak demand periods.

- **Accommodate future renewable energy system installations.**

  Potential Considerations: Upgrade roofs and other structures to allow them to support the weight of solar panels or other renewable energy installations. Upgrade electrical systems to accommodate the additional loads from renewable energy systems. Install conduits and pathways during retrofits to facilitate easy wiring of renewable energy systems. Roofing materials should be compatible with solar installations.

Embodied Carbon Reduction

- **Use low-carbon concrete, targeting a 20 percent global warming potential (GWP) reduction over regional baselines.**

  Potential Considerations: Reference regional baselines provided in Table 5-1 in the Guidelines. Use performance-based concrete specifications to allow flexibility in mix design and enable suppliers to reduce embodied carbon thresholds, measured by GWP.

- **Select and procure low-carbon materials, especially for high-impact materials like aluminum, steel, and wood.**

  Considerations: Utilize tools like the Embodied Carbon in Construction Calculator (EC3) to compare and select materials with lower GWP.

Operational Water Consumption (Potable)

- **Implement water efficiency measures to reduce both indoor and outdoor water use.**

  Potential Considerations: Install WaterSense-certified faucets and fixtures, sensor-operated fixtures, water-efficient appliances (reference ENERGY STAR), smart irrigation controllers, and leak detection systems. Use drought-tolerant landscaping, prioritizing native plants.

- **Connect to or incorporate real-time water metering to track and manage water consumption.**

Stormwater Management

- **Adhere to Section 2.2.1 "Additional Stormwater Requirements" of the Guidelines.**

- **Develop and implement an Erosion and Sedimentation Control Plan that exceeds the most stringent applicable regulations.**

Potential Considerations: Install temporary measures, such as silt fences, straw wattles, and erosion control blankets, and establish permanent measures, including vegetated swales, riprap channels, retention basins, and native/drought-tolerant landscaping for soil stabilization.

- **Strive to retain stormwater for the 95th percentile local 24-hour event.**
- **Strive to manage the annual increase in runoff volume from the natural land cover condition to the post-developed condition AND not exceed the rate or quantity of runoff for 2-, 5-, 10-, 25-, and 50-year events relative to existing conditions.**

Potential Considerations: Implement efficient infiltration, evapotranspiration, and water reuse techniques by adhering to low-impact development (LID) principles and incorporating green infrastructure solutions. Examples of green infrastructure include green roofs, rain gardens, permeable pavements, bioswales, constructed wetlands, and rainwater harvesting.

Climate Resilience

- **Integrate design features that protect against water damage, extreme winds, and airborne storm debris.**

Potential Considerations: Incorporate impact-resistant glass and connect windows/doors to robust framing systems. Install wind-rated roofing and exterior cladding in consideration of applicable wind loads and facility risk ratings (refer to ASCE 7). Apply reinforced connections (e.g., hurricane straps, clips, and hold-downs) to prevent uplift during extreme wind events. Apply waterproofing systems such as waterproof membranes and sealants to roof decks, foundations, and exterior walls. Install roof drainage systems that can effectively manage water flow, including larger gutters and downspouts and/or secondary or emergency overflow drains. Use flood-resistant materials, such as treated wood, moisture-resistant drywall, and closed-cell insulation.

Human Health and Wellness

- **Avoid the use of toxic chemicals of concern where viable alternatives are readily available. Prioritize high-impact selections, where large volumes of materials are used that often contain highly toxic ingredients.**

Potential Considerations: Specify "Red List Free" products with material transparency documentation like Health Product Declarations (HPDs). All new flooring, interior finishes, and furniture should be free of PFAS (Per- and polyfluoroalkyl substances), antimicrobials, and flame retardants (unless required by code.) All fire suppression materials should be free of halon and PFAS.

Design Guidelines Compliance Checklists

B

Massport Capital Programs

Sustainability Design Guidelines

Sustainability Guidelines Compliance Checklist – Vertical Projects

Project Origination: ☐ Capital Programs ☐ REAM ☐ TAA

Project Name & Number: _____

Massport Project Manager: _____

Construction Value ($): _____

Submission (15%, 30%, 60%, 90% / Final): _____

1. Indicate the project type and provide a narrative summary of the scope. For projects of any monetary value falling under the categories of upgrades and retrofits (e.g., energy efficiency or technology improvements), interior decoration, façade improvements, and restoration, please refer to the "Special Projects Compliance Checklist."

2. Projects valued at $5 million or more must pursue either LEED or Parksmart certification, or complete the Compliance Waiver Request Form (Attachment C of the Sustainability Design Standards) and receive signed approval from Capital Programs. The preferred target certification level is GOLD or higher, though the final certification level will be determined on a project-by-project basis. A completed LEED or Parksmart scorecard shall be submitted with each iteration of this form (see scorecards attached.)

   Indicate the relevant rating system and certification level being pursued below.

   ☐ LEED BD+C: New Construction v4.1 or later; Certification level: _____

   ☐ LEED BD+C: Core and Shell v4.1 or later; Certification level: _____

   ☐ LEED ID+C: Commercial Interiors v4.1 or later; Certification level: _____

   ☐ Parksmart; Certification level: _____

   ☐ N/A – Waiver Obtained *(Attach Waiver from Capital Programs)*

Explanation of Exception:

If applicable, indicate any other third-party rating systems being pursued: _____

3. Systems Electrification

All new building systems and equipment are fully electric (except for emergency standby power systems). ☐ Yes ☐ No ☐ N/A

a. Itemize all existing fossil fuel systems and equipment serving the project in the table below. Fossil fuel systems and equipment within the project boundary that have less than 3 years of service life remaining shall be replaced with electric-powered alternatives.

Equipment	Fossil Fuel Source	Remaining Service Life	Expected to be Electrified (Y/N)

The project includes electric vehicle charging stations. ☐ Yes ☐ No ☐ N/A

a. Number of electric vehicle charging stations (Goal = 10% of parking spaces): _____
    i. Number of "EV-ready" parking spaces (Goal = 15% of parking spaces): _____
    ii. Number of total parking spaces: _____

The project accommodates electrical infrastructure needs for Ground Power Units (GPU) and Pre-Conditioned Air (PCA) on jet bridges and charging stations for electric Ground Service Equipment (eGSE). ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

4. Energy Efficiency & Data Management

    a. Predicted Energy Use Intensity (kBtu/sf/yrEUI): _____
        i. Baseline EUI: _____
        ii. Percent reduction over baseline: _____
    b. Lighting Power Density (W/sf): _____
        i. Baseline LPD (ASHRAE 90.1 2007): _____
        ii. Percentage reduction over baseline (Goal = 25%): _____
    c. Indicate Specialized Code Compliance Pathway (Zero Energy/All-Electric/Mixed Fuel): _____

    Description of Energy Reduction Strategies (Ref. MA Stretch Energy Code, Section C406.1)

    The project is integrated with an energy management system accounting for at least 90% of energy consumption. ☐ Yes ☐ No ☐ N/A

    The project uses real-time energy metering for all HVAC, lighting, plug loads, and process loads that exceed 5% of the peak connected load of the whole building, as well as all building operations and miscellaneous loads. ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

5. Operational Net Zero Carbon Assessment

    Refer to the *LEED Zero Program Guide* (available at https://www.usgbc.org/resources/leed-zero-program-guide) and follow instructions related to Zero Carbon calculations. Transportation emissions can be omitted from the "Carbon Emitted" calculation.

    a. Total Carbon Emitted (kg CO_2e): _____
        i. Scope 1 (kg CO_2e): _____
        ii. Scope 2 (kg CO_2e): _____
    b. Total Carbon Avoided (kg CO_2e): _____
        i. Scope 1 (kg CO_2e): _____
        ii. Scope 2 (kg CO_2e): _____
    c. Difference (kg CO_2e) (Emitted less Avoided) (Goal ≤ 0): _____
        i. Scope 1 (kg CO_2e): _____
        ii. Scope 2 (kg CO_2e): _____

The project will achieve a total annual Carbon Balance of Zero (Total Carbon Emitted – Total Carbon Avoided = 0) ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

6. Embodied Carbon Reduction

   a. Global Warming Potential (GWP) of Primary Materials: _____
      i. GWP of Equivalent Baseline: _____
      ii. Percent Reduction over Baseline (Goal = 20%): _____

   b. Structural Analysis (N/A to Parking Garages)
      i. GWP of Structural System Option 1: _____
      ii. GWP of Structural System Option 2: _____
      iii. GWP of Structural System Option 3: _____
      iv. Selected Structural System: _____

Explanation of Structural System Options:

   c. Typical structural bay studies:
      i. GWP of Option 1: _____
      ii. GWP of Option 2: _____
      iii. GWP of Option 3: _____
      iv. Selected Bay Option: _____

The results of embodied carbon analysis including methodology and assumptions are summarized in narrative form and included in Preliminary Design Submission (30%). ☐ Yes ☐ No ☐ N/A

The project complies with the Low Carbon Concrete GWP limits (applicable to all non-airside projects using at least 10 cubic yards). ☐ Yes ☐ No ☐ N/A

7. Water Consumption

   a. Predicted Annual Indoor Potable Water Use (gallons): _____
      i. Baseline Annual Indoor Potable Water Use (gallons): _____
      ii. Percent Reduction Over Baseline (Goal = 50%): _____

Description of Water Reduction Strategies:

Explanation of Category Exceptions:

☐ The project includes building-level meters and sub-meters for water distribution.

☐ The project includes water bottle refilling stations. Number of stations: _____

8. Natural Resources

a. Stormwater Management

The Project Team has developed and implemented an Erosion and Sedimentation Control Plan (ESC) that exceeds the most current version of the U.S. EPA Construction General Permit, or local equivalent, whichever is most stringent. ☐ Yes ☐ No ☐ N/A

Evaluation of the need for stormwater design elements for water quality and permit compliance has been reviewed with Massport's Environmental Team. ☐ Yes ☐ No ☐ N/A

The project retains onsite runoff from the 95th percentile of local 24-hour rainfall events with infiltration, evapotranspiration, or reuse using low-impact development and green infrastructure practices. ☐ Yes ☐ No ☐ N/A

The project manages on site the annual increase in runoff volume from the natural land cover condition to the post-developed condition. ☐ Yes ☐ No ☐ N/A

The project does not exceed the rate or quantity of runoff for 2-, 5-, 10-, 25-, and 50-year events relative to existing conditions. ☐ Yes ☐ No ☐ N/A

Description of Stormwater Management/Treatment Strategies:

b. Ecological Value and Species

The Project Team has identified areas of high ecological value and implemented mitigation measures for any impacts. ☐ Yes ☐ No ☐ N/A

The project is designed to include species that require fewer fertilizers and pesticides; if needed, fertilizers and pesticides with low toxicity, persistence, and/or bioavailability are specified. ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

9. Climate and Resilience

The project has design features that protect structures from air-borne storm debris, extreme winds, and water. ☐ Yes ☐ No ☐ N/A

Description of Resilience Strategies:

The project has identified critical power systems and planned for their backup power requirements. ☐ Yes ☐ No ☐ N/A

The project has considered clean fuel alternatives and renewable energy power supplies for backup power systems. ☐ Yes ☐ No ☐ N/A

The Project Team has submitted the mandatory Floodproofing Design Submittal Form. ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

10. Materials Management

    a. Percent of products sourced from at least five different manufacturers meeting at least one of the responsible sourcing and extraction criteria (Goal = 30%, by cost): _____
    b. Percent of C&D waste diverted from disposal (Goal = 95%): _____

    The project provides dedicated and appropriately sized collection, storage, and disposal areas for trash, mixed recycling, and food waste/organics. ☐ Yes ☐ No ☐ N/A
    The project complies with 310 Code of Massachusetts Regulations (CMR) 19.017, Solid Waste Management – Waste Bans ☐ Yes ☐ No ☐ N/A

    Explanation of Category Exceptions:

11. Human Health and Wellness

    All flooring, interior finishes, and furniture are free of PFAS, Antimicrobials, and Flame Retardants. ☐ Yes ☐ No ☐ N/A

    All fire suppression materials are free of halon and PFAS. ☐ Yes ☐ No ☐ N/A

    Explanation of Category Exceptions:

LEED v4.1 BD+C
Project Checklist

Project Name:
Date:

Y	?	N			
			Credit	Integrative Process	1

Y	?	N		Location and Transportation	16
			Credit	LEED for Neighborhood Development Location	16
			Credit	Sensitive Land Protection	1
			Credit	High Priority Site and Equitable Development	2
			Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Electric Vehicles	1

Y	?	N		Sustainable Sites	10
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Protect or Restore Habitat	2
			Credit	Open Space	1
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1

Y	?	N		Water Efficiency	11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	2
			Credit	Indoor Water Use Reduction	6
			Credit	Optimize Process Water Use	2
			Credit	Water Metering	1

Y	?	N		Energy and Atmosphere	33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	6
			Credit	Optimize Energy Performance	18
			Credit	Advanced Energy Metering	1
			Credit	Grid Harmonization	2
			Credit	Renewable Energy	5
			Credit	Enhanced Refrigerant Management	1

Y	?	N		Materials and Resources	13
Y			Prereq	Storage and Collection of Recyclables	Required
			Credit	Building Life-Cycle Impact Reduction	5
			Credit	Environmental Product Declarations	2
			Credit	Sourcing of Raw Materials	2
			Credit	Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2

Y	?	N		Indoor Environmental Quality	16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Indoor Air Quality Assessment	2
			Credit	Thermal Comfort	1
			Credit	Interior Lighting	2
			Credit	Daylight	3
			Credit	Quality Views	1
			Credit	Acoustic Performance	1

Y	?	N		Innovation	6
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1

Y	?	N		Regional Priority	4
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

0	0	0	TOTALS	Possible Points:	110

ed: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum** 8(

LEED v4.1 BD+C: Core and Shell

Project Checklist

Project Name:

Date:

Y	?	N			
			Credit	Integrative Process	1

Y	?	N	Location and Transportation		20
			Credit	LEED for Neighborhood Development Location	20
			Credit	Sensitive Land Protection	2
			Credit	High Priority Site and Equitable Development	3
			Credit	Surrounding Density and Diverse Uses	6
			Credit	Access to Quality Transit	6
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Electric Vehicles	1

Y	?	N	Sustainable Sites		11
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Protect or Restore Habitat	2
			Credit	Open Space	1
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1
			Credit	Tenant Design and Construction Guidelines	1

Y	?	N	Water Efficiency		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	3
			Credit	Indoor Water Use Reduction	4
			Credit	Optimize Process Water Use	3
			Credit	Water Metering	1

Y	?	N	Energy and Atmosphere		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	6
			Credit	Optimize Energy Performance	18
			Credit	Advanced Energy Metering	1
			Credit	Grid Harmonization	2
			Credit	Renewable Energy	5
			Credit	Enhanced Refrigerant Management	1

Y	?	N	Materials and Resources		14
Y			Prereq	Storage and Collection of Recyclables	Required
			Credit	Building Life-Cycle Impact Reduction	6
			Credit	Environmental Product Declarations	2
			Credit	Sourcing of Raw Materials	2
			Credit	Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2

Y	?	N	Indoor Environmental Quality		10
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Daylight	3
			Credit	Quality Views	1

Y	?	N	Innovation		6
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1

Y	?	N	Regional Priority		4
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

0	0	0	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

LEED v4.1 ID+C: Commercial Interiors

Project Checklist

Project Name:

Date:

Y	?	N			
			Credit	Integrative Process	2

0	0	0	Location and Transportation		18
			Credit	LEED for Neighborhood Development Location	18
			Credit	Surrounding Density and Diverse Uses	8
			Credit	Access to Quality Transit	7
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	2

0	0	0	Water Efficiency		12
Y			Prereq	Indoor Water Use Reduction	Required
			Credit	Indoor Water Use Reduction	12

0	0	0	Energy and Atmosphere		38
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	5
			Credit	Optimize Energy Performance	24
			Credit	Advanced Energy Metering	2
			Credit	Renewable Energy	6
			Credit	Enhanced Refrigerant Management	1

0	0	0	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
			Credit	Long-Term Commitment	1
			Credit	Interiors Life-Cycle Impact Reduction	4
			Credit	Environmental Product Declarations	2
			Credit	Sourcing of Raw Materials	2
			Credit	Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2

0	0	0	Indoor Environmental Quality		17
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Pl	1
			Credit	Indoor Air Quality Assessment	2
			Credit	Thermal Comfort	1
			Credit	Interior Lighting	2
			Credit	Daylight	3
			Credit	Quality Views	1
			Credit	Acoustic Performance	2

0	0	0	Innovation		6
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1

0	0	0	Regional Priority		4
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1
			Credit	Regional Priority: Specific Credit	1

0	0	0	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum** 80 to

Parksmart Planning Worksheet

Project Name:						
Project Registration #:						
Parksmart Certification Measure	**Options**	**Max Points**	**Yes**	**Maybe**	**No**	**Comments & Notes**
MANAGEMENT						
A1 - Parking Pricing	Parking Pricing	6				
A2 - Shared Parking	Shared Parking Program	2				
	Oversubscription of Parking Permits	2				
	Shared Parking Analysis	6				
A3 - TMA/TMO	Transportation Management Association / Organization	4				
A4 - Recycling Program	Active Recycling Program	2				
	Percentage of Recycling: At least 25% but less than 50%	1				
	Percentage of Recycling: 50% or more	2				
A5 - Sustainable Purchasing Program	Organized Sustainable Purchasing Program	2				
	Purchasing of Product Groups	1				
A6 - Proactive Operational Maintenance	Proactive Operational Maintenance	6				
A7 - Cleaning Procedures - Occupied Spaces	Cleaning Products & Hand Cleaners	2				
A8 - Cleaning Procedures - Parking Decks	Spot Cleaning / Oil Degreasing	1				
	Power Washing: Water is Disposed	2				
	Power Washing: Water is Recycled	3				
	Sweeping: Electric or Propane	1				
	Sweeping: Power Scrubber	1				
A9 - Building Systems Commissioning	LEED 2009 or v4 Enhanced Commissioning Credit	8				
	LEED 2009 Fundamental Commissioning of Building Energy Systems prerequisite or v4 Fundamental Commissioning and Verification prerequisite	6				
	ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007	6				
	California Commissioning Guide for New or Existing Buildings	6				
	ASHRAE Level II Audit	4				
	Comparable established Certified Commissioning Authority (CxA) Standards	4				

Parksmart Certification Measure	Options	Max Points	Yes	Maybe	No	Comments & Notes
A10 -Construction Waste Management	85% or more recycled or reused	6				
	At least 50% but less than 85% recycled or reused	4				
	At least 20% but less than 50% recycled or reused	2				
A11 - Regional Materials	At least 75% sourced regionally	6				
	At least 50% but less than 75% sourced regionally	3				
A12 - Regional Labor	At least 60% regional	3				
	At least 35% but less than 60% regional	1				
	Rideshare for laborers	1				
A13 - Reused, Repurposed or Recycled Materials	At least 80% reused, repurposed or recycled	6				
	At least 50% but less than 80% reused, repurposed or recycled	4				
	At least 20% but less than 50% reused, repurposed or recycled	2				
A14 - Third Party Sustainability Certification	LEED Platinum, 2009 or v4	12				
	LEED Gold, 2009 or v4	10				
	LEED Silver, 2009 or v4	8				
	LEED Certified, 2009 or v4	6				
	LEED certified to any level, v2.2	4				
	Energy Conservation or Environmental Sustainability Program	12				
A15 - Credentialed Management	LEED AP Professional Credential	4				
	LEED Green Associate Professional Credential	3				
	Certified Administrator of Public Parking (CAPP)	2				
	Certified Parking Professional (CPP)	2				
	Facilities Management Administrator (FMA) or Real Property Administrator (RPA)	1				
	Certified Facility Manager (CFM)	1				
	Parksmart Advisor (formerly Green Garage Assessor)	1				
	Alternative Program	4				
A16 - Life Cycle Assessment	LCA performed and savings implemented on project totaling over $2 million	8				
	LCA performed and savings implemented on project totaling over $1 million	6				

Parksmart Certification Measure	Options	Max Points	Yes	Maybe	No	Comments & Notes
	LCA performed and savings implemented on project totaling over $500,000	4				
	LCA performed and savings implemented on project totaling over $100,000	2				
Subtotal		**90**	**0**	**0**	**0**	
PROGRAMS						
B1 - Placemaking	Placemaking	6				
B2 - Access to Mass Transit	Access to Mass Transit	4				
B3 - Wayfinding Systems - External	Dynamic Signage	1				
	Wayfinding System	2				
	Reservation System	1				
B4 - Wayfinding Systems - Internal	Parking Guidance via Single Space Detection	4				
	Parking Guidance via Electronic Level Occupancy Detection	3				
	Parking Guidance via Automatic Variable Signage	2				
	Parking Guidance via Manual Count and Static Signage	1				
B5 - Traffic Flow Plan	At least four traffic flow strategies	4				
	Average idle time of 5 seconds or less	4				
	At least three traffic flow strategies	3				
	At least two traffic flow strategies	2				
B6 - Carshare Program	Carshare Hub	5				
	Alternative Fuel Vehicles In Carshare Hub	1				
B7 - Rideshare Program	Rideshare: Reserved Parking Spaces	4				
	Rideshare: Incentives	2				
B8 - Low-emitting and Fuel Efficient Vehicles	Low-emitting and Fuel-efficient Vehicles: Preferred Parking Spaces	2				
	Low-emitting and Fuel-efficient Vehicles: Rate Discount	2				
B9 - Alternative Fuel Vehicles	AFV: Reserved Parking Spaces	3				
	AFV: Rate Discount	3				
B10 - Alternative Fuel Fleet Vehicles	At least 50% of fleet vehicles are powered by alternative fuels	4				
	At least 25% but less than 50% of fleet vehicles are powered by alternative fuels	2				
B11 - Bicycle Parking	Meets Tier One and Tier Two criteria	6				

Parksmart Certification Measure	Options	Max Points	Yes	Maybe	No	Comments & Notes
	Meets Tier One criteria	4				
B12 - Bicycle Sharing/Rental	Contains bicycle sharing or bicycle rental hub	6				
	Promotes bicycle sharing or bicycle rental hub	4				
B13 - Marketing/Educational Program	Marketing/Educational Program	4				
Subtotal		**64**	**0**	**0**	**0**	
TECHNOLOGY AND STRUCTURE DESIGN						
C1 - Idle Reduction Payment Systems	Idle Reduction Payment Systems	4				
C2 - Fire Suppression Systems	Halon Free Fire Suppression Systems	2				
C3 - No/Low VOC Coatings, Paints, Sealants	No/Low VOC Coatings, Paints, Sealants	2				
C4 - Tire Inflation Stations	Tire Inflation Stations	2				
C5 - EV Charging Stations	Two or more DC Fast Chargers	5				
	One DC Fast Charger	4				
	Two or more AC Level II EV Chargers, equaling at least 1% of all parking spaces	5				
	Two or more AC Level II EV Chargers, equaling at least 0.5% but less than 1% of all parking spaces	4				
	At least one AC Level II EV Charger, equaling less than 0.5% of all parking spaces	2				
	Level I equipped spaces equaling at least 0.5% of all parking spaces	1				
	No additional payment is required to charge vehicles	1				
C6 - HVAC Systems - Occupied Spaces	Energy Efficient System	2				
	CO Sensors	1				
	Programmable Thermostats	2				
	Environmentally Safer Coolants	1				
C7 - Ventilation Systems - Parking Decks	Demand Controlled Ventilation	3				
	Variable Air Flow System	2				
	Schedule or Occupancy Controls	1				
	Calibration and Maintenance	1				
	Design for Natural Ventilation	6				
C8 - Lighting Controls	At least 75% of lighting fixtures controlled by occupancy sensors	6				

Parksmart Certification Measure	Options	Max Points	Yes	Maybe	No	Comments & Notes
	At least 50% of lighting fixtures controlled by occupancy sensors	4				
	At least 50% of lighting fixtures controlled by advanced programmable system	3				
	At least 50% of lighting fixtures controlled by simple timer	2				
	At least 25% of lighting fixtures on lighting controls	1				
	At least 60% of (exterior) lighting fixtures controlled by photocells or occupancy sensors	2				
	At least 60% of (exterior) lighting fixtures controlled by programmable timer	1				
C9 - Energy Efficient Lighting System	Lighting Power Density (LPD)	7				
	Average Rated Lamp Life	1				
C10 - Stormwater Management	Implement an Erosion and Sedimentation Control Plan	2				
	Manage on-site runoff from the 80% precipitation event	2				
	Manage on-site runoff from the 90% precipitation event	2				
C11 - Rainwater Harvesting	Rainwater Harvesting	4				
C12 - Greywater Reuse	Greywater Reuse	2				
C13 - Indoor Water Efficiency	Efficient Fixtures	2				
C14 - Water Efficient Landscaping	Water Efficient Landscaping	2				
C15 - Roofing Systems	Green Roof	6				
	Blue Roof	4				
	Carport or Canopy	3				
	High SRI Roofing	2				
	Solar Panels	2				
C16 - Renewable Energy Generation	At least 75% of energy is on-site renewable energy	12				
	At least 50% and less than 75% of energy is on-site renewable energy	10				
	At least 25% and less than 50% of energy is on-site renewable energy	8				
	At least 5% and less than 25% of energy is on-site renewable energy	6				
	At least 75% of energy is offset by RECs	4				
	At least 50% and less than 75% of energy is offset by RECs	3				

Parksmart Certification Measure	Options	Max Points	Yes	Maybe	No	Comments & Notes
	At least 25% and less than 50% of energy is offset by RECs	2				
	At least 5% and less than 25% of energy is offset by RECs	1				
C17 - Design for Durability	Design for Durability	6				
C18 - Energy Resiliency - Storage	Grid Interactive Energy Storage	2				
	Grid and On-site Renewable Interactive Energy Storage	4				
Subtotal		**88**	**0**	**0**	**0**	
INNOVATION						
D1 - Innovative Approach	Innovative Approach	6				
TOTALS						
Management Subtotal		**90**	**0**	**0**	**0**	
Programs Subtotal		**64**	**0**	**0**	**0**	
Technology and Structure Design Subtotal		**88**	**0**	**0**	**0**	
Innovation		**6**	**0**	**0**	**0**	
Total		**248**	**0**	**0**	**0**	

Parksmart Planning Worksheet - February 2020

Massport Capital Programs

Sustainability Design Guidelines

Sustainability Guideline Compliance Checklist – Horizontal Projects

Project Origination: ☐ Capital Programs ☐ REAM ☐ TAA

Project Name & Number: _____

Massport Project Manager: _____

Construction Value ($): _____

Submission (15%, 30%, 60%, 90% / Final): _____

1. Indicate the project type and provide a narrative summary of the scope. For projects of any monetary value falling under the categories of upgrades and retrofits (e.g., energy efficiency or technology improvements), interior decoration, façade improvements, and restoration, please refer to the "Special Projects Compliance Checklist."

2. Projects valued at $5 million or more must pursue verification under the Institute for Sustainable Infrastructure's (ISI) Envision Rating System, or complete the Compliance Waiver Request Form (Attachment C of the Sustainability Design Standards) and receive signed approval from Capital Programs. The preferred Envision award level is GOLD or higher, which equates to earning an Envision score of at least 40%; the final award level will be determined on a project-by-project basis. A completed and updated Envision Pre-Assessment Checklist shall be submitted with each iteration of this form.

    a. Envision Rating System Version (e.g., v3): _____

    b. Anticipated Envision Score: ____/____ (Points Earned/Applicable Points) → ____%

c. Indicate the approved Envision verification level being pursued:

☐ Verified (20%)

☐ Silver (30%)

☐ Gold (40%) – *Preferred Award Level*

☐ Platinum (50%)

☐ N/A – Waiver Obtained *(Attach Waiver from Capital Programs)*

Explanation of Exception:

3. Systems Electrification

All new energy-consuming systems and equipment are fully electric (except for emergency standby power systems). ☐ Yes ☐ No ☐ N/A

a. Itemize all existing fossil fuel systems and equipment serving the project in the table below. Fossil fuel systems and equipment within the project boundary that have less than 3 years of service life remaining shall be replaced with electric-powered alternatives.

Equipment	Fossil Fuel Source	Remaining Service Life	Expected to be Electrified (Y/N)

The project includes electric vehicle charging stations. ☐ Yes ☐ No ☐ N/A

a. Number of electric vehicle charging stations (Goal = 10% of parking spaces) _____
   i. Number of "EV-ready" parking spaces (Goal = 15% of parking spaces) _____
   ii. Number of total parking spaces _____

The project accommodates electrical infrastructure needs for Ground Power Units (GPU) and Pre-Conditioned Air (PCA) on jet bridges and charging stations for electric Ground Service Equipment (eGSE). ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

4. Energy Efficiency and Renewable Energy Utilization

    a. Predicted Operational Annual Energy Use (kBtu): _____
        i. Baseline Annual kBtu: _____
        ii. Percent Reduction Over Baseline (Goal = 70%): _____

    Description of Energy Reduction Strategies:

    The project is integrated with an energy management system accounting for at least 90% of energy consumption. ☐ Yes ☐ No ☐ N/A

    The project uses real-time metering for all energy loads that exceed 5% of the peak connected load of the whole project. ☐ Yes ☐ No ☐ N/A

    b. Predicted Annual Energy Use from Renewable Energy Sources (kWh): _____
        i. Percent of Energy Needs Deriving from Renewable Energy Sources (Goal = 100%): _____
            1. Percent of Onsite Renewable Energy: _____
            2. Percent of Offsite Renewable Energy: _____
            3. Percent of Renewable Energy Deriving from RECs (or similar): _____

    Explanation of Category Exceptions:

5. Operational Net Zero Carbon Assessment

    a. Total Carbon Emitted (kg CO_2e): _____
        i. Scope 1 (kg CO_2e): _____
        ii. Scope 2 (kg CO_2e): _____
    b. Total Carbon Avoided (kg CO_2e): _____
        i. Scope 1 (kg CO_2e): _____
        ii. Scope 2 (kg CO_2e): _____
    c. Difference (kg CO_2e) (Emitted less Avoided) (Goal ≤ 0): _____
        i. Scope 1 (kg CO_2e): _____
        ii. Scope 2 (kg CO_2e): _____

    The project will achieve a total annual Carbon Balance of Zero (Total Carbon Emitted – Total Carbon Avoided = 0) ☐ Yes ☐ No ☐ N/A

    Explanation of Category Exceptions:

6. Embodied Carbon Reduction:

    a. Global Warming Potential (GWP) of Primary Materials: _____
        i. GWP of Equivalent Baseline: _____
        ii. Percent Reduction over Baseline (Goal = 20%): _____

    The results of embodied carbon analysis including methodology and assumptions are summarized in narrative form and included in Preliminary Design Submission (30%). ☐ Yes ☐ No ☐ N/A

    The project complies with the Low Carbon Concrete GWP limits (applicable to all non-airside projects using at least 10 cubic yards). ☐ Yes ☐ No ☐ N/A

    Explanation of Category Exceptions:

7. Water Consumption

    a. Predicted Annual Potable Water Use (gallons): _____
        i. Baseline Annual Potable Water Use (gallons): _____
        ii. Percent Reduction Over Baseline (Goal = 50%): _____

    Description of Water Reduction Strategies:

Explanation of Category Exceptions:

8. Natural Resources

    a. Stormwater Management

    The Project Team has developed and implemented an Erosion and Sedimentation Control Plan (ESC) that exceeds the most current version of the U.S. EPA Construction General Permit, or local equivalent, whichever is most stringent. ☐ Yes ☐ No ☐ N/A

    Evaluation of the need for stormwater design elements for water quality and permit compliance has been reviewed with Massport's Environmental Team. ☐ Yes ☐ No ☐ N/A

    The project retains onsite runoff from the 95th percentile of local 24-hour rainfall events with infiltration, evapotranspiration, or reuse using low-impact development and green infrastructure practices. ☐ Yes ☐ No ☐ N/A

    The project manages on site the annual increase in runoff volume from the natural land cover condition to the post-developed condition. ☐ Yes ☐ No ☐ N/A

    The project does not exceed the rate or quantity of runoff for 2-, 5-, 10-, 25-, and 50-year events relative to existing conditions. ☐ Yes ☐ No ☐ N/A

    Description of Stormwater Management/Treatment Strategies:

b. Ecological Value and Species

The Project Team has identified areas of high ecological value and implemented mitigation measures for any impacts. ☐ Yes ☐ No ☐ N/A

The project is designed to include species that require fewer fertilizers and pesticides; if needed, fertilizers and pesticides with low toxicity, persistence, and/or bioavailability are specified. ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

9. Climate and Resilience

The project has design features that protect structures from air-borne storm debris, extreme winds, and water. ☐ Yes ☐ No ☐ N/A

Description of Resilience Strategies:

The project has identified critical power systems and planned for their backup power requirements. ☐ Yes ☐ No ☐ N/A

The project has considered clean fuel alternatives and renewable energy power supplies for backup power systems. ☐ Yes ☐ No ☐ N/A

The Project Team has submitted the mandatory Floodproofing Design Submittal Form. ☐ Yes ☐ No ☐ N/A

Explanation of Category Exceptions:

10. Solid Waste

    a. Percent of project materials containing recycled content and/or reused materials/structures (Goal = 30%): _____
    b. Percent of C&D waste diverted from disposal (Goal = 95%): _____

    The project provides dedicated and appropriately sized collection, storage, and disposal areas for trash, mixed recycling, and food waste/organics. ☐ Yes ☐ No ☐ N/A

    The project complies with 310 Code of Massachusetts Regulations (CMR) 19.017, Solid Waste Management – Waste Bans ☐ Yes ☐ No ☐ N/A

    Explanation of Category Exceptions:

Envision Rating System
Pre-Assessment Checklist
Results Table

				Y	N	NA	
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve Community Quality of Life	0	0	3	0 of 0
2			QL1.2 Stimulate Sustainable Growth and Development	0	0	3	0 of 0
3			QL1.3 Develop Local Skills and Capabilities	0	0	3	0 of 0
4		COMMUNITY	QL2.1 Enhance Public Health and Safety	0	0	1	0 of 0
5			QL2.2 Minimize Noise and Vibration	0	0	1	0 of 0
6			QL2.3 Minimize Light Pollution	0	0	1	0 of 0
7			QL2.4 Improve Community Mobility and Access	0	0	3	0 of 0
8			QL2.5 Encourage Alternative Modes of Transportation	0	0	2	0 of 0
9			QL2.6 Improve Site Accessibility, Safety and Wayfinding	0	0	3	0 of 0
10		WELLBEING	QL3.1 Preserve Historic and Cultural Resources	0	0	2	0 of 0
11			QL3.2 Preserve Views and Local Character	0	0	2	0 of 0
12			QL3.3 Enhance Public Space	0	0	2	0 of 0
			TOTAL	**0**	**0**	26	0 of 0
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership and Commitment	0	0	3	0 of 0
14			LD1.2 Establish a Sustainability Management System	0	0	1	0 of 0
15			LD1.3 Foster Collaboration and Teamwork	0	0	3	0 of 0
16			LD1.4 Provide for Stakeholder Involvement	0	0	3	0 of 0
17		MANAGEMENT	LD2.1 Pursue By-product Synergy Opportunities	0	0	1	0 of 0
18			LD2.2 Improve Infrastructure Integration	0	0	3	0 of 0
19		PLANNING	LD3.1 Plan for Long-term Monitoring and Maintenance	0	0	2	0 of 0
20			LD3.2 Address Conflicting Regulations and Policies	0	0	2	0 of 0
21			LD3.3 Extend Useful Life	0	0	1	0 of 0
			TOTAL	**0**	**0**	19	0 of 0
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	0	2	0 of 0
23			RA1.2 Support Sustainable Procurement Practices	0	0	3	0 of 0
24			RA1.3 Use Recycled Materials	0	0	2	0 of 0
25			RA1.4 Use Regional Materials	0	0	2	0 of 0
26			RA1.5 Divert Waste from Landfills	0	0	3	0 of 0
27			RA1.6 Reduce Excavated Materials Taken off Site	0	0	3	0 of 0
28			RA1.7 Provide for Deconstruction and Recycling	0	0	3	0 of 0
29		ENERGY	RA2.1 Reduce Energy Consumption	0	0	3	0 of 0
30			RA2.2 Use Renewable Energy	0	0	2	0 of 0
31			RA2.3 Commission and Monitor Energy Systems	0	0	3	0 of 0
32		WATER	RA3.1 Protect Fresh Water Availability	0	0	7	0 of 0
33			RA3.2 Reduce Potable Water Consumption	0	0	4	0 of 0
34			RA3.3 Monitor Water Systems	0	0	4	0 of 0
			TOTAL	**0**	**0**	41	0 of 0
35	NATURAL WORLD	SITING	NW1.1 Preserve Prime Habitat	0	0	5	0 of 0
36			NW1.2 Protect Wetlands and Surface Water	0	0	3	0 of 0
37			NW1.3 Preserve Prime Farmland	0	0	1	0 of 0
38			NW1.4 Avoid Adverse Geology	0	0	3	0 of 0
39			NW1.5 Preserve Floodplain Functions	0	0	6	0 of 0
40			NW1.6 Avoid Unsuitable Development on Steep Slopes	0	0	2	0 of 0
41			NW1.7 Preserve Greenfields	0	0	2	0 of 0
42		LAND & WATER	NW2.1 Manage Stormwater	0	0	2	0 of 0
43			NW2.2 Reduce Pesticide and Fertilizer Impacts	0	0	5	0 of 0
44			NW2.3 Prevent Surface and Groundwater Contamination	0	0	4	0 of 0
45		BIODIVERSITY	NW3.1 Preserve Species Biodiversity	0	0	4	0 of 0
46			NW3.2 Control Invasive Species	0	0	3	0 of 0
47			NW3.3 Restore Disturbed Soils	0	0	2	0 of 0
48			NW3.4 Maintain Wetland and Surface Water Functions	0	0	5	0 of 0
			TOTAL	**0**	**0**	47	0 of 0
49	CLIMATE	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions	0	0	2	0 of 0
50			CR1.2 Reduce Air Pollutant Emissions	0	0	2	0 of 0
51		RESILIENCE	CR2.1 Assess Climate Threat	0	0	1	0 of 0
52			CR2.2 Avoid Traps and Vulnerabilities	0	0	2	0 of 0
53			CR2.3 Prepare for Long-term Adaptability	0	0	1	0 of 0
54			CR2.4 Prepare for Short-term Hazards	0	0	2	0 of 0
55			CR2.5 Manage Heat Island Effects	0	0	1	0 of 0
			TOTAL	**0**	**0**	11	0 of 0

Quality of Life

1. Purpose

QL 1.1 Improve Community Quality of Life

Intent: Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.

Metric: Measures taken to assess community needs and improve quality of life while minimizing negative impacts.

Assessment Questions:	Yes	No	N/A	
Are the relevant community needs, goals and issues being addressed in the project?	o	o	o	?
Are the potentially negative impacts of the project on the host and nearby communities been reduced or eliminated?	o	o	o	?
Has the project design received broad community endorsement, including community leaders and stakeholder groups?	o	o	o	?
Total	0	of	0	

QL 1.2 Stimulate Sustainable Growth and Development

Intent: Support and stimulate sustainable growth and development, including improvements in job growth, capacity building, productivity, business attractiveness and livability.

Metric: Assessment of the project's impact on the community's sustainable economic growth and development.

Assessment Questions:	Yes	No	N/A	
Will the project contribute significantly to local employment?	o	o	o	?
Will the project make a significant increase in local productivity?	o	o	o	?
Will the project make the community more attractive to people and businesses?	o	o	o	?
Total	0	of	0	

QL 1.3 Develop Local Skills and Capabilities

Intent: Expand the knowledge, skills and capacity of the community workforce to improve their ability to grow and develop.

Metric: The extent to which the project will improve local employment levels, skills mix and capabilities.

Assessment Questions:	Yes	No	N/A	
Does the project team intend to hire and train a substantial number of local workers?	o	o	o	?
Does the project team intend to use a substantial number of local suppliers and specialty firms?	o	o	o	?
Will the project, through local employment, subcontracting and education programs, make a substantial improvement in local capacity and competitiveness?	o	o	o	?
Total	0	of	0	

2. Wellbeing

QL 2.1 Enhance Public Health and Safety

Intent: Take into account the health and safety implications of using new materials, technologies or methodologies above and beyond meeting regulatory requirements.

Metric: Efforts to exceed normal health and safety requirements, taking into account additional risks in the application of new technologies, materials and methodologies.

Assessment Questions:	Yes	No	N/A	
Does the owner and the project team intend to identify, assess and institute new standards to address additional risks and exposures created by the application of new technologies, materials, equipment and/or methodologies?	o	o	o	?
Total	0	of	0	

QL 2.2 Minimize Noise and Vibration

Intent: Minimize noise and vibration generated during construction and in the operation of the completed project to maintain and improve community livability.

Metric: The extent to which noise and vibration will be reduced during construction and operation.

Assessment Questions:	Yes	No	N/A	
Will the project reduce noise and vibration to levels below local permissable levels during construction and operation?	o	o	o	?
Total	0	of	0	

QL 2.3 Minimize Light Pollution

Intent: Prevent excessive glare, light at night, and light directed skyward to conserve energy and reduce obtrusive lighting and excessive glare.

Metric: Lighting meets minimum standards for safety but does not spill over into areas beyond site boundaries, nor does it create obtrusive and disruptive glare.

Assessment Questions:	Yes	No	N/A	
Will the project be designed to reduce excessive lighting, prevent light spillage and preserve/restore the night sky?	o	o	o	?
Total	0	of	0	

QL 2.4 Improve Community Mobility and Access

Intent: Locate, design and construct the project in a way that eases traffic congestion, improves mobility and access, does not promote urban sprawl, and otherwise improves community livability.

Metric: Extent to which the project improves access and walkability, reductions in commute times, traverse times to existing facilities and transportation. Improved user safety considering all modes, e.g., personal vehicle, commercial vehicle, transit and bike/pedestrian.

Assessment Questions:	Yes	No	N/A	
Will the project provide good, safe access to adjacent facilities, amenities and transportation hubs?	o	o	o	?
Will the project design take into consideration the expected traffic flows and volumes in and around the project site to improve overall mobility and efficiency?	o	o	o	?
Has the project team coordinated the design with other infrastructure assets to reduce traffic congestion, and improve walkability and livability?	o	o	o	?
Total	0	of	0	

QL 2.5 Encourage Alternative Modes of Transportation

Intent: Improve accessibility to non-motorized transportation and public transit. Promote alternative transportation and reduce congestion.

Metric: The degree to which the project has increased walkability, use of public transit, non-motorized transit.

Assessment Questions:	Yes	No	N/A	
Will the project be within walking distance of accessible multi-modal transportation?	o	o	o	?
Through its design, will the project encourage the use of transit and/or non-motorized transportation?	o	o	o	?
Total	0	of	0	

QL 2.6 Improve Accessibility, Safety and Wayfinding

Intent: Improve user accessibility, safety, and wayfinding of the site and surrounding areas.

Metric: Clarity, simplicity, readability and broad-population reliability in wayfinding, user benefit and safety.

Assessment Questions:	Yes	No	N/A	
Will the project contain the appropriate signage for safety and wayfinding in and around the constructed works?	o	o	o	?
Will the project address safety and accessibility in and around the constructed works for users and emergency personnel?	o	o	o	?
Will the project extend accessibility and intuitive signage to protect nearby sensitive sites or neighborhoods?	o	o	o	?
Total	0	of	0	

3. Community

QL 3.1 Preserve Historic and Cultural Resources

Intent: Preserve or restore significant historical and cultural sites and related resources to preserve and enhance community cultural resources.

Metric: Summary of steps taken to identify, preserve or restore cultural resources.

Assessment Questions:	Yes	No	N/A	
Will the project minimize negative impacts on historic and cultural resources?	o	o	o	?
Will the project be designed so that it fully preserves and/or restores historic/cultural resources on or near the project site?	o	o	o	?
Total	0	of	0	

QL 3.2 Preserve Views and Local Character

Intent: Design the project in a way that maintains the local character of the community and does not have negative impacts on community views.

Metric: Thoroughness of efforts to identify important community views and aspects of local landscape, including communities, and incorporate them into the project design.

Assessment Questions:	Yes	No	N/A	
Will the project be designed in a way that preserves views and local character?	o	o	o	?
Will the project be designed to improve local character, views or the natural landscape through preservation and/or restorative actions?	o	o	o	?
Total	0	of	0	

QL 3.3 Enhance Public Space

Intent: Improve existing public space including parks, plazas, recreational facilities, or wildlife refuges to enhance community livability.

Metric: Plans and commitments to preserve, conserve, enhance and/or restore the defining elements of the public space.

Assessment Questions:	Yes	No	N/A	
Will the project make meaningful enhancements to public space?	o	o	o	?
Will the project result in a substantial restoration to public space?	o	o	o	?
Total	0	of	0	

CONTINUE ON TO THE LEADERSHIP CATEGORY →

Leadership

1. Collaboration

LD1.1 Provide Effective Leadership and Commitment

Intent: Provide effective leadership and commitment to achieve project sustainability goals.

Metric: Demonstration of meaningful commitment of the project owner and the project team to the principles of sustainability and sustainable performance improvement.

Assessment Questions:	**Yes**	**No**	**N/A**	
Has the project team issued public statements stating their commitment to sustainability?	○	○	○	?
Is the project team's commitment to sustainability backed up by examples of actions taken or to be taken?	○	○	○	?
Do these commitments and actions demonstrate sufficiently that sustainability is a core value of the project team?	○	○	○	?
Total	0	of	0	

LD 1.2 Establish a Sustainability Management System

Intent: Create a project management system that can manage the scope, scale and complexity of a project seeking to improve sustainable performance.

Metric: The organizational policies, authorities, mechanisms and business processes that have been put in place and the judgment that they are sufficient for the scope, scale and complexity of the project.

Assessment Questions:	**Yes**	**No**	**N/A**	
Does the project team intend to establish a sound, workable sustainability management system that meets the requirements of the project?	○	○	○	?
Total	0	of	0	

LD 1.3 Foster Collaboration and Teamwork

Intent: Eliminate conflicting design elements, and optimize system by using integrated design and delivery methodologies and collaborative processes.

Metric: The extent of collaboration within the project team and the degree to which project delivery processes incorporate whole systems design and delivery approaches.

Assessment Questions:	**Yes**	**No**	**N/A**	
Are the project owner and the project team intending to take a systems view of the project, considering the performance relationship of this project to other community infrastructure elements?	○	○	○	?
Will the project owner and the project team establish a collaborative relationship on the project to achieve higher levels of sustainable performance?	○	○	○	?
Will the project owner and the project team institute a whole systems design and delivery process with the objective of maximizing sustainable performance?	○	○	○	?

	Total	0	of	0

LD 1.4 Provide for Stakeholder Involvement

Intent: Establish sound and meaningful programs for stakeholder identification, engagement and involvement in project decision making.

Metric: The extent to which project stakeholders are identified and engaged in project decision making. Satisfaction of stakeholders and decision makers in the involvement process.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will key stakeholders in the project be identified and lines of communication established?	o	o	o	?
Does the project team plan to engage with stakeholders and solicit stakeholder feedback?	o	o	o	?
Will the project team establish a strong stakeholder involvement process designed to involve the public meaningfully in project decision-making?	o	o	o	?
Total	0	of	0	

2. Management

LD 2.1 Pursue By-Product Synergy Opportunities

Intent: Reduce waste, improve project performance and reduce project costs by identifying and pursuing opportunities to use unwanted by-products or discarded materials and resources from nearby operations.

Metric: The extent to which the project team identified project materials needs, sought out nearby facilities with by-product resources that could meet those needs and capture synergy opportunities.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project team establish a program to locate, assess and make use of unwanted by-products and materials on the project?	o	o	o	?
Total	0	of	0	

LD 2.2 Improve Infrastructure Integration

Intent: Design the project to take into account the operational relationships among other elements of community infrastructure which results in an overall improvement in infrastructure efficiency and effectiveness.

Metric: The extent to which the design of the delivered works integrates with existing and planned community infrastructure, and results in a net improvement in efficiency and effectiveness.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project team seek to optimize sustainable performance at the infrastructure component level?	o	o	o	?
Will the project team seek to optimize sustainable performance by designing the project as an integrated system?	o	o	o	?
Will the project be planned and designed so that its operation and functions are fully integrated with all infrastructure elements in the community?	o	o	o	?
Total	0	of	0	

3. Planning

LD 3.1 Plan For Long-term Maintenance and Monitoring

Intent: Put in place plans and sufficient resources to ensure as far as practical that ecological protection, mitigation and enhancement measures are incorporated in the project and can be carried out.

Metric: Comprehensiveness and detail of long-term monitoring and maintenance plans, and commitment of resources to fund the activities.

Assessment Questions:	Yes	No	N/A	
Will the project have a plan for long term monitoring and maintenance?	○	○	○	?
Will that plan be sufficiently comprehensive, covering all aspects of long-term monitoring and maintenance?	○	○	○	?
Total	0	of	0	

LD 3.2 Address Conflicting Regulations and Policies

Intent: Work with officials to Identify and address laws, standards, regulations or policies that may unintentionally create barriers to implementing sustainable infrastructure.

Metric: Efforts to identify and change laws, standards, regulations and/or policies that may unintentionally run counter to sustainability goals, objectives and practices.

Assessment Questions:	Yes	No	N/A	
Will an assessment of applicable regulations, policies and standards be done, identifying those that may run counter to project sustainable performance goals, objectives and targets?	○	○	○	?
Do the owner and the project team intend to approach decision-makers to resolve conflicts?	○	○	○	?
Total	0	of	0	

LD 3.3 Extend Useful Life

Intent: Extend a project's useful life by designing a completed project that is more durable, flexible, and resilient.

Metric: The degree to which the project team incorporates full life-cycle thinking in improving the durability, flexibility, and resilience of the project.

Assessment Questions:	Yes	No	N/A	
Will the project be designed in ways that extend substantially the useful life of the project?	○	○	○	?
Total	0	of	0	

CONTINUE ON TO THE RESOURCE ALLOCATION CATEGORY →

Resource Allocation

1. Materials

RA1.1 Reduce Net Embodied Energy

Intent: Conserve energy by reducing the net embodied energy of project materials over the project life.

Metric: Percentage reduction in net embodied energy from a life cycle energy assessment.

Assessment Questions:	Yes	No	N/A	
Does the project team plan to conduct an assessment of the embodied energy of key materials over the project life?	o	o	o	?
Will the project achieve at least a 10% reduction in net embodied energy over the life of the project?	o	o	o	?
Total	0 of 0			

RA 1.2 Support Sustainable Procurement Practice

Intent: Obtain materials and equipment from manufacturers and suppliers who implement sustainable practices.

Metric: Percentage of materials sourced from manufacturers who meet sustainable practices requirements.

Assessment Questions:	Yes	No	N/A	
Will the project team establish a preference for using manufacturers, suppliers and service companies that have strong sustainable policies and practices?	o	o	o	?
Will the project team establish a sound and viable sustainable procurement program?	o	o	o	?
Does the project team intend to source at least 15% of project materials, equipment, supplies and services from these companies?	o	o	o	?
Total	0 of 0			

RA 1.3 Use Recycled Materials

Intent: Reduce the use of virgin materials and avoid sending useful materials to landfills by specifying reused materials, including structures, and material with recycled content.

Metric: Percentage of project materials that are reused or recycled.

Assessment Questions:	Yes	No	N/A	
Will the project team consider the appropriate reuse of existing structures and materials and incorporated them into the project?	o	o	o	?
Will the project team specify that at least 5% of materials with recycled content be used on the project?	o	o	o	?
Total	0 of 0			

RA 1.4 Use Regional Materials

Intent: Minimize transportation costs and impacts and retain regional benefits through specifying local sources.

Metric: Percentage of project materials by type and weight or volume sourced within the required distance.

Assessment Questions:	Yes	No	N/A	
Will the project team work to identify local/regional sources of materials?	o	o	o	?
Are at least 30% of project materials locally sourced?	o	o	o	?
Total	0	of	0	

RA 1.5 Divert Waste from Landfills

Intent: Reduce waste and divert waste streams away from disposal to recycling and reuse.

Metric: Percentage of total waste diverted from disposal.

Assessment Questions:	Yes	No	N/A	
Will the project team identify potential recycling and reuse destinations for construction and demolition waste generated on site?	o	o	o	?
Will the project team develop an operations waste management plan to decrease and divert project waste from landfills and incinerators during construction and operation?	o	o	o	?
Will the project divert at least 25% of project waste from landfills?	o	o	o	?
Total	0	of	0	

RA 1.6 Reduce Excavated Materials Taken Off Site

Intent: Minimize the movement of soils and other excavated materials off site to reduce transportation and environmental impacts.

Metric: Percentage of excavated material retained on site.

Assessment Questions:	Yes	No	N/A	
Will the project be designed to balance cut and fill to reduce the amount of excavated material taken off site?	o	o	o	?
When necessary, will the project team taken steps to identify local sources/receivers of excavated material?	o	o	o	?
Will the project reuse at least 30% of suitable excavated material onsite?	o	o	o	?
Total	0	of	0	

RA 1.7 Provide for Deconstruction and Recycling

Intent: Encourage future recycling, up-cycling, and reuse by designing for ease and efficiency in project disassembly or deconstruction at the end of its useful life.

Metric: Percentage of components that can be easily separated for disassembly or deconstruction.

Assessment Questions:	Yes	No	N/A	
Will the project team assess whether materials specified can be easily recycled or reused after the useful life of the project has ended?	o	o	o	?
Will the project be designed so that at least 15% of project materials can be easily separated for recycling or readily reused at the end of the project's useful life?	o	o	o	?
Will the project team incorporate methods for increasing the likelihood of materials recycling when the project is operating?	o	o	o	?
Total	0	of	0	

2. Energy

RA 2.1 Reduce Energy Consumption

Intent: Conserve energy by reducing overall operation and maintenance energy consumption throughout the project life cycle.

Metric: Percentage of reductions achieved.

Assessment Questions:	Yes	No	N/A	
Will the project team conduct reviews to identify options for reducing energy consumption during operations and maintenance of the constructed works?	o	o	o	?
Will the project team conducted feasibility studies and cost analyses to determine the most effective methods for energy reduction and incorporated them into the design?	o	o	o	?
Is the project expected to achieve at least a 10% reduction in energy consumption?	o	o	o	?
Total	0	of	0	

RA 2.2 Use Renewable Energy

Intent: Meet energy needs through renewable energy sources.

Metric: Extent to which renewable energy resources are incorporated into the design, construction and operation.

Assessment Questions:	Yes	No	N/A	
Will the owner and project team identify and analyze options to meet operational energy needs through renewable energy?	o	o	o	?
Will the project meet at least 25% of its energy needs through renewable energy?	o	o	o	?
Total	0	of	0	

RA 2.3 Commission and Monitor Energy Systems

Intent: Ensure efficient functioning and extend useful life by specifying the commissioning and monitoring of the performance of energy systems.

Metric: Third party commissioning of electrical/mechanical systems and documentation of system monitoring equipment in the design.

Assessment Questions:	Yes	No	N/A	
Does the owner and project team intend to conduct an independent commissioning of the project's energy and mechanical systems?	o	o	o	?
Will the project team assemble the necessary information needed to train operations and maintenance workers in a way that facilitates proper training and operations?	o	o	o	?
Will the design incorporate advanced monitoring systems, such as energy sub-meters, to enable more efficient operations?	o	o	o	?
Total	0	of	0	

3. Water

RA 3.1 Protect Fresh Water Availability

Intent: Reduce the negative net impact on fresh water availability, quantity and quality.

Metric: The extent to which the project uses fresh water resources without replenishing those resources at their source.

Assessment Questions:	Yes	No	N/A	
Will the project team assess project water requirements?	o	o	o	?
Does the project team plan to conduct a comprehensive assessment of the project's long-term impacts on water availability?	o	o	o	?
Will the project only access water that can be replenished in both quantity and quality?	o	o	o	?
Will the project consider the impacts of fresh water withdrawal on receiving waters?	o	o	o	?
Will the project discharge into receiving waters meet quality and quantity requirements for high value aquatic species?	o	o	o	?
Will the project achieve a net-zero impact on water supply quantity and quality?	o	o	o	?
Will the project restore the quantity and quality of fresh water surface and groundwater supplies to an undeveloped native ecosystem condition?	o	o	o	?
Total	0	of	0	

RA 3.2 Reduce Potable Water Consumption

Intent: Reduce overall potable water consumption and encourage the use of greywater, recycled water, and stormwater to meet water needs.

Metric: Percentage of water reduction.

Assessment Questions:	Yes	No	N/A	
Will the project team conduct planning or design reviews to identify potable water reduction strategies?	o	o	o	?
Will the project team conduct feasibility and cost analysis to determine the most effective methods for potable water reduction and incorporated them into the design?	o	o	o	?
Will the project achieve at least a 25% reduction in potable water consumption?	o	o	o	?
Will the project result in a net positive generation of water, and water up-cycling, as a result of on-site purification or treatment?	o	o	o	?
Total	0	of	0	

RA 3.3 Monitor Water Systems				
Intent: Implement programs to monitor water systems performance during operations and their impacts on receiving waters.				
Metric: Documentation of system in the design				
Assessment Questions:	**Yes**	**No**	**N/A**	
Will the owner and project team conduct an independent commissioning/monitoring of the project's water systems in order to validate the design objectives?	o	o	o	?
Will the project design incorporate the means to monitor water performance during operations?	o	o	o	?
Will the project integrate long-term operations and impact monitoring to mitigate negative impacts and improve efficiency?	o	o	o	?
Will specific strategies be put in place to utilize monitoring and leak detection in order for the project to be more responsive to changing operating conditions?	o	o	o	?
Total	0	of	0	

CONTINUE ON TO THE NATURAL WORLD CATEGORY →

Natural World

1. Siting

NW 1.1 Preserve Prime Habitat

Intent: Avoid placing the project – and the site compound/temporary works – on land that has been identified as of high ecological value or as having species of high value.

Metric: Avoidance of high ecological value sites and establishment of protective buffer zones.

Assessment Questions:	Yes	No	N/A	
Will the project team take steps to identify and document areas of prime habitat near or on the site?	o	o	o	?
Will the project avoid development on land that is judged to be prime habitat?	o	o	o	?
Will the project establish a minimum 300 ft. natural buffer zone around all areas deemed prime habitat?	o	o	o	?
Will the project significantly increase the area of prime habitat through habitat restoration?	o	o	o	?
Will the project improve habitat connectivity by linking habitats?	o	o	o	?
Total	0	of	0	

NW 1.2 Protect Wetlands and Surface Water

Intent: Protect, buffer, enhance and restore areas designated as wetlands, shorelines, and waterbodies by providing natural buffer zones, vegetation and soil protection zones.

Metric: Size of natural buffer zone established around all wetlands, shorelines, and waterbodies.

Assessment Questions:	Yes	No	N/A	
Will the project avoid development on wetlands, shorelines, and waterbodies?	o	o	o	?
Will the project maintain soil protection zones (VSPV) around all wetlands, shorelines, and waterbodies?	o	o	o	?
Will the project restore degraded existing buffer zones to a natural state?	o	o	o	?
Total	0	of	0	

NW 1.3 Preserve Prime Farmland

Intent: Identify and protect soils designated as prime farmland, unique farmland, or farmland of statewide importance.

Metric: Percentage of prime farmland avoided during development.

Assessment Questions:	Yes	No	N/A	
Will this project avoid development on land designated as prime farmland.	o	o	o	?
Total	0	of	0	

NW 1.4 Avoid Adverse Geology

Intent: Avoid development in adverse geologic formations and safeguard aquifers to reduce natural hazards risk and preserve high quality groundwater resources.

Metric: Degree to which natural hazards and sensitive aquifers are avoided and geologic functions maintained.

Assessment Questions:	Yes	No	N/A	
Will the project team identify and address the impacts of sensitive or adverse geology?	o	o	o	?
Will the project be designed to reduce the risk of damage to sensitive geology?	o	o	o	?
Will the project be designed to reduce the risk of damage from adverse geology?	o	o	o	?
Total	0	of	0	

NW 1.5 Preserve Floodplain Functions

Intent: Preserve floodplain functions by limiting development and development impacts to maintain water management capacities and capabilities.

Metric: Efforts to avoid floodplains or maintain predevelopment floodplain functions.

Assessment Questions:	Yes	No	N/A	
Will the project avoid or limit development within the design frequency floodplain?	o	o	o	?
Will the project maintain pre-development floodplain infiltration and water quality?	o	o	o	?
Will the project design incorporate a flood emergency operations and/or evacuation plan?	o	o	o	?
Will the project maintain or enhance riparian and aquatic habitat, including aquatic habitat connectivity?	o	o	o	?
Will the project maintain sediment transport?	o	o	o	?
Does the project team intend to modify or remove infrastructure subject to frequent damage by floods?	o	o	o	?
Total	0	of	0	

NW 1.6 Avoid Unsuitable Development on Steep Slopes

Intent: Protect steep slopes and hillsides from inappropriate and unsuitable development in order to avoid exposures and risks from erosion and landslides, and other natural hazards.

Metric: The degree to which development on steep slopes is avoided, or to which erosion control and other measures are used to protect the constructed works as well as other downslope structures.

Assessment Questions:	Yes	No	N/A	
Will the project team use best management practices to manage erosion and prevent landslides?	o	o	o	?
Will the project team minimize or avoid all development on or disruption to steep slopes?	o	o	o	?
Total	0	of	0	

NW 1.7 Preserve Greenfields

Intent: Conserve undeveloped land by locating projects on previously developed greyfield sites and/or sites classified as brownfields.

Metric: Percentage of site that is a greyfield or the use and cleanup of a site classified as a brownfield.

Assessment Questions:	Yes	No	N/A	
Will the project team consider how the project can conserve undeveloped land?	o	o	o	?
Will at least 25% of the project development be located on previously developed sites, that is, sites classified as greyfields or brownfields?	o	o	o	?
Total	0	of	0	

2. Land and Water

NW 2.1 Manage Stormwater

Intent: Minimize the impact of infrastructure on stormwater runoff quantity and quality.

Metric: Infiltration and evapotranspiration capacity of the site and return to pre-development capacities.

Assessment Questions:	Yes	No	N/A	
Will the project be designed to reduce storm runoff to pre-development conditions?	o	o	o	?
Will the project be designed to significantly improve water storage capacity?	o	o	o	?
Total	0	of	0	

NW 2.2 Reduce Pesticides and Fertilizer Impacts

Intent: Reduce non-point source pollution by reducing the quantity, toxicity, bioavailability and persistence of pesticides and fertilizers, or by eliminating the need for the use of these materials.

Metric: Efforts made to reduce the quantity, toxicity, bioavailability and persistence of pesticides and fertilizers used on site, including the selection of plant species and the use of integrated pest management techniques.

Assessment Questions:	Yes	No	N/A	
Will operational policies be put in place to control and reduce the application of fertilizers and pesticides?	o	o	o	?
Will the project include runoff controls to minimize contamination of ground and surface water?	o	o	o	?
Will the project team select landscaping plants to minimize the need for fertilizer or pesticides?	o	o	o	?
Will the project team select fertilizers and pesticides appropriate for site conditions with low-toxicity, persistence, and bioavailability?	o	o	o	?
Will the project be designed to eliminate the need for pesticides or fertilizers?	o	o	o	?
Total	0	of	0	

NW 2.3 Prevent Surface and Groundwater Contamination

Intent: Preserve fresh water resources by incorporating measures to prevent pollutants from contaminating surface and groundwater and monitor impacts over operations.

Metric: Designs, plans and programs instituted to prevent and monitor surface and groundwater contamination.

Assessment Questions:	Yes	No	N/A	
Will the project team conduct or aquire hydrologic delineation studies?	o	o	o	?
Will spill and leak prevention and response plans and design be incorporated into the design?	o	o	o	?
Will the project design reduce or eliminate potentially polluting substances from the project?	o	o	o	?
Will the project team seek to reduce future contamination by cleaning up areas of contamination and instituting land use controls to limit the introduction of future contamination sources?	o	o	o	?
Total	0	of	0	

3. Biodiversity

NW 3.1 Preserve Species Biodiversity

Intent: Protect biodiversity by preserving and restoring species and habitats.

Metric: Degree of habitat protection.

Assessment Questions:	Yes	No	N/A	
Will the project team identify existing habitats on and near the project site?	o	o	o	?
Will the project protect existing habitats?	o	o	o	?
Will the project increase the quality or quantity of existing habitat?	o	o	o	?
Will the project preserve, or improve, wildlife movement corridors?	o	o	o	?
Total	0	of	0	

NW 3.2 Control Invasive Species

Intent: Use appropriate non-invasive species and control or eliminate existing invasive species.

Metric: Degree to which invasive species have been reduced or eliminated.

Assessment Questions:	Yes	No	N/A	
Will the project team specify locally appropriate and non-invasive plants on the site?	o	o	o	?
Will the project team implement a comprehensive management plan to identify, control, and/or eliminate, invasive species?	o	o	o	?
Will the project team implement a comprehensive management plan to prevent or mitigate the future encroachment of invasive species?	o	o	o	?
Total	0	of	0	

NW 3.3 Restore Disturbed Soils				
Intent: Restore soils disturbed during construction and previous development to bring back ecological and hydrological functions.				
Metric: Percentage of disturbed soils restored.				
Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project restore 100% of soils disturbed during construciton?	o	o	o	?
Will the project restore 100% of soils disturbed by previous development?	o	o	o	?
	Total	0 of 0		

NW 3.4 Maintain Wetland and Surface Water Functions				
Intent: Maintain and restore the ecosystem functions of streams, wetlands, waterbodies and their riparian areas.				
Metric: Number of functions maintained and restored.				
Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project maintain or enhance hydrologic connetion?	o	o	o	?
Will the project maintain or enhance water quality?	o	o	o	?
Will the project maintain or enhance habitat?	o	o	o	?
Will the project maintain or restore sediment transport?	o	o	o	?
Will wetlands and surface water be maintained or restored so as to have a fully functioning aquatic and riparian ecosystem?	o	o	o	?
	Total	0 of 0		

CONTINUE ON TO THE CLIMATE AND RISK CATEGORY →

Climate and Risk

1. Emissions

CR1.1 Reduce Greenhouse Gas Emissions

Intent: Conduct a comprehensive life-cycle carbon analysis and use this assessment to reduce the anticipated amount of net greenhouse gas emissions during the life cycle of the project, reducing project contribution to climate change.

Metric: Percent reduction of life-cycle net carbon dioxide equivalent (CO_2e) emissions.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will a life-cycle carbon assessment be conducted on the project?	○	○	○	?
Based on that assessment, will the project be designed to reduce carbon emissions by at least 10%?	○	○	○	?
Total	0	of	0	

CR 1.2 Reduce Air Pollutant Emissions

Intent: Reduce the emission of six criteria pollutants; particulate matter (including dust), ground level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, lead, and noxious odors.

Metric: Measurements of air pollutants as compared to standards used.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project be designed in a way that substantially reduces dust and odors on the site?	○	○	○	?
Will the project be designed in a way that substantially exceeds the National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants?	○	○	○	?
Total	0	of	0	

2. Resilience

CR 2.1 Assess Climate Threat

Intent: Develop a comprehensive Climate Impact Assessment and Adaptation Plan.

Metric: Summary of steps taken to prepare for climate variation and natural hazards.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project team develop a Climate Impact Assessment and Adaptation Plan?	○	○	○	?
Total	0	of	0	

CR 2.2 Avoid Traps and Vulnerabilities

Intent: Avoid traps and vulnerabilities that could create high, long-term costs and risks for the affected communities.

Metric: The extent of the assessment of potential long-term traps, vulnerabilities and risks due to long-term changes such as climate change and the degree to which these were addressed in the project design and in community design criteria.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will a comprehensive review be conducted to identify the potential risks and vulnerabilities that would be created or made worse by the project?	○	○	○	?
Is there an intent by the owner or the project team to alter the design to reduce or eliminate these risks and vulnerabilities?	○	○	○	?
Total	0	of	0	

CR 2.3 Prepare for Long-Term Adaptability

Intent: Prepare infrastructure systems to be resilient to the consequences of long-term climate change, perform adequately under altered climate conditions, or adapt to other long-term change scenarios.

Metric: The degree to which the project has been designed for long-term resilience and adaptation.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project be designed to accommodate a changing operating environment throughout the project life cycle?	○	○	○	?
Total	0	of	0	

CR 2.4 Prepare for Short-Term Hazards

Intent: Increase resilience and long-term recovery prospects of the project and site from natural and man-made short-term hazards.

Metric: Steps taken to improve protection measures beyond existing regulations.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will a hazard analysis be conducted covering the likely natural and man-made hazards in the project area area?	○	○	○	?
Will the project be designed so that is it is able to recover quickly and cost-effectively from short-term hazard events?	○	○	○	?
Total	0	of	0	

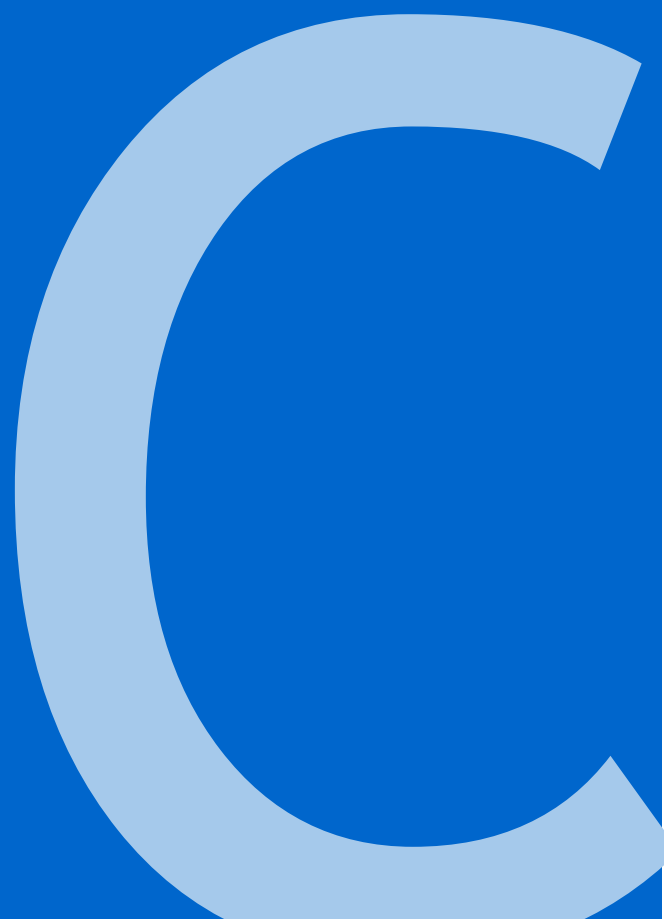
CR 2.5 Manage Heat Island Effects

Intent: Minimize surfaces with a low solar reflectance index (SRI) to reduce localized heat accumulation and manage microclimates.

Metric: Percentage of site area that meets SRI Criteria.

Assessment Questions:	**Yes**	**No**	**N/A**	
Will the project be designed to reduce heat island effects by reducing the percentage of low solar reflectance index (SRI) surfaces?	○	○	○	?
Total	0	of	0	

Compliance Waiver Request Form



Massport Capital Programs

Sustainability Design Guidelines – Compliance Waiver Request Form

Project Origination: ☐ Capital Programs ☐ REAM ☐ TAA

Project Name & Number: _____

Massport Project Manager: _____

Construction Value ($): _____

Project Category: ☐ Vertical ☐ Horizontal ☐ Other

1. Indicate the type of waiver request.

   ☐ LEED Certification
   ☐ Parksmart Certification
   ☐ Envision Award
   ☐ Envision Verification Pathway
   ☐ Other: _____

2. Provide a detailed justification for the above waiver request(s). Explain the constraints or limitations that make compliance difficult or impossible and describe the implications for the project if the waiver request is denied. Additionally, identify any alternative solutions considered and explain why they are infeasible. Specify whether the request is temporary or permanent, along with its scope and limitations.

Request Determination: ☐ **Approved** ☐ **Not Approved** ☐ **Other**

Notes:

_____ _____

Signature (Director of Capital Programs) Date