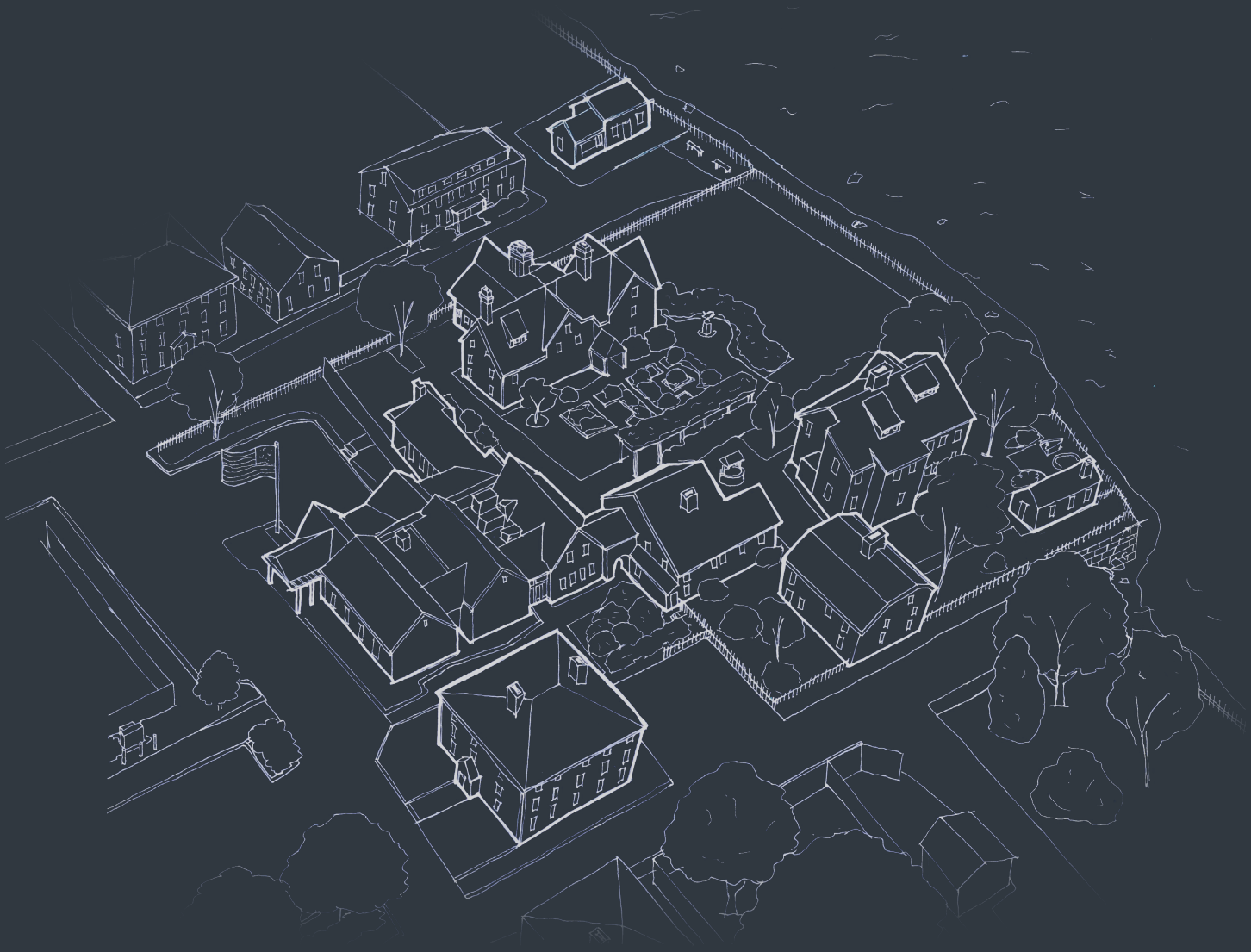

Preserving History: Assessments and Climate Adaptations at the House of the Seven Gables

VOLUME I | Salem, MA | June 2024

This report and associated tasks were made possible by grant funding from the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), and administered through its Office of Coastal Zone Management (CZM).

The House of the Seven Gables Association, a certified 501(C)(3) non-profit organization, was awarded the FY23 Coastal Resilience Grant Program. The duration of the grant and process outlined in this report was over the course of two fiscal years.

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The House of the Seven Gables

Salem Sound COASTWATCH

ARCHITECTURE & MASTER PLANNING

UNION

Places of Value. *Value of Place.*

SITE ENGINEERS

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Sustainable Environmental Solutions

CIVIL ENGINEERS

COLLINS ENGINEERS INC.

SPECIAL THANKS TO:

MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS

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CITY OF SALEM, MASSACHUSETTS

THE HOUSE OF THE SEVEN GABLES STAFF

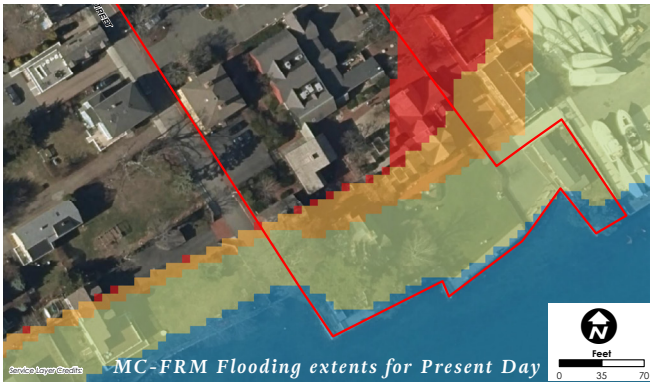
VOLUME ONE: FINAL REPORT

VOLUME TWO: APPENDICES A & B

Supporting Data, Research, and Documentation

The two-year investigation leading up to this plan has been eye-opening for the team at The House of the Seven Gables. We are preservationists at heart, and do not take any change to our historic buildings and grounds lightly. At the same time, we recognize climate change as an existential threat, with impacts we are already seeing. The scale of climate change will only escalate in the years to come, with effects far greater than we have seen in the recent past. We must demonstrate a willingness to change as the climate and coastline change around us. To truly preserve this iconic historic landmark, we must plan for what lies ahead of us.

Leading up to this project, we had already begun to see more humidity in our basements after rainfall, growing pools of water collecting on site, and an increase in storms battering our seawall. In the first three months of 2024, Salem saw two unprecedented storm and flooding events. There has been a growing call to action, but the path forward is not always clear.



We initially assumed that protecting The Gables was a matter of simply raising the height of our seawall, while other aspects of our site remained the same. As we gathered data, we learned this would not be enough. It became clear that climate change would fundamentally alter our historic site, pushing floodwaters toward us from all directions, not just along the seawall. Our approach shifted toward an individualized assessment of the vulnerabilities of each of our buildings and a multifaceted plan that considered different strategies for each. We came to understand, too, that a managed retreat was likely inevitable.

While these adaptation plans for The Gables are meant to be taken seriously, they should also serve as a warning. Individual actions against climate change are, at best, a patchwork. The most effective and efficient solutions require a community response. Community-wide resiliency plans could stem the tide at any point and reduce the burden on any one property. We hope to be an example for other historic sites and coastal properties, but we recognize that not everyone has the same opportunities. At some point, it will be imperative that we act collectively if we aim to preserve our historic properties and our cities.

Individual actions against climate change are, at best, a patchwork. The most effective and efficient solutions require a community response.

This plan covers a broad scope of actions, and is broken into five sections. ***Section 1: Museum Campus and Context*** begins with an acknowledgment of the historic significance and value of our existing site. In addition to the Turner Ingersoll Mansion, our campus is home to other historic buildings moved here because they were threatened in their original location. Though designed to appear frozen in time, our historic campus reflects a long history of change and adaptation in Salem.

Section 2: Adaptation Planning details the wide variety of climate impacts we anticipate and the broad range of adaptations we have considered. Our consultants evaluated the entire site and its condition, including each building. All adaptations come with tradeoffs to be considered, including impact on historic fabric, setting, and future utility. We worked to target strategies that provided the most relief while minimizing negative impacts.

In ***Section 3: Strategic Vision, Timelines and Triggers***, we consider how our adaptations must evolve over time. With so many factors rapidly increasing or potentially decreasing the precipitation of climate challenges to our campus, it felt pertinent to identify environmental prompts as moments of preemptive action rather than relying solely on dates and timelines. Using maps and data projecting conditions for 2030, 2050, and 2070 as our baseline, we have established "triggers" that signal when it is time to begin planning or implementation of the next phase.

Those phases are further explored in ***Section 4: Masterplanning & Phasing***. Through the planning process, we began to see that the climate's unnatural evolution will force transformational change on our entire site. Rather than be reactive to that force, we aim to build planned adaptations, resilience, and mitigation into our future operational and organizational goals. This culminated in the development of a masterplan broken into five phases, with the final phase envisioning much of the Gables campus relocated to safety further inland, in the area of the current parking lot.

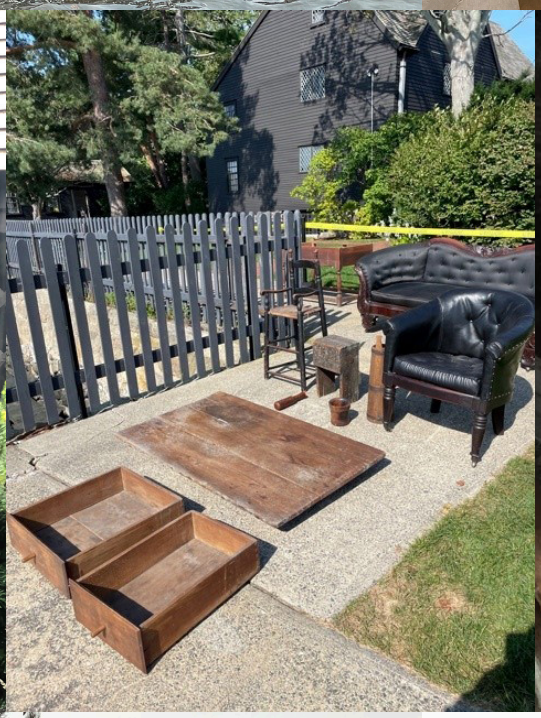
Though designed to appear frozen in time, our historic campus reflects a long history of change and adaptation in Salem.

Shifting towards a managed retreat was a shocking prospect to consider, but our site is no stranger to change, and moving buildings to preserve them is part of our history. Ultimately under this phased plan, we will approach retreat in small steps and consider alternatives and impacts as we move, while also ensuring that we don't narrow our options for a full retreat.

The final section of this plan, ***Section 5: Envisioning a Future for the Gables Campus***, seeks to integrate practices of climate resilience and mitigation into every facet of The Gables' operations. On the small scale, we have already taken steps like installing basement dehumidifiers and climate monitors, making slight improvements to our gutters during recent roof work, and re-pointing our seawall. On a more foundational level, we are also evaluating new projects for opportunities to improve our climate resilience and lessen our carbon footprint. Our ongoing strategic and campus plans include the climate adaptation masterplan in their processes and recognize that the time for action is now.

Signed with intention,

Dakota Russell, Executive Director,
The House of the Seven Gables Settlement Association
June 2024



PROJECT LOCATION

115 Derby Street
Salem, MA 01970

PROJECT BACKGROUND

As part of the ENV 23 CZM 02 Coastal Resilience Grant, from September 2022 to June 2024, the House of the Seven Gables Settlement Association took on an assessment and planning project, Preserving History: Assessments and Climate Adaptations at the House of the Seven Gables. Collaborating with a range of partners such as Coastal Zone Management, Salem Sound Coastwatch, Union Studio Architecture & Community Design, Horsley Witten Group, and Collins Engineers, the project's objective was to evaluate and strategize for an integrated climate change strategy at the historic House of the Seven Gables campus.

CLIMATE CHANGE VULNERABILITIES AND IMPACTS

Due to its harborside location, The Gables is distinctly vulnerable to the effects of climate change, particularly as it relates to rising sea and groundwater levels. The campus lies at the bottom of a gradual decline with a heavily populated neighborhood to the north. The campus was extended when tidelands were filled in circa 1780 and is protected by a seawall as are the two city streets that border the property and dead-end onto Salem harbor.

The Gables property, assets, and collections are distinctly vulnerable to the effects of climate change, particularly as it relates to rising sea and groundwater levels.

The Gables is in the Salem Wetlands and Flood Hazard Overlay District and FEMA VE: High Risk Coastal Area and AE: 1% Annual Chance of Flooding. The Gables' Primm House and Counting House sit within those zones, at either corner of the property's harbor edge, and experience frequent flooding during storms. The property has been experiencing an excess of problems on the site associated with increased precipitation, storm surge, and rising tides when combined with rising sea and groundwater levels.

Every building on the site has been impacted. Of particular concern are the seawall and its short and long-term efficacy, saltwater encroachment beyond the seawall undermining the ground, and rising groundwater that is causing increased basement flooding and water intrusion with resulting mold blooms and structural rotting, as well as the flood-prone locations of all utilities.

GUIDANCE, RESOURCES & REGULATIONS

The following resources were identified and used as instructional tools in the project development and decision making.

NATIONAL PARK SERVICE

The National Park Service (NPS) has publicized several standards and documents to provide guidance prior to beginning work on historic properties. The two major publications that will be used as a guideline when looking at finding appropriate, feasible and affordable adaptation strategies to reduce the risk of flooding but maintaining the building's historic character (*Figure 1*) are 'The Secretary of the Interior's Standards for Rehabilitation' and 'Guidelines on Flood Adaptation for Rehabilitating Historic Buildings'[1]. Choosing the appropriate adaptation treatment for the buildings will vary and depend on multiple factors such as location, condition, historic significance, flood risk, materials and architectural style.

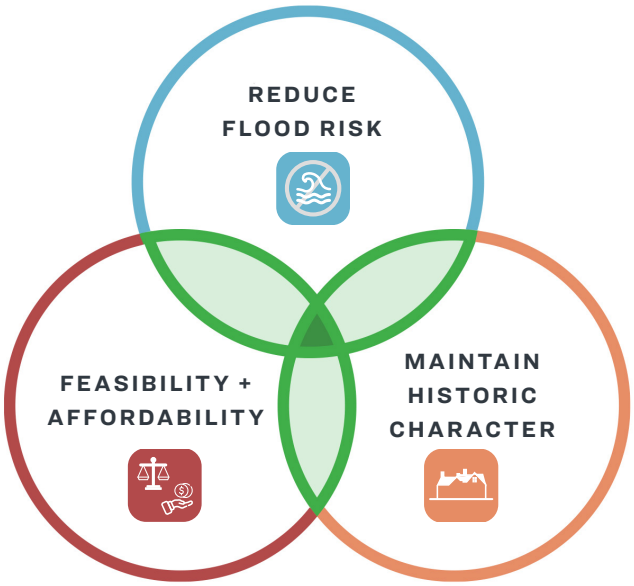


Figure 1 - Adopted from National Park Service

AIA RESILIENT PROJECT PROCESS GUIDE

The American Institute of Architects (AIA) has published this guide to put an emphasis on and guiding the critical role of architects addressing resilience challenges by understanding project risks and vulnerabilities, advising clients about climate-adaptive alternatives, supporting performance goals through the design phase, implementing them in construction, and leading stakeholder engagement efforts throughout.[2]

US ARMY CORPS OF ENGINEERS

The US Army Corps of Engineers performed a study in 2019 on Flood Resilience of Traditional Building Materials. The summary and the results of this study can be found in the "Best Practices & Precedents" Appendix of this report.

FEMA

The Federal Emergency Management Agency (FEMA) manages the federal government's response to natural and man made disasters. FEMA also manages the National Flood Insurance Program (NFIP) and produces Flood Insurance Rate Maps (FIRM). See the project's FIRM map to the right. FEMA has published several technical bulletins that provide guidance on flood resiliency and planning for flood events. They also provide guidelines for protecting structures (with a special bulletin on historic buildings) that building owners can adopt to reduce their flood insurance premiums through NFIP. FEMA also has developed a Community Rating System that allows cities to work collaboratively to improve their flood resilience. At this time, Salem is not a participating community.[3]

HISTORIC NEW ENGLAND PROPERTY CARE WHITE PAPERS

Historic New England is a regional heritage organization dedicated to protecting New England's history. Their team published a series of white papers on property care, with an emphasis on preserving historic character. They break most of the papers into three sections - Philosophy, Guidelines, and Technical Information. The topics include, but are not limited to, Building Preservation and Maintenance, Documentation, Energy Efficiency, Gutters and Downspouts (referenced in this report), Roofing, Site Drainage (referenced in this report), and Tree Care, among others.[4]

CITY OF SALEM HAZARD MITIGATION PLAN 2020

To be eligible for FEMA funding, a community must create a Hazard Mitigation Plan to identify vulnerabilities and steps that can be taken to mitigate them. The City of Salem's latest Hazard Mitigation Plan was updated in 2020, after the original was adopted in 2012. It has determined that flooding presents the "greatest hazard" to the city. It provides suggestions for protecting historic properties as well.[5]

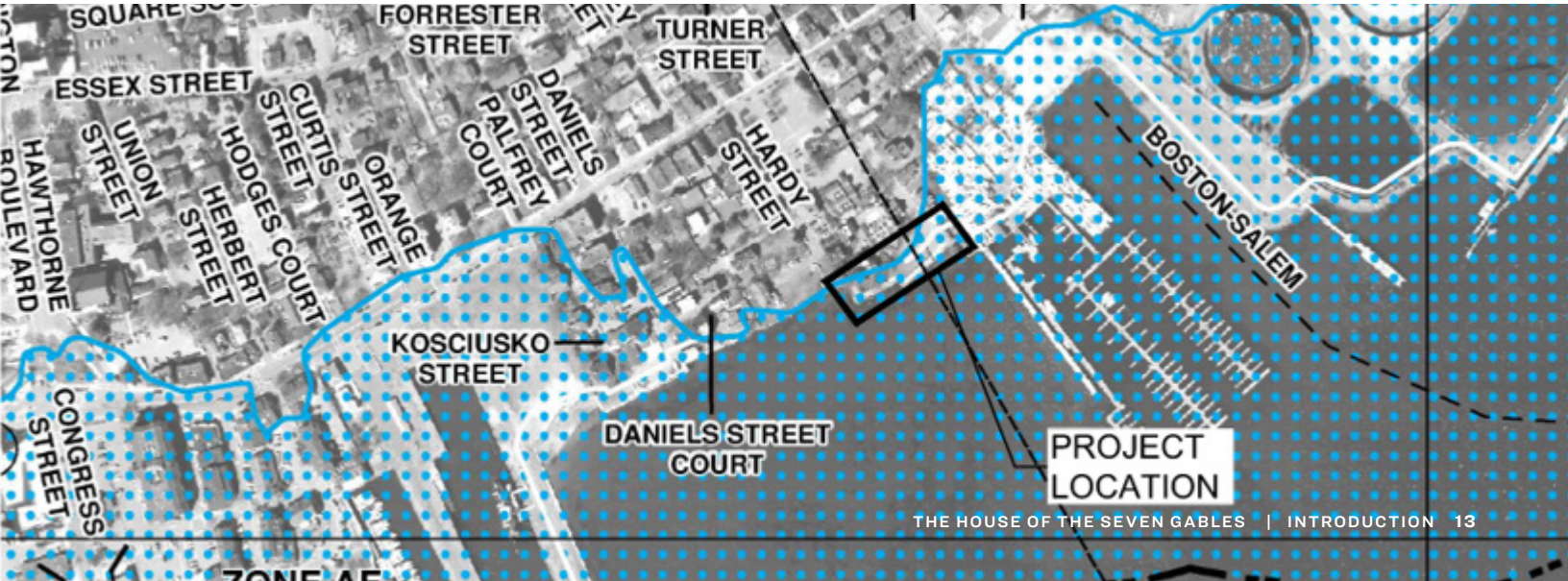
SALEM HISTORICAL COMMISSION GUIDELINES

The historical commission of Salem has formulated and approved guidelines for property owners and others to get an idea of the criteria the Commission uses in evaluating proposed changes to properties in historic districts. The guidelines will assist and advise the treatment of the historic properties located on the House of the Seven Gables campus in order to preserve and enhance their unique character. "The Guidelines do not intend to freeze buildings in time, but to manage change to prevent unnecessary or even unintentional loss of Salem's built heritage".[6]

"The Guidelines do not intend to freeze buildings in time, but to manage change to prevent unnecessary or even unintentional loss of Salem's built heritage".

-Salem Historical Commission Guidelines

FEMA FIRM Map for the campus as of June 2024



KEY TERMS

1%, 10%, 50% OR 100% ANNUAL FLOOD PROBABILITY

The extent of flooding that has a 1%, 10%, 50% or 100% chance of being equaled or exceeded in any given year. FEMA uses the 1% annual chance flood as the Base Flood for its Flood Insurance Rate Maps, and in some cases FEMA has determined the water surface elevation that corresponds to the Base Flood. The 1% Annual Chance Flood or Base Flood have commonly been referred to as the 100-year storm, however this terminology is now discouraged as it can be misleading or confusing.

ADAPTATION

The act of making changes to become better suited to one's environment. Climate adaptation is the act of making changes to live within the evolving conditions resulting from climate change.

BASE FLOOD ELEVATION (BFE)

The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

FEMA FLOOD ZONE

This is the geographical area that FEMA has defined according to varying levels of flood risk based on historical events. Each zone reflects the estimated severity or type of flooding in the area.

HAZARD

A potential source of danger caused by a naturally occurring or human-induced process or event with the potential of creating loss.[7]

MASSACHUSETTS COASTAL FLOOD RISK MODEL (MC-FRM)

A high-resolution flood risk model which represents inundation predictions based on a combination of sea level rise and storm surge. Calibrated to historical storm events, it includes the impacts of tides, waves, wave run-up and overtopping, storm surge, winds, and currents over a range of storm conditions, representing the dynamic nature of flooding. The model is able to capture the net effect of varying storm types, magnitudes, and frequencies.

MEAN HIGHER HIGH WATER (MHHW)

The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch (NTDE).

MEAN LOWER LOW WATER (MLLW)

The average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch (NTDE).

MEAN SEA LEVEL (MSL)

The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch (NTDE).

MITIGATION

Reducing negative impact. Lessening of the potential adverse impacts of physical hazards through actions that reduce hazard, exposure, and vulnerability.[8]

NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Created by Congress in 1968, the National Flood Insurance Program (NFIP) provides insurance to help reduce the socio-economic impact of floods. Flood insurance is a separate policy that can cover building,

the contents in a building, or both. The NFIP provides flood insurance to property owners, renters, and businesses, and have this coverage help them recover faster when floodwaters recede. The NFIP is a public-private partnership between the federal government, the property, and casualty insurance industry, states, local officials, lending institutions, and property owners.[9]

NATIONAL TIDAL DATUM EPOCH (NTDE)

A 19-year time period established by the National Ocean Service for collecting observations on water levels and calculating tidal datum values (e.g. mean sea level, mean lower low water). The present NTDE is 1983 through 2001 and is actively considered for revision every 20-25 years. As such, we are on the precipice of a newly revised NTDE, yet to be issued. The new NTDE will be based on data collected from 2002 through 2020.

NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88)

The vertical control datum established in 1991 which consists of a leveling network on the North American Continent, ranging from Alsaka, through Canada, across the United States, and is affixed to a single origin point on the continent. It holds fixed the height of the primary tidal bench mark.

REGENERATIVE DESIGN

Restores and improves the surrounding natural environment by enhancing the quality of life for biotic and abiotic components of the environment.

RESILIENCE

The ability of a system to prepare for, withstand, and recover quickly from a disaster.

STORM SURGE

Storm surge is the abnormal rise in seawater level during a storm, measured as the height of the water above the normal predicted astronomical tide. The surge is caused primarily by a storm's winds pushing water onshore. The amplitude of the storm surge at any given location depends on the orientation of the coastline with the storm track; the intensity, size, and speed of the storm.[10]

SUSTAINABILITY

Practices that protect the health of people and the environment.

TIDAL DATUM

A standard elevation defined by a certain phase of the tide. Used as a reference to measure local water levels and tied to fixed points known as bench marks. They are also the basis for establishing privately owned land, state owned land, territorial sea, exclusive economic zone, and high seas boundaries.

Aerial View of the House of the Seven Gables Campus
Photo by Hugh Hou

SECTION 1

Museum Campus & Context

The Gables Campus, located on two acres along Salem Harbor and protected by a seawall, features colonial revival gardens and seven historic buildings, including three First Period houses from the 1600s. The site also includes a modern visitor center and large parking area. All seven historic buildings are subject to local, state, and federal preservation standards.

HISTORY OF THE GABLES CAMPUS

Salem Harbor was once known as *Naumkeag*—or "Fishing Place"—to the members of the Massachusett Tribe who made it their seasonal home. Fish and shellfish abounded along the coastline. Further inland, stands of virgin timber were plentiful with game animals. These natural resources drew Europeans to the area, who quickly and violently displaced the Indigenous inhabitants. While descendants of those Indigenous people still live in Massachusetts today, the English colonists claimed the land.

In 1668, one of those colonists—wealthy merchant and ship-owner John Turner—built a dwelling on the harbor, which he later expanded into a seven-gabled mansion. In 1782, Turner's heirs sold the house to the Ingersoll family, relatives of American author Nathaniel Hawthorne. Hawthorne's visits to the Turner-Ingersoll Mansion inspired his 1851 novel—*The House of the Seven Gables*.

Our mission: to be a welcoming, thriving, historic site and community resource that engages people of all backgrounds in our inclusive American story.

In 1908, wealthy activist Caroline Emmerton purchased the Turner-Ingersoll Mansion to serve as both a museum of Salem's early history and a Settlement House providing social services to local immigrant populations. As tourists and neighbors alike flocked to The Gables, Emmerton realized more space would be needed. She moved other endangered buildings from around Salem to the campus, beginning with the Hooper-Hathaway House in 1911. The Retire Beckett House was moved to the property in 1924, and the Nathaniel Hawthorne Birthplace arrived on campus in 1958.


Photo by Capture, LLC.

Our multifaceted mission preserves and interprets our historic structures and campus while providing needed services to the local community through settlement work.

Over a century later, The House of the Seven Gables Settlement Association continues Emmerton's passion for history and social service. Since 1910, The Gables has provided residents of Salem and visitors from around the world with a nationally recognized museum campus that educates visitors about American architecture, Salem's maritime history, the lives of the Turner and Ingersoll families, and the literary legacy of Nathaniel Hawthorne—all while delivering community-based services to newly arrived immigrants and their families. Our multifaceted mission is to preserve and interpret our historic structures and site while serving the local community. In 2007, The Gables' campus was designated a National Historic Landmark District.

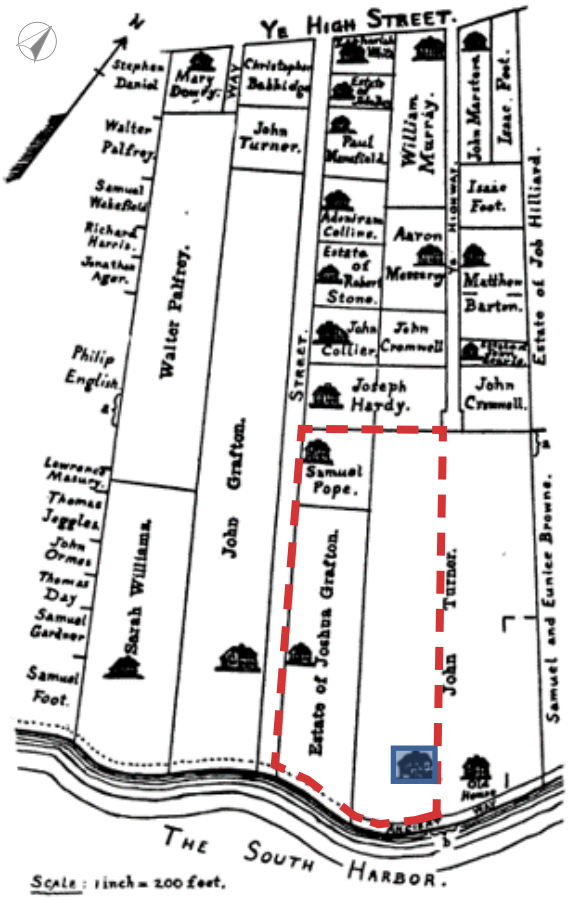
Today, The Gables annually engages with over 110,000 year-round visitors from all 50 states and over 50 countries through tours, public programming, settlement work and educational offerings. The museum is responsible for active and responsible stewardship of the property, buildings and collections, utilizing best museum and preservation practices. As sea level rise, storm surge, and other impacts of climate change increasingly threaten the historic campus, rising to the challenge of this responsibility is more important than ever.

We have the responsibility to steward our campus in such a way that it is protected for future generations. This is becoming increasingly challenging in light of climate change vulnerabilities.

TRANSFORMATION OF THE CAMPUS

1700s

1700

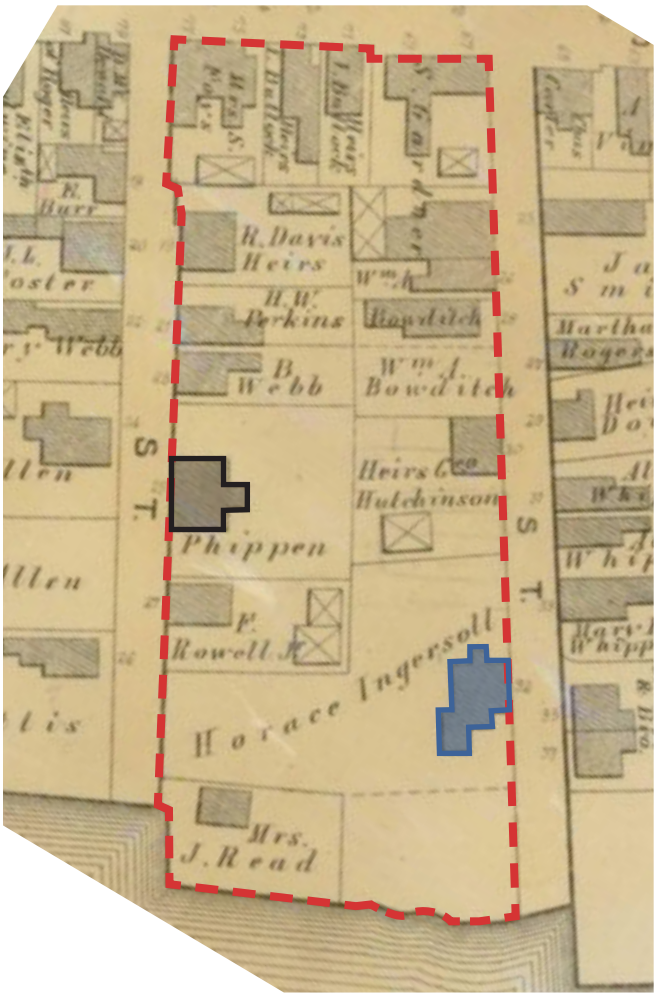


PART OF SALEM IN 1700. NO. 23.

This reconstructed 1921 map based on 1700s property records shows the future site of the Turner-Ingersoll Mansion under the ownership of John Turner. The Mansion is shown illustratively on the map, as the residence had been built 32 years prior. The outline of the present-day Museum property is indicated with the red, dashed line.

1800s

1874

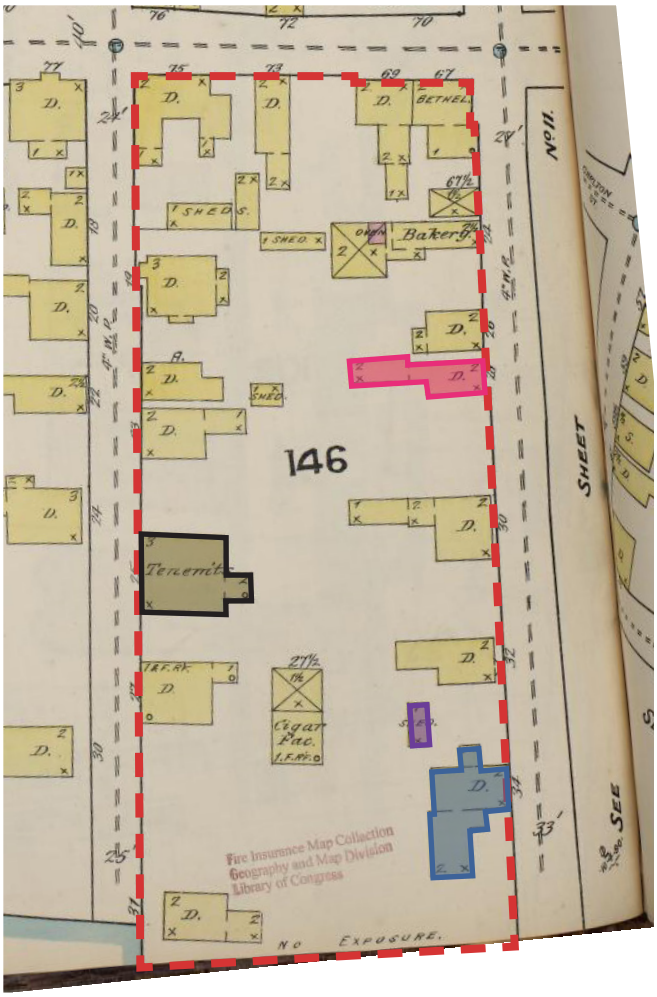


By the time this map had been drawn, the mansion and surrounding property had been sold to the Ingersoll Family, who became half the namesake of the Mansion (shown in **blue**). The southern portion of the block had been extended into the bay as well. Visible on this map as well is the Phippen House (in **black**), which still exists on the property to this day.

Revisiting historic mapping of the campus to understand the site's evolution over time is critical to thoughtfully and sensitively informing future adaptation, resiliency & mitigation measures.

1900s

1890



Above is a Sanborne Map, showing not only the Turner-Ingersoll Mansion (**blue**) and the Phippen House (now labeled as a Tenement House), but also presumably the garden shed that became the current Counting House (in **purple**). The southern edge of the site is cut off in this map. In **dark pink** is 42 Turner Street, the only property on the block not yet acquired by the Museum.

1906

This map shows the Primm House in its current location for the first time (in **light pink**), as well as the now-demolished Salem Maritime Society Bethel. The southern edge of the site has been expanded again into the bay - the profile closely matches the current condition.

The Gables site is no stranger to change, and moving buildings to preserve or protect them is part of it's history.

1900s → **2000s**

1957

In 1908, Caroline Emmerton established the House of the Seven Gables Museum and Settlement House. By the time this map was created, she had moved the Retire-Beckett House (orange) and the Hooper-Hathaway House (light blue) to the Museum. The Barn and the Tea House (shown in yellow) are present as well. Turner Hall (the former Salem Maritime Society Bethel) moved up to the north side of the property.

TODAY

Since the 1950s, the House of the Seven Gables has acquired the remaining properties on the block, with the exception of 42 Turner Street, to expand their campus. The Nathaniel Hawthorne House was moved in 1958 to its current location (shown in dark red). The Visitor's Center (shown in yellow) was built adjacent to the Barn and the Tea House, which were renovated to house some of the Museum's essential operations.

Identifying constants that are foundational to the association and community provides a framework for what can change over time, and what should not.

THE **CONSTANTS** OF THE CAMPUS THROUGH HISTORY

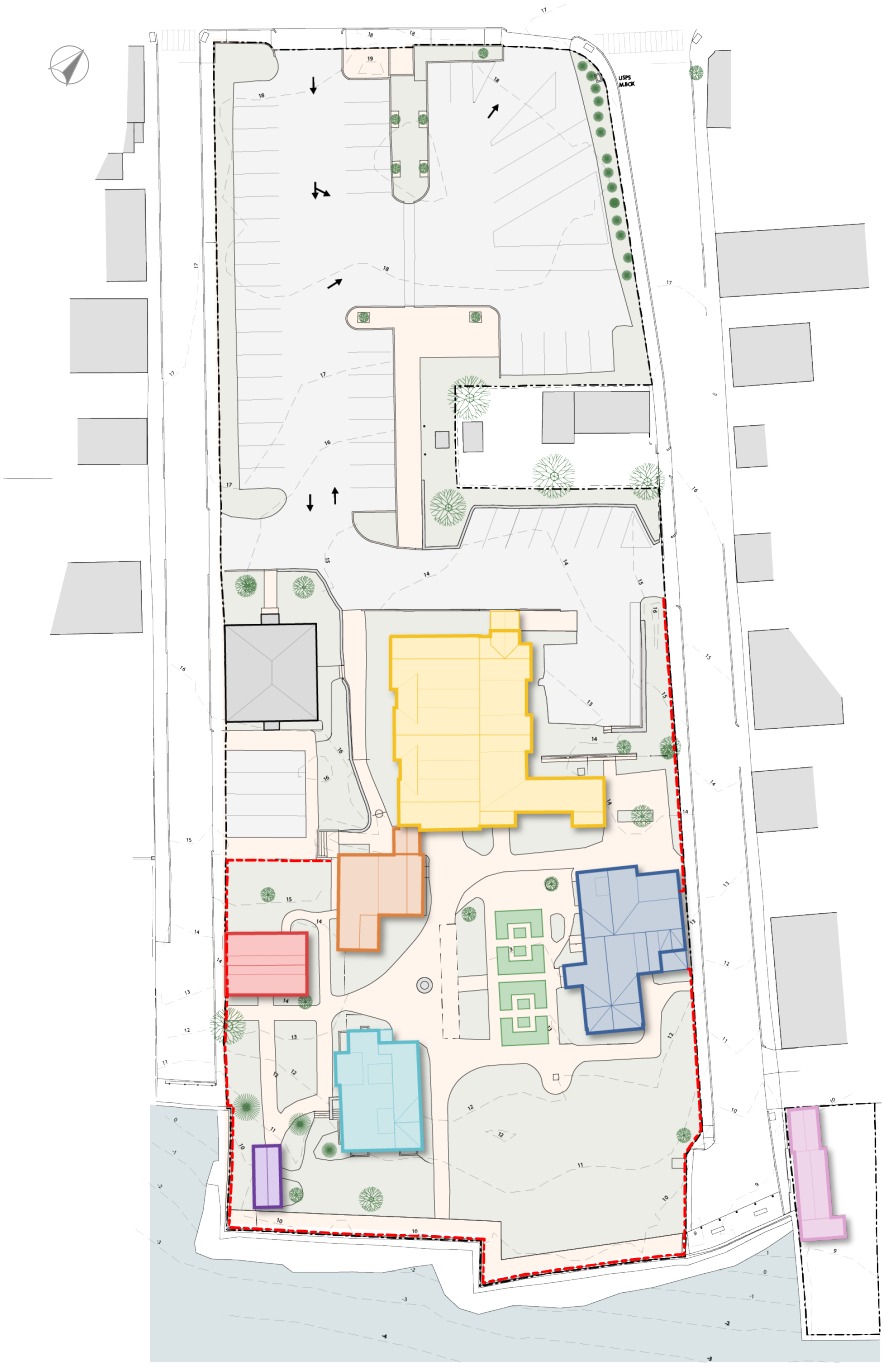
- The physical location within the City of Salem
- The historic & architectural prominence
- The settlement association organization
- Being a community resource and steward of Salem's history

THE **CHANGES** OF THE CAMPUS THROUGH HISTORY

- Densification
- Building relocations
- Disasters
- Demolitions
- Additions to individual buildings and campus
- Building restorations, modernizations and renovations
- Building change of use and/or orientation
- Change of landscapes to suit the era and needs

THE GABLES CAMPUS TODAY

The following diagrams and mapping outline the existing conditions of the site and infrastructure to provide context for current and anticipated issues related to climate change. Analysis and data for overall site and infrastructure was performed by Horsely Witten Group, while the seawall analysis was undertaken by Collins Engineering.



SITE & INFRASTRUCTURE

North end of site looking towards parking lot

Central campus walkways & gardens

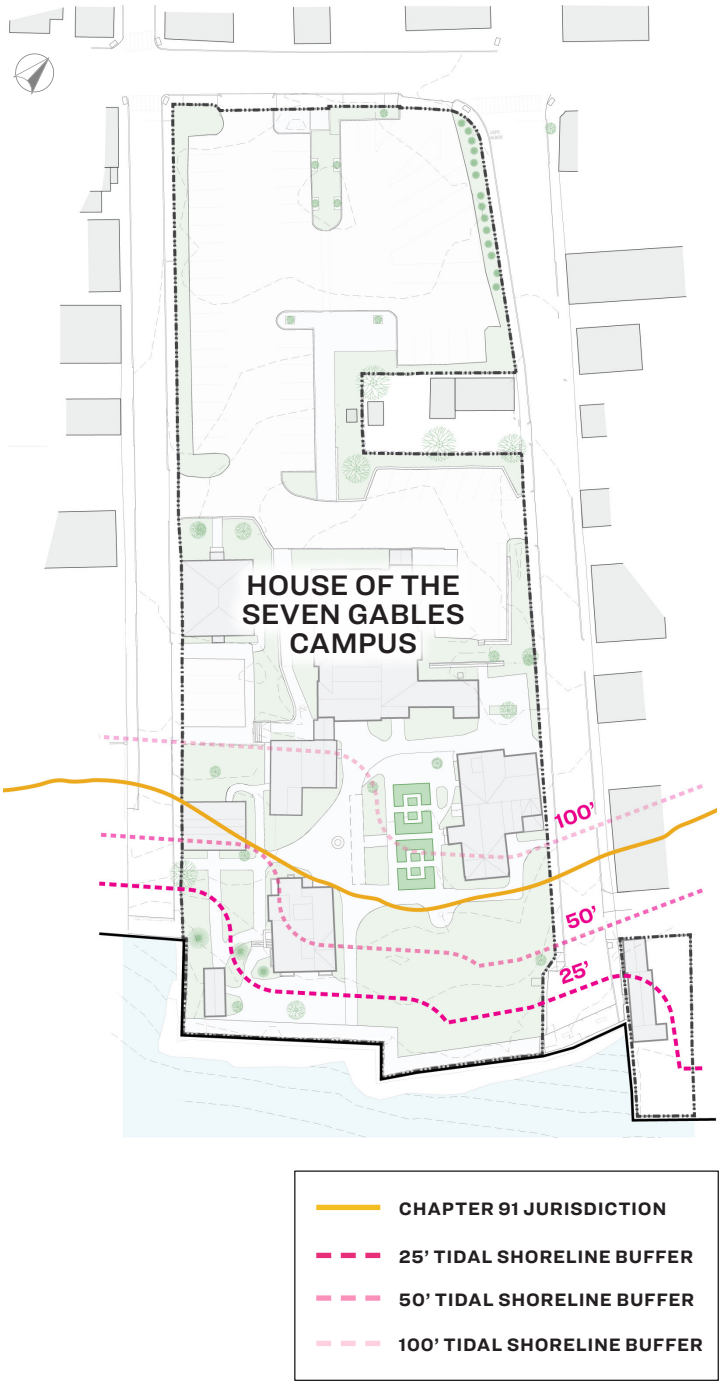
South end of site looking towards Counting House (far left) and Turner Ingersoll (far right)

FILLED TIDELANDS, TIDAL SHORELINE, AND BUFFER AREAS

Historically, the coastal edge of the property was a natural tideland, but it has been filled and hardened over the years in an effort to accommodate the development at the site. The coastal edge extending inland approximately 100 feet is characterized as historic filled tideland under MGL Chapter 91, the Massachusetts Public Waterfront Act, which aims to preserve public access and waterfront dependent land uses along the historic MA shoreline.

The seawall along the site's shore is subject to a Chapter 91 license, which allows for maintenance of the wall. The historic filled tidelands of the property are also subject to provisions of the MA Public Waterfront Act providing for public access across the property's filled tideland.

A portion of the Gables Campus buffers the tidal shoreline, playing a crucial ecological role in protecting Salem Harbor. This area is safeguarded by the MA Wetlands Protection Act and the Salem Wetlands Protection Ordinance. Any site alterations within 100 feet of the tide line require review and permitting by the Salem Conservation Commission, with stricter protections within 25 and 50 feet of the shoreline. While existing conditions predate current regulations, changes are encouraged to replace paved surfaces with native vegetation. The regulations establish a 50-foot mitigation zone and a 25-foot no-disturb zone to limit development and promote a natural buffer.

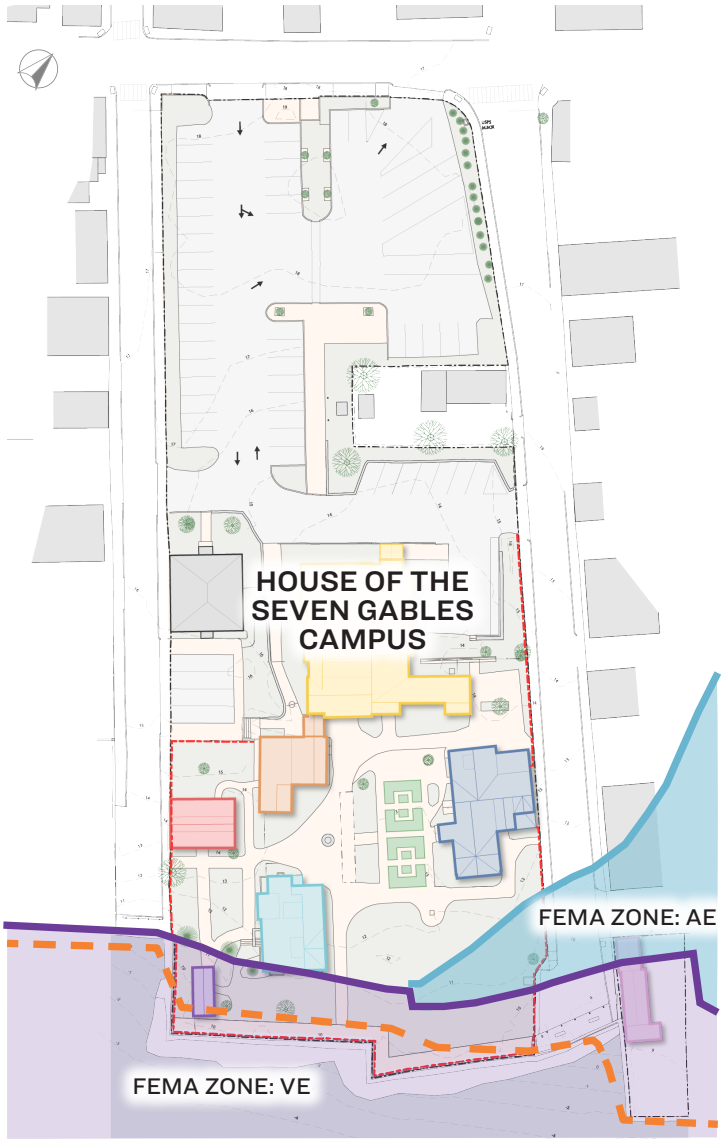


COASTAL FLOOD PLAIN

The southern coastal portion of the Gables Campus lies within a coastal floodplain and occasionally floods during extreme tides and storms.

According to FEMA's Flood Insurance Rate Map (effective 7/16/2014), this area falls within Zone AE (Base Flood Elevation of 10 feet) and Zone VE (Base Flood Elevation of 13 feet), indicating significant flood risk. Development in this floodplain is regulated by local and state codes to reduce building risks and is also protected for its ecological value under the MA Wetlands Protection Act and the Salem Wetlands Protection Ordinance.

Future structures should ideally be built outside these flood zones. For planning purposes, any future structures on this campus should consider and be constructed or installed entirely outside of the VE zone and outside the AE zone to the extent possible.

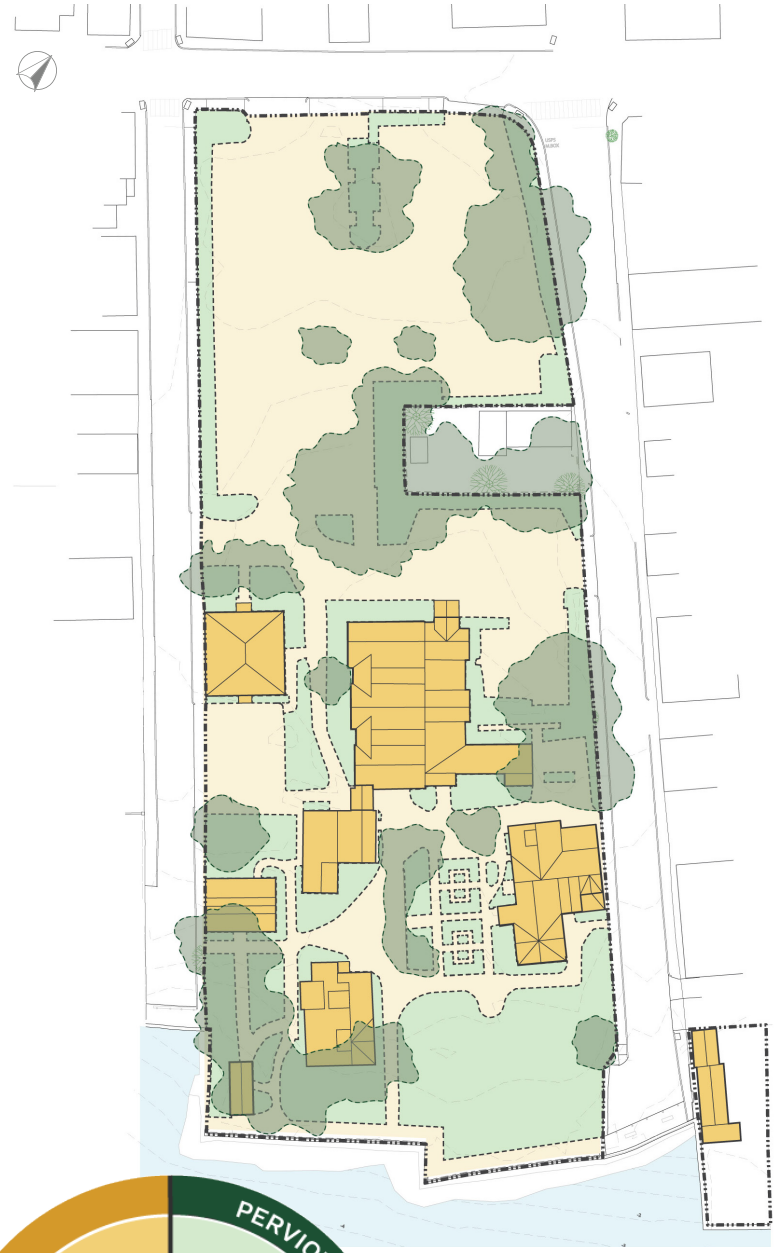


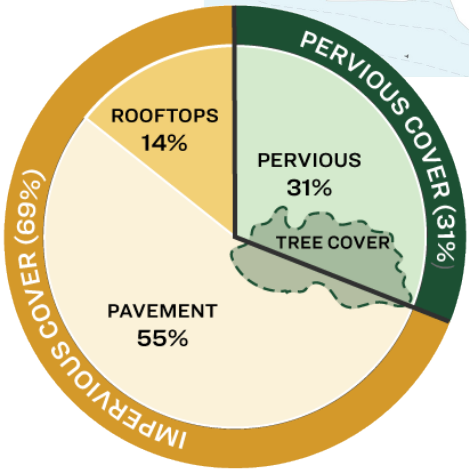
LAND COVERAGE

The Gables Campus is a combination of buildings, gardens, parking areas, paths, and other associated landscaped areas. These areas cover the land in different ways, and can be described in terms of whether or not they allow rainwater to infiltrate into the ground.

Impervious surfaces, which do not allow water to pass through into the ground, include rooftops, pavement and other highly compacted areas. The brick pavement is being considered as impervious, even though it has gaps, because of the density of its subsurface. These areas generate stormwater runoff during rain events and are the primary reason that stormwater management systems are required on the property. More than two thirds of the Gables Campus is impervious.

Pervious surfaces, which do allow water to filter into the ground, include grassy areas, landscaped areas, and gardens. These areas are important because they generate significantly less stormwater runoff during rain events, and sometimes provide a place for runoff originating elsewhere to filter into the ground. Just under one third of the Gables Campus can be considered pervious cover.



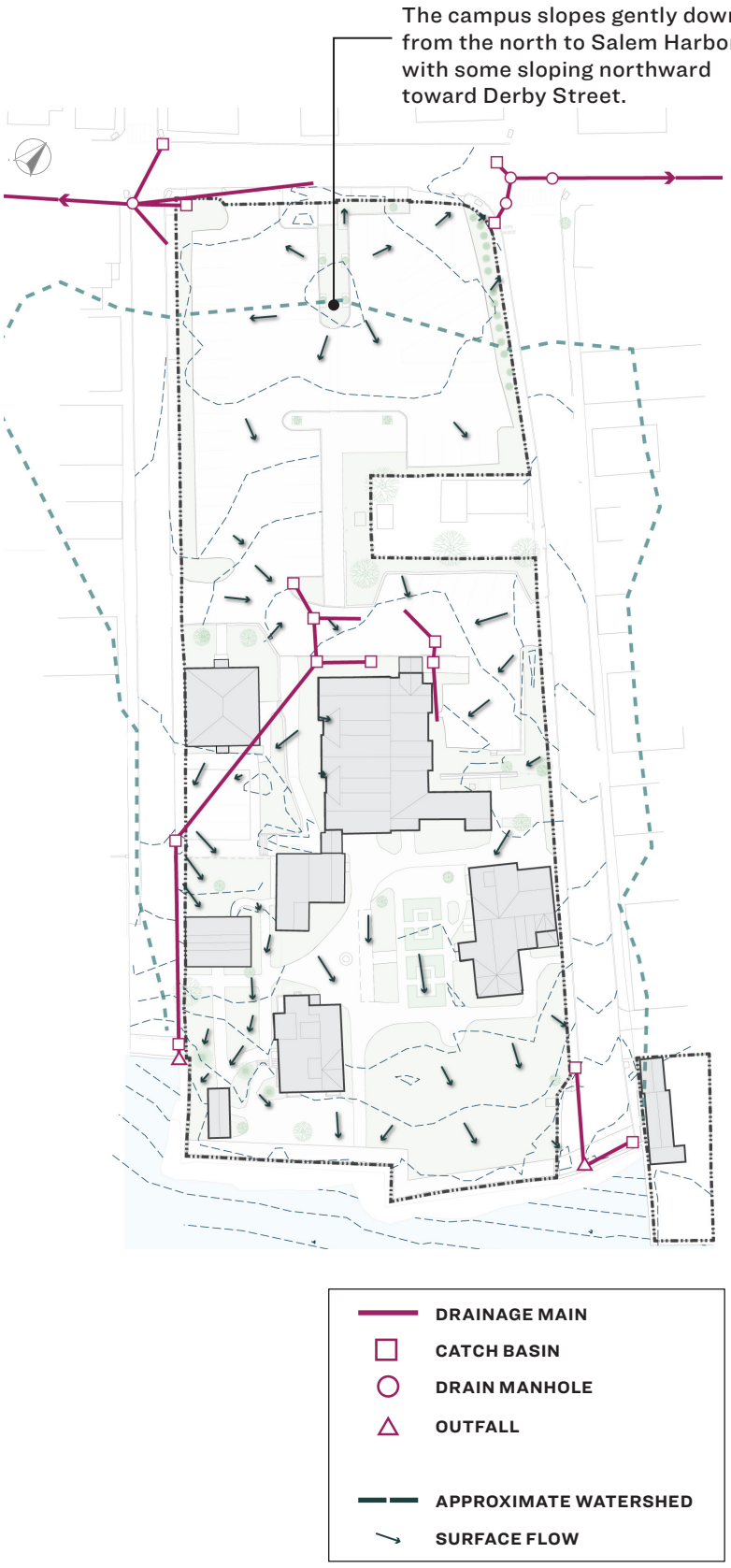


TOPOGRAPHY & DRAINAGE PATTERNS

The map highlights the Gables Campus watershed, showing pervious and impervious surfaces and surface flow directions. Rainfall is partially directed to the City's storm drain on Hardy Street, leading to the Harbor, and partly flows overland. High tide causes backups, leading to stormwater accumulation on campus.

Landscaping depressions capture minor stormwater, but heavy rain overwhelms them and the drainage system, causing overland runoff to the harbor. Hardy and Turner Streets slope towards the campus but are intercepted by street drainage systems.

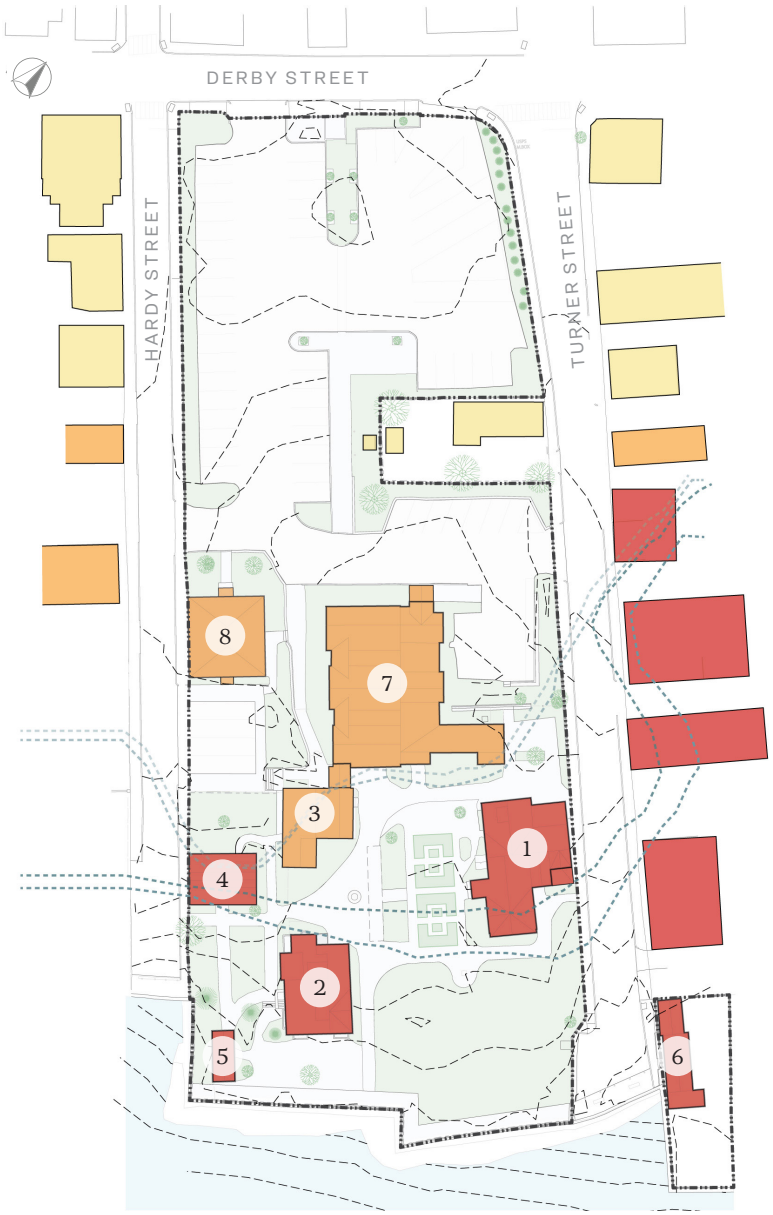
Runoff from the upper parking lot flows to main buildings and is captured by basins connected to the Hardy Street drainage system, discharging into Salem Harbor. Severe storms cause runoff from lower areas to sheet flow over the seawall. The colonial revival gardens suffer from poor drainage, pooling water near the Turner-Ingersoll Mansion. Originally, downspouts drained directly to the Harbor, but now most drain to the land surface as the original outlets are non-functional.



VULNERABILITY & CRITICAL BUILDING ELEVATIONS

Sea levels and storm surge risk are increasing, and will contribute to an increased severity and frequency of flooding along the southern portion of the Gables Campus.

The elevations 'critical' to the future of the Gables Campus buildings elevations would be those associated with the 1% annual flood risk in 2030 (high vulnerability), 2050 (medium vulnerability) and 2070 (low vulnerability), which are approximately 10.90, 12.90, and 14.60 respectively, according to the MA Coastal Flood Risk Model (MC-FRM). These flood projections indicate that some historic buildings as well as the formal gardens on the campus are at risk of future flooding. These critical elevations are presented in relation to the first floor elevations of campus buildings are identified in the phasing and long-term planning for the House of Seven Gables Campus.



1. TURNER-INGERSOLL MANSION
2. HOOPER-HATHAWAY HOUSE
3. RETIRE BECKETT HOUSE
4. HAWTHORNE BIRTHPLACE
5. COUNTING HOUSE
6. PRIMM HOUSE
7. SEAMAN'S VISITOR CENTER
8. PHIPPEN HOUSE

MASSACHUSETTS COASTAL FLOOD RISK MODELING FOR THE CAMPUS:

MC-FRM Flood Risk estimates for Present Day

MC-FRM Flood Risk estimates for 2030

MC-FRM Flood Risk estimates for 2050

MC-FRM Flood Risk estimates for 2070

Date: 3/19/2023
Data Sources: Bureau of Geographic Information (MassGIS), Woods Hole Group, ESRI

This map is for informational purposes and may not be suitable for legal, engineering, or surveying purposes.

Project Area

Flood Probabilities

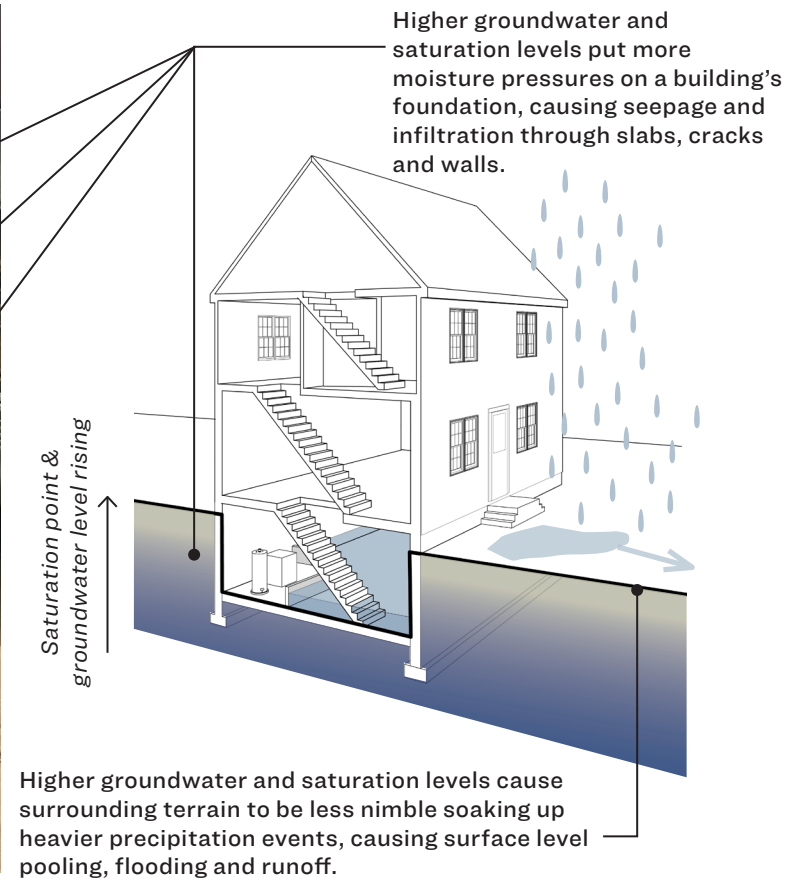
- 1% (100-yr)
- 10% (10-yr)
- 50% (2-yr)
- 100% (1-yr)

Refer to Key Terms for explanation of flood probability percentages.

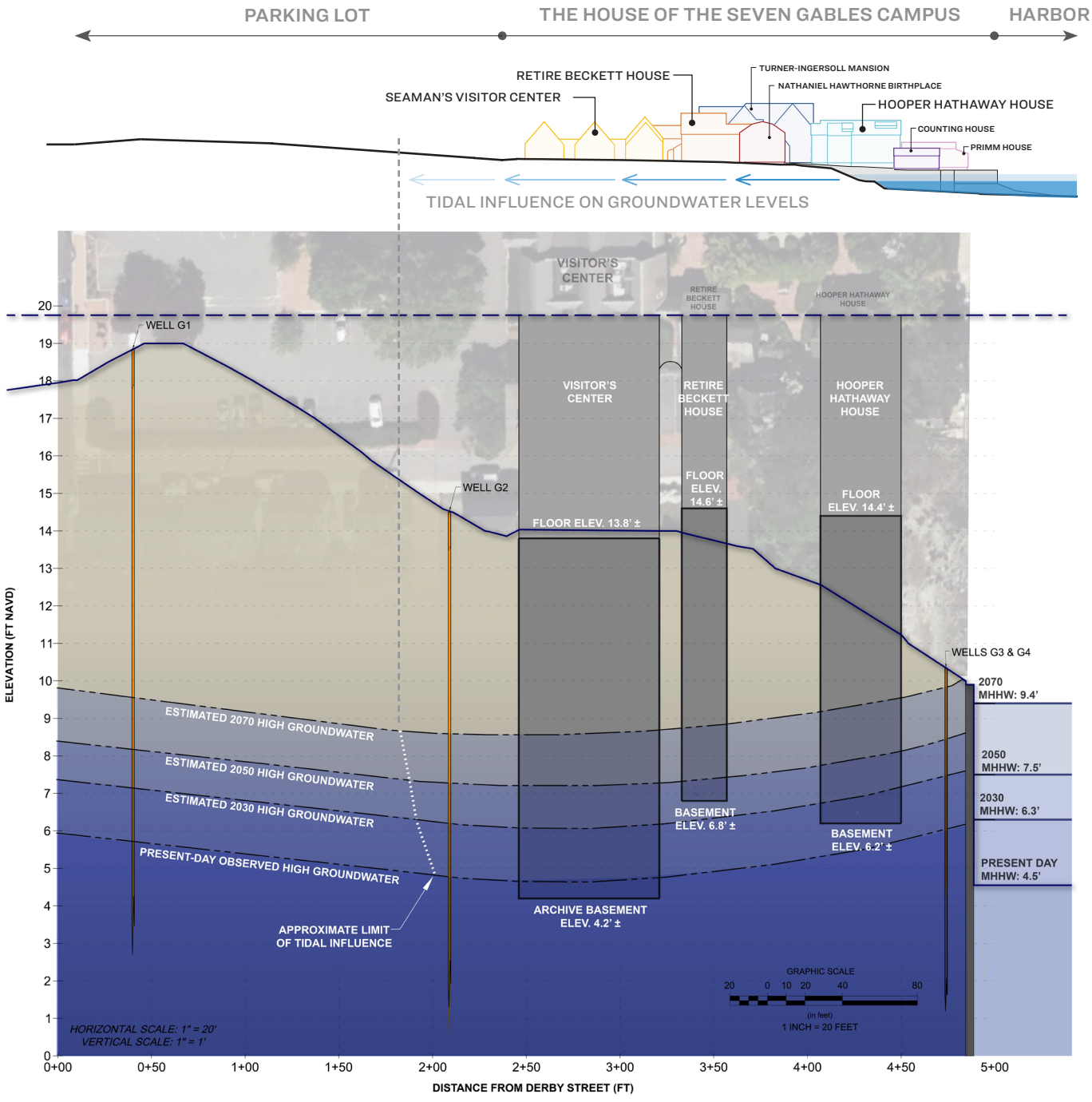
GROUNDWATER ASSESSMENT AND CONDITIONS

Groundwater below the Gables Campus is relatively shallow and has contributed to flooding and seepage of water into the basement foundations of some Gables Campus buildings. Groundwater elevation is also an important factor to consider for designing stormwater management and drainage practices at the site. Climate change is anticipated to bring a higher groundwater table due to both increased annual rainfall and sea level rise. Sea level influences the groundwater table elevation near the shoreline. Because fresh water is less dense than salt water, it "floats" above the saltwater in immediate near-shore settings so that, as the sea level rises, the fresh groundwater can be pushed upward and inland, resulting in a water table near the shoreline that is closer to the land surface.

Horsley Witten Group (HWG) installed four groundwater monitoring wells at the site and installed instrumentation in those wells to record the groundwater table and harbor water elevation fluctuations for the immediate site area. Water level elevations were recorded at six-minute intervals during the two years of this planning project. The monitoring revealed that groundwater within approximately two hundred eighty feet from the shoreline on approximately the southern half of the site are tidally influenced, meaning that those groundwater levels rise and fall with a regular periodicity that is directly related to the tidal fluctuations observed in the adjacent harbor. The further you move inland the lesser the amplitude of the observed tidal change relative to the harbor as well as the more delayed the tidal response is relative to the harbor.



With this practical understanding of the relationship between groundwater at the site and tidal fluctuations in Salem Harbor, we were able to develop rough estimates of future groundwater elevations at the site in response to anticipated sea level rise. The figure below presents the estimated groundwater elevations as they relate to current to future tidal projections as well as the foundations of three key Gables Campus buildings of concern, the Visitor's Center, the Retire Beckett House and the Hooper Hathaway House.

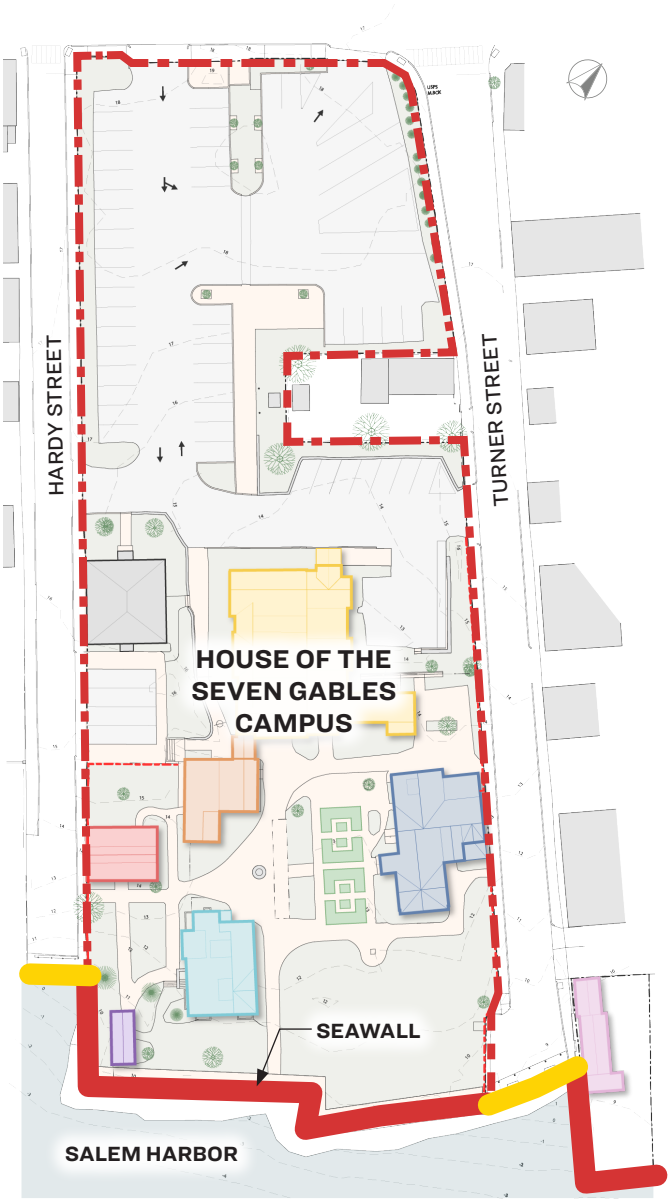


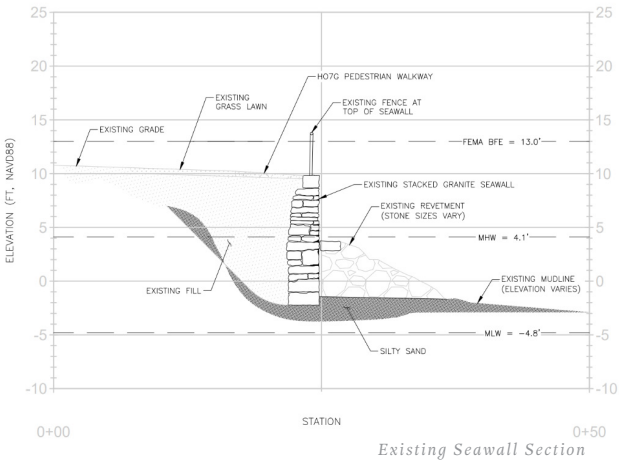
SEAWALL & REVETMENT

Collins Engineers was contracted by the House of Seven Gables to perform an above water Design-Level Inspection of the existing seawall. The inspection was conducted by Collins personnel on November 17th and 18th, 2022 at low tide when the wall could be observed in the dry. This inspection included a top-to-bottom examination of the 414-foot granite block seawall and adjacent riprap revetment, supplemented by an aerial survey.

The inspection aimed to assess the seawall's condition and identify unstable areas. The structure supports historic buildings, a garden, a sidewalk, and two public streets. A preliminary geotechnical and structural analysis suggested overall fair condition, with localized voids due to grout loss. Detailed deficiencies and repair recommendations are in Appendix A - Subtask 2.1 House of the Seven Gables Waterfront Inspection Report.

Collins proposed repair options from minor maintenance to complete reconstruction, considering future sea-level rise.



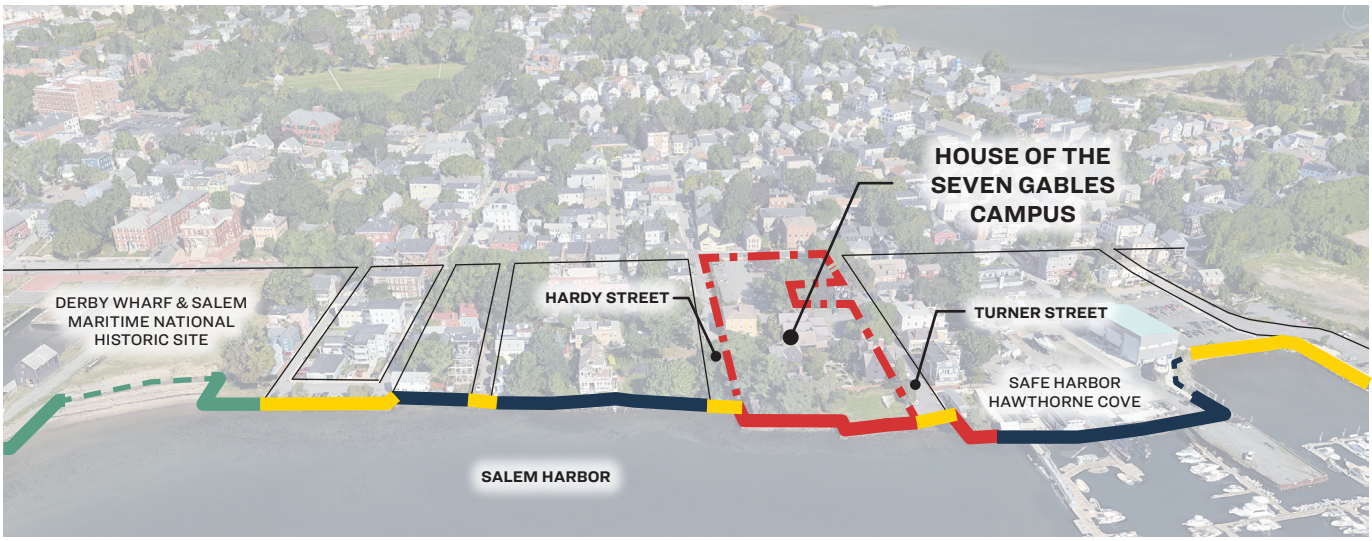


Existing Seawall Section

MASSDEP CHAPTER 91 PLANS

The MassDEP Chapter 91 license, issued in 1999, allows for seawall maintenance and revetment at the property until June of 2098. The approved plan for the license can be found in Appendix A - Subtask 2.1 House of Seven Gables Historical Memo.

The seawall along the Salem Harbor, including the section by the Gables, is crucial for protecting against coastal erosion and flooding. With a mix of public, private and federal sections, its effectiveness depends on the consistent and ongoing maintenance efforts of all property owners.



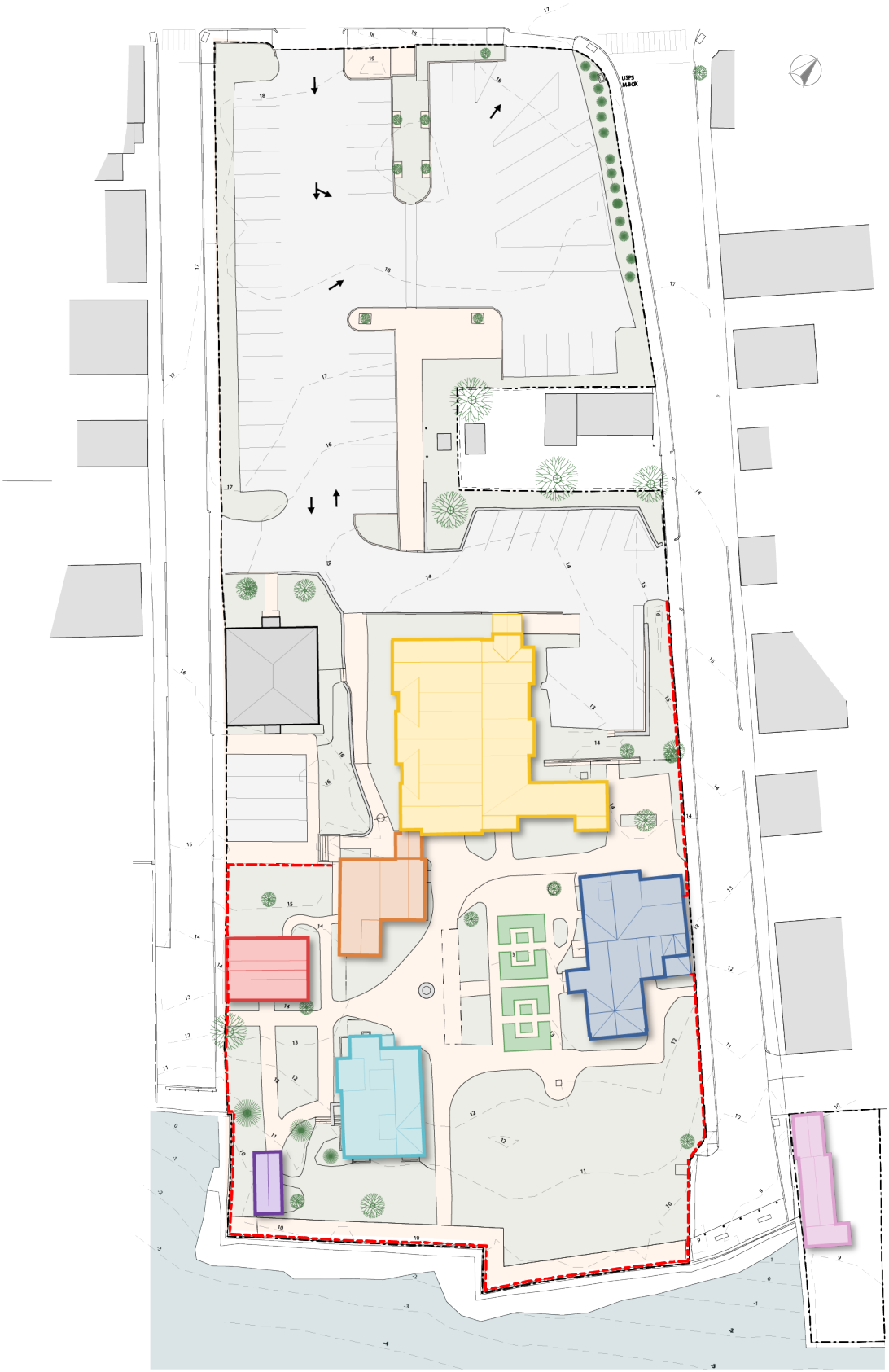
However, when one property owner raises their seawall, it can impact neighboring properties by changing water flow and increasing erosion or flooding risks. Therefore, it's essential for the entire community to collaborate on planning and implementing seawall adjustments. Coordinated efforts ensure consistent protection for the entire neighborhood, safeguarding all properties and maintaining the seawall's integrity.

- HOUSE OF THE SEVEN GABLES
- CITY OF SALEM
- FEDERAL GOVERNMENT PROPERTY
- PRIVATE PROPERTIES
- NO SEAWALL

Seawall - looking towards Primm House

Seawall

THE GABLES CAMPUS TODAY



BUILDING & LANDSCAPE ASSETS

The following data outlines the existing conditions of each of the contributing buildings on campus to provide context for the current and anticipated issues related to climate change. Information and analysis was completed by Union Studio Architecture & Community Design. The Gables Campus is listed on the National Register of Historic Places and is part of the Derby Street Historic District, with a preservation restriction in place.

TURNER-INGERSOLL MANSION (1668):
Known as "an architectural high-water mark," it remains on its original foundation and features unique rubble stone walls and an intact 1677 chimney foundation, the last remaining example of its kind in the nation.

HOOPER-HATHAWAY HOUSE (1682):
Moved in 1911, it now hosts public programs, a research library, offices, and collections storage.

RETIRE BECKETT HOUSE (C. 1687):
Once owned by the Beckett ship-building family, it now houses the Museum Store and offices.

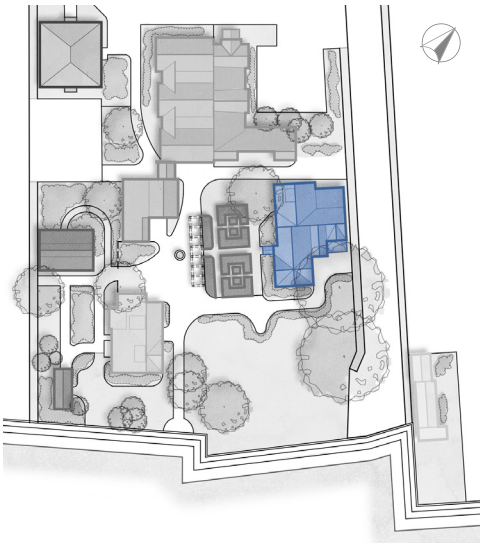
HAWTHORNE BIRTHPLACE (1750):
Birthplace of Nathaniel Hawthorne, moved to the site in 1958, now exhibits Hawthorne-related artifacts.

COUNTING HOUSE (1830):
A maritime merchant building now serving as a children's discovery zone.

PRIMM HOUSE:
Appears in an 1851 map, used for storage, and vulnerable to tidal flooding.

SEASIDE GARDENS:
Designed by prominent landscape architects, featuring paths, planting beds, and a wisteria arbor, hosting various events year-round.

SEAMAN'S VISITOR CENTER (1994):
A modern museum visitor center. The early-twentieth century barn and tearoom are incorporated into the design of the building.



TURNER-INGERSOLL MANSION

Built in 1668 and enlarged in 1677 and beyond, this architecturally important house is believed to be the only mansion house of the time still on it's original foundation. Abbot Lowell Cummings, the noted American architectural historian, said the house represents "an architectural high-water mark" and is "the most ambitious surviving 17th century framed house in New England."

ORIGINAL LOCATION

115 Derby Street, Salem (current)

SIGNIFICANT CHANGES TO DATE

The Turner-Ingersoll Mansion has undergone various changes and restoration efforts since it was built in 1668. Below lists the years when major changes were undertaken.

- 1693
- 1720
- 1794
- 1890s
- 1909
- 1922

CURRENT USE

The house is currently mainly open to the public as a museum with a small collection of archival storage on the second floor, and collections storage in attic spaces on the third floor.

SIGNIFICANCE

- The House of the Seven Gables is nationally significant for its Colonial Revival restoration in 1909 by Joseph Everett Chandler. The cellar, extending under the entire house, has walls of rubble stone. The cellar retains the 1677 chimney foundation intact, a brick arch set on stone piers. The foundation, the shadow-molded exterior sheathing, and the overhang with decorative pendants are earlier examples of their type in New England.[11]

BASEMENT

- No dehumidifiers in basement.
- Architectural elements collection stored in basement that have been recently tagged/organized (will need to find new space for those).

Issues related to water infiltration

- Water coming in from uphill side during/after heavy precipitation.
- Water infiltration at most bulkheads.

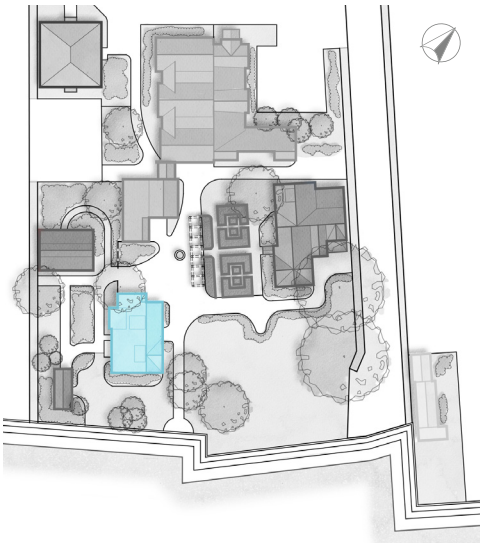
ATTIC

- Blown-in insulation at one side-gable of main house.
- Nails that were used in 2008 for re-roofing were defective, re-roofed in 2016.

EXTERIOR ELEVATIONS

- Gutters are pooled up, especially at northeast side (between main building and addition). Clean-up needed regularly.
- The siding on the south side has reached its life expectancy and is vulnerable to water infiltration.

Top: Exterior of the Turner-Ingersoll Mansion. Bottom left: the original fieldstone foundation walls in the Mansion basement. Bottom right: the original fireplace arch detail, one of few remaining in the country. All photos by Union Studio.



HOOPER-HATHAWAY HOUSE

Built in 1682 by Benjamin Hooper, cordwainer, on a lot near present-day Washington Street in Salem, the house was moved to the museum grounds in 1911 to save it from demolition.

ORIGINAL LOCATION

23 Washington Street, Salem - moved to Gables Campus in 1911

SIGNIFICANT CHANGES TO DATE

- 1784
- 1911

CURRENT USE

Public programming and small private events, a research library for staff and members, offices on second floor, and collection storage on the first and third floors. The basement is currently used as the Preservation and Maintenance shop.

SIGNIFICANCE

- The house is significant for its Post-medieval architectural features, and its role in the settlement house work as a part of the setting for the House of the Seven Gables.[12]

GENERAL

- Major water issues, surface water + flooding events, coming from basement entry (south side).
- Water heaters will likely need to move to different location/higher ground because of the current flooding issues.

BASEMENT

- Location of mech./air handlers to be reconsidered (currently located low in basement)
- No dehumidifiers in basement.
- Is there concrete slab located under wooding flooring boards?

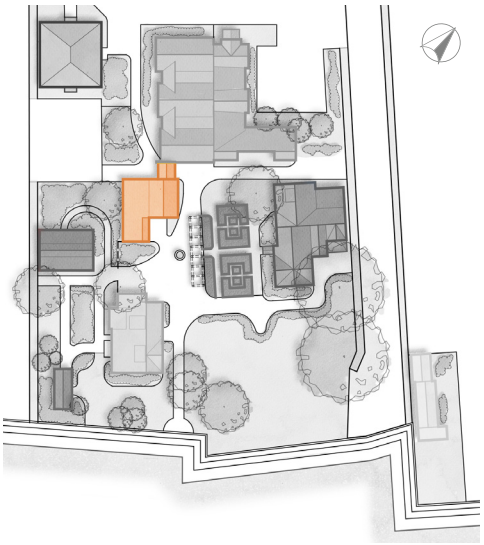
Issues related to water infiltration

- Buckling of flooring visible, resulted from water infiltration.
- In summertime lots of condensation visible on mech. equipment. Dehumidifiers necessary!
- Most water coming in from basement entrance (south side.

EXTERIOR

- Gutters are pooled up with debris. Clean-up needed regularly.
- The northwest side of this building is in disrepair. Windows and siding need to be addressed as well as gutters and downspouts to prevent water from cascading onto the siding.

Top: Exterior of the Hooper-Hathaway House, facing the waterfront. Bottom left: Entry to the House's basement (which has experienced flooding). Bottom right: the workshop in the basement with full-height windows facing the water. All photos by Union Studio.



RETIRE BECKETT HOUSE

Built in c. 1687, the Retire Beckett House was once owned by the famous Salem ship-building Beckett family, the Retire Beckett House is a First Period house moved and restored from its original location in 1924 by Joseph Chandler to save it from demolition. The building now is home to the Museum Store and offices.

ORIGINAL LOCATION

Beckett Street, Salem - moved to Gables Campus in 1924.

SIGNIFICANT CHANGES TO DATE

- 1850
- 1924

CURRENT USE

Museum Store and offices.

SIGNIFICANCE

- The role of Joseph Chandler in moving and restoring the house created a setting for the House of the Seven Gables.[13]

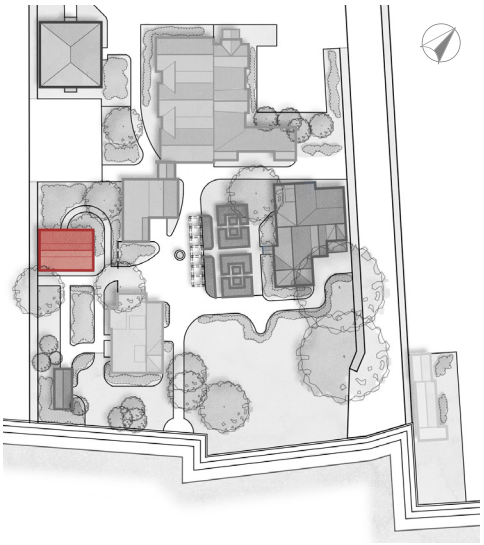
GENERAL

- Threats minimal, no/minimal water infiltration.
- No collection stored in building.
- Basement/foundation dates to the 1920s.

EXTERIOR

- Gutters are pooled up with debris. Clean-up needed regularly.
- The northwest side of this building is in need of repair. Windows, siding and rear door will need to be addressed.

The exterior of the Retire Beckett House. Interior evaluation was not part of project scope. Photo by Union Studio.



NATHANIEL HAWTHORNE BIRTHPLACE

In this modest Georgian Colonial house, that was built in 1790, the well-known author Nathanial Hawthorne was born on July 4, 1804. It was moved to it's current location in 1958 to save it from demolition, and now houses a Hawthorne exhibit and other historically interpreted rooms.

ORIGINAL LOCATION

Union Street, Salem - moved to Gables Campus in 1958.

SIGNIFICANT CHANGES TO DATE

- 1958

CURRENT USE

The building is part of the museum, housing a Hawthorne exhibit and other historically interpreted rooms.

SIGNIFICANCE

- The house is contributing to the Gables campus as the birthplace of one of America's foremost nineteenth-century authors, and as part of the educational complex created by the settlements association.[14]

GENERAL

- Downspout and cisterns on uphill side are blocked up, infrastructure of cistern underground is questionable.
- Condenser units are located on uphill side where stormwater floods - needs to move?
- Building has encountered mold growth issues throughout because of moisture in basement.

BASEMENT

- Dehumidifiers in basement to stabilize climate for small amount of collection that is stored in basement.

Issues related to water infiltration

- Water comes in from uphill side, under main stair + bulkheads.
- Standing puddle coming from stairs (currently dry).
- Signs of efflorescence on foundation wall (uphill side).
- Signs of carpenter ants at framing.

EXTERIOR ELEVATIONS

- Multiple repairs occurred on northeast elevation, cause/source of water infiltration not certain. Possibly bad flashing at window sills or bad paint job.
- 2019, repairs happened to northeast elevation, including girt framing members.

Top: The exterior of the Nathaniel Hawthorne Birthplace. Bottom left: mechanical equipment in the basement, particularly a dehumidifier to combat high moisture levels in the Birthplace. Bottom right: Collection storage in the basement. All photos by Union Studio.

COUNTING HOUSE

The Counting House, circa 1830, is typical of the small buildings in which maritime merchants completed much of their business on or around the wharfs. In the summer of 2007, renovations to the Counting House opened the space to children as a maritime discovery zone called Kids' Cove at The Gables.

SIGNIFICANCE

- The counting house contributes to the House of the Seven Gables campus as a part of the educational complex created for the Seven Gables Settlement Association as a museum attraction to emphasize the maritime history of the site.[15]

GENERAL

- Electrical service panel located in crawl space.
- Crawlspace stays mostly dry.

ORIGINAL LOCATION

Moved to the Gables Campus in end of nineteenth century from where garden is now to it's present location.

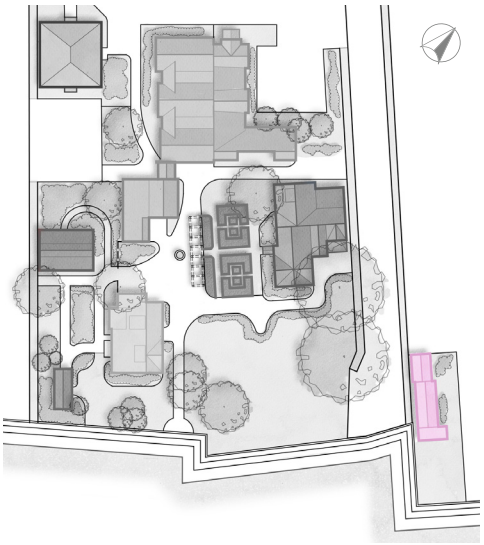
SIGNIFICANT CHANGES TO DATE

- 2007

CURRENT USE

Kid's Cove at The Gables.

Top: the Counting House exterior. Bottom left: the CMU crawlspace beneath the Counting House, built after the Counting House was moved to its current location. Bottom right: the interior of the Counting House. All photos by Union Studio.



PRIMM HOUSE

Little is known about this house, but it does appear in an 1851 map of Salem. Located across the street from the main campus, Primm is currently used as storage for the Preservation and Maintenance team. Due to its location, the building is particularly vulnerable to tidal flooding.

GENERAL

- Storage of maintenance equipment.
- Used to be studio, gentlemen's club and a Cent Shop.
- Future, keep being used as storage for maintenance equipment? Barndoor in back for lawnmower?

Issues related to water infiltration

- Critical location on site, huge water threat.
- Relocation negotiable, raising possible.

ORIGINAL LOCATION

57 Turner Street, Salem (current)

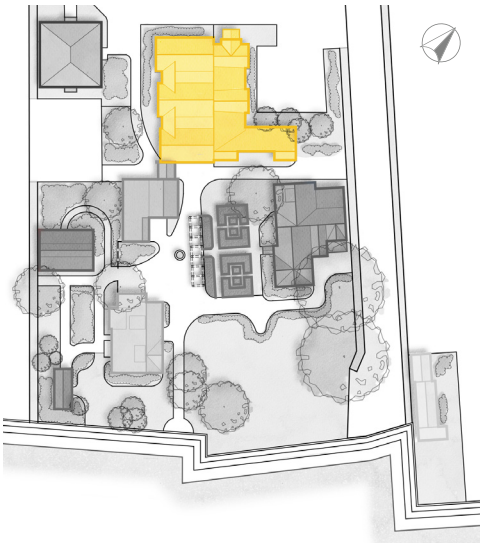
SIGNIFICANT CHANGES TO DATE

- Unknown

CURRENT USE

Storage of maintenance equipment.

The exterior of the Primm House, showing deterioration and settling. Interior evaluation was not part of project scope. Photo by Union Studio.



SEAMAN'S VISITOR CENTER

The Seaman's Visitor Center, built in 1994, is a modern museum visitor center designed with facilities for the public and space for functions and exhibits. The early-twentieth century barn and tearoom are incorporated into the design of the building.

GENERAL

- Front and rear elevations are the same to allow for visitor accessibility - this has created a "bowl" in front of building for water collection during precipitation events.
- Cisterns in this area are collapsing.

BASEMENT

- Lots of collection stored in basement.
- No humidity controls.
- No major water issues ongoing.

Issues related to water infiltration

- Some moisture building up on west wall (uphill side), currently fan running to help dry.

EXTERIOR ELEVATIONS

- Multiple repairs will need to be done because of its poor construction. The roof, siding and windows will need to be addressed.

ORIGINAL LOCATION

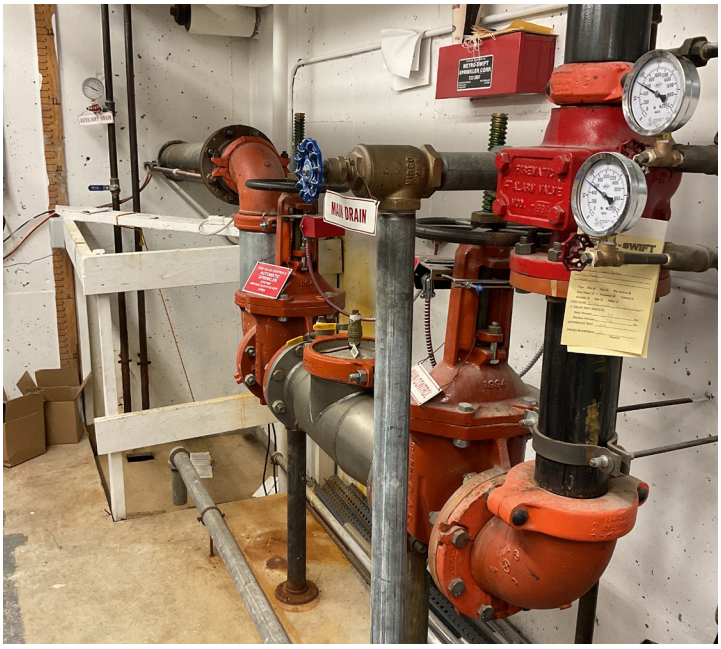
115 Derby Street, Salem (current)

SIGNIFICANT CHANGES TO DATE

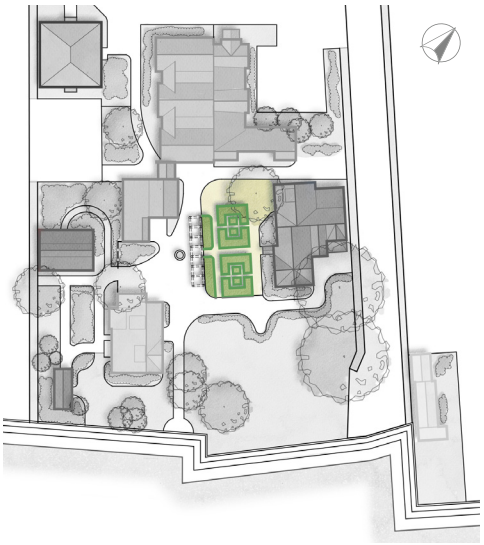
- None

CURRENT USE

Visitor center including classrooms, galleries, meeting or lecture rooms. Collection storage located in basement.



Top: Exterior of the Visitor's Center. Bottom left: collections storage in the basement. Bottom right: mechanical equipment in the basement. All photos by Union Studio,



SEASIDE GARDENS

Serving as the physical centerpiece of the campus is the dramatic colonial revival garden and sweeping lawn designed by famed landscape architects Joseph Everett Chandler in 1909. Arthur Shurcliff, and Daniel Foley later adjusted this plan. With walking paths, Jacobean knot planting beds, a shady wisteria arbor, and the lawn leading to the water with a spectacular view, the garden is enjoyed by visitors year-round. The lawn is the site of member and public programs, educational programming, weddings, and naturalization day ceremonies.

SIGNIFICANCE

- The garden is significant on a national level for its role as part of the setting of the House of the Seven Gables, and for the design contributions of two important landscape architects of the Colonial Revival period.[16]

ORIGINAL LOCATION

115 Derby Street, Salem (current)

SIGNIFICANT CHANGES TO DATE

- 1924

Historic images of Seaside Garden, ca. 1954. By House of the Seven Gables Museum.

Top: Looking northwest at Seaside Garden. Bottom left: well and trellis southwest of the Seaside Garden. Bottom right: Seaside Garden looking at Turner Ingersoll Mansion. All photos by Union Studio,

Photo looking from Hardy Street towards Counting House
Photo by Paul Wright, January 13, 2024

SECTION 2

Adaptation Planning

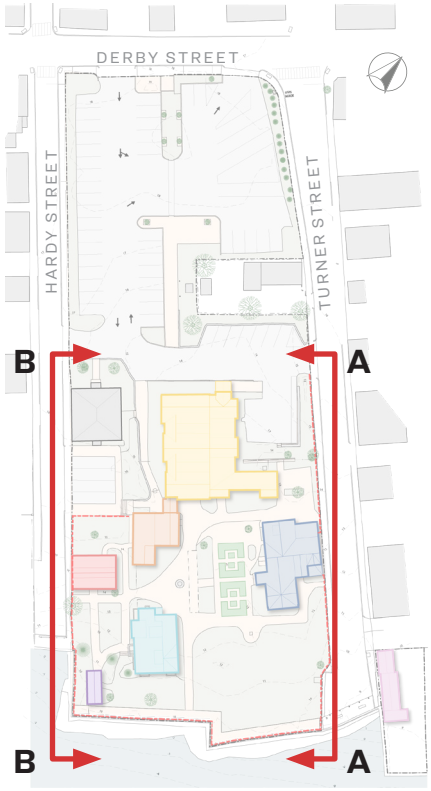
Before beginning any detailed planning for specific assets on the Gables Campus, the project team took time to research and understand more fully the strategies and techniques commonly used to protect and preserve buildings and places at risk. The alternatives that best balanced the goal of preservation, cost, and long term effectiveness became the adaptation tools that informed the final recommendations.

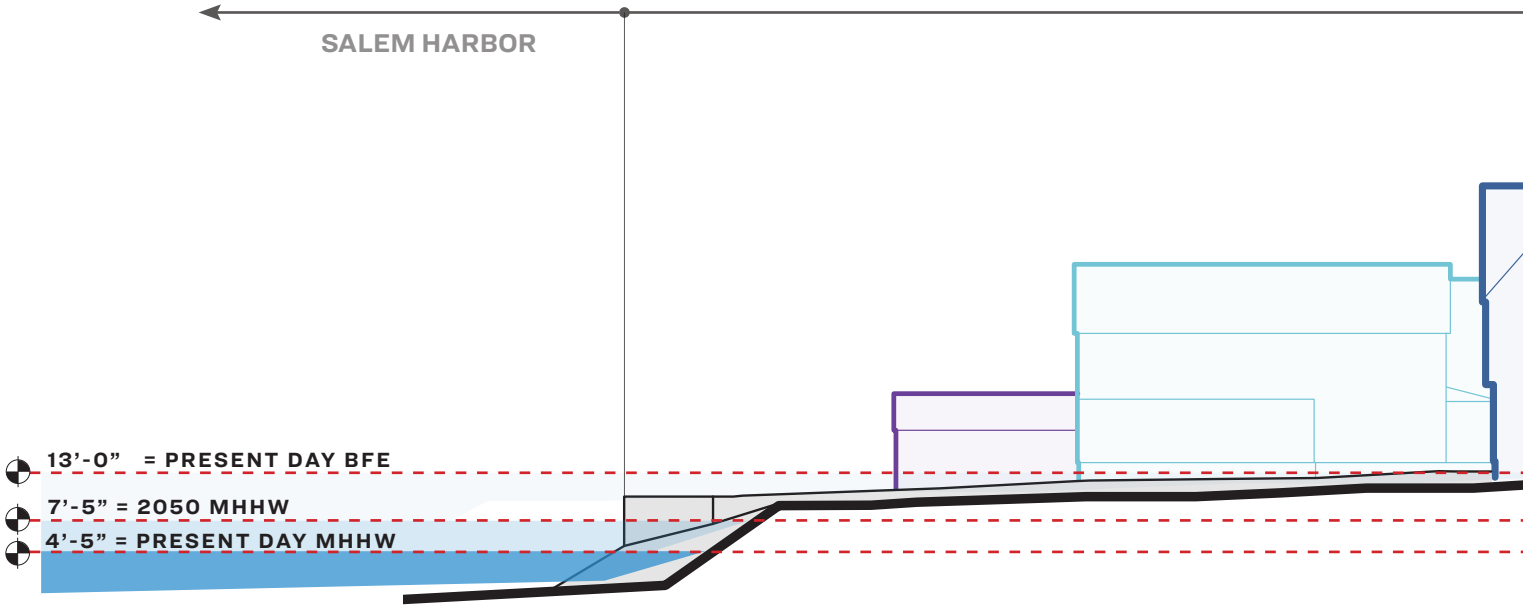
ANTICIPATED IMPACT ON GABLES CAMPUS

Site sections illustrate current and projected future mean higher high water (MHHW) levels, and rising sea level challenges the campus is facing.

The following sections illustrate the overall site in relation to projected sea level rise, focusing on Hardy Street and Turner Street near the House of the Seven Gables campus. These sections depict current and estimated future Mean Higher High Water (MHHW) levels, calculated from NOAA data.

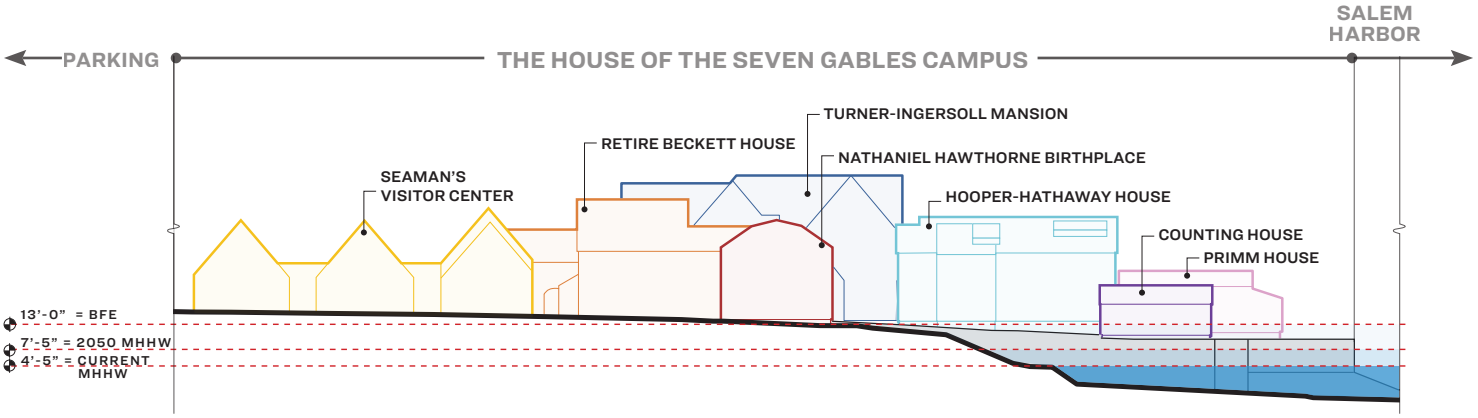
The current MHHW for Salem Harbor is 4'-5", with projections of 6'-3" in 2030, 7'-5" in 2050, and 9'-4" in 2070. These diagrams highlight the potential inundation risks for each building due to sea level rise.

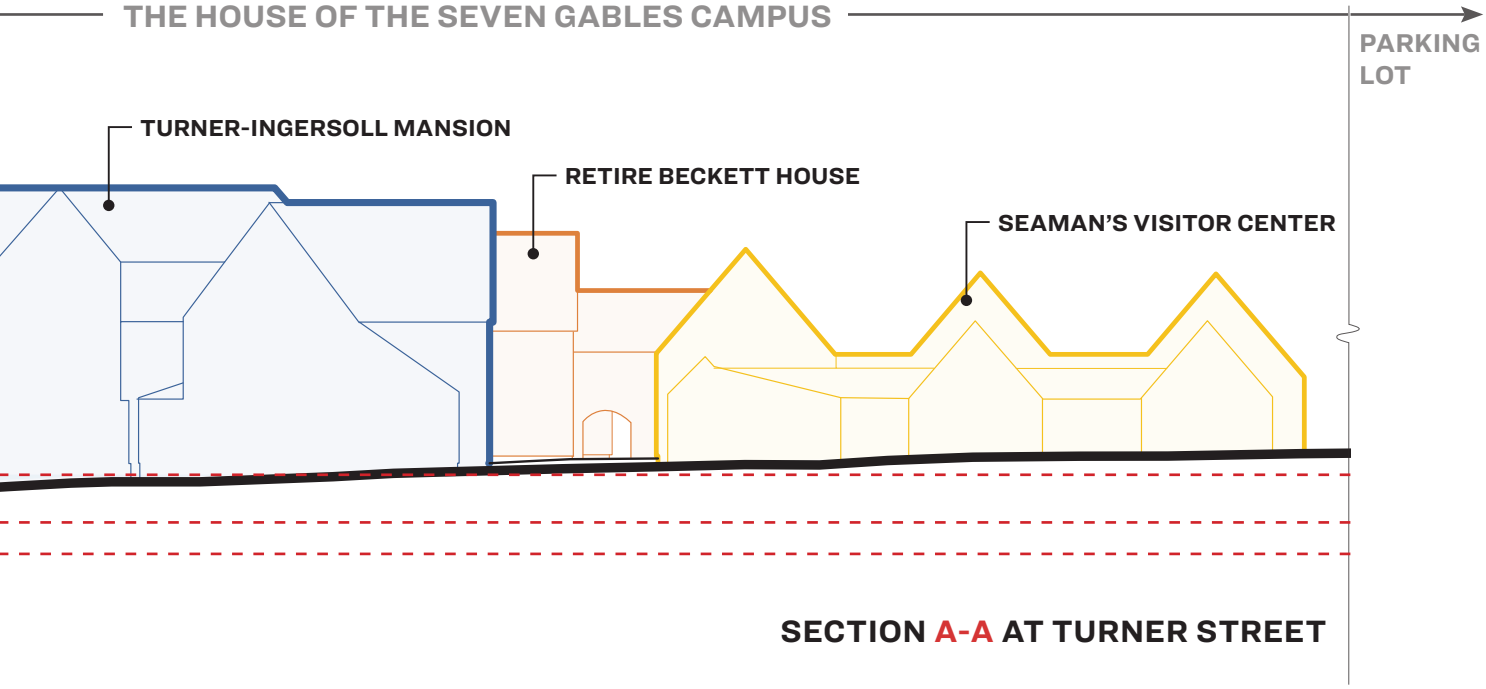




Refer to Key Terms for explanation of terminology.

SECTION B-B AT HARDY STREET



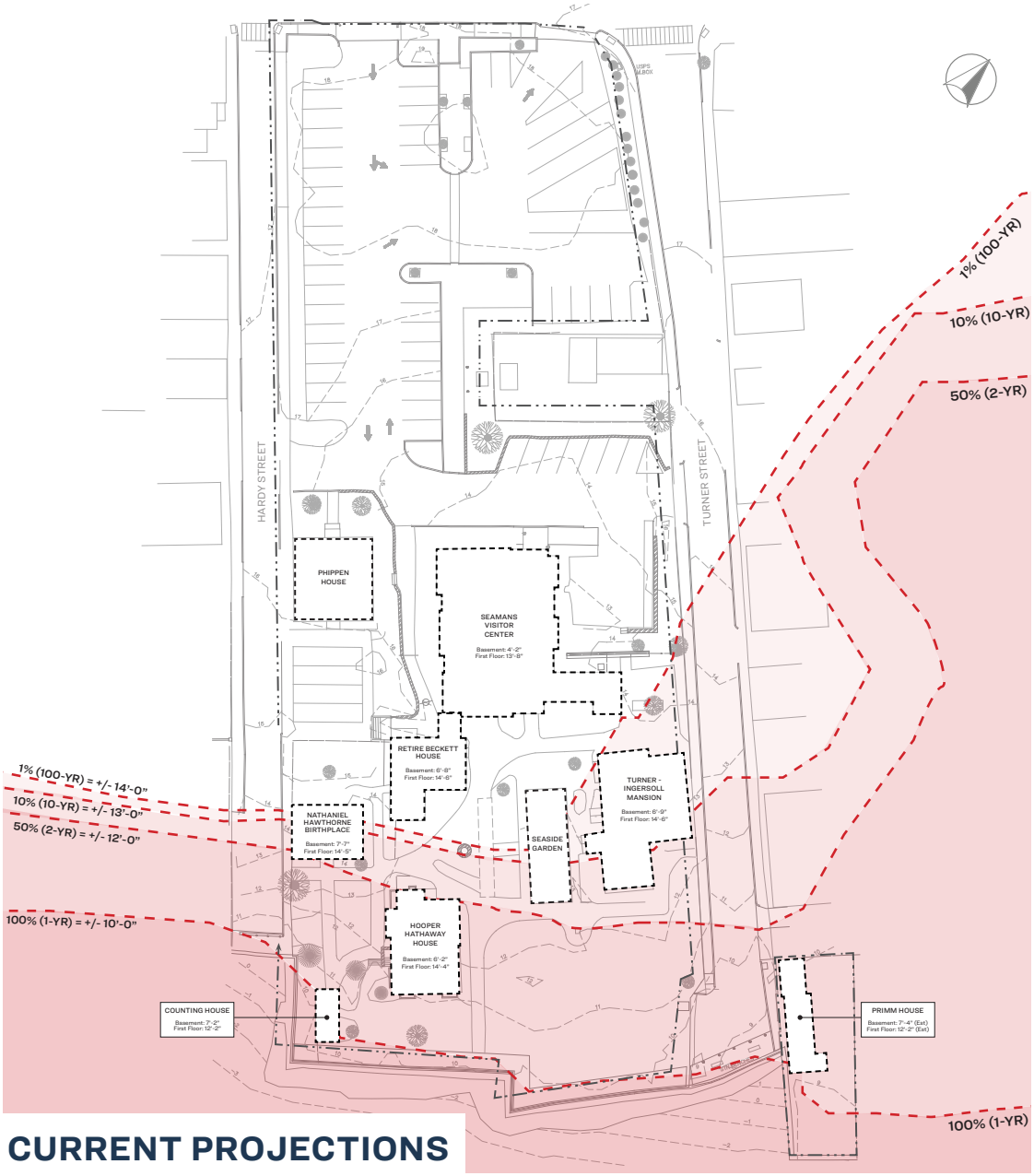


SECTION A-A AT TURNER STREET

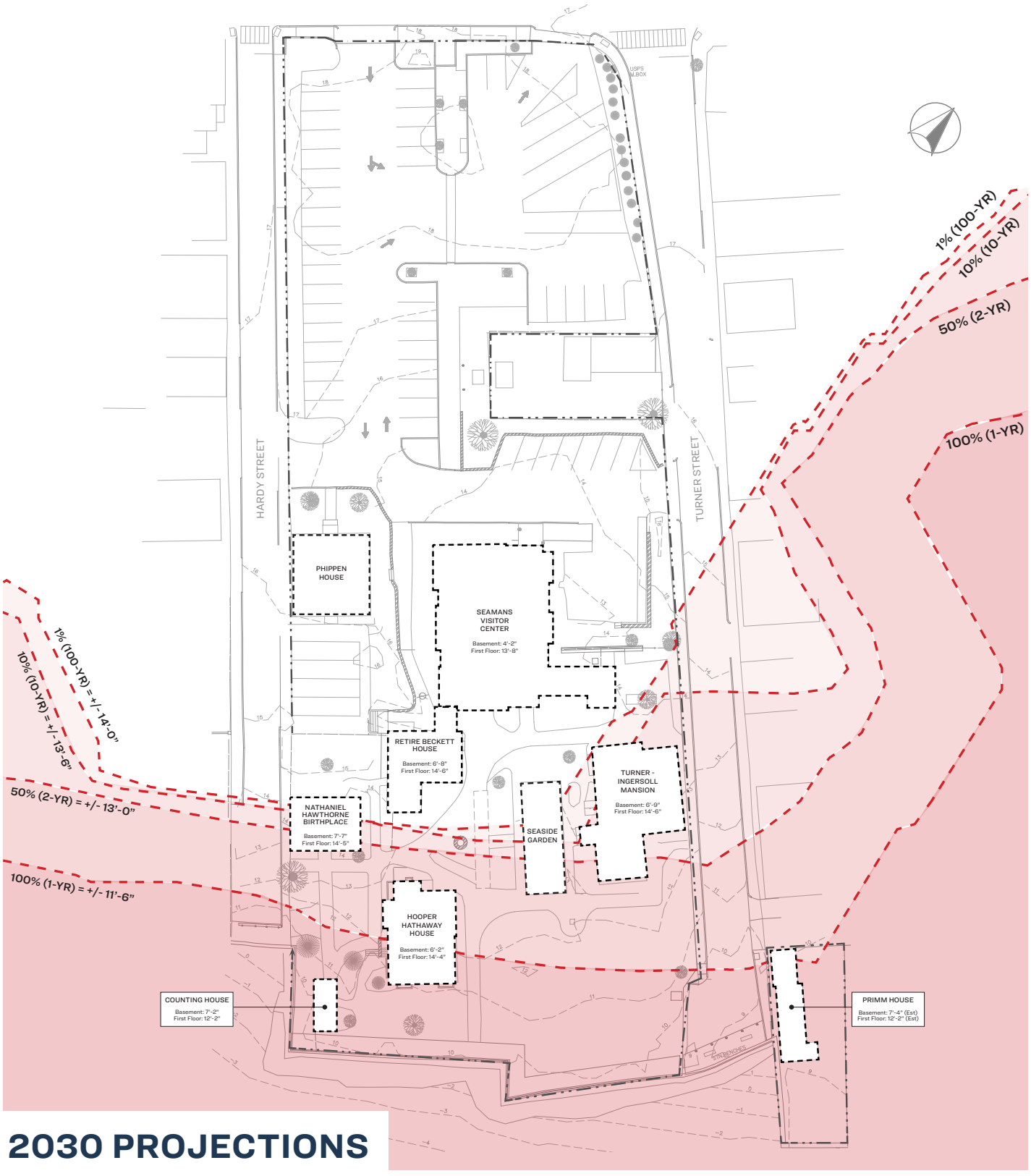
STORM & FLOOD PROBABILITY MAPPING

The data for the following maps was provided by the Massachusetts Coast Flood Risk Model (MC-FRM). They illustrate the flood risk at different points in time for different storms, so that each building's level of risk can be assessed.

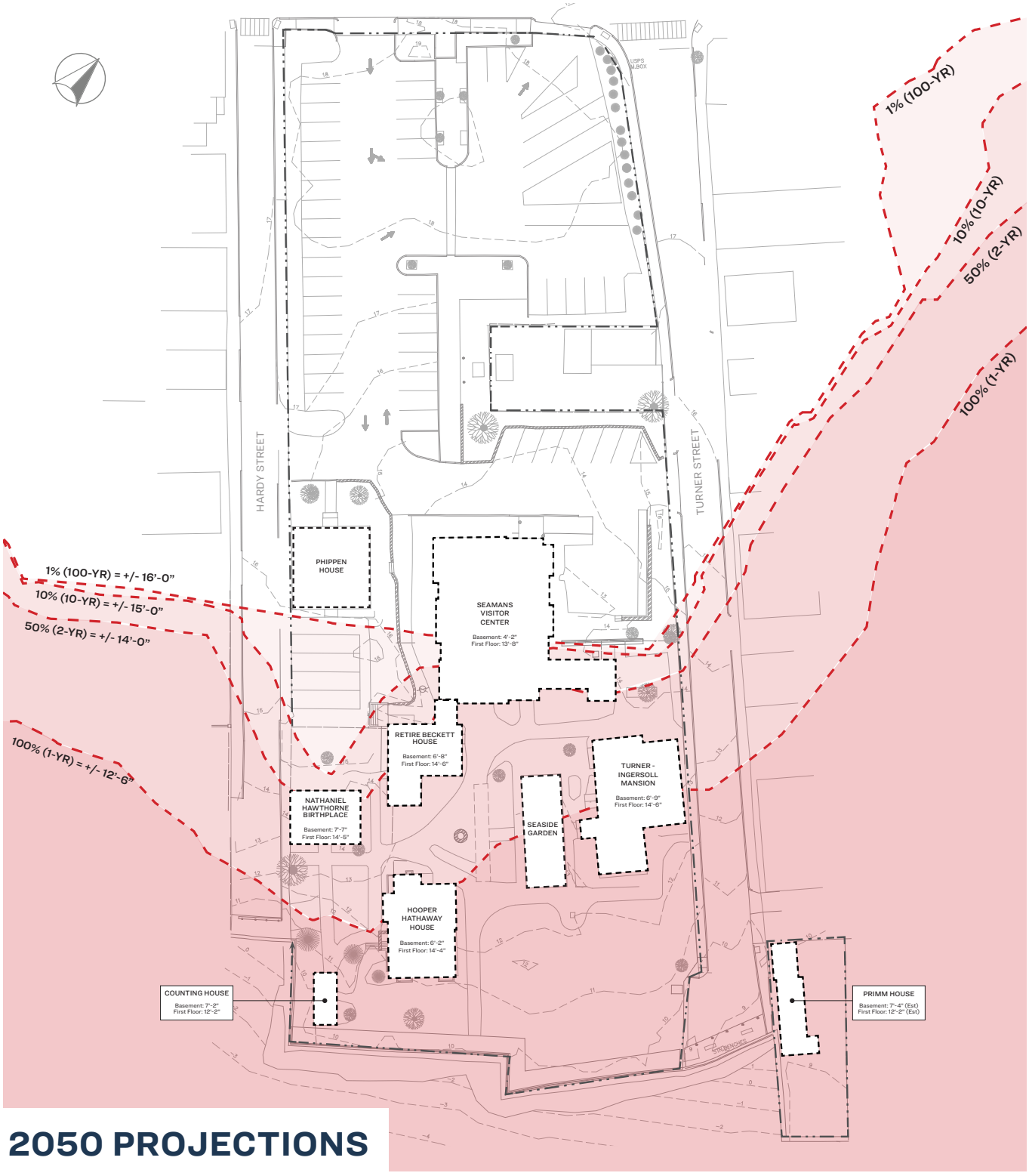
Refer to Key Terms for explanation of terminology used in these maps.



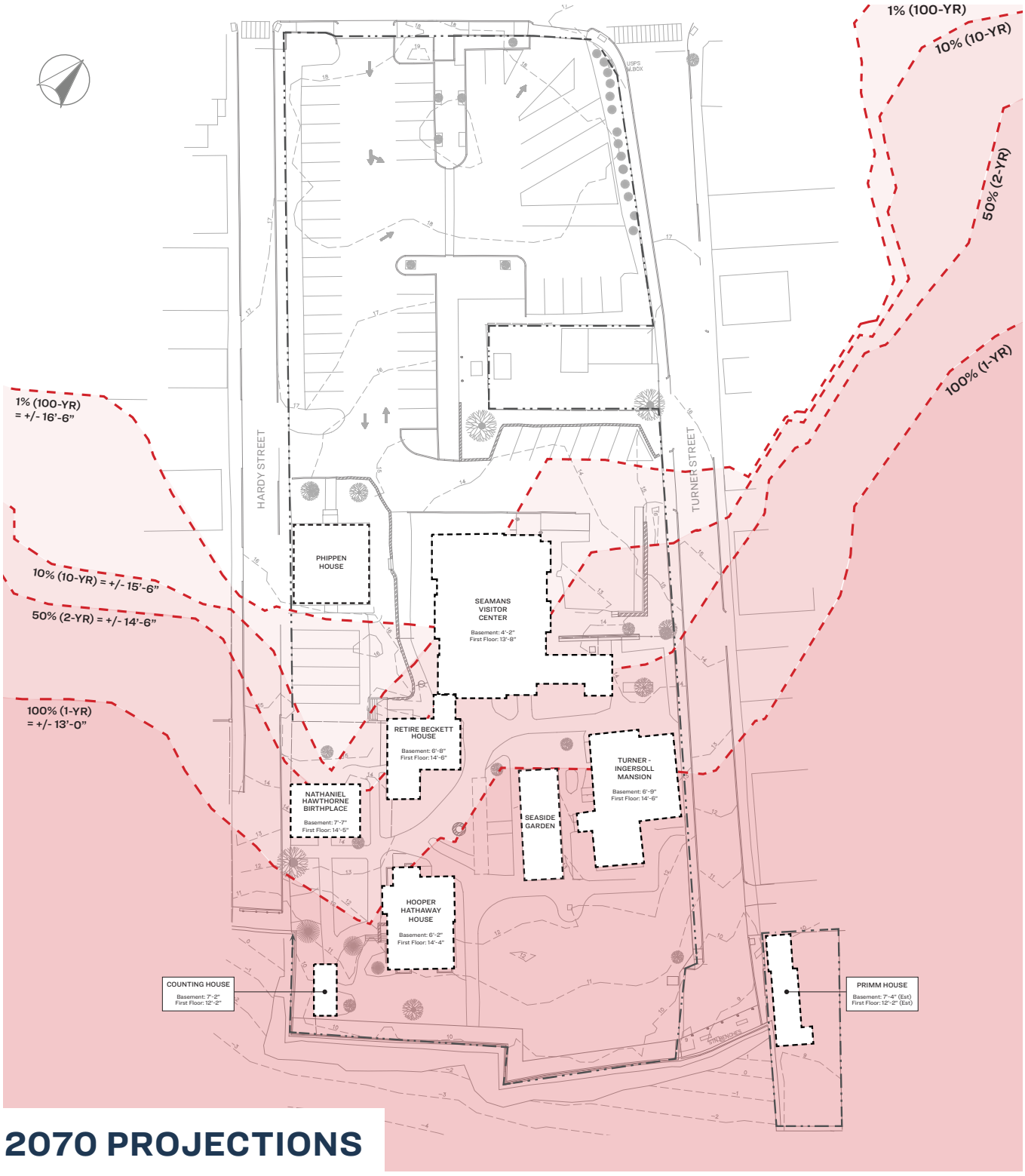
CURRENT PROJECTIONS



2030 PROJECTIONS



2050 PROJECTIONS



2070 PROJECTIONS

STORMWATER STRATEGIES

Today, most of the land use surrounding and within the House of the Seven Gables campus contributes to increasing stormwater runoff, rather than managing it at the source. The surrounding area is part of the larger fully developed downtown historic neighborhood in Salem. Both on and off-site runoff flows to the two outfalls along Turner Street and Hardy Street. These flows contribute to the strain on the larger stormwater system serving the surrounding neighborhood. The House of Seven Gables must start at the source of their stormwater problem and identify opportunities to better manage stormwater on-site to manage their portion of the larger watershed. Therefore, the Site Plan Approach recommends implementing a more site wide approach relying on GSI to move stormwater and mitigate the impacts within the Campus based on the following five stormwater strategies:

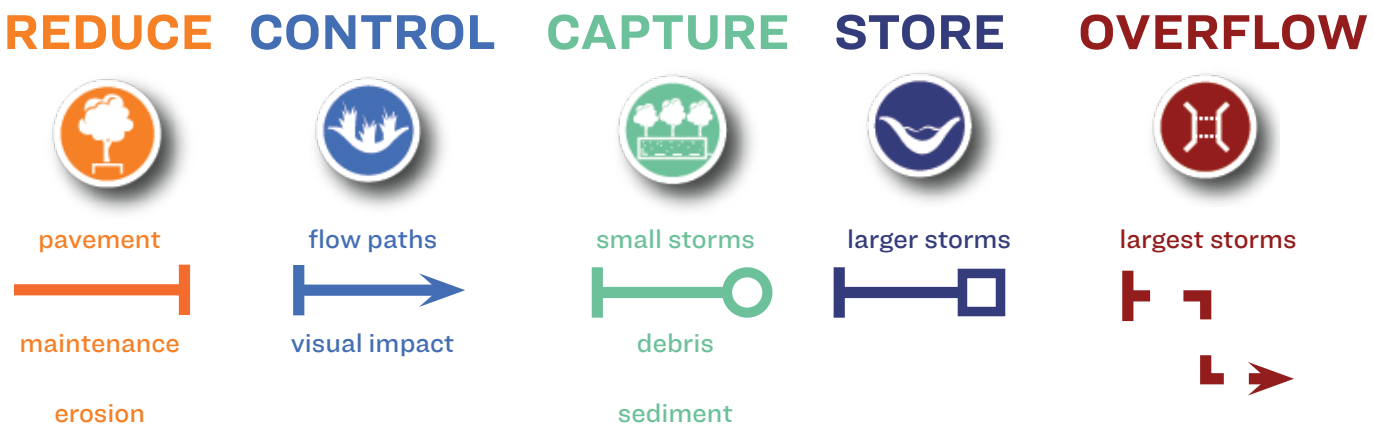
1. **REDUCE.** The first step is to reduce contributing sources of runoff and erosion. Examples include removing unnecessary paved surfaces, converting pavement to permeable surfaces and green space, stabilizing dirt and gravel surfaces, adding tree canopy, and disconnecting roof runoff where possible.

2. **CONTROL.** The next goal is to better control the stormwater runoff. Examples may include incorporating diversion techniques to interrupt long flow paths and divert runoff, or increasing the flow path and retention times with conveyance swales.

3. **CAPTURE.** Once the stormwater is better controlled, low flows should be captured as close to the contributing source as possible. Paved inlet flumes and sediment forebays can be used to direct and pre-treat stormwater prior to capturing the stormwater in rain gardens and tree trenches. The techniques can be applied to disconnect and retain small volumes of water and help reduce localized flooding impacting adjacent structures or features downhill. This is done by distributing the burden of collection across the campus.

4. **STORE.** Due to poor draining soils and a high water table, infiltration of stormwater is limited. For larger storm events, when runoff exceeds the capacity additional water must be stored until the storm subsides or high tide passes, and water can be released. Examples may include retrofitting area as detention basins, adding linear wet swales, and creating a constructed wetland.

5. **OVERFLOW.** Last, but perhaps the most important, is considering adverse impacts during the worst-case scenario, when storage systems are at capacity and the City storm drain is inundated by hight tide. It will be critical to allow water to be released from the campus by over land flow to avoid the inundation of critical infrastructure and parts of historic buildings such as basements and thresholds. Examples include integrated overland spillways, bypass structures, and pipes.



GREEN STORMWATER INFRASTRUCTURE TECHNIQUES

For each strategy, specific Green Stormwater Infrastructure (GSI) techniques are identified. GSI is a nature-based solutions to stormwater management problems often caused by urban runoff. GSI provides benefits such as beautified communities, creation of ecological habitat, and environmental sustainability and resilience.

These techniques can be applied individually or combined to create a hydrologically connected system to better manage runoff at the source and build resilience across the site with a web of interconnected solutions. These site specific techniques must also be designed with maintenance in mind. Design should include sediment forebays to provide pretreatment and to reduce maintenance burdens by capturing debris in a designated location. Pretreatment and regular maintenance will allow these stormwater systems to perform more effectively. Using a nature-based approach to stormwater management can also be an effective way to incorporate native and historically appropriate plants into the landscape, contributing to the campus's preservation and education mission.

Some Icons are incorporated into the Plan to identify the specific type of GSI technique and their proposed locations within the campus. While some of the options listed are available as tools in the "stormwater toolbox", some are not used on this site in lieu of a more amenable option based on the considerations including current and future site configuration, groundwater, and adaptability. These options are still listed as future conditions and consideration may change which would make these options more favorable.

A STORMWATER TOOLBOX

A comprehensive approach to stormwater management will often require multiple solutions integrated systematically to filter and treat stormwater at or near where it falls. These systems, called Green Stormwater Infrastructure (GSI), can be thought of as a "stormwater toolbox" with components that can be combined to treat any number of stormwater concerns.

To successfully integrate GSI at The House of Seven Gables Campus, a variety of techniques should be employed. The following pages illustrate a suite of recommended techniques, their function, and site-specific opportunities for integration into the campus. Icons are used as a quick reference and to demonstrate where these techniques can be applied.

In many instances, the best GSI solution for a site may include multiple techniques designed as a system to provide multi-functional campus-wide benefits.

Consistent with the overall stormwater approach, the techniques available in the "stormwater toolbox" are categorized by five defined strategies further described in the next section:

1. **REDUCE**
2. **CONTROL.**
3. **CAPTURE.**
4. **STORE.**
5. **OVERFLOW.**

Beyond providing tangible solutions, the stormwater toolbox also helps to simplify the stormwater management design into a more manageable system. Each of these defined strategies have techniques that can be implemented during the near, mid, or long-term plans for the campus. As options are explored and stormwater control measures are implemented on a site-specific basis during different phases of the campus's future planning and programming, over time we will create a web of water smart spaces which reduce, control, capture, store and overflow stormwater more efficiently. To that end, prior to beginning each project, the House of Seven Gables Campus staff should meet to discuss the stormwater goals, strategies, techniques, maintenance responsibilities, and expectations in the current state. Identifying the site context can also provide valuable information about existing or future uses and considerations for the implementation of GSI. Some techniques may be better suited for a specific location or site context than others.

Finally, a thorough site analysis prior to implementation should be completed to ensure that the GSI is properly applied, mimics the natural environment, functions as designed, minimizes maintenance burdens and, perhaps most importantly, respects the historic landscape of the campus.

REDUCE

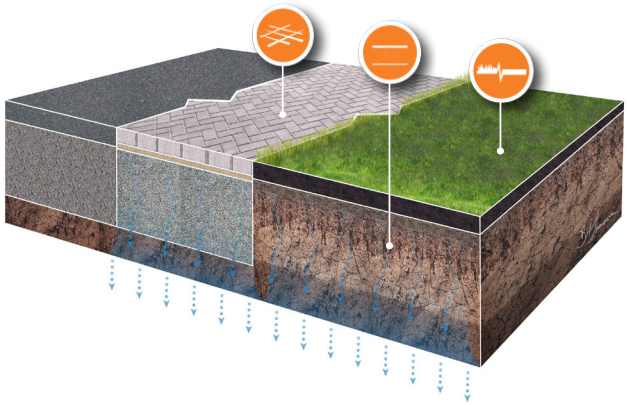
Reduces sources of stormwater runoff and erosion. Remove, convert, stabilize, and disconnect.

PAVEMENT REMOVAL is the ideal option when looking for stormwater solutions. By removing pavement, impervious cover within the stormwater watershed is reduced and therefore less rain accumulates at the low point. The House of Seven Gables long term site plan reduces impervious area on-site that would concentrate stormwater runoff.

PERMEABLE PAVEMENT / PAVERS are the next best option. In high-traffic areas where space is in high demand for a variety of intense uses, permeable pavement or pavers can alleviate the total burden by allowing a portion of stormwater to percolate into the soil profile below. The House of Seven Gables campus provides many opportunities along walkways for stormwater control and reduction of runoff on-site.

RAIN BARRELS collect and store small amounts of stormwater from a controlled source. Rain barrels are perfect for disconnecting rooftops. Incorporating Rain Barrels where gutter downspouts currently exist on historic buildings provides an easy opportunity for improvements in small storm evens.

MATURE CANOPY TREES are often undervalued as a GSI technique. A robust tree canopy helps reduce erosion caused by falling rain, and provide surfaces area where rain water lands and evaporates. Tree roots can also take up water and help create conditions in the soil that promote infiltration.



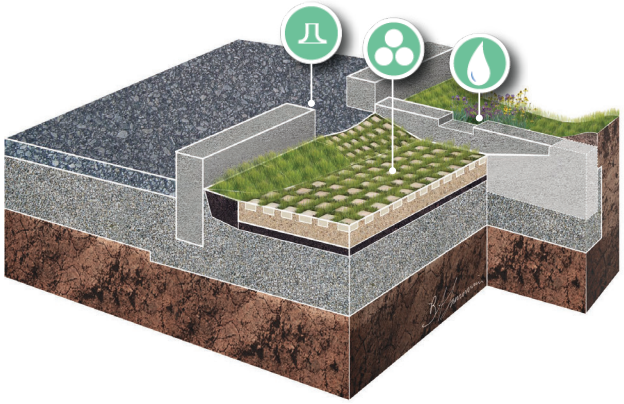
CAPTURE

Captures and cleans stormwater close to its source. Collect, retain, and filter.

PAVED INLET FLUME intercept stormwater from paved surfaces and direct the runoff into a sediment forebay or storage area. Paved inlet flumes are most compatible with surface-level GSI options.

SEDIMENT FOREBAY is designed to capture sediment and debris before directing stormwater into the next component of the stormwater management. Sediment forebays are important to isolate maintenance efforts and reduce potential eyesores.

STORMWATER TREE TRENCH can be designed to capture small amounts of stormwater both at or below the surface for infiltration and tree root uptake. Stormwater tree trenches may be viable at higher elevations on campus where groundwater separation is more sufficient for healthy tree growth.



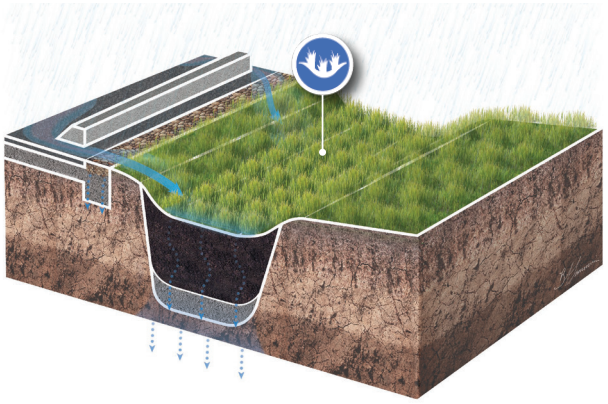
RAIN GARDEN is often a simple, shallow depression in the landscape, providing limited storage and promoting positive drainage. Rain gardens implemented on-site at the House of Seven Gables Campus could capture rain close to contributing sources like buildings and parking areas, disconnecting accumulating stormwater runoff during smaller storm events.

CONTROL

Controls and moves the stormwater runoff. Divert, interrupt, slow, and convey.

MOUNTABLE CURB is a dual-function technique designed to allow vehicular access up and over the curb while also maintaining the gutter line. Mountable curbs may be used along the campus perimeter streets to control off-campus runoff.

LIVING SHORELINE / NATURAL BARRIER is a dual-function technique designed to allow vehicular access up and over the curb while also maintaining the gutter line. Mountable curbs may be used along the campus perimeter streets to control off-campus runoff.

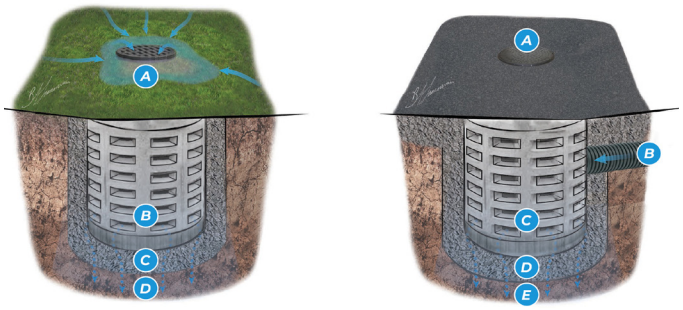


VEGETATED SWALE is a linear landscape that conveys stormwater. The planted channel not only moves stormwater, but can also add ornamental beauty and an environmental habitat. Vegetated swales are best used where ample space is available.

STORE

Stores stormwater intentionally for future release. Detain, infiltrate, and disperse.

DRY WELL a storage structure option that is designed to collect stormwater and infiltrate in a small area of the campus. The principal function is similar to an infiltration basin but within a smaller footprint and scale.



DETENTION/INFILTRATION BASIN is a storage technique that is designed to temporarily hold and infiltrate (when possible) excess water during larger rain events and high tides. The principal function is to disperse stormwater storage and reduce the flooding in critical areas that are looking for more resilience. Subsurface basins could be critical in providing storage for drainage from lawn areas or existing infrastructure that would otherwise be overwhelmed in larger events.

OVERFLOW

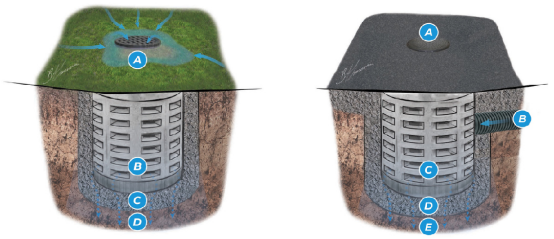
Release stormwater by controlled overland flow. Direct, bypass, and control.

SPILLWAYS are surface features located to release detained stormwater from the site. A spillway is a surface technique to move stormwater from the campus in a controlled manner.

STRUCTURES & PIPES allows stormwater to be moved below ground and discharged to an outlet. Found throughout the watershed, pipes and structures can serve as the primary overflow mechanism when low tide allows discharge at the outfall.

BOARDWALKS permit surface flow of stormwater underneath pathways. They can be used to provide surface overflow from one area to another while maintaining pedestrian and vehicular circulation paths.

LANDSCAPE & SITE STRATEGIES

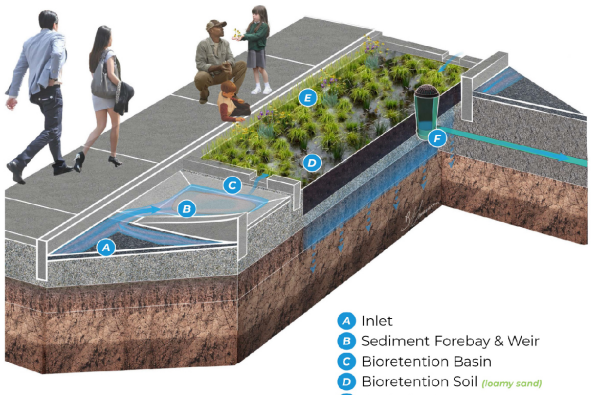


A Crate set higher than Shallow Depression
B Dry Well *(Perforated Structures)*
C Washed Stone
D Approved Subsoils

A Cover
B Inlet Pipe *(from deep sump catch basin)*
C Dry Well *(Perforated Structures)*
D Washed Stone
E Approved Subsoils

DRY WELL

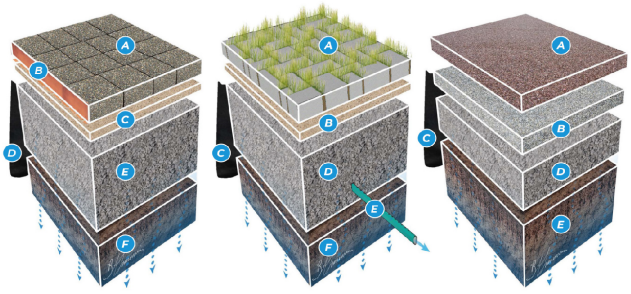
A drywell is a storage structure option that is designed to collect stormwater and infiltrate in a small area of the campus. The principal function is similar to an infiltration basin but within a smaller footprint and scale.



A Inlet
B Sediment Forebay & Weir
C Bioretention Basin
D Bioretention Soil *(loamy sand)*
E Vertical Edge *(curb)*
F Overflow Structure

BIORETENTION

Bioretention areas are often a simple, shallow depression in the landscape, providing limited storage and promoting positive drainage. Bioretention Areas implemented on-site at the House of Seven Gables Campus could capture rain close to contributing sources like buildings and parking areas, disconnecting accumulating stormwater runoff during smaller storm events.



A Pervious Pavers
B Edging *(Per Manufacturer)*
C Bedding Course
D Filter Fabric *(Sidewalls Only)*
E Gravel Reservoir
F Approved Subsoil

A Grass Pavers
B Bedding Course
C Filter Fabric *(Sidewalls Only)*
D Gravel Reservoir
E Perforated Underdrain
F Approved Subsoil

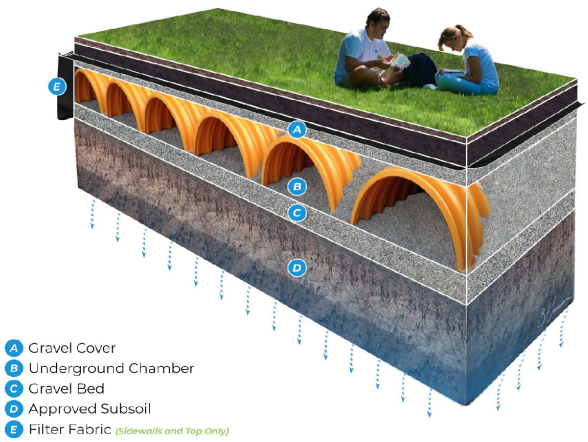
A Porous Pavement
B Choker Course
C Filter Fabric *(Sidewalls Only)*
D Filter Course
E Approved Subsoil

PERMEABLE PAVEMENT/ PAVERS

In high-traffic areas where space is in high demand for a variety of intense uses, permeable pavement or pavers can alleviate the total burden by allowing a portion of stormwater to percolate into the soil profile below. The House of Seven Gables campus provides many opportunities along walkways for stormwater control and reduction of runoff on-site.

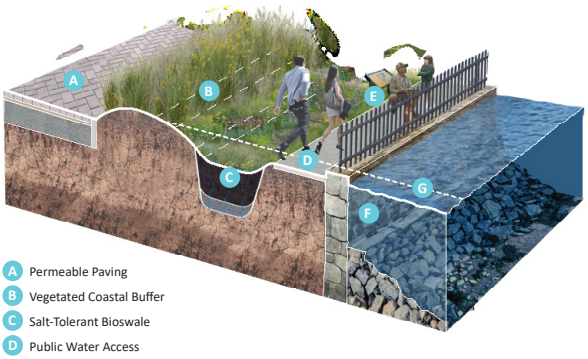
STORMWATER TREE TRENCH

Stormwater tree trenches can be designed to capture small amounts of stormwater both at or below the surface for infiltration and tree toot uptake. Stormwater tree trenches may be viable at higher elevations on campus where groundwater separation is more sufficient for healthy tree growth.



SUBSURFACE STORAGE/ INFILTRATION CHAMBERS

Subsurface storage and infiltration chambers is a storage technique that is designed to temporarily hold and infiltrate (when possible) excess water during larger rain events and high tides. The principal function is to disperse stormwater storage and reduce the flooding in critical areas that are looking for more resilience. Subsurface basins could be critical in providing storage for drainage from lawn areas or existing infrastructure that would otherwise be overwhelmed in larger events.



LIVING SHORELINE/ NATURAL BARRIERS

Living shorelines and natural barriers are a dual-function technique designed to allow vehicular access up and over the curb while also maintaining the gutter line. Mountable curbs may be used along the campus perimeter streets to control off-campus runoff.

BUILDING STRATEGIES

Temporary and permanent adaptation strategies to shape the future for the gables campus.

The strategies presented will involve a range of options, some of which are worth considering for implementation across the entire House of the Seven Gables campus and others of which are appropriate for implementation at individual buildings. See the adaptation strategies and their icons on the right.

TEMPORARY BUILDING ADAPTATION MEASURES


FLOODGATES


SANDBAGS


BUILDING WRAP

PERMANENT BUILDING ADAPTATION & RESILIENCY MEASURES


BUILDING SUBSURFACE DRAINAGE SYSTEMS


PROTECTING UTILITIES & POWER


DRY FLOODPROOFING


WET FLOODPROOFING


FILLING THE BASEMENT


ABANDONING THE LOWEST FLOOR


ELEVATING THE INTERIOR


ELEVATING THE STRUCTURE


BUILDING RELOCATION

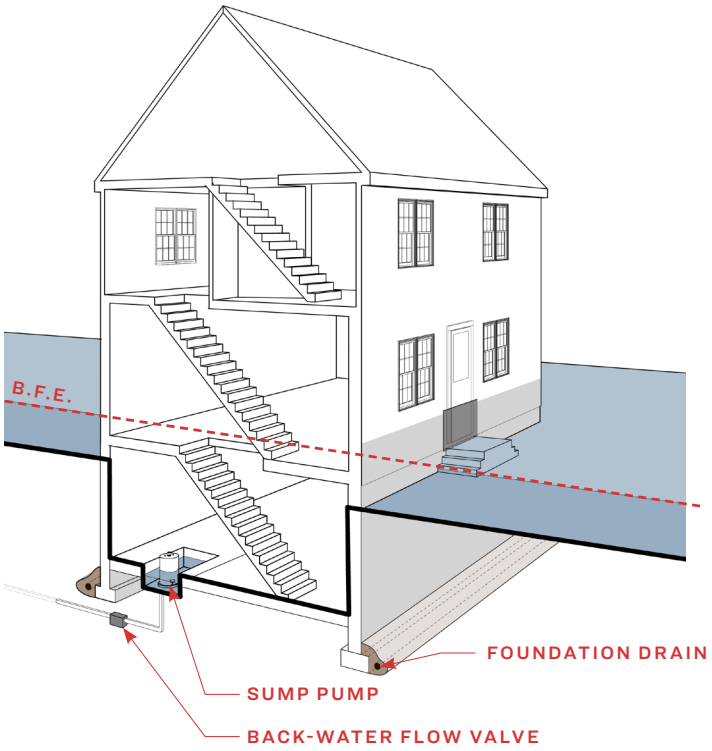

IMPROVING BUILDING ENERGY EFFICIENCY


STORMWATER MANAGEMENT


LANDSCAPE & SITE ADAPTATION

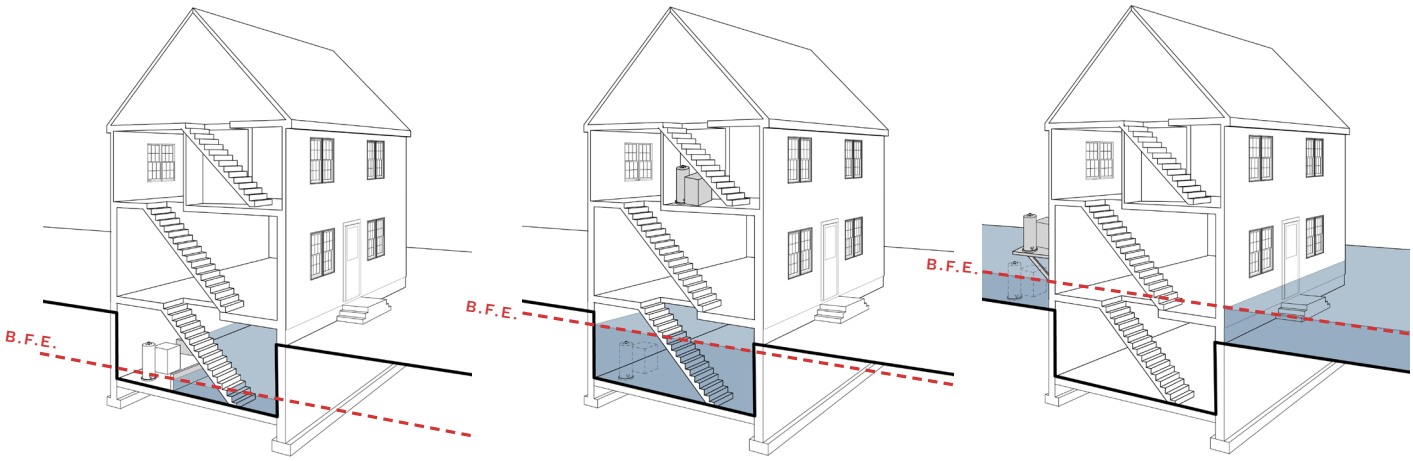
BUILDING SUBSURFACE DRAINAGE SYSTEMS

HELP ELIMINATE EXCESS HYDROSTATIC LOADS.



PROTECTING UTILITIES & POWER

PROTECT SENSITIVE BUILDING SYSTEMS FROM WATER.



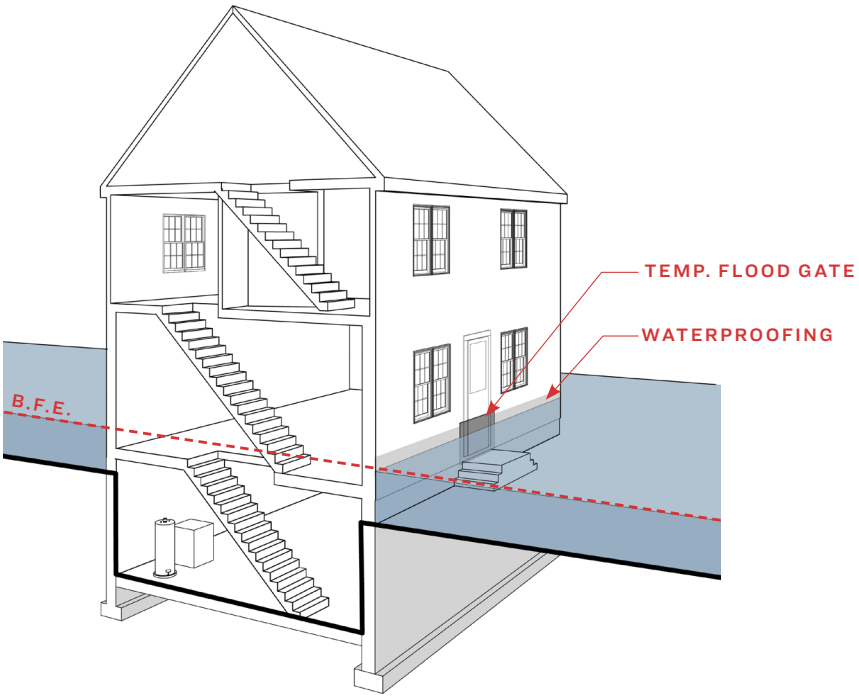
DRY FLOODPROOF UTILITIES

RELOCATE INTERIOR UTILITIES

RELOCATE EXTERIOR UTILITIES

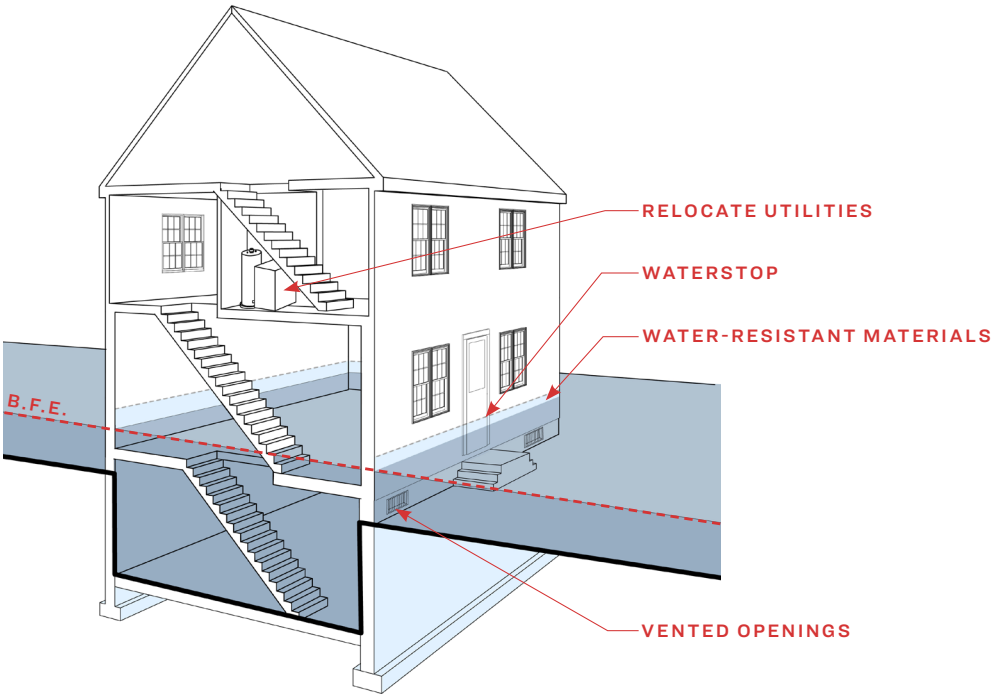
DRY FLOODPROOFING

KEEP ALL WATER OUT OF THE BUILDING OR STRUCTURE



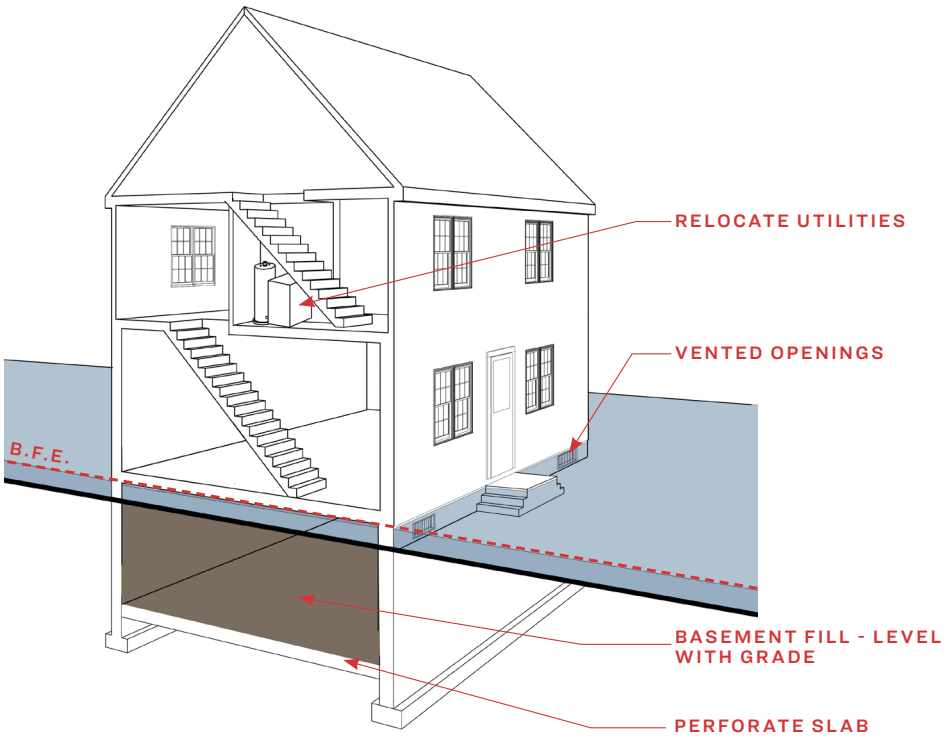
WET FLOODPROOFING

ALLOW WATER TO ENTER STRUCTURE IN A CONTROLLED WAY



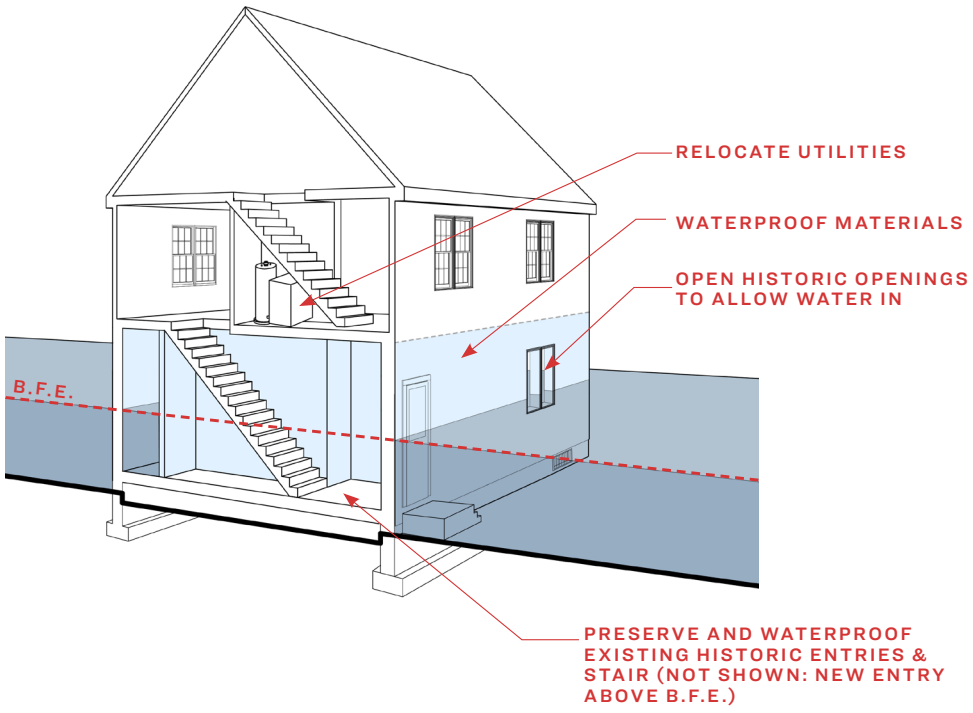
FILLING THE BASEMENT

INFILL THE EXISTING BASEMENT AND ALLOW TO FILL WITH WATER DURING FLOODING EVENTS



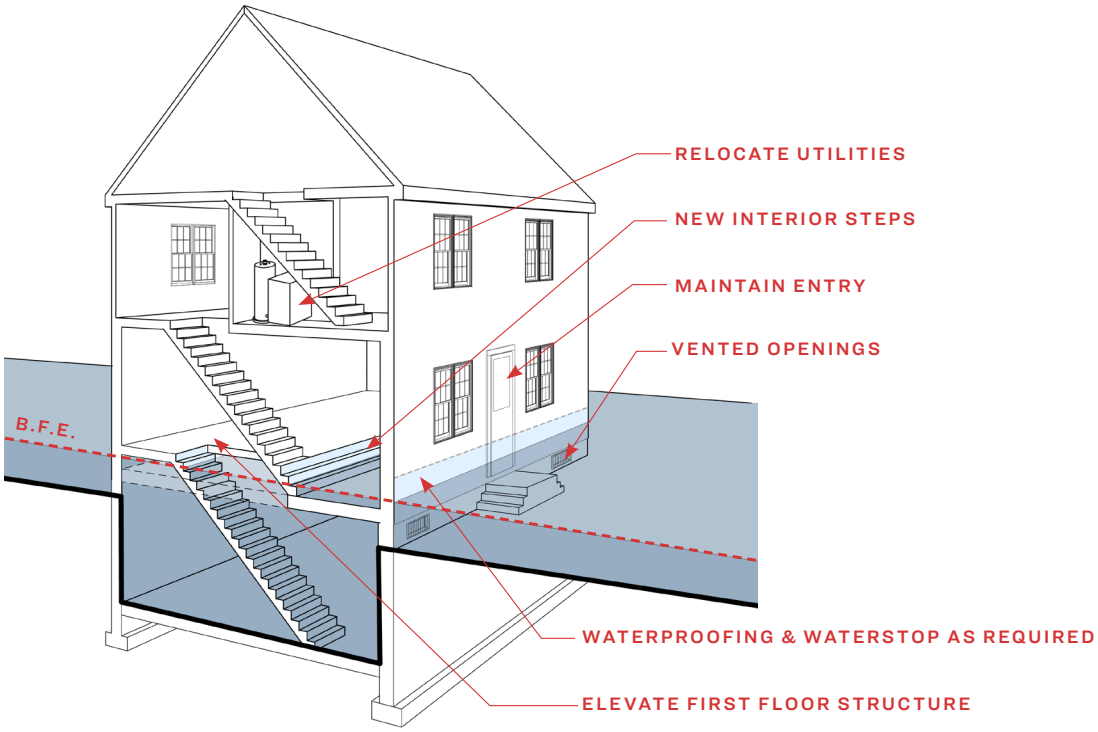
ABANDONING THE LOWEST FLOOR

RELOCATE ALL SENSITIVE PROGRAM FROM THE LOWEST FLOOR TO PROTECT FROM FLOODING.



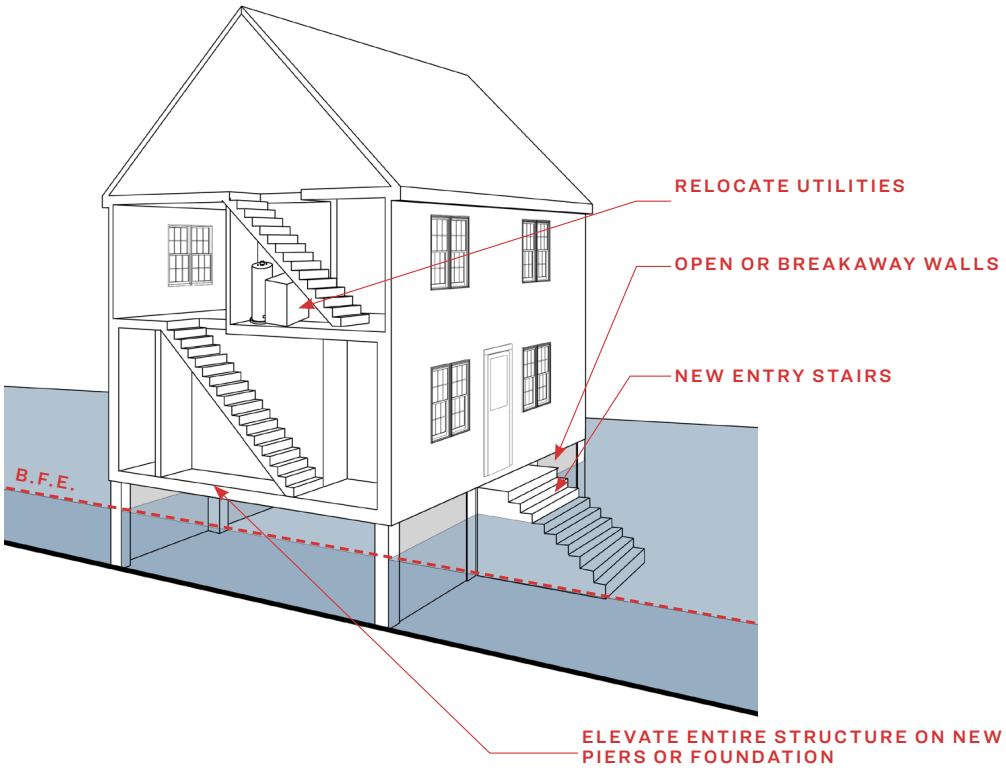
ELEVATING THE INTERIOR

MAINTAIN THE FACADE + ORIGINAL ENTRY WHILE PROTECTING THE FIRST FLOOR FROM FLOODING.



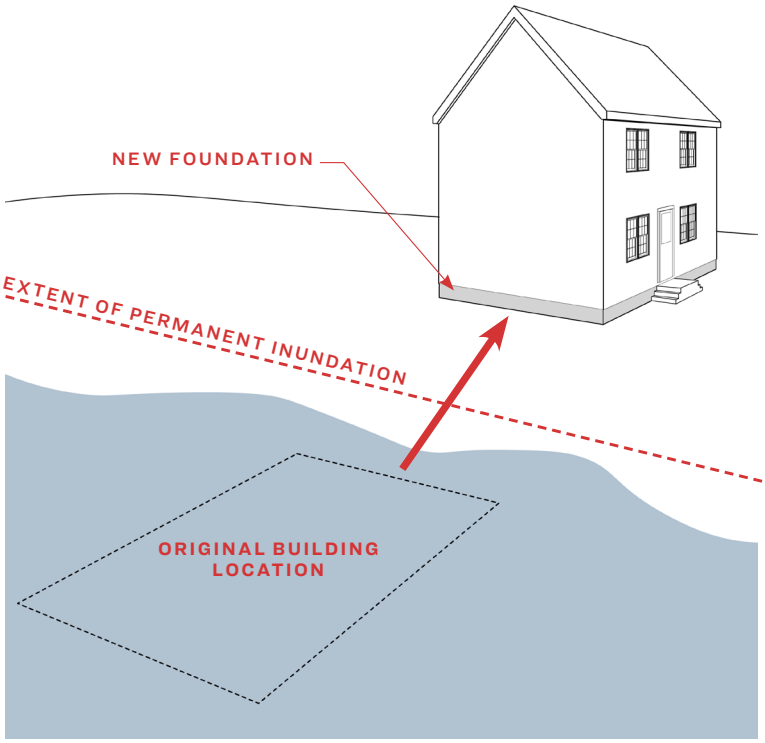
ELEVATING THE STRUCTURE

LIFT THE BUILDING TO REDUCE OR ELIMINATE FLOOD EXPOSURE.



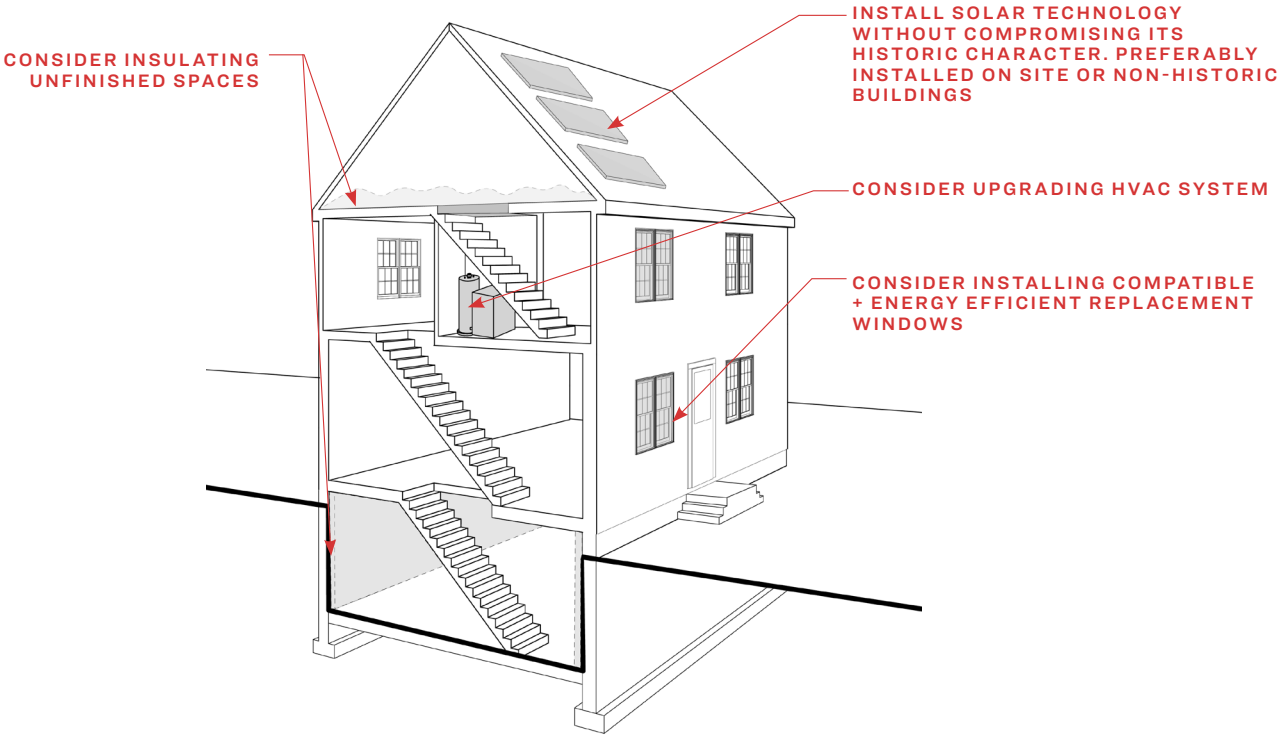
BUILDING RELOCATION

PROTECT THE BUILDING BY MOVING IT ENTIRELY OUT OF THE FLOOD RISK AREA



IMPROVING BUILDING ENERGY EFFICIENCY

CONSIDER ENERGY EFFICIENCY IMPROVEMENTS TO ENHANCE THE SUSTAINABILITY OF THE BUILDING.



EVALUATION OF BUILDING ADAPTATION STRATEGIES

Not all strategies are mutually compatible or immediately applicable for implementation in the historic Gables campus. Some adaptation strategies were considered but ultimately not implemented in the phased masterplan of the House of the Seven Gables campus.

If a strategy was not proposed to be implemented, it was because it did not comply with the identified National Park Service guidelines (see figure below) which focuses on being an appropriate, feasible and affordable strategy that reduces the risk of flooding but maintaining the building or campus its historic character.

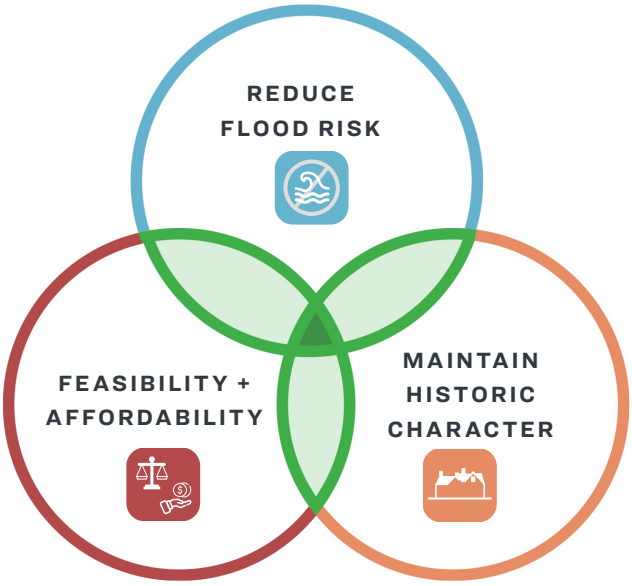


Figure 1 - Adopted from National Park Service

TEMPORARY BUILDING ADAPTATION MEASURES

- FLOODGATES
- SANDBAGS
- BUILDING WRAP

PERMANENT BUILDING ADAPTATION & RESILIENCY MEASURES

- BUILDING SUBSURFACE DRAINAGE SYSTEMS
- PROTECTING UTILITIES & POWER
- DRY FLOODPROOFING
- WET FLOODPROOFING
- FILLING THE BASEMENT
- ABANDONING THE LOWEST FLOOR
- ELEVATING THE INTERIOR
- ELEVATING THE STRUCTURE
- BUILDING RELOCATION
- IMPROVING BUILDING ENERGY EFFICIENCY
- STORMWATER MANAGEMENT
- LANDSCAPE & SITE ADAPTATION

The following chart was used by the team to help evaluate the applicability of strategies for buildings within the House of the Seven Gables campus. These evaluations later helped determine the interplay of site and infrastructure adaptation measures alongside the building adaptation measures against a timeline of risks and data.

EXAMPLE EVALUATION CHART FOR A SINGLE BUILDING:

STRATEGY	FEASIBLE + AFFORDABLE	REDUCE FLOOD RISK	KEEP HISTORIC CHARACTER
Temporary Measures	● ● ●	● ○ ○	● ● ●
Stormwater Management	● ● ●	● ○ ○	● ● ○
Building Subsurface Drainage Systems	● ● ○	● ○ ○	● ● ○
Protecting Utilities	● ● ●	○ ○ ○	● ● ●
Dry Floodproofing	● ● ○	● ● ○	● ● ○
Wet Floodproofing	● ○ ○	● ● ○	● ○ ○
Fill the Basement	○ ○ ○	● ○ ○	● ○ ○
Abandoning the Lowest Floor	● ○ ○	● ● ○	● ○ ○
Elevating the Interior	● ○ ○	● ● ○	● ● ●
Elevating the Exterior	● ○ ○	● ● ●	● ○ ○
Building Relocation	○ ○ ○	● ● ●	● ○ ○
Improving Building Energy-Efficiency	● ● ●	○ ○ ○	● ● ○
Landscape & Site Adaptation	● ● ○	● ● ●	● ● ○

LEVEL OF APPLICABILITY:

HIGH ● ● ● MEDIUM ● ● ○ LOW ● ○ ○ NONE ○ ○ ○


BRIDGE ST
3RD ST

SECTION 3

Strategic Vision, Timeline & Triggers

Integrating collected scientific data points and probable timelines with environmental prompts or “triggers” as moments of action serves as a critical road map for the House of the Seven Gables Association. It not only provides a considered framework of action steps but also guides prioritization efforts, ensuring a coordinated approach to safeguarding the campus and delineating crucial phasing and next steps.

PROJECT TEAM CHARETTES

Stakeholders and team members collaborated to address challenges and solutions for the House of Seven Gables campus. Key participants included architectural team from Union, engineers from Horsley Witten Group and Collins Engineers, and representatives from the House of Seven Gables, Coastal Zone Management, and Salem Sound Coastwatch.

The first charette working session, 4.26.23. Photo by HSG.

The first charette working session, 4.26.23. Photo by Union.

FIRST CHARETTE (APRIL 26, 2023):

- **Public Session:** Presentations on site conditions and project goals by House of the Seven Gables, Union, Horsley Witten Group, and Collins Engineers.
- **Working Session:** Project team discussed flood risks, stormwater movement, and potential interventions using diagrams and magnetized site maps. Stakeholders shared preliminary ideas for protecting buildings and mitigating issues. Design teams gained direction for developing adaptation strategies.

SECOND CHARETTE (JANUARY 26, 2024):

- Horsley Witten Group gave an update on the groundwater data and reviewed the flood risk model.
- Union proposed two site plans with phased relocation of historic buildings and new structures to support museum operations.
- Museum staff provided feedback and future campus direction.
- Collins updated on seawall improvements.

Following the charettes, the next steps for the project teams involved refining and implementing the strategies discussed. Ongoing collaboration with stakeholders has ensured that all proposed measures align with the museum's long-term vision and operational needs.

The first charette working session, 4.26.23. Photos by Union.

The second charette working session, 1.26.24. Photo by Union.

DEVELOPING THE STRATEGIC VISION

During the charette, comprehensive charts were used to document and sequence adaptation strategies discussed for each building and the overall site. These charts played a crucial role in organizing the gathered data, ensuring that all considerations were addressed.

The chart, shown on the next page, provides a thorough overview of all the contributing buildings. It includes a timeline that highlights potential storm flooding events and projects the anticipated rise in groundwater levels. This projection is particularly critical, as it identifies the specific periods when water levels are expected to infiltrate the basements of the buildings.

STRATEGIC IMPLICATIONS

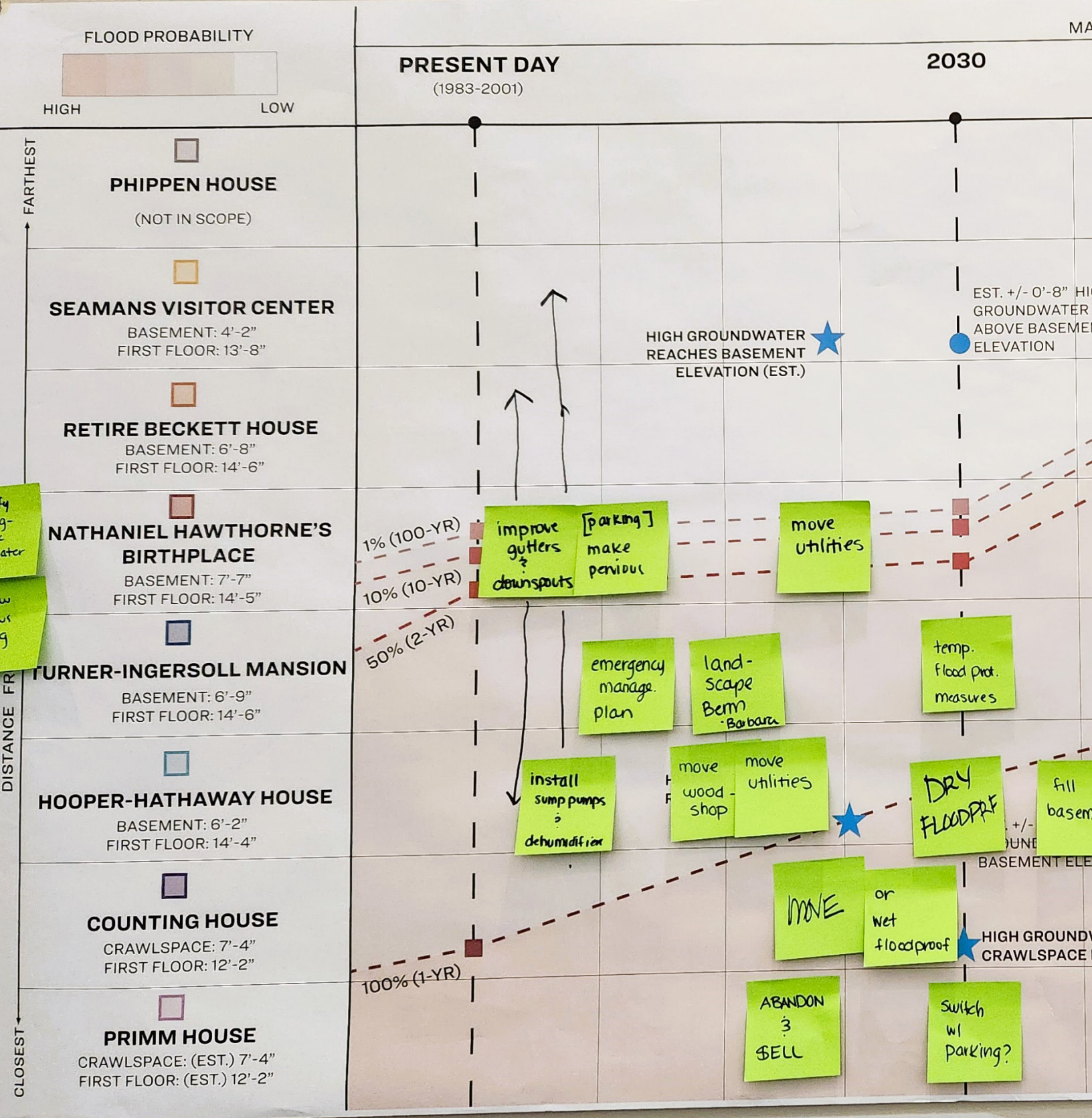
This chart served multiple purposes:

- **Risk Assessment:** By predicting when and where flooding might occur, the chart enabled the project team to assess the risk levels for each building.
- **Prioritization of Interventions:** The timeline helped determine the urgency and sequence of implementing adaptation strategies. Buildings most at risk were prioritized to ensure timely protective measures.
- **Phased Masterplan Development:** The insights gained from the chart helped with creating the phased masterplan for the House of the Seven Gables Campus. This masterplan outlines a structured approach to implementing the adaptation strategies over time, ensuring a manageable and sustainable progression.

From there a road map was developed which outlines the major action steps included in the adaptation masterplan. These steps specify the buildings or areas of focus, the strategies to be implemented, and the trigger points (highlighted in red) that justify the timing of each action. This road map not only provides a structured schedule of actions but also guides prioritization efforts, ensuring a coordinated approach to safeguarding the campus and detailing crucial phases and next steps.

The previously discussed projection maps, groundwater profiles, and existing condition studies of the buildings, site, and seawall have been considered when determining trigger points and action steps for the Gables campus.

Note: *The road map is subject to change, as the data used to identify trigger points and actions are based on projections. Given the unpredictability of climate conditions, flooding, and storms, adjustments may be necessary.*



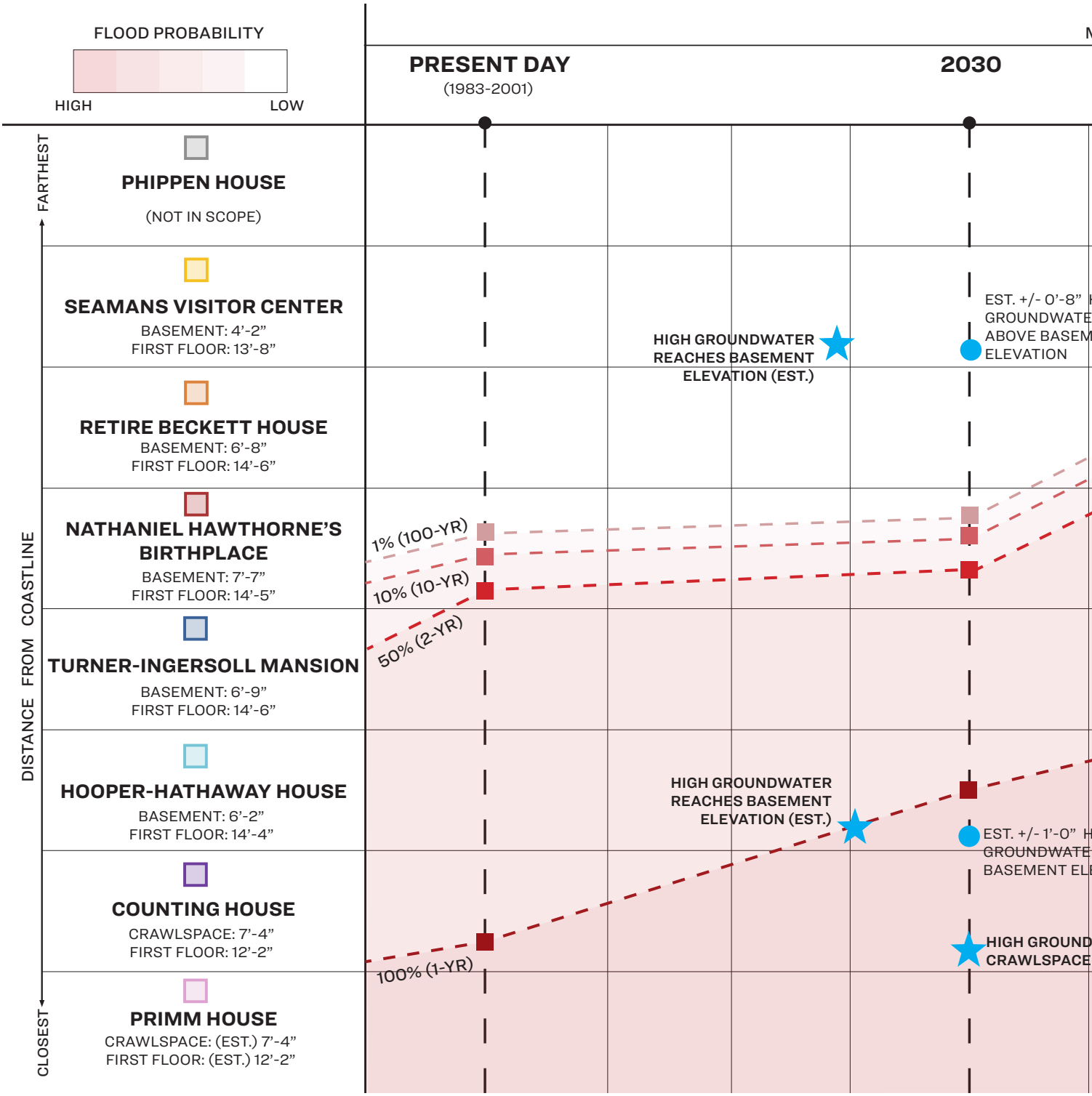
PRIMM

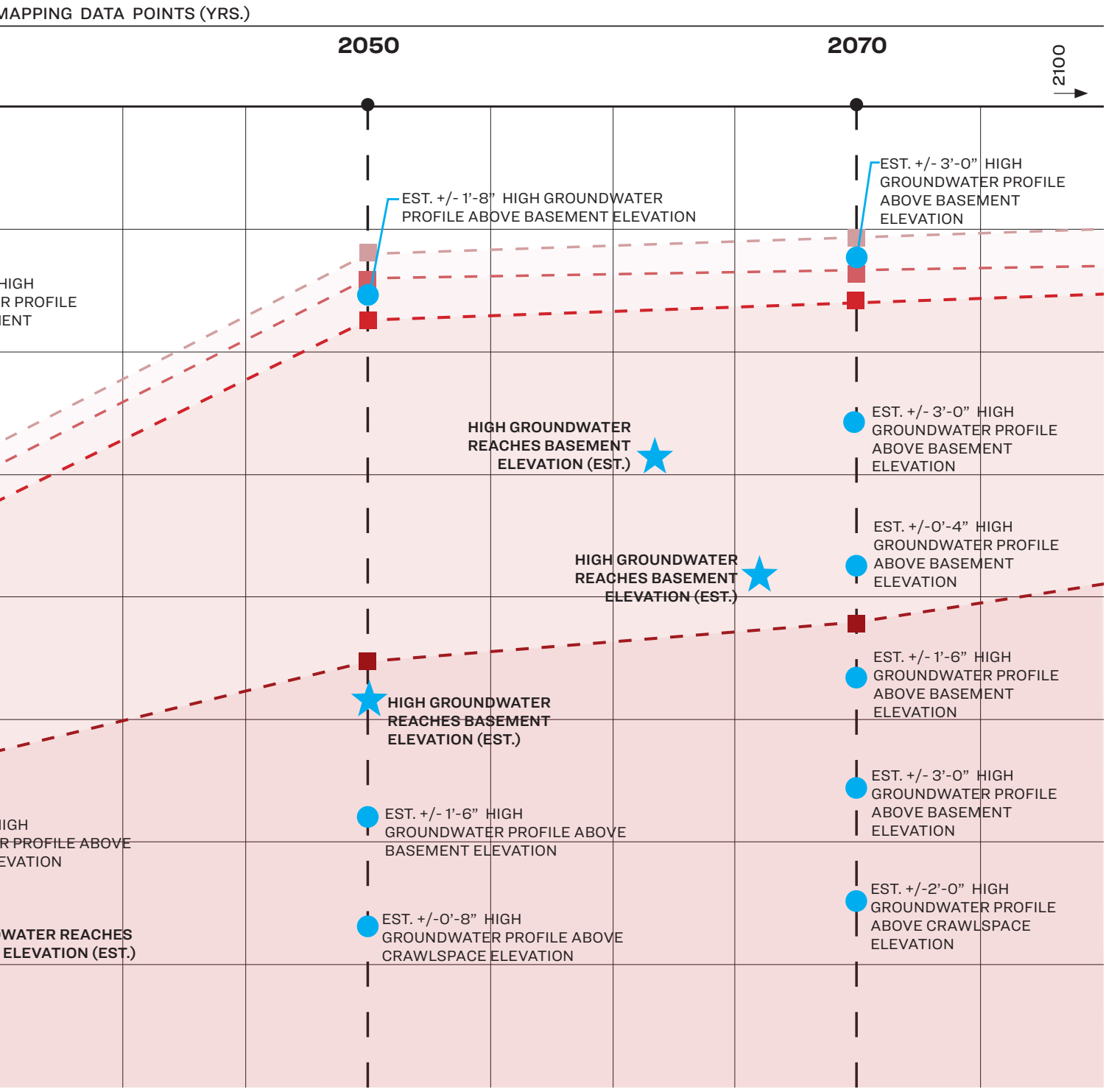
- NOT OF HIGHEST CONCERN

★ WET FLOODPROOFING, FOR ANY BLDG LIKELY NOT USEFUL

COUNTING

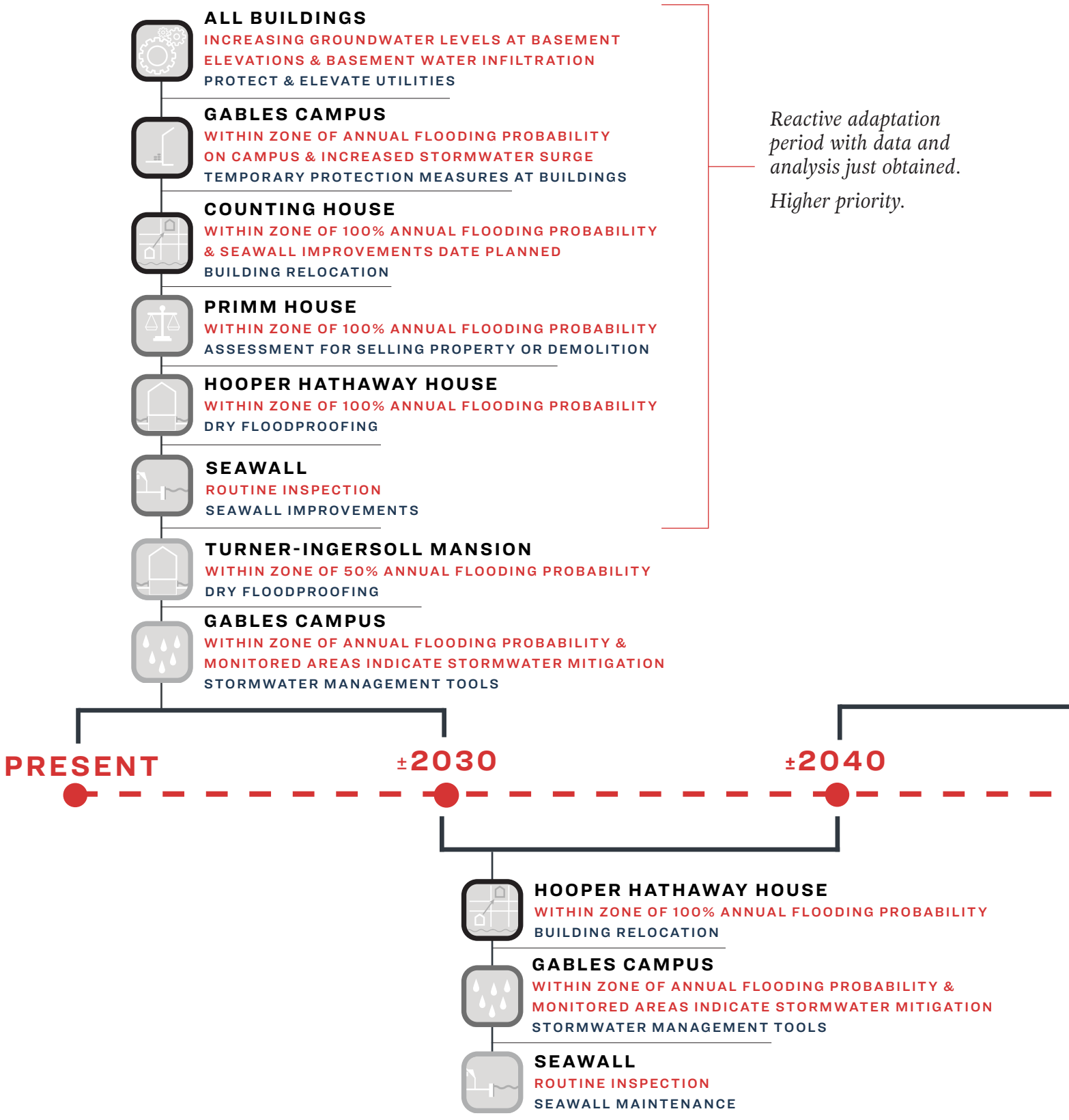
MERGING ADAPTATION STRATEGIES





Information shown in this chart was last updated May 2023 with data available at the time.

ROAD MAP FOR THE GABLES CAMPUS



LEVEL OF PRIORITY:

HIGH

MEDIUM

LOW

ADAPTATION MEASURE

BUILDING OR AREA OF FOCUS

TRIGGER

ADAPTATION MEASURE

*What is a **TRIGGER**? With so many factors rapidly increasing or potentially decreasing the precipitation of climate challenges to the campus, it felt pertinent to identify environmental prompts as moments of preemptive action rather than relying solely on dates and timelines. Using data projecting conditions for 2030, 2050, and 2070 as the baseline, "triggers" have been established signaling when it is time to begin planning or implementation of the adaptation measure.*

NATHANIEL HAWTHORNE BIRTHPLACE

WITHIN ZONE OF 50% ANNUAL FLOODING PROBABILITY

BUILDING RELOCATION

RETIRE BECKETT HOUSE

WITHIN ZONE OF 50% ANNUAL FLOODING PROBABILITY

BUILDING RELOCATION

GABLES CAMPUS

WITHIN ZONE OF ANNUAL FLOODING PROBABILITY & MONITORED AREAS INDICATE STORMWATER MITIGATION

STORMWATER MANAGEMENT

SEAWALL

ROUTINE INSPECTION

SEAWALL MAINTENANCE

GABLES CAMPUS

SITE + LANDSCAPE RESILIENCY STRATEGIES

TURNER-INGERSOLL MANSION

WITHIN ZONE OF 100% ANNUAL FLOODING PROBABILITY

BUILDING RELOCATION

GABLES CAMPUS

WITHIN ZONE OF ANNUAL FLOODING PROBABILITY & MONITORED AREAS INDICATE STORMWATER MITIGATION

STORMWATER MANAGEMENT TOOLS

SEAWALL

ROUTINE INSPECTION

SEAWALL MAINTENANCE

±2050 ±2060 ±2070

HISTORIC BARN + TEA HOUSE

SEAMAN'S VISITOR CENTER WITHIN AREA OF 50% ANNUAL FLOODING PROBABILITY & PLAN FOR CONSTRUCTION OF NEW VISITOR CENTER

BUILDING RELOCATION

GABLES CAMPUS

WITHIN ZONE OF ANNUAL FLOODING PROBABILITY & MONITORED AREAS INDICATE STORMWATER MITIGATION

STORMWATER MANAGEMENT TOOLS

SEAWALL

ROUTINE INSPECTION

SEAWALL MAINTENANCE

Refer to Key Terms for explanation of flood probability percentages.

SECTION 4

Masterplanning & Phasing

The project team has developed a five-phased adaptation, resiliency & mitigation plan for The Gables. With flexibility for each phase, the plan addresses environmental triggers, feasibility, and affordability. It focuses on organizational structure, key priorities and opportunities, ensuring necessary adaptations while preserving the historic significance of The House of the Seven Gables Settlement Association.

GUIDING PRINCIPLES FOR REORGANIZATION

OVERALL SITE

- The Colonial Revival gardens should be recreated somewhere within the site. **PRESERVATION OF GREEN SPACE** should be prioritized overall.
- **POINTS OF ENTRY** into the relocated historic campus should be minimized for operational and security reasons.
- The relocated campus should be designed to accommodate both present and anticipated needs for **STORMWATER MANAGEMENT.**
- The **FORMER HISTORIC CAMPUS AREA** should be **USED FOR NATURAL SPACE** as well as **PARKING**, even if it means reducing the amount of parking on site.
- In addition to seawall improvements, **NATURAL BARRIERS AND FLOOD MANAGEMENT SOLUTIONS** should be considered.
- The campus should be **RECONFIGURED AND REBUILT** on the Gables site, rather than moved to another location entirely.

INDIVIDUAL BUILDINGS

- The Turner-Ingersoll Mansion should remain on Turner Street, but otherwise **RETREAT** to the location it can be preserved for the longest period of time.
- The Turner-Ingersoll Mansion basement should be **PRESERVED AS A RELIC** and remain open and visible to the public.
- Relocations of other historic buildings should take into account - but not necessarily be beholden to - their **PAST CONTEXT AND ORIENTATION**.
- With greater **DENSITY OF BUILDINGS**, stronger fire prevention measures should be put into place and fireproofed material should be used wherever possible.
- The historic houses should be used for **MUSEUM INTERPRETATION AND EDUCATION** as much as possible, limiting office and administrative uses.
- Space should be **BUILT AND ADAPTED** to accommodate a maintenance shop and a collections storage facility.
- Space should be **BUILT AND ADAPTED** to accommodate administrative offices, equipment and materials.
- Steps should be taken to **ACQUIRE OR SECURE FUTURE ACQUISITION** of 42 Turner Street.

PRIORITIES & OPPORTUNITIES

MAIN PRIORITIES

- MOVE BUILDINGS AS FEW TIMES AS POSSIBLE
- CONSIDER FINANCIAL CONSTRAINTS
- MAINTAIN THOUGHTFUL COMPOSITION AND COHESIVENESS OF CAMPUS THROUGH ITS TRANSITION
- CONTINUE TO SUPPORT & ENHANCE PROGRAMMING SPACES FOR SETTLEMENT ASSOCIATION

OPPORTUNITIES

- A MORE STAFF- AND VISITOR-FRIENDLY CAMPUS
- REDUCED PROGRAMMING INEFFICIENCY
- IMPROVED BUILDING INFRASTRUCTURE
- FREE UP MORE SPACE IN HISTORIC HOMES FOR INTERPRETATION AND EXHIBITS
- NEW CONTEXT TO EDUCATE PUBLIC ON CLIMATE CHANGE, ADAPTATION, RESILIENCE & MITIGATION
- LARGER OUTDOOR EVENT SPACE
- PURPOSEFUL VISITOR CENTER WITH IMPROVED AMENITIES & PROGRAMMING
- REDUCED DISASTER PREPARATION, RESOURCE-MANAGEMENT AND POST-DISASTER REPAIR/CLEAN-UP

REDUCE FLOOD RISK

FEASIBILITY + AFFORDABILITY

MAINTAIN HISTORIC CHARACTER

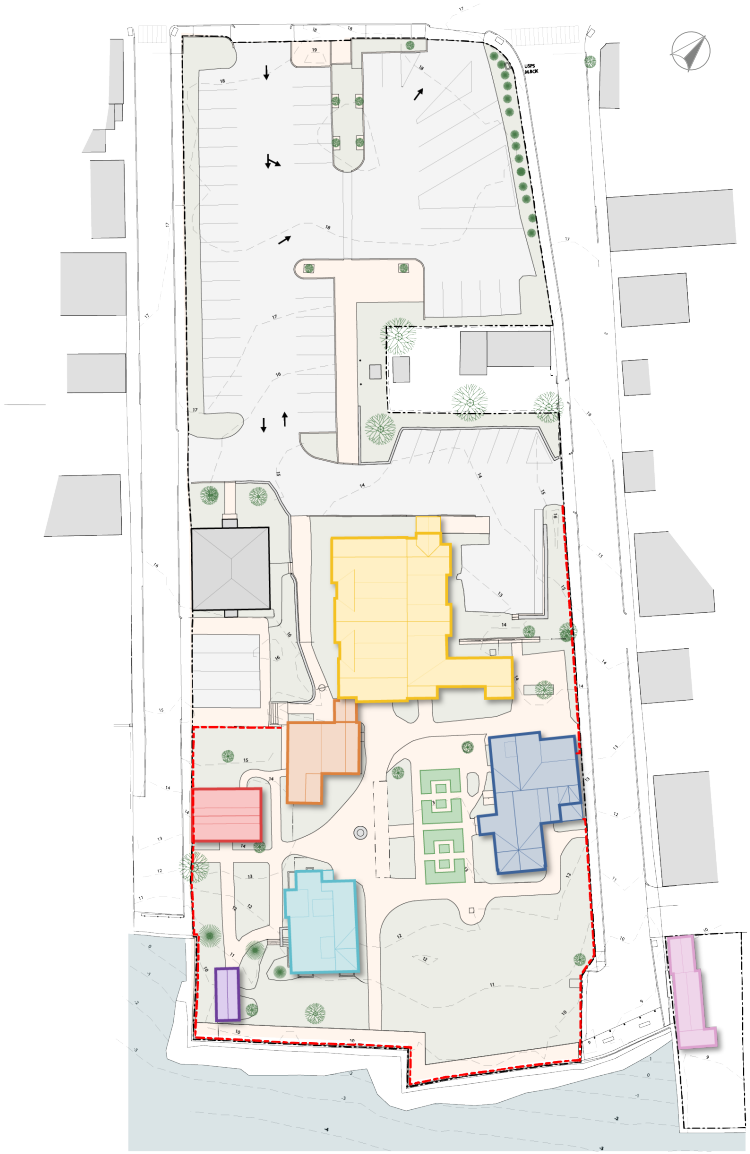
MASTERPLAN DEVELOPMENT

The project team has crafted an interdisciplinary managed retreat vision for The Gables, balancing short and long-term strategies through a five-phased masterplan.

The project team has worked towards an interdisciplinary managed retreat vision for The Gables, designed to be immediately actionable for short-term site enhancements while also providing a framework for long-term strategies over the coming decades. It comprises of a five-phased masterplan, with each phase intricately linked to anticipated triggers.

CURRENT CAMPUS

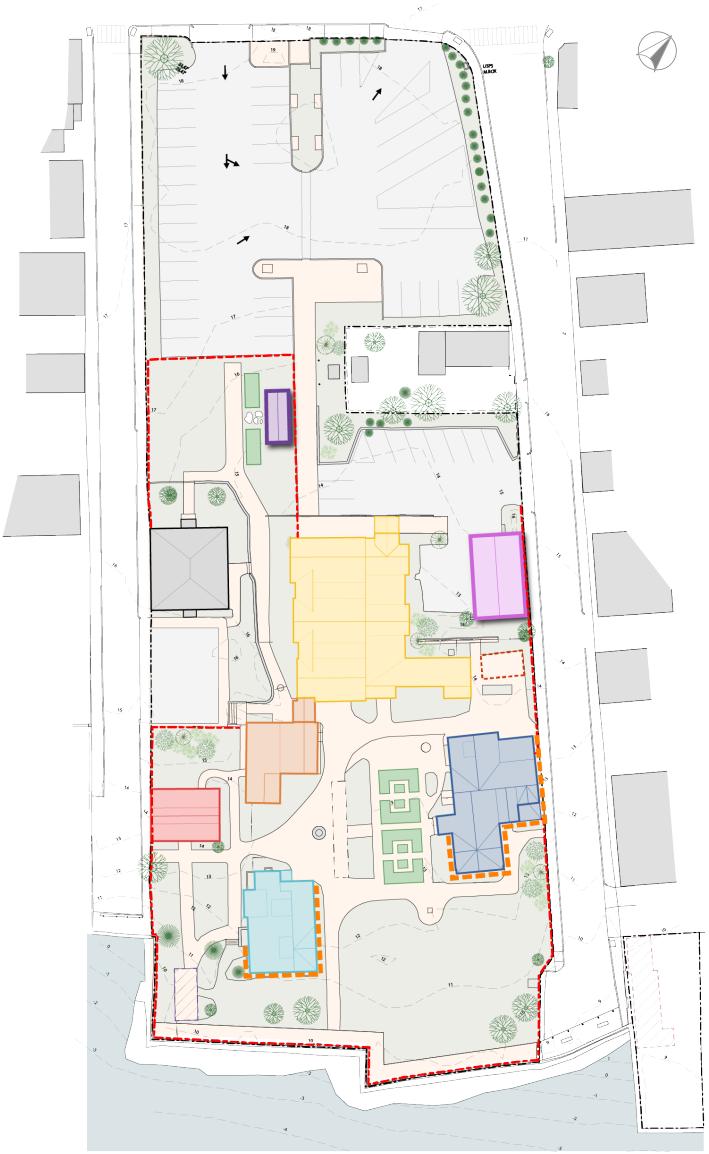
- NATHANIEL HAWTHORNE BIRTHPLACE
- RETIRE BECKETT HOUSE
- SEAMAN'S VISITORS CENTER
- SEASIDE GARDENS
- HOOPER-HATHAWAY HOUSE
- TURNER-INGERSOLL MANSION
- COUNTING HOUSE
- PRIMM HOUSE



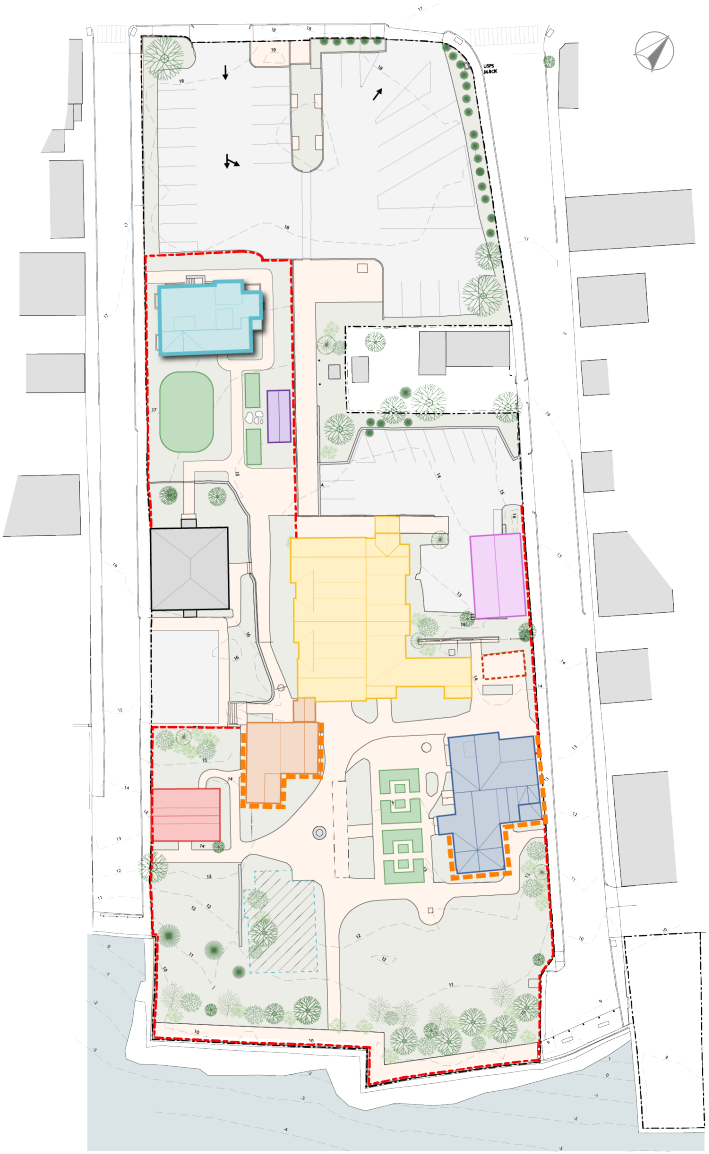
Initial implementation is projected for 2030, followed by subsequent phases in 2040, 2050, 2060, and 2070, allowing for a flexibility window of ±5 years for each phase. This flexibility accounts for environmental triggers, feasibility assessments, and affordability considerations associated with each action item.

The masterplan reflects the established guiding principles, prioritizing organizational structure, focusing on priorities and taking advantage of the opportunities. It embraces both the changes necessary for adaptation and the timeless elements that will continue to define The House of the Seven Gables Settlement Association.

PHASE I



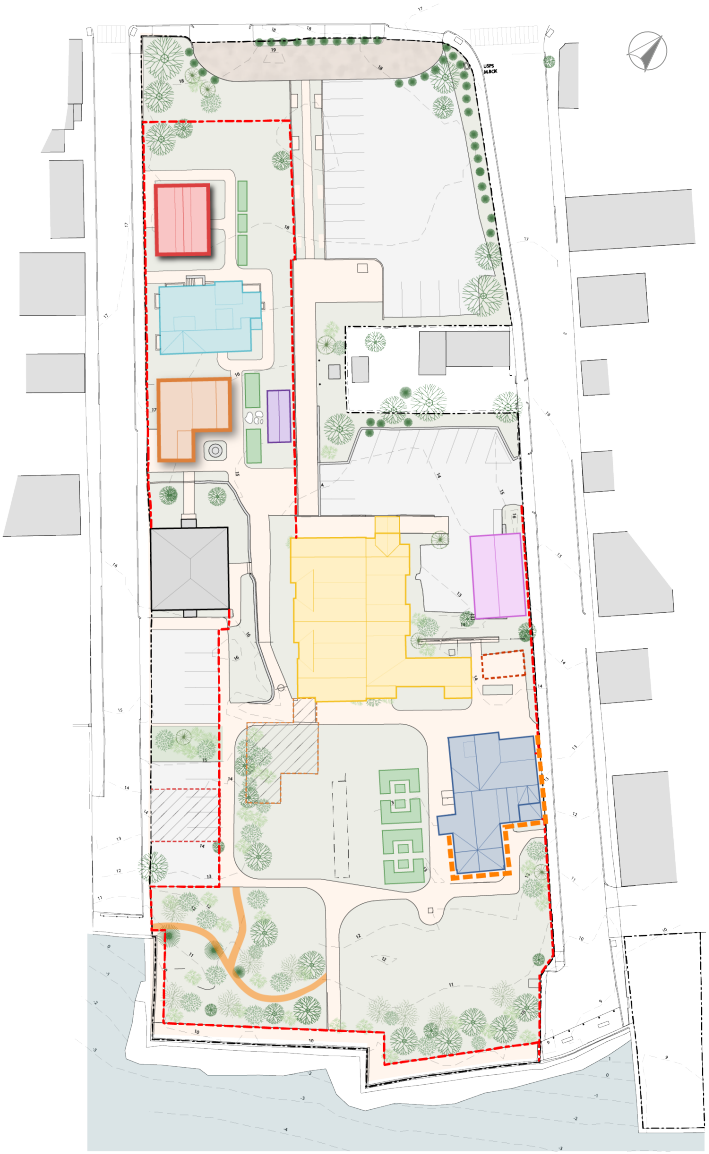
PHASE II



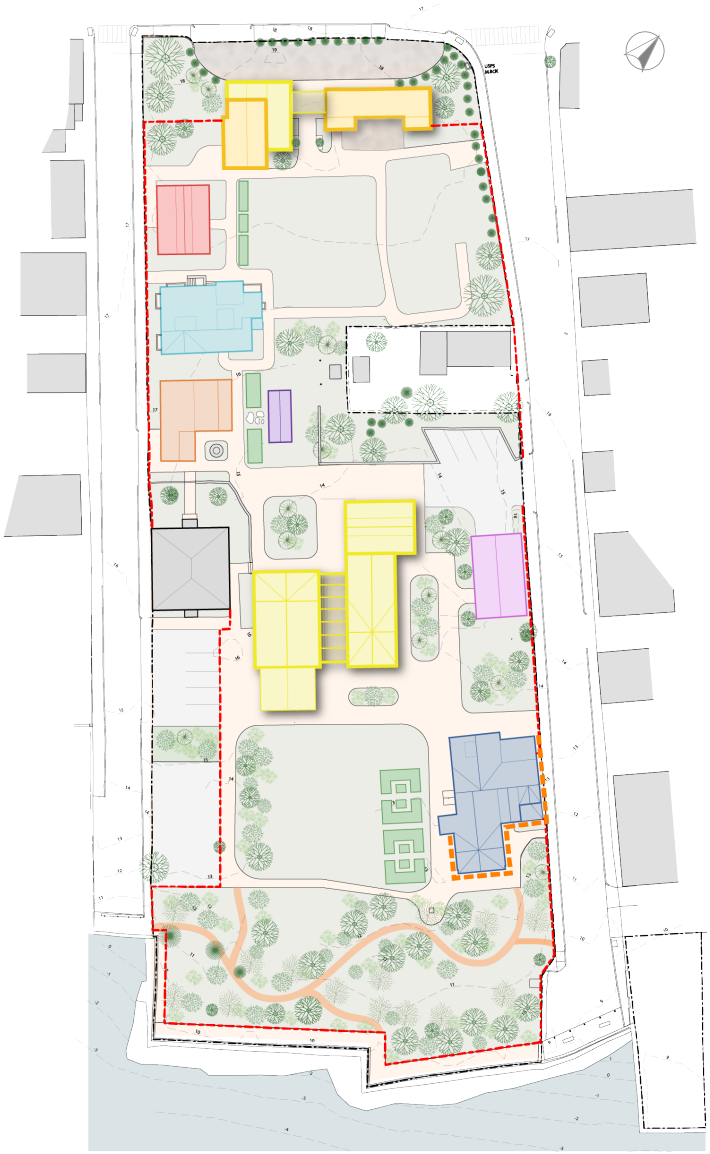
MASTERPLAN DEVELOPMENT

- NATHANIEL HAWTHORNE BIRTHPLACE
- RETIRE BECKETT HOUSE
- SEAMAN'S VISITORS CENTER
- SEASIDE GARDENS
- HOOPER-HATHAWAY HOUSE
- TURNER-INGERSOLL MANSION
- COUNTING HOUSE
- PRIMM HOUSE
- PHIPPEN HOUSE - *NOT INCLUDED IN PROJECT SCOPE*

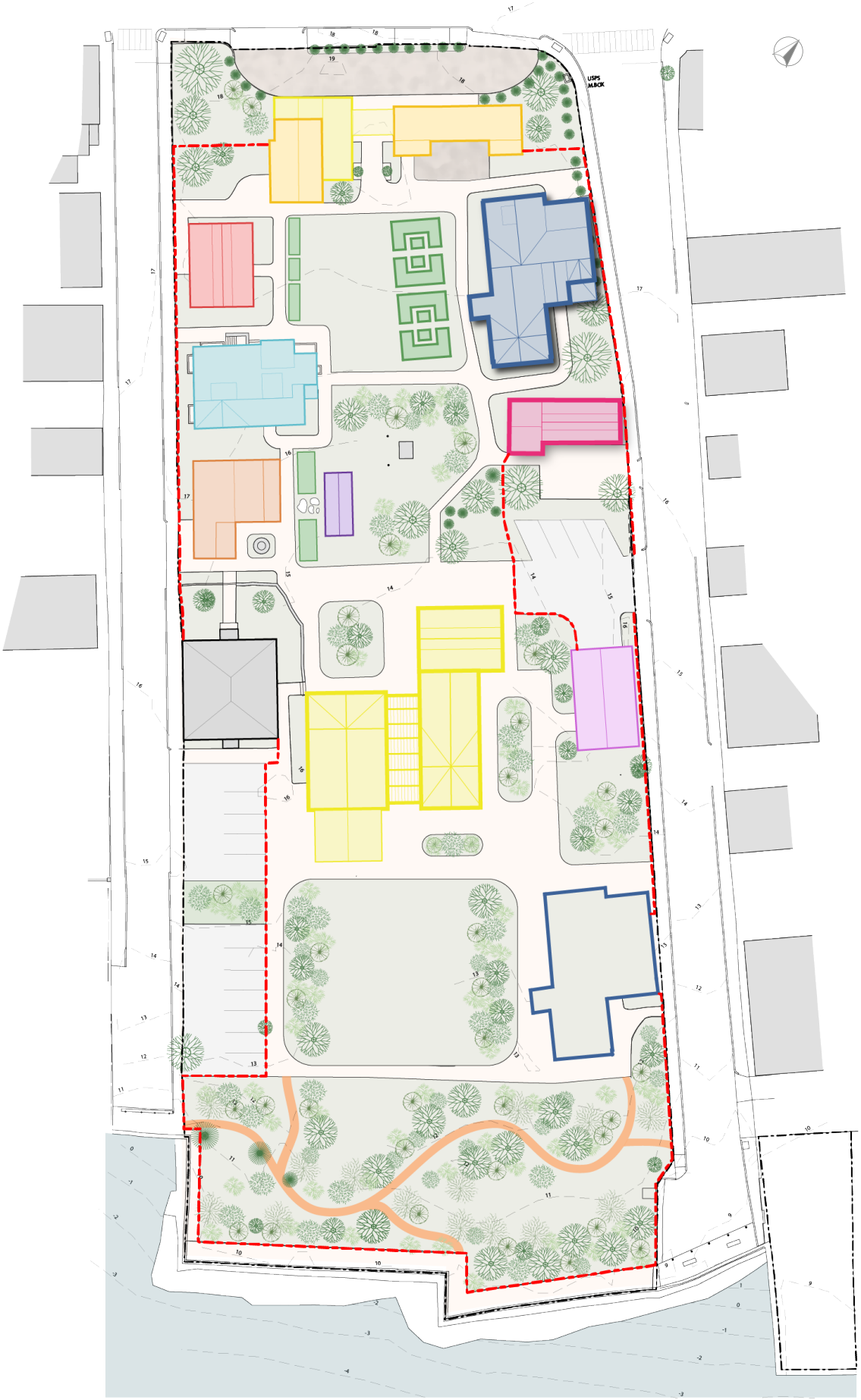
PHASE III



PHASE IV

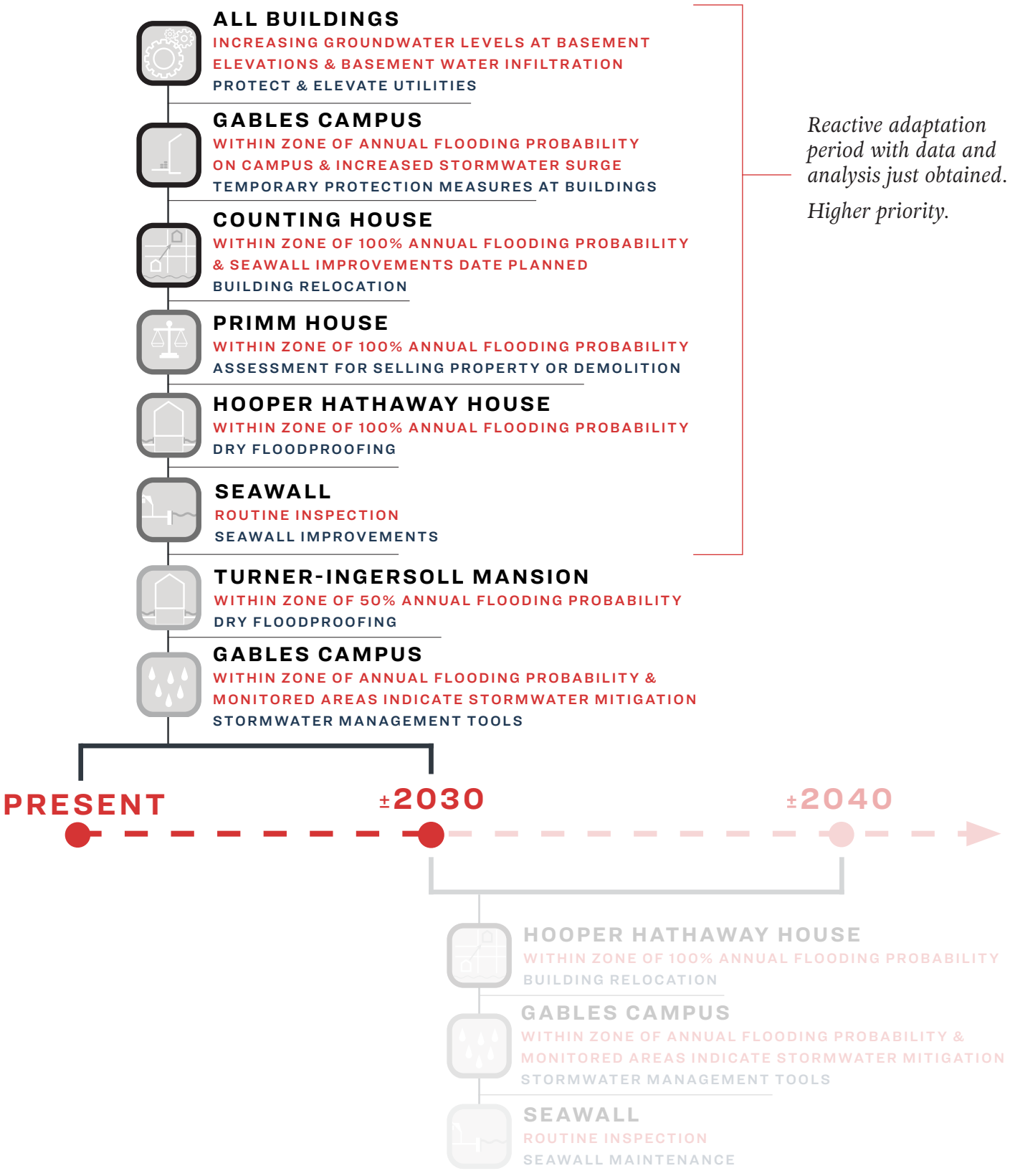


PHASE V - FINAL MASTERPLAN



View of playground at Counting House, looking over Salem Harbor.

MASTERPLAN - PHASE I



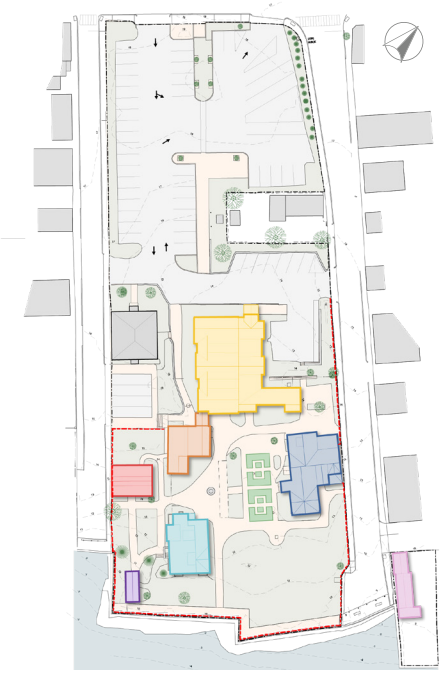
MASTERPLAN - PHASE I

THE FIRST PHASE FOCUSES ON IMMEDIATE ACTIONS TO PROTECT VULNERABLE STRUCTURES AND CRITICAL UTILITIES.

Identified vulnerabilities, such as the Primm House and Counting House, prompt targeted strategies like relocation and thorough flood risk assessments. Dry floodproofing measures for the Hooper Hathaway House and relocating critical uses and utilities to floodproof buildings are prioritized to safeguard operations and valuable collections.

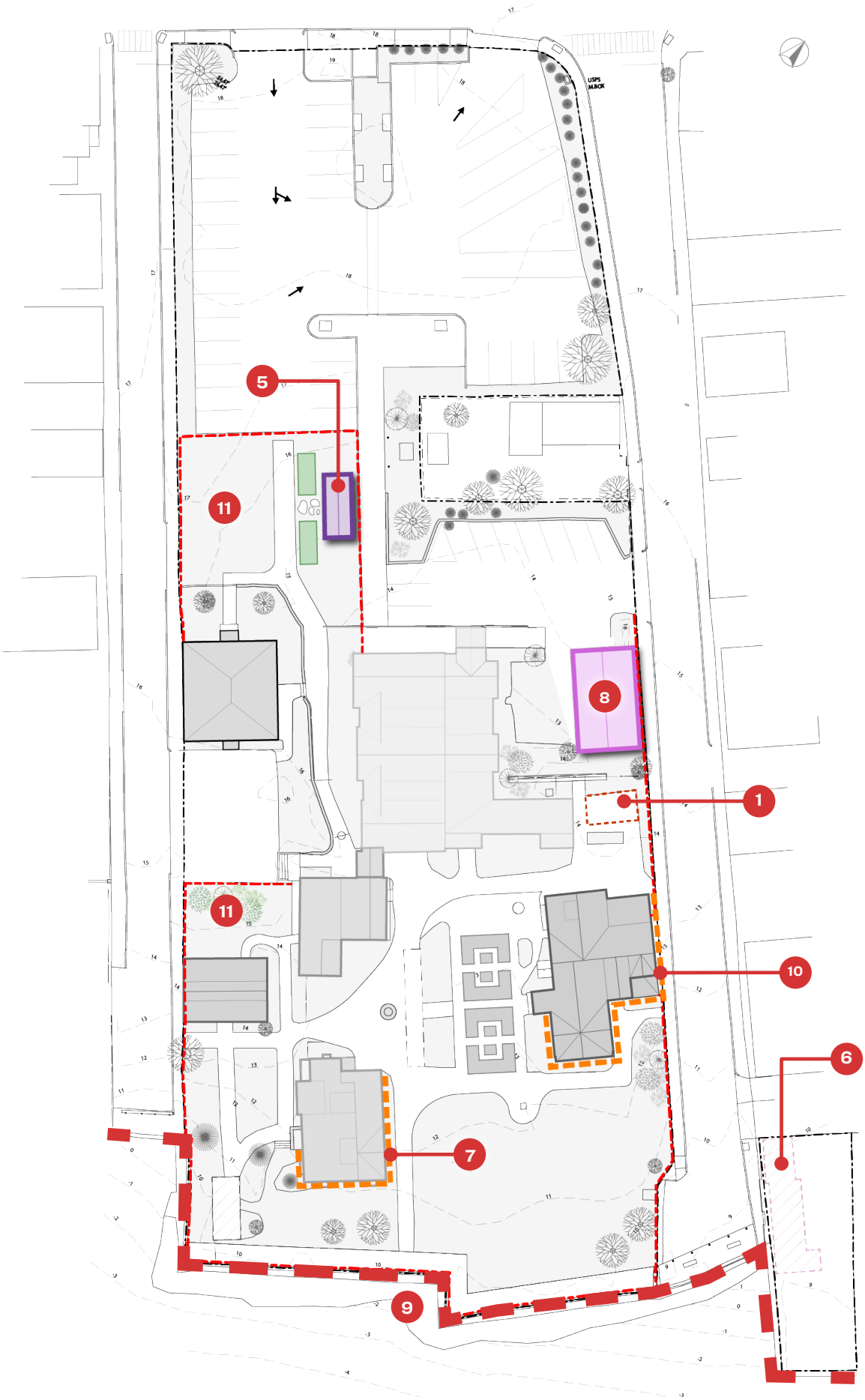
Emergency deployable barriers and infrastructure updates are key components of storm preparedness, particularly for basement utilities and stored collections vulnerable to water damage. Additionally, ongoing maintenance of seawalls and site enhancements are integral for ensuring the campus's resilience and preserving its historic structures in the face of future challenges.

CURRENT CAMPUS



	TRIGGERS	ACTION ITEMS
1	Increasing groundwater levels at basement elevations & basement water infiltration	Protect & Elevator Utilities
2	Within zone of annual flooding probability on campus & increased stormwater surge	Emergency Deployable Barriers
3	Insufficient size and drainage capacity	Gutters & Downspouts
4	Insufficient drainage capacity	Rain barrels & Fencing
5	Within zone of 100% annual flooding probability & seawall improvements date planned	Relocate Counting House
6	Within zone of 100% annual flood probability	Assessments Primm House
7	Within zone of 100% annual flood probability	Dry floodproof Hooper Hathaway
8	Increasing water infiltration at Hooper Hathaway Basement	New Maintenance Building
9	Routine Inspection	Seawall Maintenance
10	Within zone of 50% annual flood probability	Dry floodproof Turner-Ingersoll
11	Within zone of annual flood probability & monitored areas indicate stormwater mitigation	Site Improvements

PHASE I



PROTECT & UPDATE UTILITIES

PROTECTING AND UPDATING UTILITIES AND CAN SAFEGUARD VULNERABLE SYSTEMS WITHOUT COMPROMISING HISTORIC INTEGRITY.

Most buildings, except the Seaman's Visiting Center, share similar HVAC systems, primarily gas-fueled, located in flood-prone basements. To address environmental concerns and improve efficiency, transitioning to all-electric Variable Refrigerant Flow (VRF) Heat Pump Systems is proposed.

Additionally, introducing energy recovery ventilation (ERV) systems will ensure proper air circulation and humidity control, vital for preserving artifacts and maintaining indoor air quality. Integrating these solutions while considering the buildings' unique characteristics and challenges is essential for long-term preservation and sustainability.

HVAC SYSTEM MAINTENANCE PLAN

Regular HVAC maintenance is crucial for optimal performance, ensuring high air quality and precise temperature control, while timely filter replacement and careful system balancing are essential for effective preservation of building conditions. Refer to Appendix A for further information.

DEHUMIDIFIERS & SUMP PUMPS

The Gables basements often experience water intrusion, particularly through window wells, due to grading and drainage issues. Consequently, basement flooding is a recurring problem, necessitating the installation of dehumidifiers to control humidity levels and improve air quality.

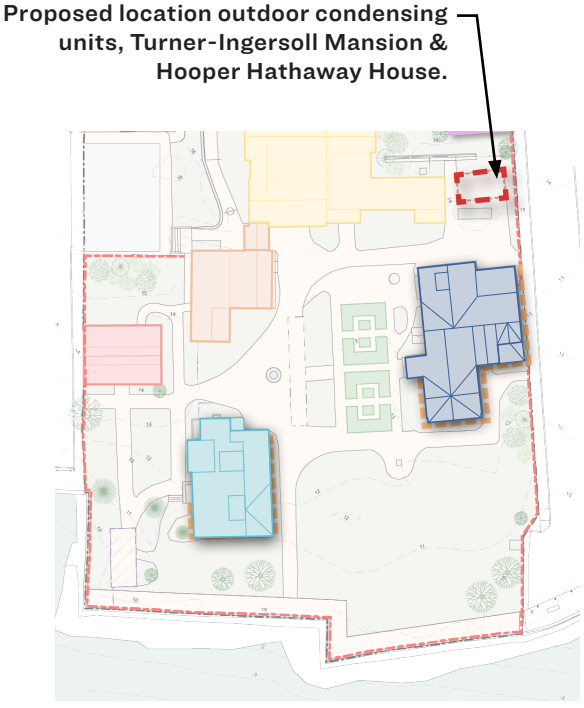
PROPOSED VARIABLE REFRIGERANT FLOW (VRF) SYSTEM CONFIGURATION

To get an overall understanding of the HVAC system recommended for all historic buildings, two buildings of the Gables campus were evaluated:

- Turner-Ingersoll Mansion
- Hooper Hathaway House

The intent is to use the conceptual design for the upgrade of other historical buildings.

For significant renovations or upgrades, elevate equipment to minimize flood damage. Use roof or attic spaces instead of basements for equipment, as basements often flood and should be used for low-priority storage only. Install outdoor condensing units on stands to reduce flood risk. Careful placement of equipment is crucial due to the site's historic nature.



EMERGENCY DEPLOYABLE BARRIERS - ALTERNATIVE MEASURE

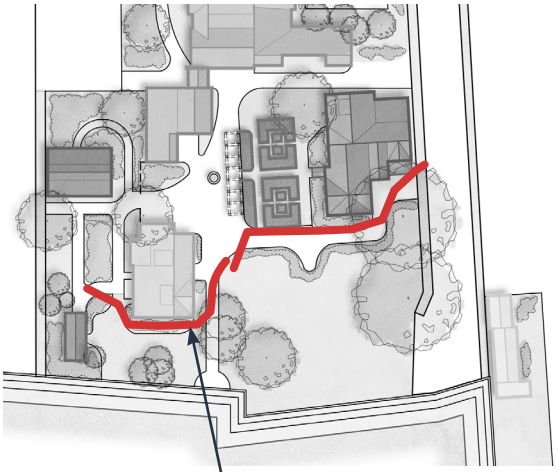
ALTERNATIVE PROTECTION MEASURE TO ADDRESS MAJOR FLOODING AND STORM IMPACT ACROSS THE CAMPUS.

Emergency deployable barriers can play a critical role in safeguarding specific areas of the museum campus. Given the historical significance of these buildings and their vulnerability to flooding and stormwater, careful consideration must be given to the alternative measure of placement and design of deployable barriers to ensure effective protection.

It is important to note that while deployable barriers provide an alternative temporary protection for these historic buildings, the priority is to dry floodproof and focus on protecting openings of buildings and storm management. If the alternative measure of emergency deployable barriers are used, these should be viewed as temporary and short-term solutions, the long-term solution involves relocating the campus to higher ground.

NOAQ TUBEWALL DEPLOYMENT
by Floodcontrol International

WATER-GATE
by Quick Dam



Proposed locations of Emergency Deployable Barrier

EMERGENCY DISASTER PREPAREDNESS

Having a centralized storage facility and clear distribution protocols ensures that emergency deployable barriers can be quickly accessed and deployed when needed. With designated personnel overseeing storage and deployment, clear protocols and regular training drills conducted to maintain readiness, the museum can effectively protect its valuable cultural heritage assets and neighboring properties from the impact of flooding and other emergencies.

GUTTERS & DOWNSPOUTS

THE GABLES CAMPUS IS FACING CHALLENGES RELATED TO THE SIZE AND DRAINAGE CAPACITY OF GUTTERS AND DOWNSPOUTS OF ITS HISTORIC BUILDINGS. IT IS IMPERATIVE TO CONDUCT A THOROUGH ASSESSMENT AND CALCULATION TO ENSURE THESE ELEMENTS CAN EFFECTIVELY MANAGE PRECIPITATION RUNOFF FROM THE STRUCTURES.

Following the Salem Historical Commission Guidelines, preserving and maintaining historic gutters is advised whenever possible. Regular inspection and cleaning of gutters, downspouts, scuppers, and other drainage components are crucial to prevent debris buildup and maintain optimal functionality. Additionally, it is essential to ensure proper grading to facilitate drainage away from the buildings, as excess moisture can lead to deterioration of foundations and wall bases.

If replacement of gutters or downspouts becomes necessary due to inadequate drainage capacity to handle increased precipitation, efforts should be made to replicate the original design when feasible. The historic gutters of the Gables campus are V-shaped profiles coated with protective paint to safeguard the underlying wood substrate, while the downspouts are wrapped in wood matching the color of the respective buildings to minimize visibility.

Current gutters and downspouts of the Gables campus.

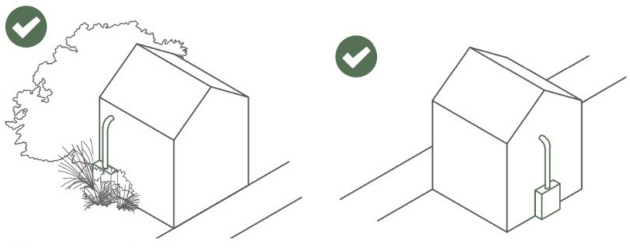
RAIN BARRELS & FENCING

WHEN CONSIDERING RAIN BARRELS AND HVAC SYSTEMS ON-SITE, REVIEW OF THE SALEM HISTORICAL COMMISSION GUIDELINES IS RECOMMENDED TO ENSURE THEIR SUITABILITY FOR BOTH THE GABLES CAMPUS AND THE CITY OF SALEM. MITIGATION MEASURES SUCH AS GREENERY, LANDSCAPING, OR SIMPLE ENCLOSURES LIKE FENCING CAN BE EMPLOYED TO ADDRESS VISIBILITY CONCERNS.

Current exterior fencing and enclosures at the Gables campus.

RAINBARRELS

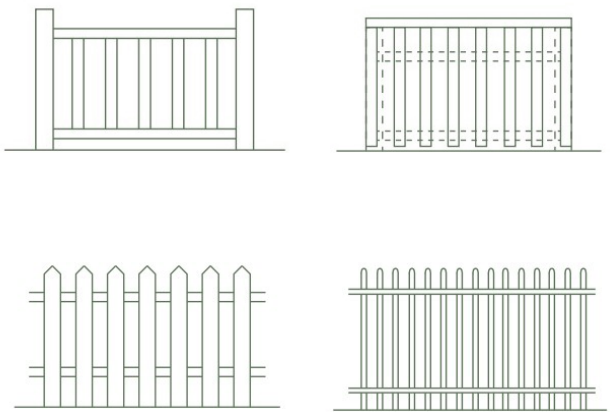
The City of Salem has formed a partnership with the Great American Rain Barrel Company (TGARBC)[17], to provide rain barrels to Salem residents. The city offers 60 gallon capacity rain barrels at a cost of $85 to help residents conserve water, save money and reduce stormwater run-off. By utilizing rain barrels that are carefully selected to align with the architectural style, materials, and colors of the existing buildings and fencing, the museum can maintain its historic significance and visual cohesion while promoting sustainable practices and collecting rainwater to mitigate flooding.



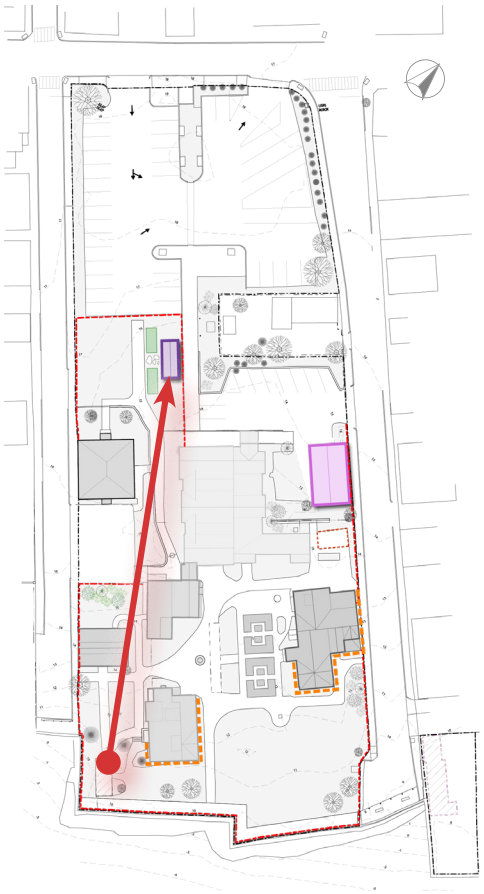
Figures from Salem Historical Commission Guidelines Notebook.[19]

FENCES

"For new privacy fences or screening for mechanical equipment and similar exterior items, select simple designs that respect the primary of the historic building. Allow for transparency whenever possible and minimize the amount of opaque area to the greatest extent possible. Appropriate fence types include capped flat board, lattice, and flat board with lattice panels."[18]



COUNTING HOUSE - RELOCATION



WHY RELOCATE THE COUNTING HOUSE?

The Counting House is vulnerable to coastal flooding due to its proximity to the waterfront and its location in FEMA Flood Zone VE, with a Base Flood Elevation of 13'-0". The first floor is at 12'-2" above sea level, and the crawl space housing electrical panels is at 7'-2".

One option is to raise the building above the Base Flood Elevation. Massachusetts Building Code requires the structure's bottom to be 2'-0" above the BFE, placing the first floor at 16'-0" and eliminating the crawl space. However, historically, a counting house would not have been elevated this way. Another reason for relocating the Counting House is to facilitate necessary seawall improvements.

The best solution is to move the Counting House to the north end of the campus, incorporating it into the new campus master plan. Along with new landscaping and gardens, the Counting House would become the anchor for the campus expansion over the parking lots.

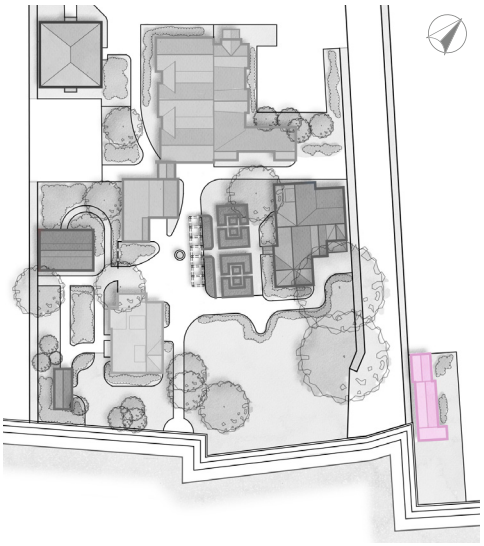
POTENTIAL FUTURE USE:

Other than the new proposed visitor center, this is the closest building to the water open to guests on the campus by the final phase of changes. This, and a counting house's actual use, makes it an ideal spot to discuss maritime history.

Above: the Counting House and the sea wall during a storm event on 1/13/24; photo by the House of the Seven Gables. Left: the crawl space in the Counting House; photo by Union.

The interior of the Counting House. Photo by Union.

PRIMM HOUSE



The Primm House. Photo by Union.

ORIGINAL LOCATION

Turner Street

CURRENT USE

Existing Occupancy = Group U (Utility and Miscellaneous – Shed)

CAN THE PRIMM HOUSE SERVE AS THE NEW MAINTENANCE BUILDING?

The museum currently uses the basement of the Hooper Hathaway House for its maintenance and preservation workshop. Due to threats from storm surge and flooding, the workshop needs to be relocated, and the Primm House is being considered as the new site.

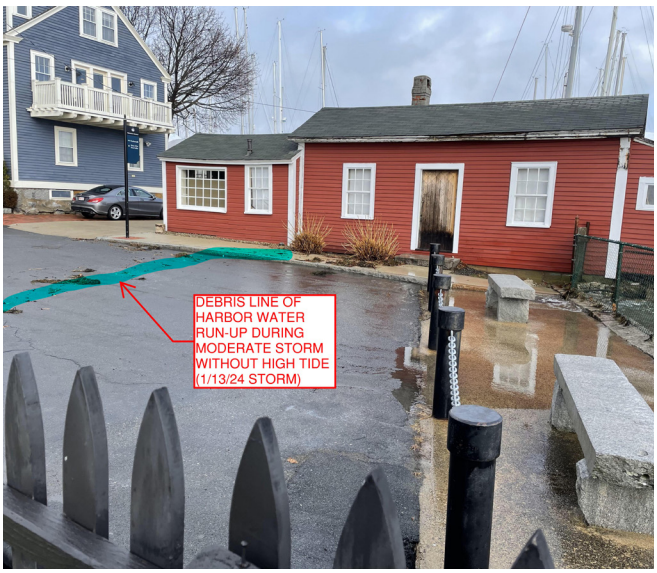
The Primm House is also subject to flooding because of its proximity to the shoreline. According to Massachusetts Building Code, it must be raised above the Base Flood Elevation (BFE) of 13'-0" established by FEMA. This means the underside of the floor structure must be at 15'-0" above sea level, placing the first floor at approximately 16'-0", depending on the floor structure depth. The first floor is currently around 10'-0" above sea level, so the building needs to be elevated by about 6'-0".

The street front constraints present challenges in managing the 6'-0" height difference with code-compliant stairs without re-siting the building. Additionally, using the building for a workshop with woodworking equipment and moving furniture would be impractical with a 6'-0" stairway. Even after raising it, the Primm House would remain in a high hazard flood zone, with ongoing flooding risks and limited access during severe events. The foundation required to withstand high-velocity wave impacts would be substantial. Despite efforts and costs, the building would still be under threat from worsening flooding, making it uncertain if it would be protected and accessible for the museum's needs long-term.

For more detailed code reference and information, see Appendix A, Primm House Memo.

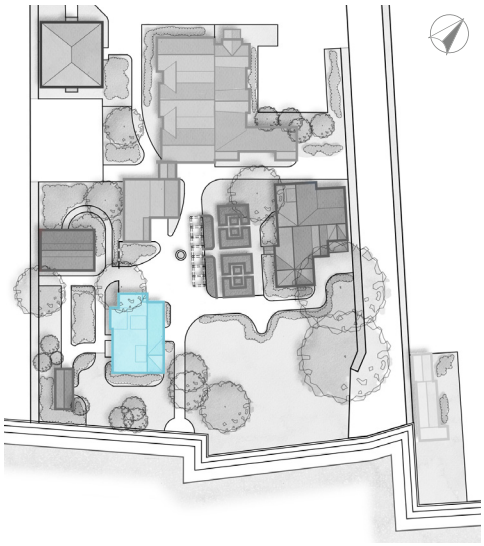
UNION'S RECOMMENDATION

After the review of the Primm House and discussions with the House of the Seven Gables, Union recommends that the Museum not use the Primm House for maintenance. Besides the complications with adapting the building, the Gables has concerns about the actual space available in the Primm House being able to house their tools and equipment. Together, Union and the Gables have decided to include a new maintenance building in the proposed master plans, and to eventually sell the property and/or demolish the Primm House. There is no timeline for demolishing the house or selling the property, but the Gables should be cognizant of increased risk and costs. Prior to sale or demolition, the Primm House should be assessed for any historic elements for salvage and reuse.



Left, above: A photo of the Primm House after a storm, 1/13/24. Photo by the House of the Seven Gables, annotations by Union. Left, below: a photo of the Primm House after a storm, 1/13/24. Photo by the House of the Seven Gables, annotations by Union. Above: the Primm House during a storm, 12/23/22.

HOOPER HATHAWAY HOUSE - DRY FLOODPROOFING



ORIGINAL LOCATION

23 Washington Street, Salem - moved in 1911

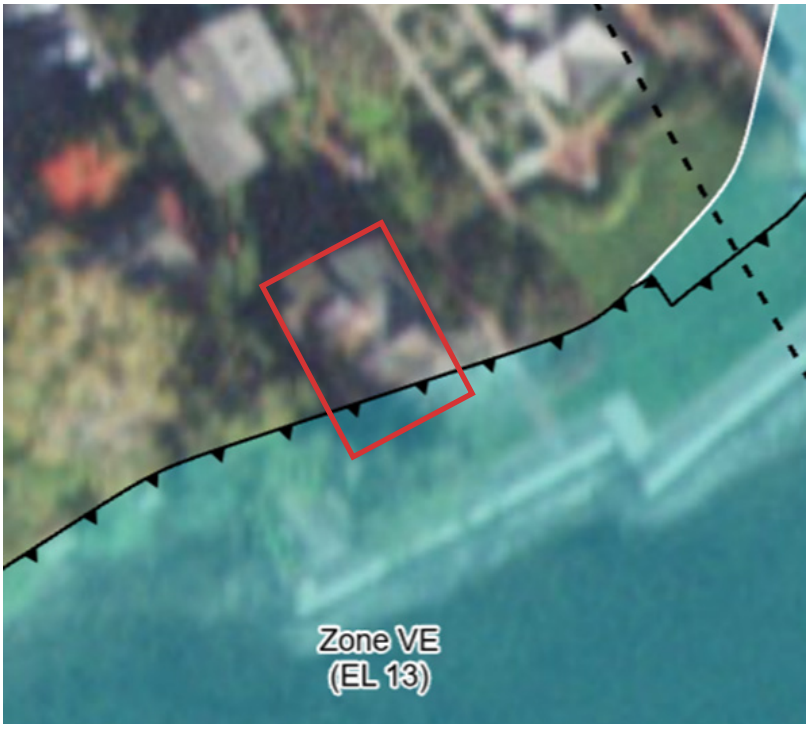
SIGNIFICANT CHANGES TO DATE

- 1784
- 1911

CURRENT USE

Public programming and small private events, a research library (for staff and members) and offices on second floor, and collection storage on the first and third floors. The basement is currently used as the workshop.

The Hooper-Hathaway House currently falls partially within the FEMA Flood Zone VE, and within the Limit of Moderate Wave Action (black line, with arrows pointing towards the area of Moderate Wave Action). See image below for the Hooper Hathaway notated on the FEMA Flood Map.



FEMA Flood Map, with the Hooper-Hathway House outlined in red.

The basement of the Hooper-Hathaway House sits at about 6'-2" above sea level, and the first floor at about 14'-4" above sea level. Flood projections for 2030 show the 1% annual flooding reaching 14'-0". More critical in the short term is the 100% Annual Flood, which is projected to reach 11'-6" above sea level. In both instances, the water will reach (and surpass, in the former's case) the footprint of the Hooper-Hathaway House.

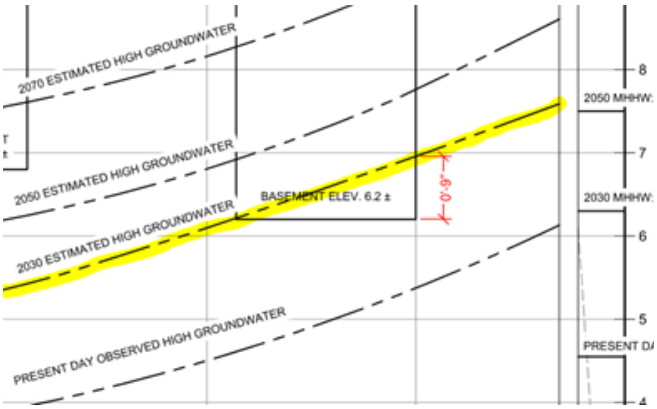
Besides coastal flooding, the Hooper-Hathaway House is under threat from rising groundwater levels. By 2030, the level of the groundwater will sit 0'-9" above the basement level along the southern

(seafront) side of the House at its highest point. The presence of water outside of the basement walls raises the possibility of water infiltrating the basement through the slab and foundation walls. The slab and foundation walls will also face increasing hydrostatic pressure from the groundwater, and could suffer deterioration or failures as a result.

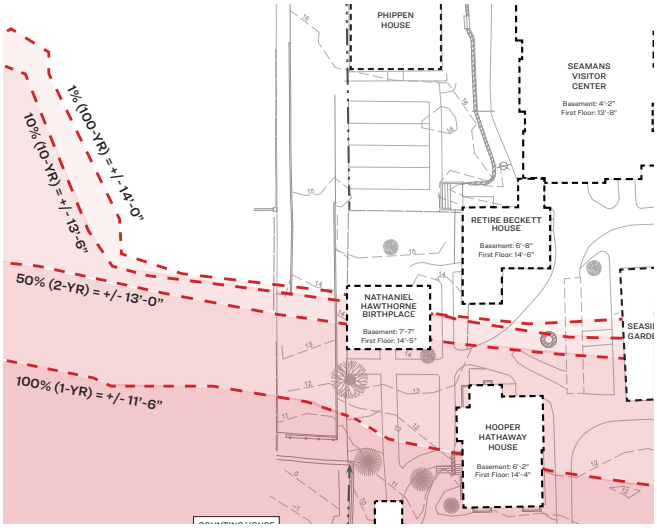
The basement of the Hooper-Hathaway House itself is durable, with a masonry foundation and concrete floor. However, the workshop is not. The electrical equipment and machinery, not to mention the furniture and wares being repaired in that workshop, are not water-resistant. The workshop and basement need to be protected from coastal flooding and groundwater flooding.

The first recommendation is to provide an automatic sump pump system in the basement of the Hooper-Hathaway House to remove any water that accumulates in the basement, whether from the ground or the sea. The basement walls and slab should be inspected for any openings where water could infiltrate, and those openings sealed. Union also recommends installing a drain at the base of the stairwell to prevent water from accumulating against the foundation wall and the door.

The second recommendation is to remove the windows in the foundation wall. The openings can be infilled with masonry (concrete masonry units are shown in the drawings as an example) and the edges and joints should all be carefully sealed with mortar. The surrounding grade adjusted



The projected high groundwater level in 2023. HWG.



Projected flood elevations for 2030.

The basement stairwell flooding during a storm event, 1/10/24. Photo by the House of the Seven Gables.

HOOPER HATHAWAY HOUSE - DRY FLOODPROOFING

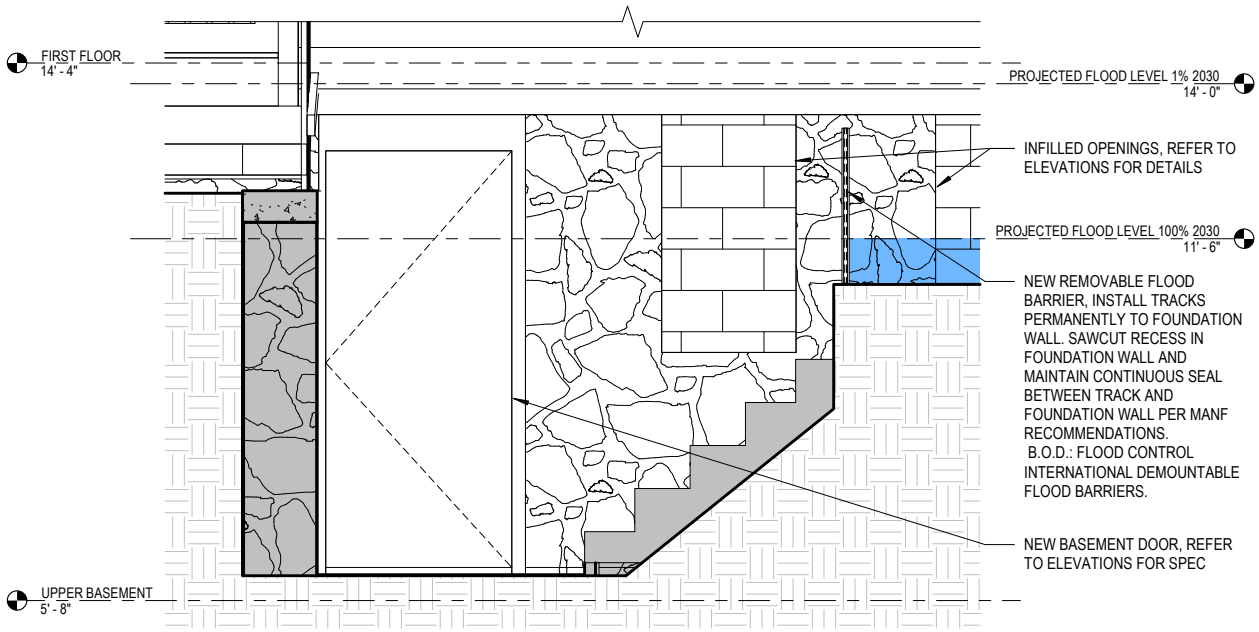
where possible to slope away from the foundation, and the window wells backfilled to match that grade. Another option would be to install floodproof windows in the place of the current windows, if the Museum wanted to maintain natural light in the basement.
Union also recommends building up the retaining walls that surround the basement access stairwell and extending and/or replacing the fence that sits above the existing retaining wall. The opening should be fitted with a removable barrier. It can also be painted or finished to match fence or fieldstone foundation to minimize the visual impact. This gate will not protect against the 100-Year storm flooding, but will provide protection against the yearly storm flooding and other incidental flooding.

The last recommendation is to replace the door accessing the basement from the exterior stairs with one that is floodproofed. It can be finished with a custom powder coat to match the other existing doors and windows in the building. The upper doors, while less susceptible to water infiltration, should be fitted with temporary flood barriers as well.

The methods outlined in this section are intended to protect the basement from water infiltration predicted in the year 2030 and are intended to extend the lifespan of the workshop in its current location while the Museum prepares to fund and construct a new home for it.

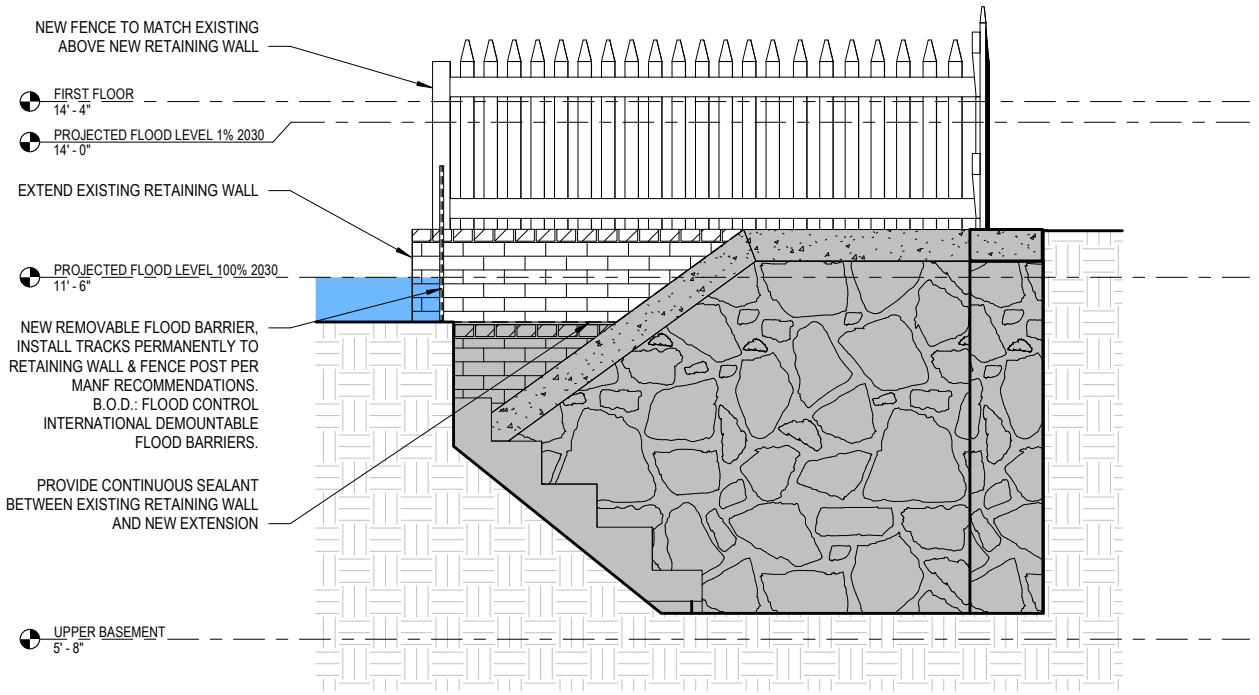
Existing brick window wells on the west facade. Photo by Union.

The existing stairwell and basement door. Photo by Union.



SECTION: BASEMENT STAIRWELL

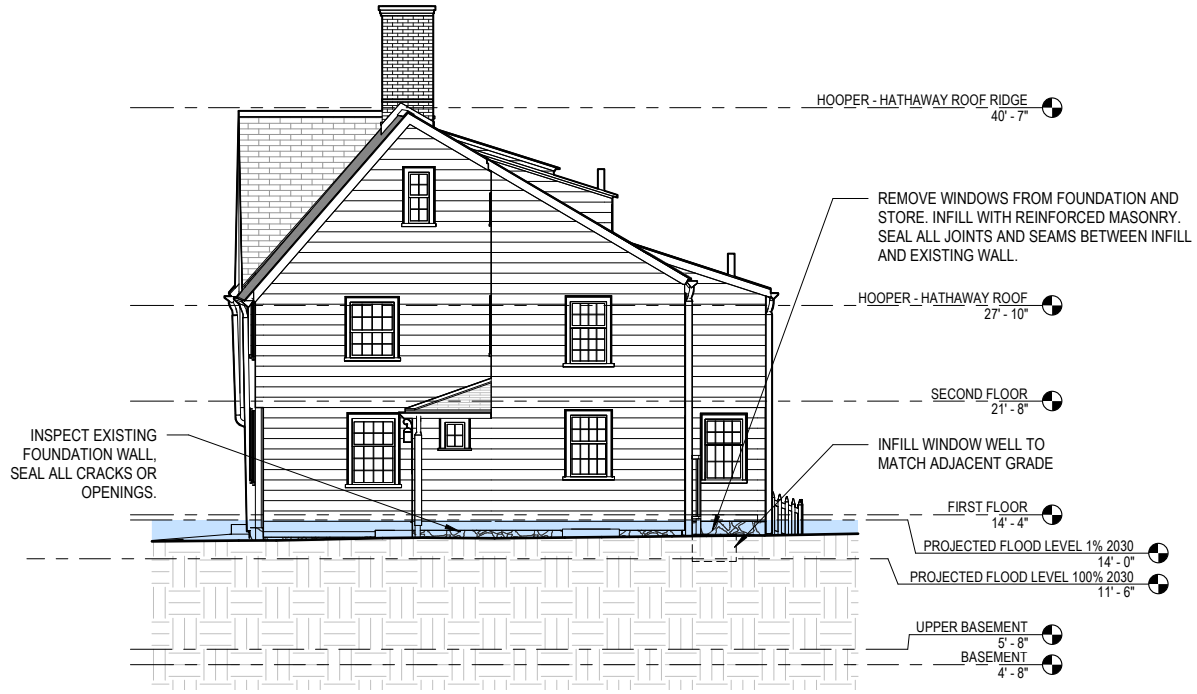
NOT TO SCALE



SECTION: BASEMENT STAIRWELL

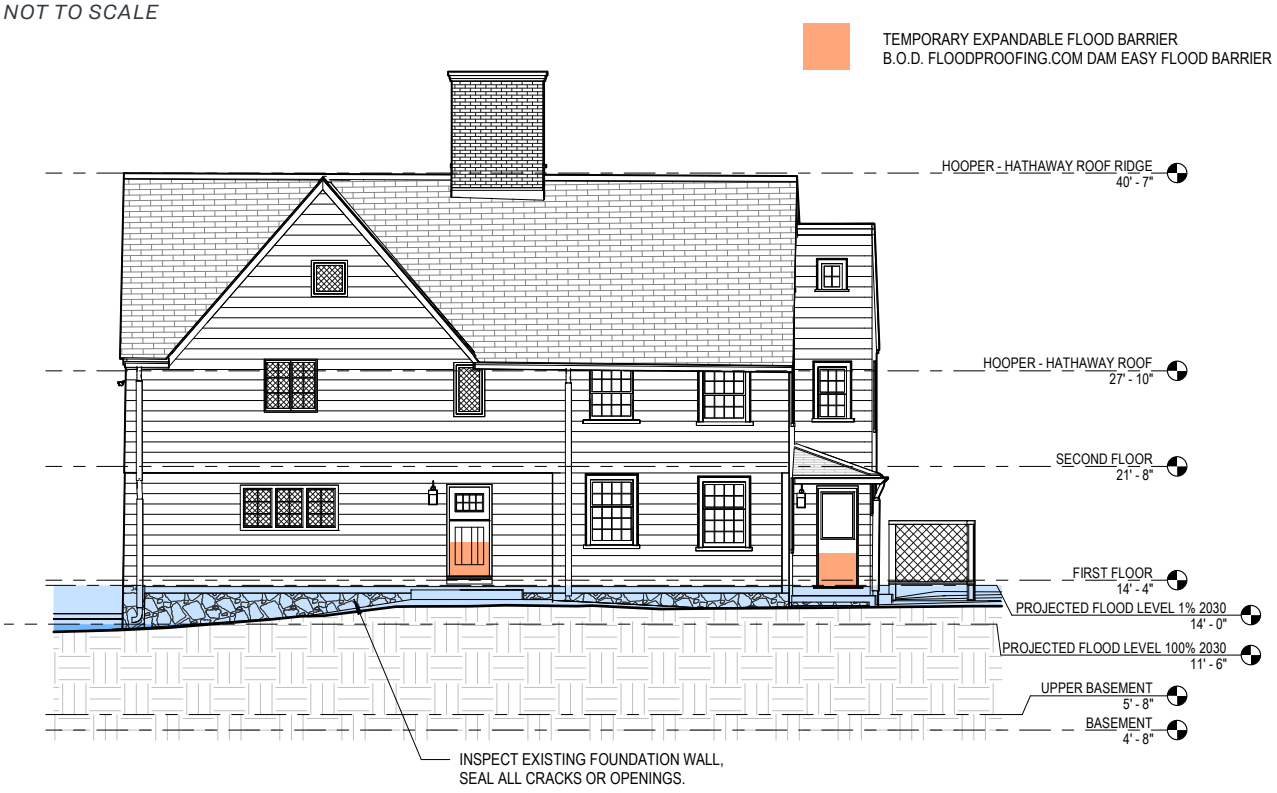
NOT TO SCALE

HOOPER HATHAWAY HOUSE - DRY FLOODPROOFING



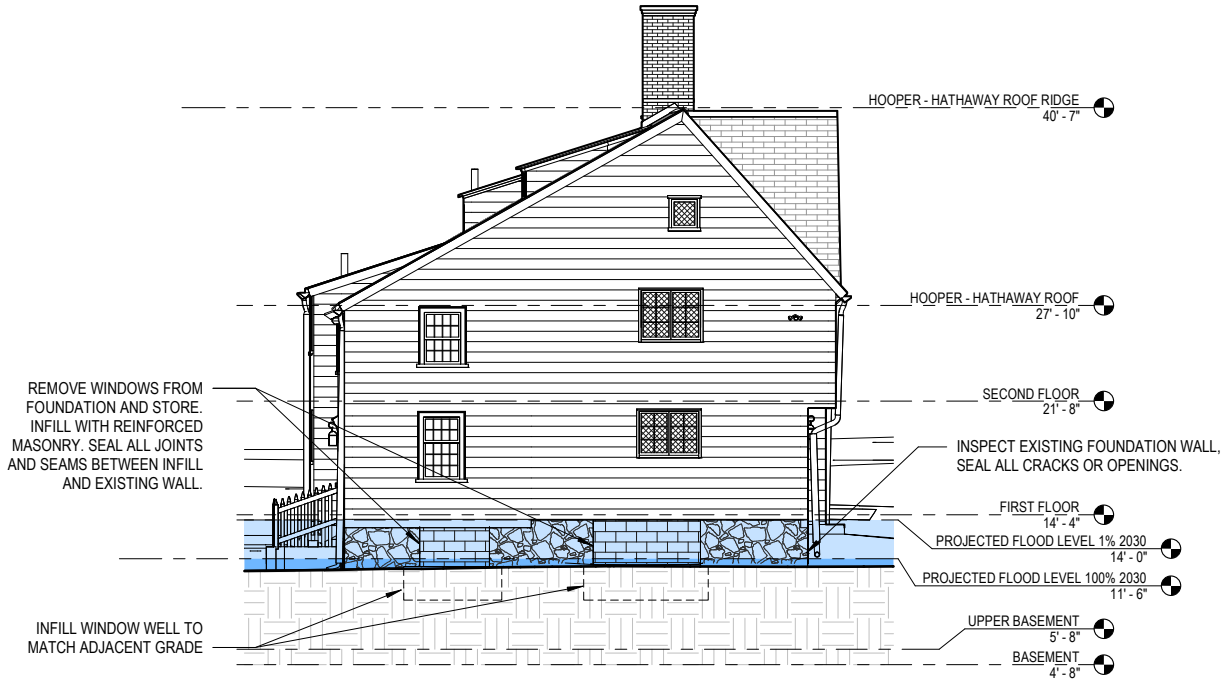
NORTH ELEVATION

NOT TO SCALE



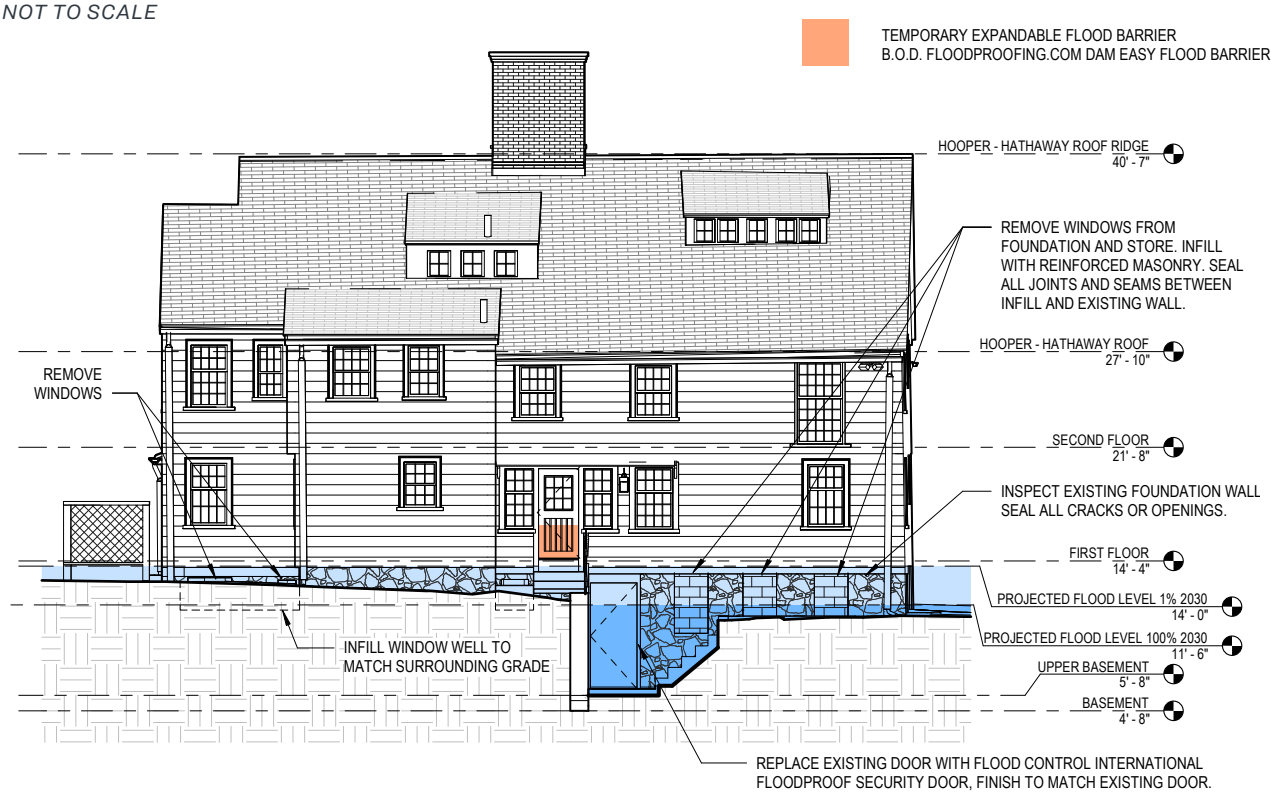
EAST ELEVATION

NOT TO SCALE



SOUTH ELEVATION

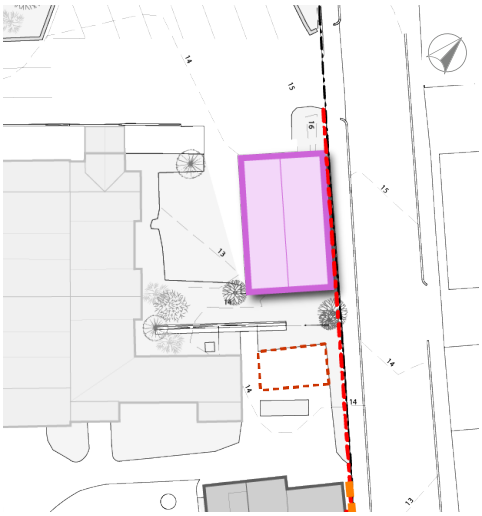
NOT TO SCALE



WEST ELEVATION

NOT TO SCALE

NEW MAINTENANCE BUILDING



INTRODUCTION OF A NEW MAINTENANCE BUILDING SERVES CRUCIAL PURPOSES, RELOCATING THE WORKSHOP AWAY FROM FLOOD-PRONE AREAS, SAFEGUARDING EQUIPMENT, AND ENSURING OPERATIONAL CONTINUITY. THIS FACILITY NOT ONLY CENTRALIZES STORAGE FOR MAINTENANCE AND PRESERVATION BUT ENABLES ADVANCED PRESERVATION MEASURES, WHILE ITS STRATEGIC LOCATION NEAR THE VISITOR CENTER ENSURES EFFICIENT ACCESS WITHOUT DISRUPTING THE VISITOR EXPERIENCE.

The introduction of a new maintenance building for the museum serves multiple crucial purposes, first of all being the relocation of the workshop away from vulnerable areas prone to flooding and water infiltration, in the Primm House and Hooper Hathaway House basement. By moving the workshop to a separate, dedicated facility, the threat of damage to essential maintenance equipment and materials during flooding events is significantly reduced. This relocation not only protects valuable resources but also ensures the continuity of essential maintenance operations, allowing the museum to remain functional and operational even in the face of environmental challenges.

In addition to serving as a workshop for woodworking and other maintenance tasks, the facility can include dedicated storage space for maintenance and preservation equipment.

The proposed location of the new maintenance building is along Turner Street, in proximity to the Visitor Center. The staff parking will be along this street and therefore provides a back-of-house feeling where staff can have access without interrupting the experience of the

visitors . Access to the maintenance building will be efficient from the street and to the buildings on the Gables campus. Its design should respect current architectural styles, materials and craftsmanship techniques that are currently on site to ensure visual cohesion. The building will have to be in accordance to established preservation standards and guidelines, for example, the National Park Service, “The Secretary of the Interior’s Standards for Rehabilitation”, and the Salem Historical Commission Guidelines should be referred to and used to ensure that the design aligns with national and local preservation guidelines and regulations.

Flooding and water infiltration occurring at Hooper Hathaway House and Primm House.
All photos by House of the Seven Gables,

SEAWALL IMPROVEMENTS

The following short-term repairs were highlighted in the inspection report (see Appendix A) and are further detailed below in no particular order of importance.

REPOINTING AND MORTAR REPAIR/ INSTALLATION

During the inspection, there were several locations noted as recent repairs and/or missing stones. It was recommended that all missing stones were to be replaced with the largest possible stone to properly fit the space, chinking stone were recommended to fill the small joints to sufficiently secure the new stones, and repointing with mortar suitable for masonry seawall repairs was to be implemented. Mortar requirements included a rapid set product suitable for use in a marine environment. Wall joints were recommended be cleared of loose mortar, vegetation, and all debris prior to mortar installation. The maintenance suggested was put out to bid in the summer of 2023 and the work was completed in October 2023.

BACKFILL

Voids were observed behind the wall in the grassy area at the east end of the site adjacent to the Counting House. Collins recommended excavating down to the limit of the observed voids and backfill with suitable material. Backfill material was specified to be ordinary borrow meeting MassDOT M1.01, a modified rockfill or a crushed gravel and was detailed to be wrapped in a geotextile filter fabric to prevent further fines from escaping through the wall. The maintenance suggested was put out to bid in the spring of 2024 and repairs were completed in June 2024.

RAILING

The railing from station 3+30 to station 4+15 in front of the Primm House consists of a chain link fence with posts cored into the granite capstones and was observed to be in critical condition. It is recommended to be removed and replaced in-kind; however, the final railing type and connection may be modified as approved by the Owner.

ROUTINE INSPECTION

It is recommended that the seawall be visually inspected yearly to look for visual defects, loss of mortar, sink holes, and any voids in the wall.

REGULATORY REQUIREMENTS

The scope of work described above includes maintenance on a coastal bank and was be completed within the Land Subject to Coastal Storm Flowage, and is therefore within the jurisdictional area of local and state regulatory agencies. Collins prepared and submitted a Request for Determination of Applicability (RDA) permit application and received a negative determination at the hearing on March 21st, 2023. The RDA permit application with supporting documentation, and negative determination is attached in Appendix A.

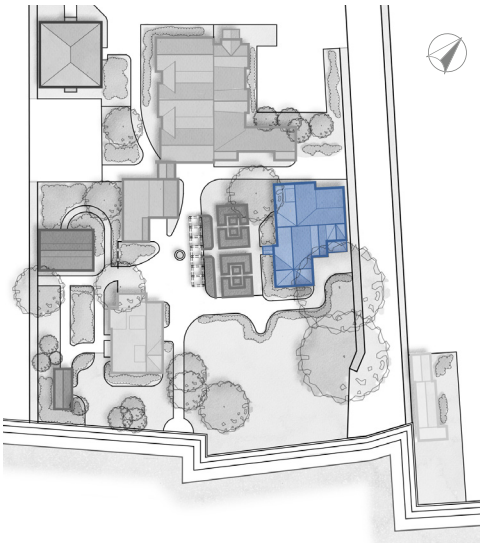
Seawall Improvements: re-pointing and mortar repair. June 2024.

Seawall Improvements: backfill seawall at Counting House. June 2024.

Seawall Improvements: re-pointing and mortar repair. June 2024.

Seawall Improvements: backfill seawall at Counting House. June 2024.

TURNER-INGERSOLL MANSION - DRY FLOODPROOFING



Key map: The House of the Seven Gables Campus

ORIGINAL LOCATION

115 Derby Street, Salem (current)

SIGNIFICANT CHANGES TO DATE

The Turner-Ingersoll Mansion has undergone various changes and restoration efforts since it was built in 1668. Below listed the years when major changes were done to the house.

- 1693
- 1720
- 1794
- 1890s
- 1909
- 1922

CURRENT USE

The house is currently mainly open to the public as a museum with a small collection of archival storage on the second and third floors.

The Turner-Ingersoll Mansion sits on its original foundation in its original location. The design team and the Museum decided to prioritize keeping it in place for as long as possible when developing the Master Plan due to its important architectural history and setting on the Gables Campus. However, before thinking long-term, one has to assess the near-term threats and challenges facing this building.

By 2030, the Mansion is under threat of coastal flooding due to 2-year, 10-year and 100-year storms. The projected flood level of each of these is not anticipated to surpass the first floor level; however, the design team is proposing installing removable flood barriers at the doors (the same as those proposed at the Hooper-Hathaway House), to be installed by the Museum staff as needed before flood events.

The basement will be impacted by coastal flooding. Some water is anticipated to come through the fieldstone walls, in which case a basement sump pump system is recommended to flush out any water that may accumulate. The current windows are a concern for water infiltration as well. The drawings on the following page propose extending the existing window wells up to be level with the first floor level. The Museum can also fit them with covers to prevent rain from accumulating in the wells (see the photo on the facing page). Despite offering means to protect against water infiltration in the basement, it's recommended that the Museum relocate any sensitive equipment in the basement to a more protected area.

To prepare for future adaptations, the design team suggests removing the large bushes along the building's south facade. This will allow Museum staff direct access during floods when the building may be temporarily wrapped. Consider replacing the bushes with lower-profile shrubs or extending the brick walkway to the building.

Top: a window well filling with rain during a storm, Jan. 10, 2024. Above left: water entering the Mansion under an entry door during a storm, Aug. 8, 2023. Right: water entering the basement during a storm, Aug. 8, 2023. All photos by the House of the Seven Gables Museum.

TURNER-INGERSOLL MANSION - DRY FLOODPROOFING

WEST ELEVATION

NOT TO SCALE

TEMPORARY EXPANDABLE FLOOD BARRIER
B.O.D. FLOODPROOFING.COM DAM EASY FLOOD BARRIER

NORTH ELEVATION

NOT TO SCALE

EAST ELEVATION

NOT TO SCALE

TEMPORARY EXPANDABLE FLOOD BARRIER
B.O.D. FLOODPROOFING.COM DAM EASY FLOOD BARRIER

SOUTH ELEVATION

NOT TO SCALE

SITE IMPROVEMENTS

Based on the data collected, the project team has developed key understandings of groundwater and surface water conditions at the site. HWG suggests intermittent but continued groundwater monitoring, such that an adaptive timeline for improvements can be determined based on future data forecasting and climate triggers.

IMPLEMENTATION AREA

BIORETENTION

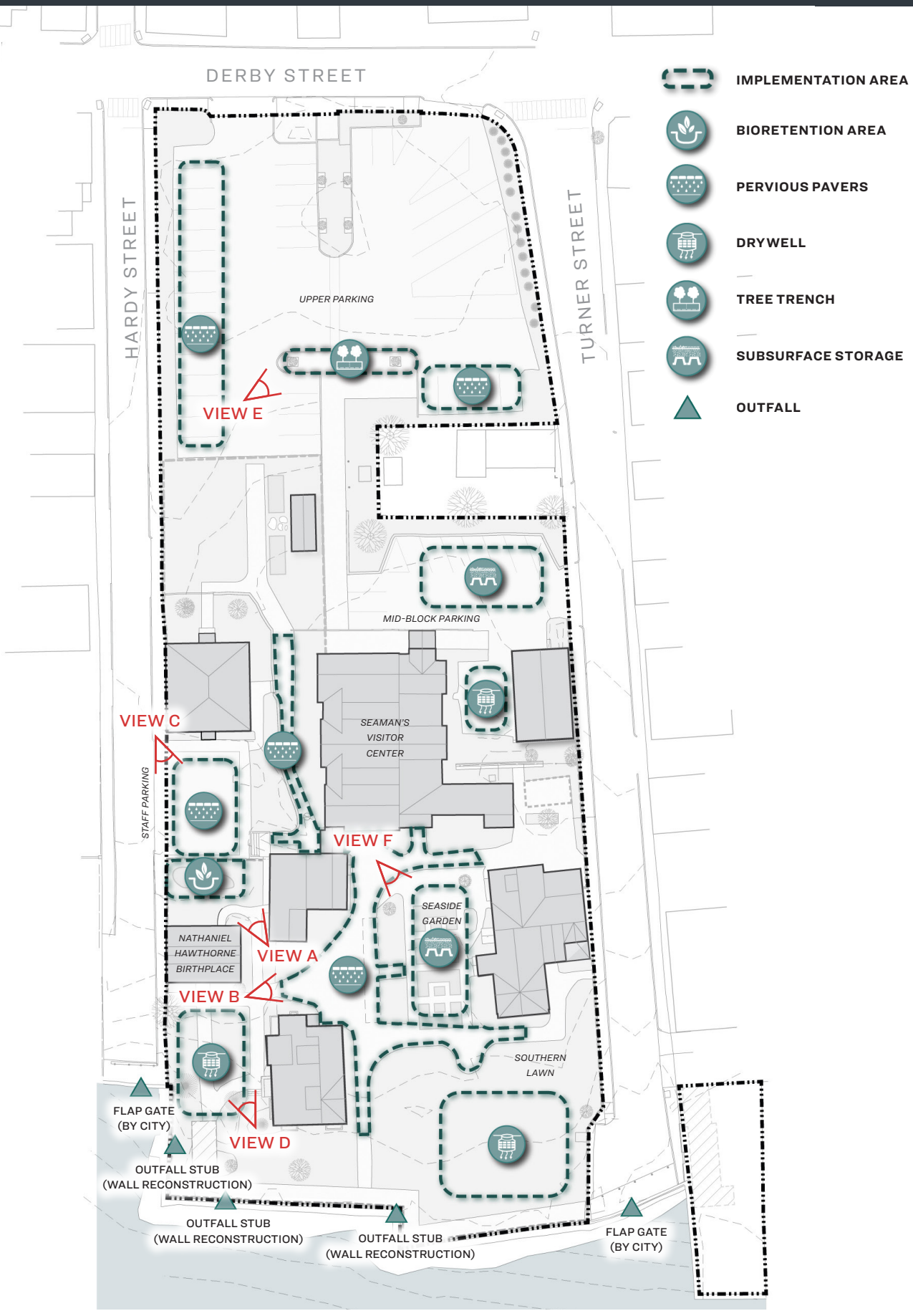
- Install Bioretention on the south side of Nathaniel Hawthorne Birthplace

PERVIOUS PAVEMENT/PAVERS

- Install Pervious Pavers on west side of Visitor Center
- Install Pervious Pavers on south side of Visitor Center, view B
- Install Pervious Pavement on west side of upper parking area
- Install Pervious Pavement on east side of upper parking area
- Install Pervious Pavement on staff parking area, view C

Site Improvement Diagrams

PHASE I


DERBY STREET
HARDY STREET
TURNER STREET
UPPER PARKING
MID-BLOCK PARKING
STAFF PARKING
SEAMAN'S VISITOR CENTER
SEASIDE GARDEN
NATHANIEL HAWTHORNE BIRTHPLACE
SOUTHERN LAWN
VIEW A
VIEW B
VIEW C
VIEW D
VIEW E
VIEW F
FLAP GATE (BY CITY)
OUTFALL STUB (WALL RECONSTRUCTION)
OUTFALL STUB (WALL RECONSTRUCTION)
OUTFALL STUB (WALL RECONSTRUCTION)
FLAP GATE (BY CITY)
IMPLEMENTATION AREA
BIORETENTION AREA
PERVIOUS PAVERS
DRYWELL
TREE TRENCH
SUBSURFACE STORAGE
OUTFALL

SITE IMPROVEMENTS

DRYWELL

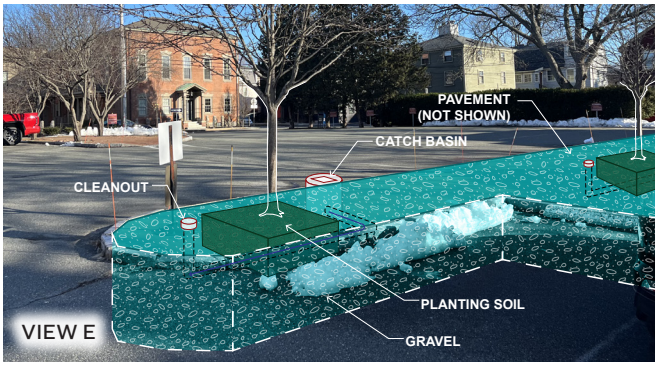
- Install Drywell on the south side of Nathaniel Hawthorne Birthplace, view D
- Install Drywell in southern lawn area
- Install Drywell in Maintenance area adjacent to Visitor Center

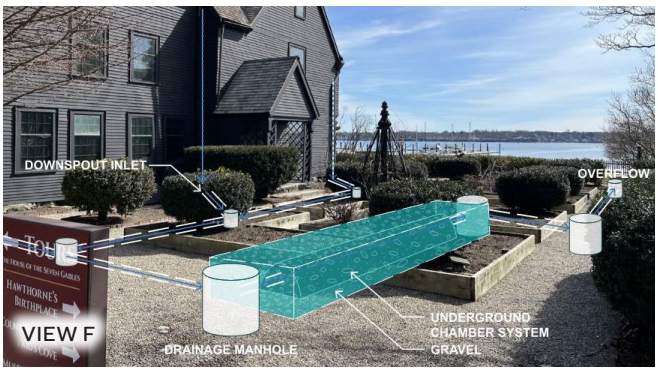
TREE TRENCH

- Install Tree Trench in Upper Parking Area, view E

SUBSURFACE INFILTRATION

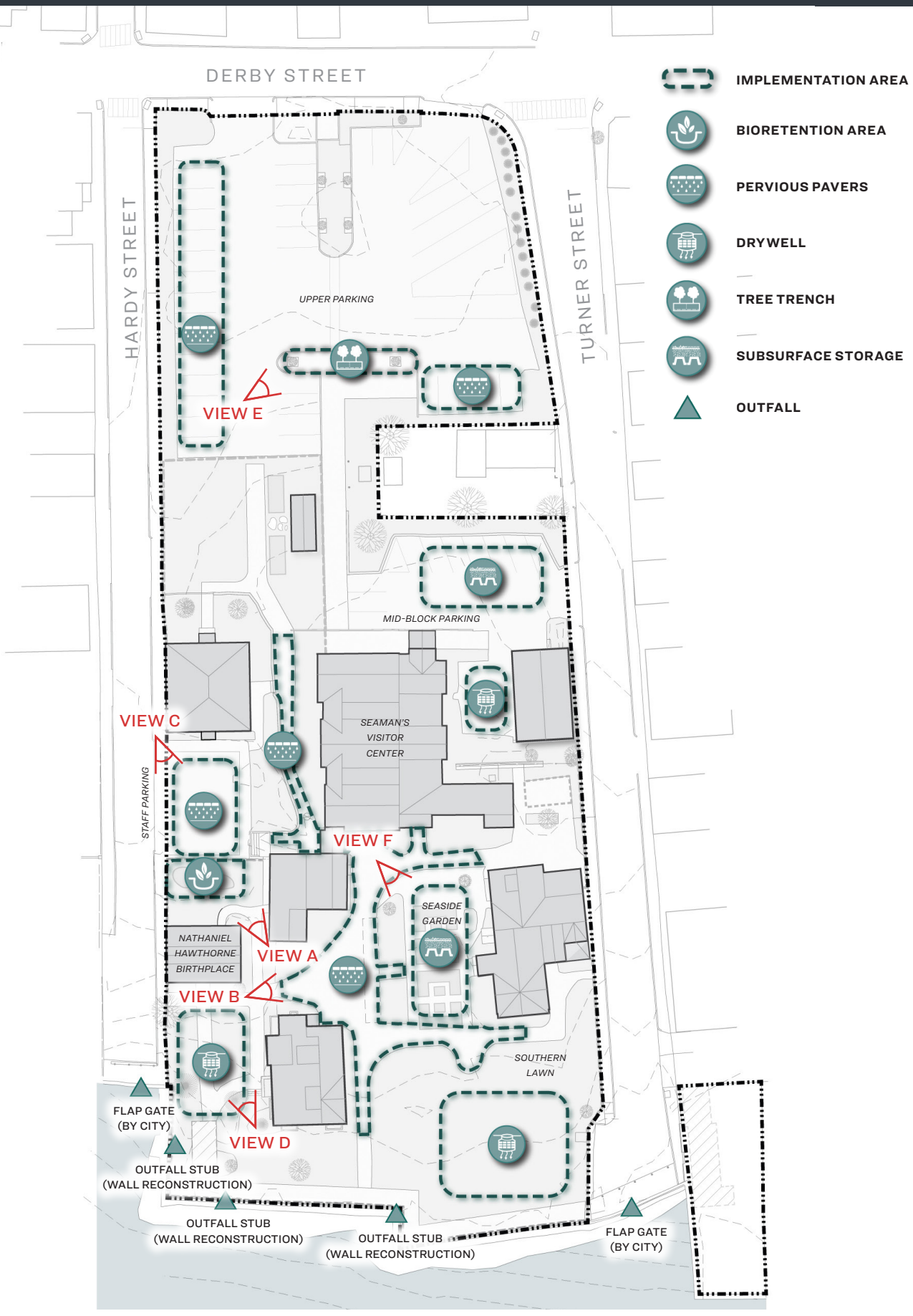
- Install Subsurface system in mid-block Parking Area
- Install Subsurface system at Seaside Gardens, view F





Site Improvement Diagrams

PHASE I


DERBY STREET
HARDY STREET
TURNER STREET
UPPER PARKING
MID-BLOCK PARKING
STAFF PARKING
SEAMAN'S VISITOR CENTER
SEASIDE GARDEN
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FLAP GATE (BY CITY)
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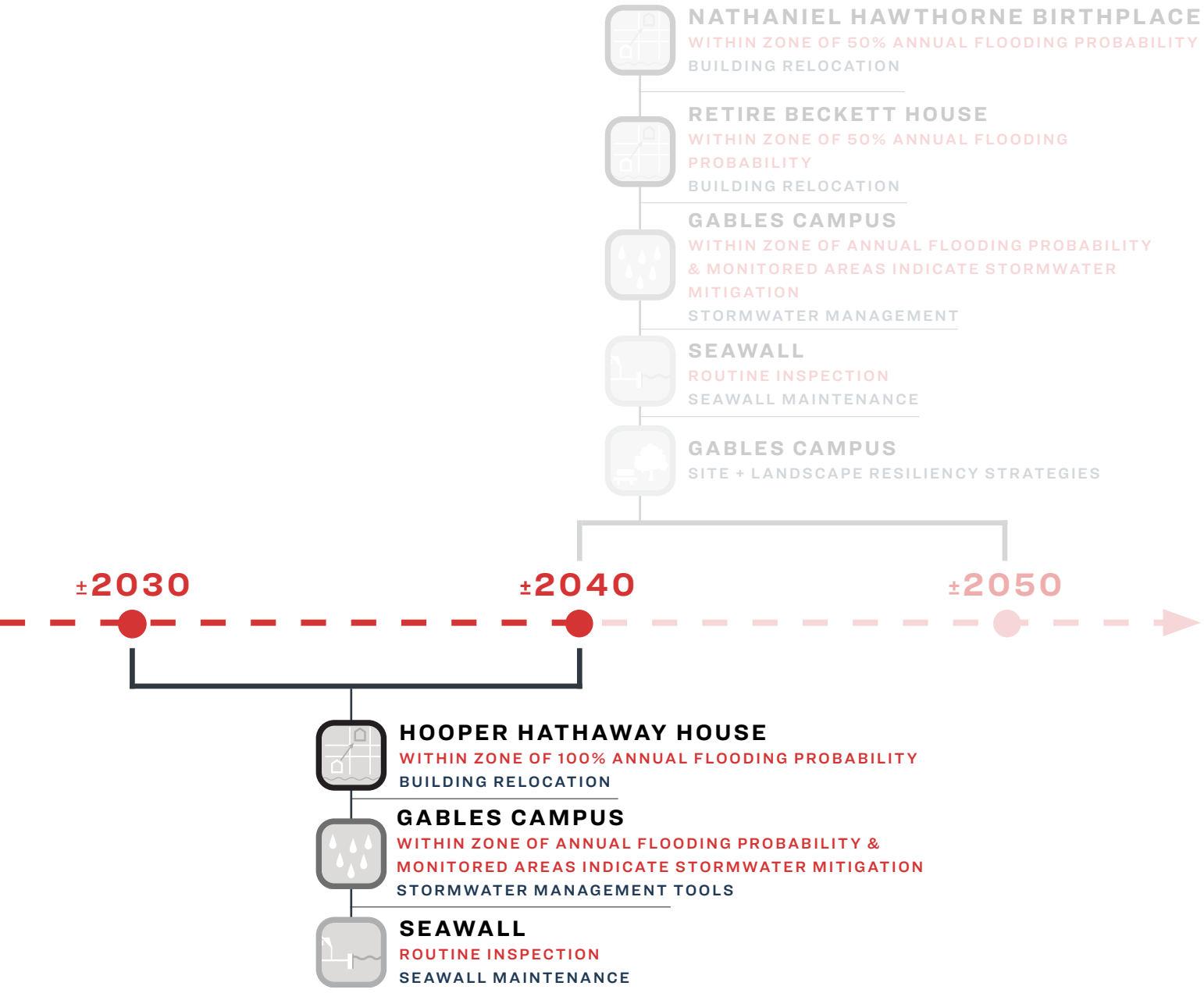
FLAP GATE (BY CITY)
IMPLEMENTATION AREA
BIORETENTION AREA
PERVIOUS PAVERS
DRYWELL
TREE TRENCH
SUBSURFACE STORAGE
OUTFALL

View of Hooper Hathaway House.
Photo by Union.

MASTERPLAN - PHASE II



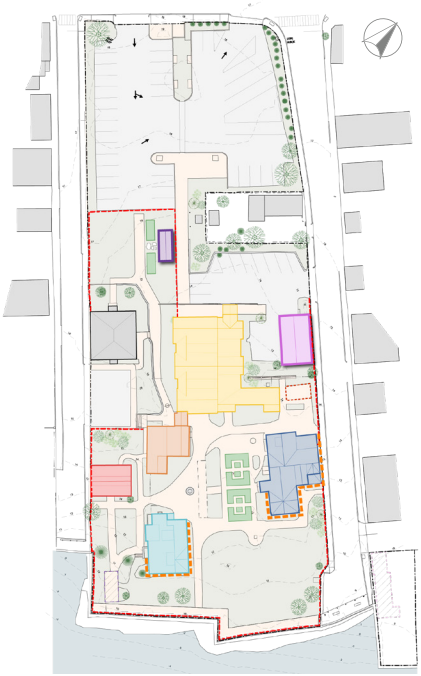
MASTERPLAN - PHASE II

THE SECOND PHASE OF THE ADAPTATION MASTERPLAN FOCUSES ON RELOCATING AND RE-PURPOSING THE HOOPER HATHAWAY HOUSE TO MITIGATE FLOODING RISKS, ENHANCING BOTH STRUCTURAL RESILIENCE AND VISITOR EXPERIENCE.

Recognizing the urgency of the situation, the Hooper Hathaway house will be relocated to the upper part of the campus along Hardy Street. By removing the workshop from the basement and relocating administrative and office spaces, Hooper Hathaway House can be re-purposed as an interpretive museum space, specifically highlighting its architectural significance and its role in the history of settlement and the Gables history. This transformation not only mitigates the structural vulnerabilities of the house but also enriches the visitor experience by offering deeper insights into its historical context and architectural heritage.

Similar to the first phase there will be continuing efforts to enhance the resilience of the campus which will involve implementing site improvements and ensuring regular maintenance of seawalls.

PHASE I



	TRIGGERS	ACTION ITEMS
1	Within zone of 100% annual flooding probability	Relocate Hooper Hathaway House
2	Within zone of annual flooding probability & monitored areas indicate stormwater mitigation	Site Improvements
3	Routine inspection	Seawall Maintenance

PHASE II

HOOPER HATHAWAY - RELOCATION

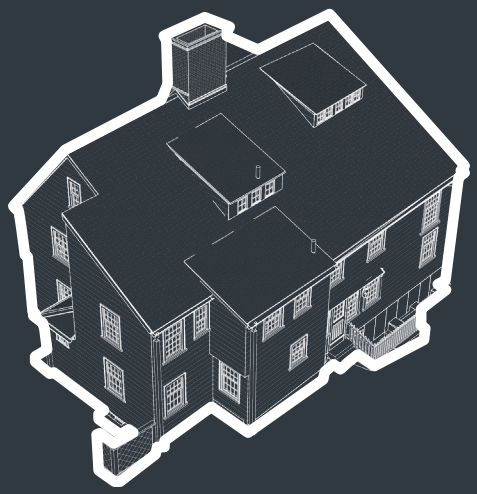
WHY RELOCATE THE HOOPER HATHAWAY HOUSE?

The Hooper-Hathaway House, due to its proximity to the waterfront and the active use of its basement as a workshop, is under threat of coastal flooding in the near-term. The recommendations outlined in Phase 1 will provide the protection the House needs for the near future while the House of the Seven Gables prepares the necessary funds and site for relocation, but will not protect the building long-term as the projected flood levels increase.

Relocating the Hooper-Hathaway House offers a unique opportunity to restore some of the building's history as well. The building will be situated against the street as it was in its original location, helping visitors to understand the historic context of the House. The Museum has the opportunity to bring back the walk-out basement (shown in the photo on the facing page). Providing access to this floor level opens up more exhibition floor space, more opportunities for interpretation, and allows the Museum to potentially show the House's historic use as a bakery.

POTENTIAL FUTURE USE:

This space is large enough to host exhibition space, particularly once staff and collections storage are removed from it prior to its move. To offer continuity to the Counting House's maritime interpretation, this is the most logical place to feature a more in-depth maritime history exhibit. This is also a good space for educational programming offerings to be executed, should such space not be included in the new visitor center. **examples.**



The Hooper-Hathaway House in its original location, showing a walk-out basement and elevated first floor. Date unknown. Source: Historic New England.

SITE IMPROVEMENTS

IMPLEMENTATION AREAS

BIORETENTION

- Install Bioretention on south side of relocated Hooper Hathaway House

Note: In phase III of the masterplan, buildings will be relocated to this area. The installing of the bioretention will be done with anticipation of future adaptation.

PERVIOUS PAVEMENT/PAVERS

- Install Pervious Pavers north of Visitor Center

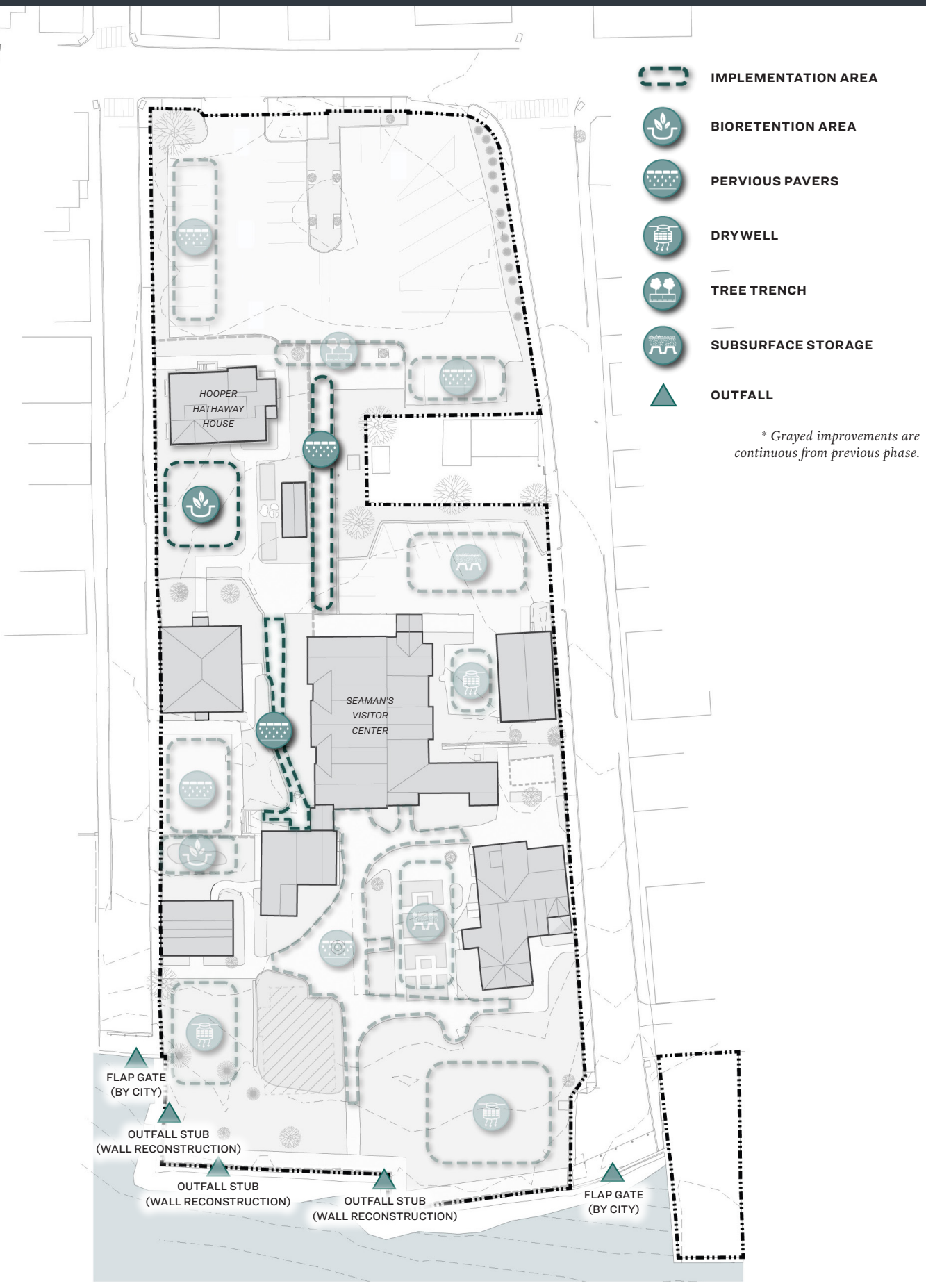
ALTERED OR REMOVED

Altering and removing site areas is suggested as a strategic approach to provide temporary, intermittent relief while preparing for future adaptation. This method offers flexibility in responding to unpredictable environmental changes and urgent risks.

PERVIOUS PAVEMENT

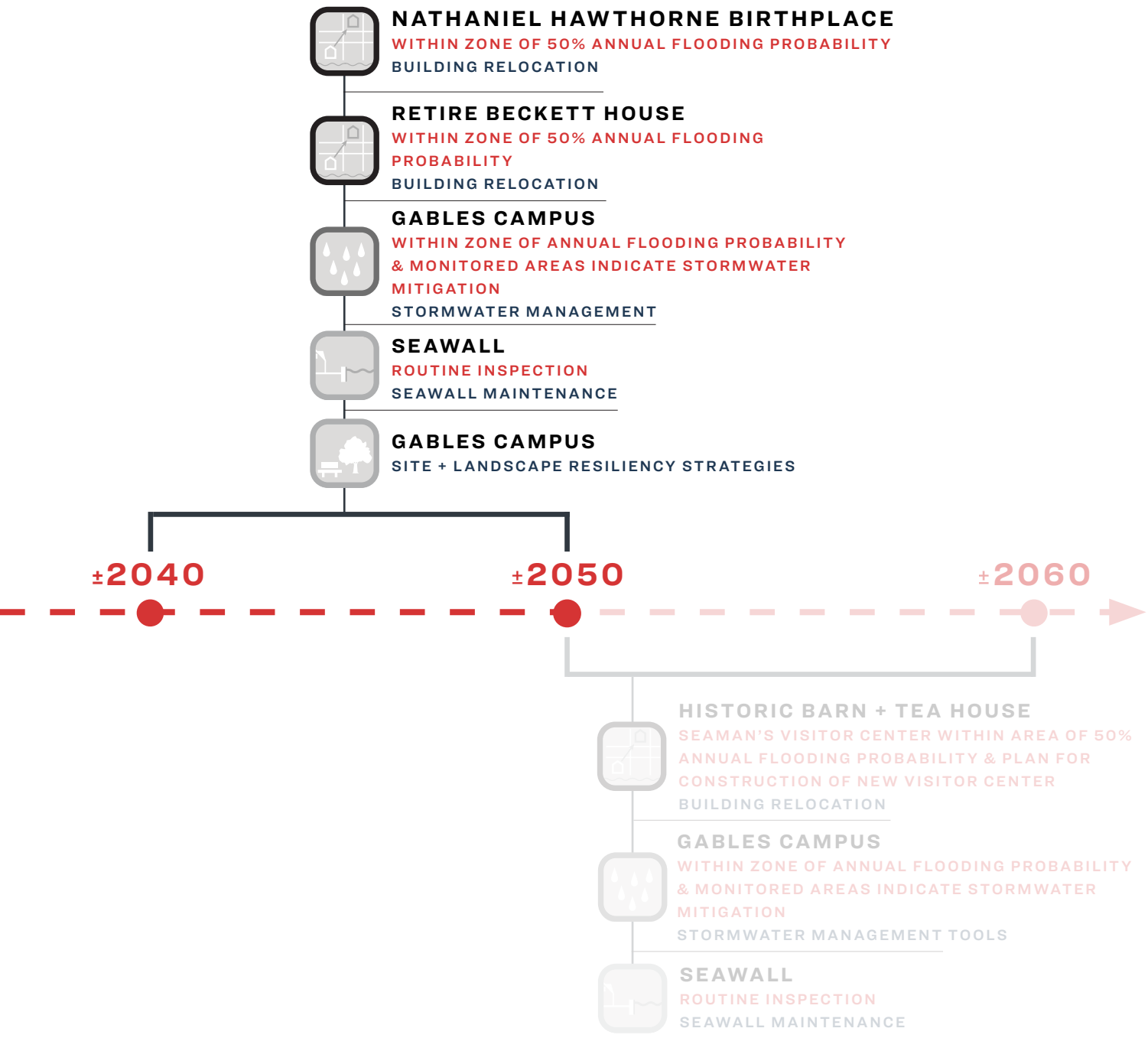
- Alter Pervious Pavement on west side of Visitor Center

PHASE II


IMPLEMENTATION AREA
BIORETENTION AREA
PERVIOUS PAVERS
DRYWELL
TREE TRENCH
SUBSURFACE STORAGE
OUTFALL
* Grayed improvements are continuous from previous phase.
HOOPER HATHAWAY HOUSE
SEAMAN'S VISITOR CENTER
FLAP GATE (BY CITY)
OUTFALL STUB (WALL RECONSTRUCTION)
OUTFALL STUB (WALL RECONSTRUCTION)
OUTFALL STUB (WALL RECONSTRUCTION)
FLAP GATE (BY CITY)

View of playground at Counting House, looking over Salem Harbor.

MASTERPLAN - PHASE III



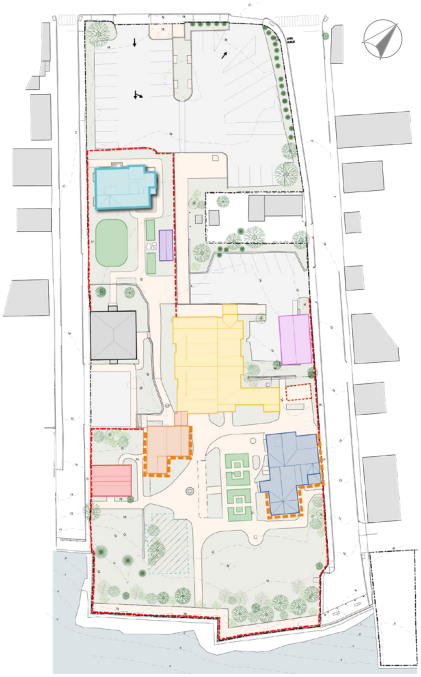
MASTERPLAN - PHASE III

THE THIRD PHASE OF THE ADAPTATION MASTERPLAN FOCUSES ON RELOCATING THE RETIRE BECKETT HOUSE AND NATHANIEL HAWTHORNE BIRTHPLACE ALONG HARDY STREET, ENHANCING CAMPUS RESILIENCE, AND CREATING AN EDUCATIONAL LOOP TRAIL ALONG THE WATERFRONT.

The Retire Beckett House and Nathaniel Hawthorne Birthplace will find new homes along Hardy Street. As part of this phase, parking facilities will also be relocated along Hardy Street, further integrating the visitor experience with the surrounding neighborhood. A new transit drop-off point is being introduced, providing visitors with public transportation options or potential shuttle service to the museum campus. Site improvements and ongoing seawall maintenance will continue to be prioritized to ensure the resilience of the campus against environmental challenges.

Additionally, a significant aspect of this phase involves the implementation of a loop trail along the waterfront of the museum campus. With most buildings now situated in the upper portion of the site, the waterfront will be left open for visitors to explore via a loop trail that focuses on indigenous history and climate change.

PHASE II



	TRIGGERS	ACTION ITEMS
1	Within zone of 50% annual flooding probability	Relocate Hawthorne Birthplace
2	Within zone of 50% annual flooding probability	Relocate Retire Beckett House
3	Within zone of annual flooding probability & monitored areas indicate stormwater mitigation	Site Improvements
4	Reduce impact of annual flooding threats	Shoreline Treatment
5	Hooper Hathaway House relocation	Loop Trail w/ Indigenous History & Climate Change + Public Access
6	Decreased visitor parking on-site	Transit Drop-Off

PHASE III

NATHANIEL HAWTHORNE BIRTHPLACE - RELOCATION

WHY RELOCATE THE NATHANIEL HAWTHORNE BIRTHPLACE?

The Hawthorne Birthplace is under threat from coastal flooding as well as surface flooding. Horsley Witten Group has proposed measures to reduce the surface flooding (from rainwater running off the staff parking lot), but it will be beneficial in the long run to move the building due to rising projected flood levels.

Moving the Hawthorne Birthplace will protect it and enhance the Museum campus to the north. It will be positioned facing the street, as it was originally on Union Street, helping visitors understand its historic context. Along with the relocated Retire-Beckett House, the Birthplace will help restore the neighborhood feel of Hardy Street, similar to its appearance before the parking lot was built, see map of 1906 on this page.

POTENTIAL FUTURE USE:

In 2017, The Gables re-imagined the Hawthorne Birthplace as the Hawthorne Museum. While interpretation will be reviewed regularly over time, it is the intention that this will remain a Hawthorne Museum. The storage in the basement could be relocated to another building on campus with better temperature and humidity control to better preserve these historic items.

THE WEATHER

Sunny, mild today with blustery southwest winds. Clear, cool tonight. Fair, warm Friday.

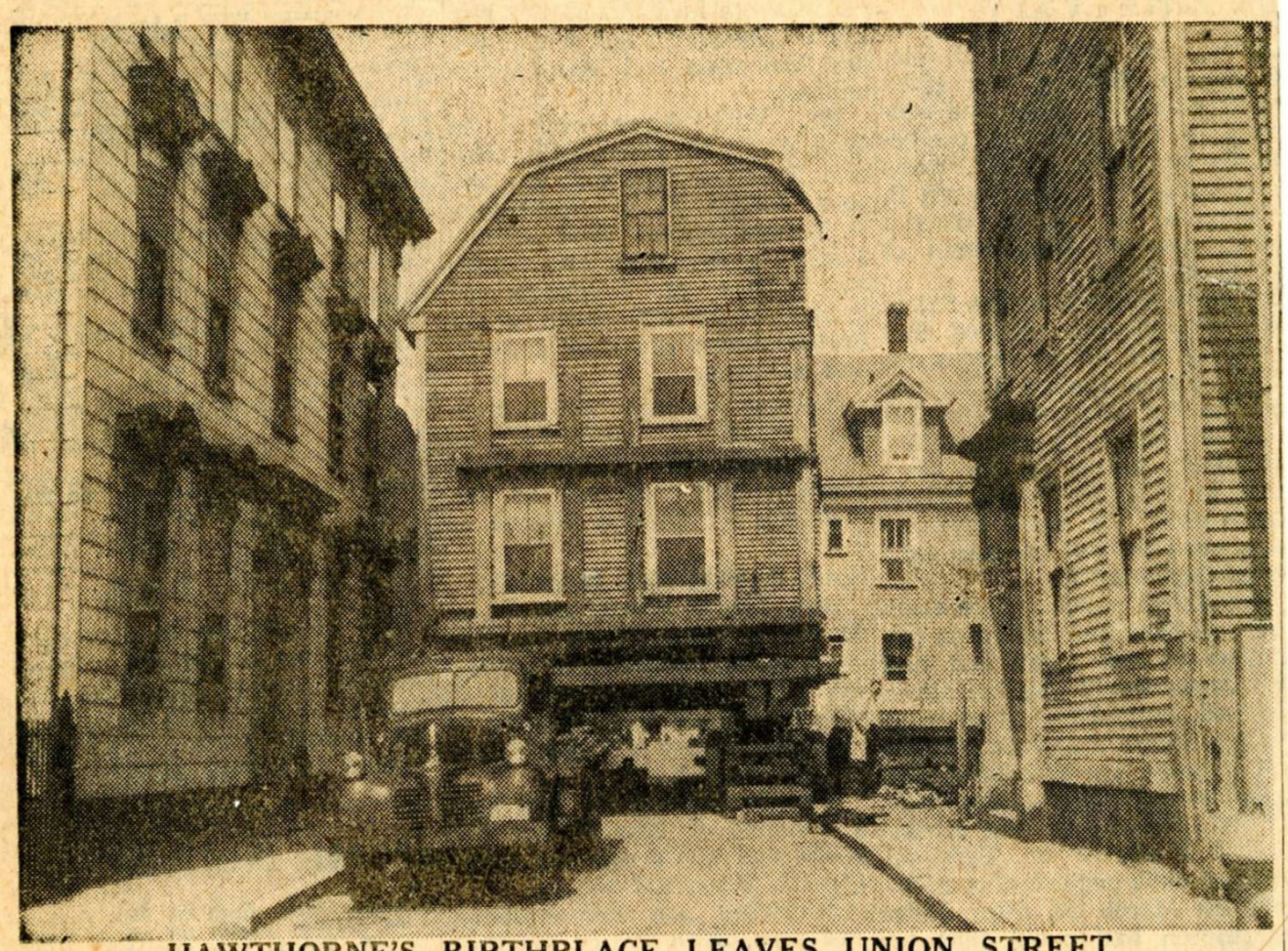
Sun: Sets, 7.43. Rises, 5.38.
High Tides: 10.17 P. M., 10.48 A. M.

32 PAGES

MAY 1 - 1958

THE SA

Published in Salem, for Salem, Peabody, Marblehead, Essex, Manchester, Rowley, Beverly, Hamilton, Wen Boxford, Danvers, Topsf



HAWTHORNE'S BIRTHPLACE LEAVES UNION STREET

For years a private residence, Nathaniel Hawthorne's birthplace on Union street is being moved to the House of Seven Gables area, off Turner street, which his writing made famous. The building will be a permanent addition to the historic Gables site. To get the structure through narrow Union street it was necessary for the mover to slice off one section of the frame dwelling. (Salem News Photo)

A newspaper article in the Salem News documenting the moving of the Nathaniel Hawthorne Birthplace on May 1, 1958. Source: the House of the Seven Gables Archives.

RETIRE BECKETT HOUSE - RELOCATION

WHY RELOCATE THE RETIRE BECKETT HOUSE?

The Retire-Beckett House arguably faces the least threat of coastal flooding of all of the historic houses, besides the Phippen House. However, it is still under threat of being inundated by a 100-year storm by the year 2050. Like the Hawthorne Birthplace, its proposed relocation will not only ensure the building is protected from coastal flooding but also help to rebuild the Museum campus on the north end of the site.

The House will be located along Hardy Street to help re-imagine the neighborhood context of this block as it was before the parking lot was built. The bridge that connects it to the historic Barn will be removed, as the House will now be free-standing (similar to its original condition).

POTENTIAL FUTURE USE:

After entering the site from the historic Tea Room, those not yet (or after) entering the Turner-Ingersoll Mansion will have the opportunity view an exhibition on the history of Settlement in Retire-Beckett, across from the house that sustains this work to this day. When the Visitor's Center is redesigned, the Museum can move the gift shop out of the Retire-Beckett House and use that space for exhibits or other uses.

THE SALEM EVENING NEWS—SALEM, MASS., SATURDAY, MAY 17, 1924

FAMOUS OLD BECKETT HOUSE WILL BE MOVED TO TURNER ST. SITE

Structure Built 259 Years Ago by Old-Time Shipbuilder Will Become Tea House of House of Seven Gables

RETIRE BECKETT HOUSE, BECKETT AVENUE

A newspaper article in the Salem Evening News documenting the moving of the Retire-Beckett House on May 17, 1924. Source: the House of the Seven Gables Archives.

VISITOR EXPERIENCE & VIEW FROM HARDY STREET

To accommodate the relocation of Nathaniel Hawthorne Birthplace, Retire Beckett House, and in previous phase, the Hooper Hathaway House, parking adjustments have been made at the Gables campus. Visitor parking has shifted to Hardy Street, when visitors park on Hardy Street, there will be a notable change in the arrival experience.

As visitors make their way along Hardy Street towards the new Welcome Center on Derby Street, they will encounter a unique opportunity to appreciate Nathaniel Hawthorne Birthplace, Retire Beckett House and Hooper Hathaway from a street-facing perspective. The relocation of the buildings along Hardy Street reflect the original orientation of these buildings when they were situated in various parts of Salem before being relocated to the Gables campus in the twentieth century.

NATHANIEL HAWTHORNE BIRTHPLACE

HOOPER HATH

HAWAY HOUSE

RETIRE BECKETT HOUSE

SHORELINE TREATMENT RECOMMENDATIONS

LIVING SHORELINES/ NATURAL BARRIERS

Living shorelines and natural barriers are a dual-function technique designed to allow vehicular access up and over the curb while also maintaining the gutter line. Mountable curbs may be used along the campus perimeter streets to control off-campus runoff.

All photos: City of Salem, Salem Sound Coastwatch

Projects funded by CZM.

INDIGENOUS HISTORY & CLIMATE CHANGE TRAIL

With native salt-resistant plantings added to the area where the event lawn is currently located, the landscape will appear more similar to the time of Indigenous occupation, before European colonists arrived. Working in partnership with the Massachusett Tribe at Ponkapoag, The House of the Seven Gables will create an Indigenous Peoples History and Climate Change Trail. This represents a significant opportunity to enrich the visitor experience and engage with important social and environmental themes. Through immersive exhibits, interactive displays, and interpretive signage along the trail, visitors will learn about the Massachusett and their enduring connection to the land. They will also learn about the critical environmental issues The Gables is facing and how climate change has impacted the campus.

PUBLIC ACCESS - CHAPTER 91

The integration of public access rights under Chapter 91, presents an opportunity to enrich the experience of the public along the waterfront. Now, the public and visitors can enjoy the connectivity between Salem's waterfront areas and the museum's outdoor exhibit. The public will not be able to access the Gables property via the trail.

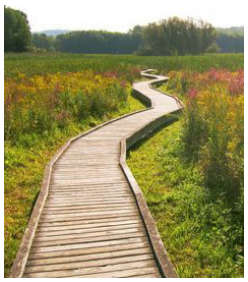
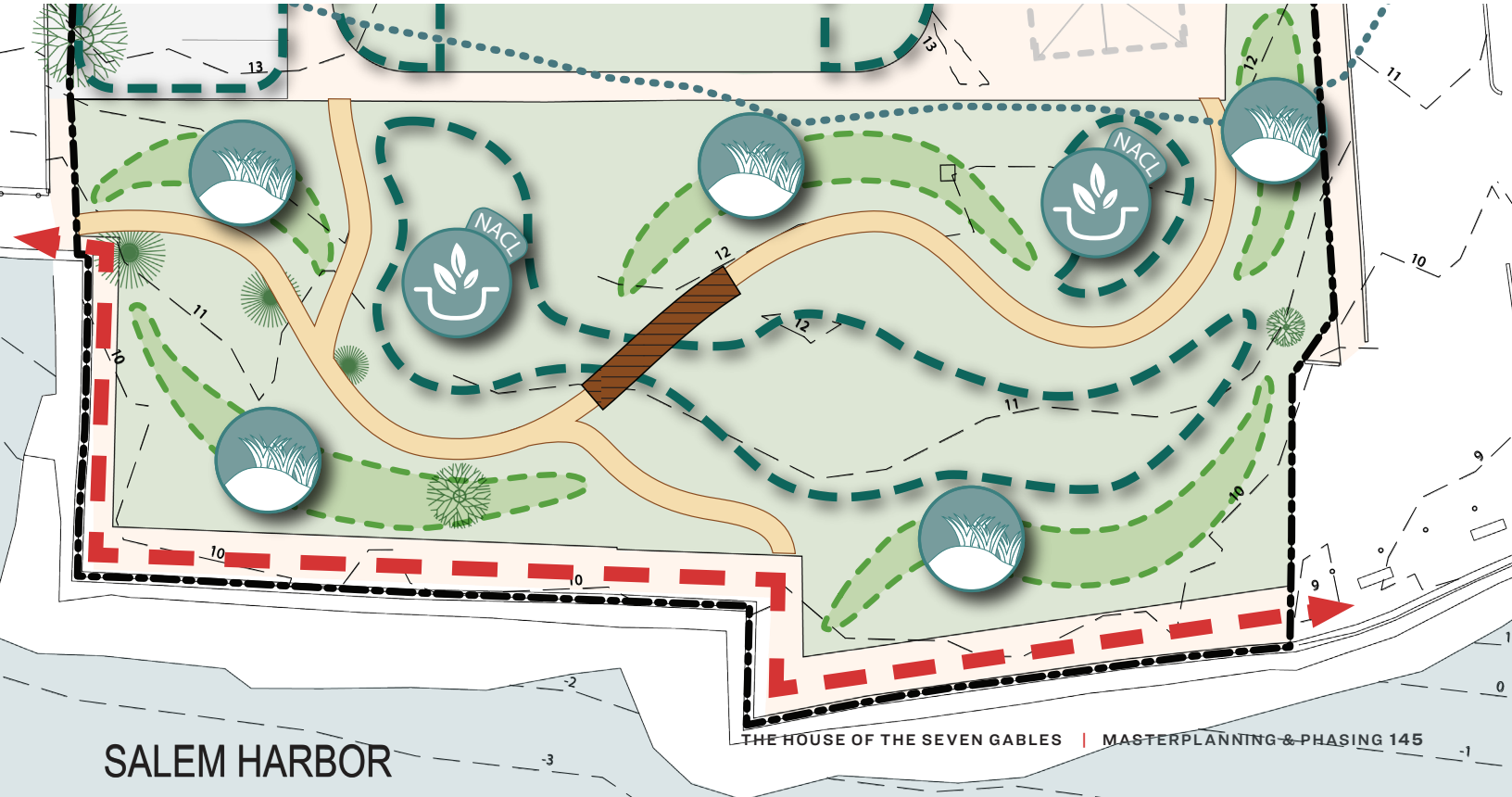


Image Source: PannierGraphics and Pochuck Quagmire Boardwalk



SITE IMPROVEMENTS

IMPLEMENTATION AREAS

BIORETENTION

- Install Salt Tolerant Bioretention on the south lawn
- Install Bioretention on the northwest corner of campus
- Install Bioretention east of new Nathaniel Hawthorne Birthplace

PERVIOUS PAVEMENT/PAVERS

- Install Pervious Pavement at old Nathaniel Hawthorne Birthplace
- Install Pervious Pavement on east side of Upper Parking Area

TREE TRENCH

- Install Tree Trench on the northwest corner of campus

ALTERED OR REMOVED

DRYWELL

- Remove Drywell on the south side of old Nathaniel Hawthorne Birthplace

BIORETENTION

- Remove Bioretention on the south side of new Nathaniel Hawthorne Birthplace

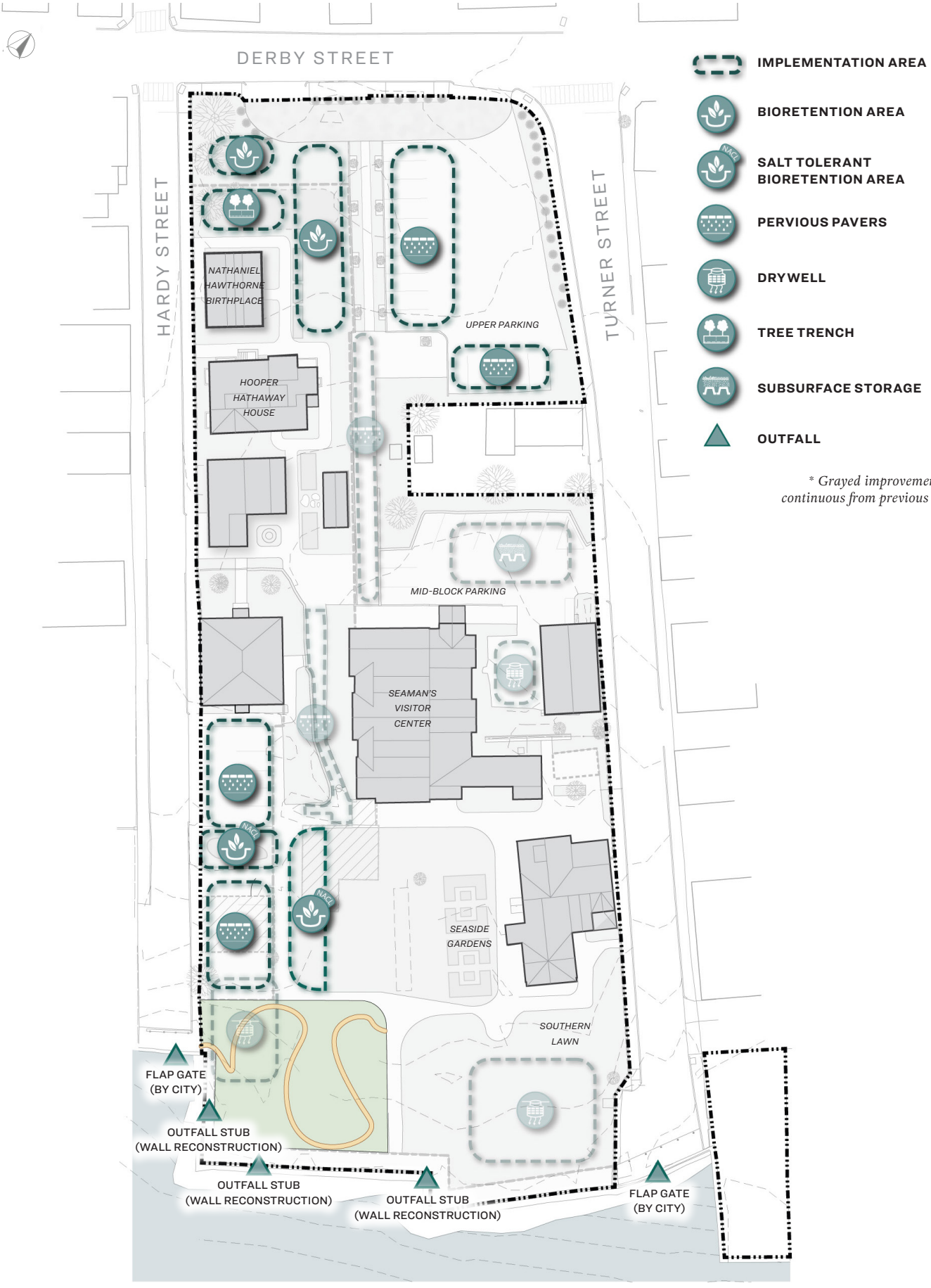
PERVIOUS PAVEMENT/PAVERS

- Remove Pervious Pavers on south side of Visitor Center
- Remove Pervious Pavers in Memorial Gardens area
- Remove Pervious Pavement on west side of Upper Parking Area

TREE TRENCH

- Remove Tree Trench in Upper Parking Area

PHASE III



** Grayed improvements are continuous from previous phase.*

SEAWALL IMPROVEMENTS

For medium to long term considerations, Collins has provided an analysis on different alternatives that could be implemented at the site, all with pros and cons to help the House of the Seven Gables select an alternative that would meet their needs. Three main concepts were submitted for consideration, each concept with multiple ways of achieving the desired result: strengthening the existing wall, increasing the height of the existing wall, and replacing the wall.

Ultimately, the Gables decided that strengthening their existing wall was the best fit for the site as it would allow for future height increase and eliminate the fines migrating through the seawall, thus eliminating the frequency with which sinkholes had developed in the past. Strengthening the seawall includes installing a concrete stem wall directly behind the stone wall, installing weep drains to allow hydrostatic pressure to drain, and supplementing the existing revetment with additional stones of equal size. The alternatives analysis report, 75% design plans, and technical specifications are attached in Appendix A.

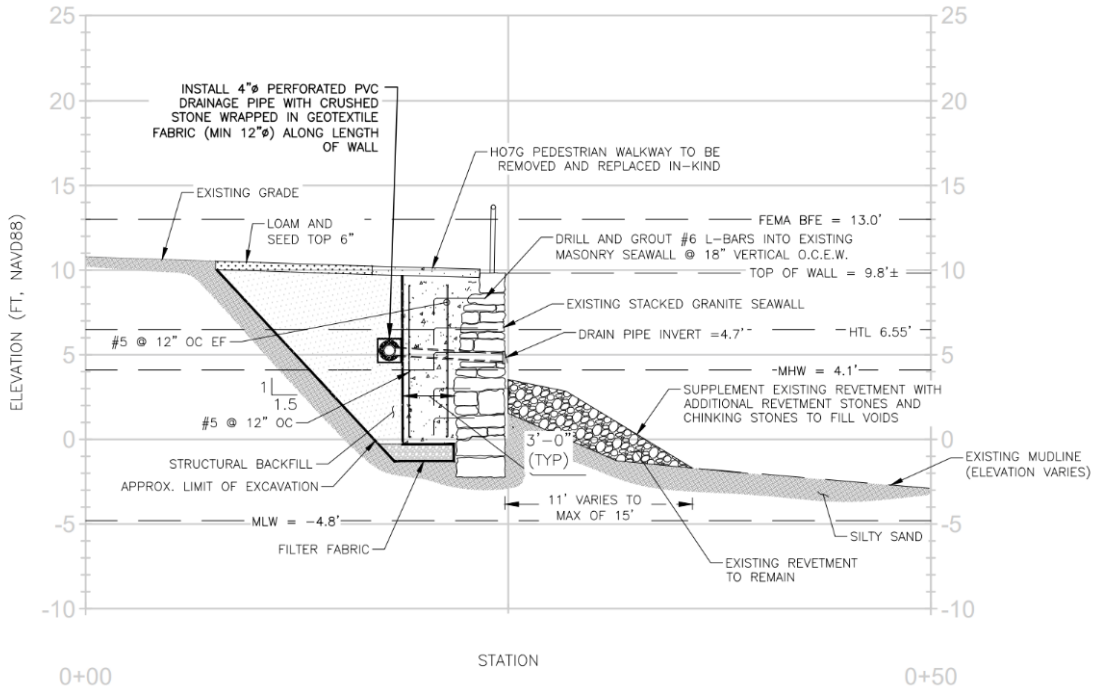
REGULATORY REQUIREMENTS

The scope of work described includes disturbance to a coastal bank and land subject to coastal storm flowage, resources defined by the Massachusetts Wetlands Protection Act (WPA). Collins prepared and submitted a Notice of Intent permit application the Salem Conservation Commission and to MassDEP and attended a hearing on May 21st, 2024 where they were granted approval with a letter of conditions.

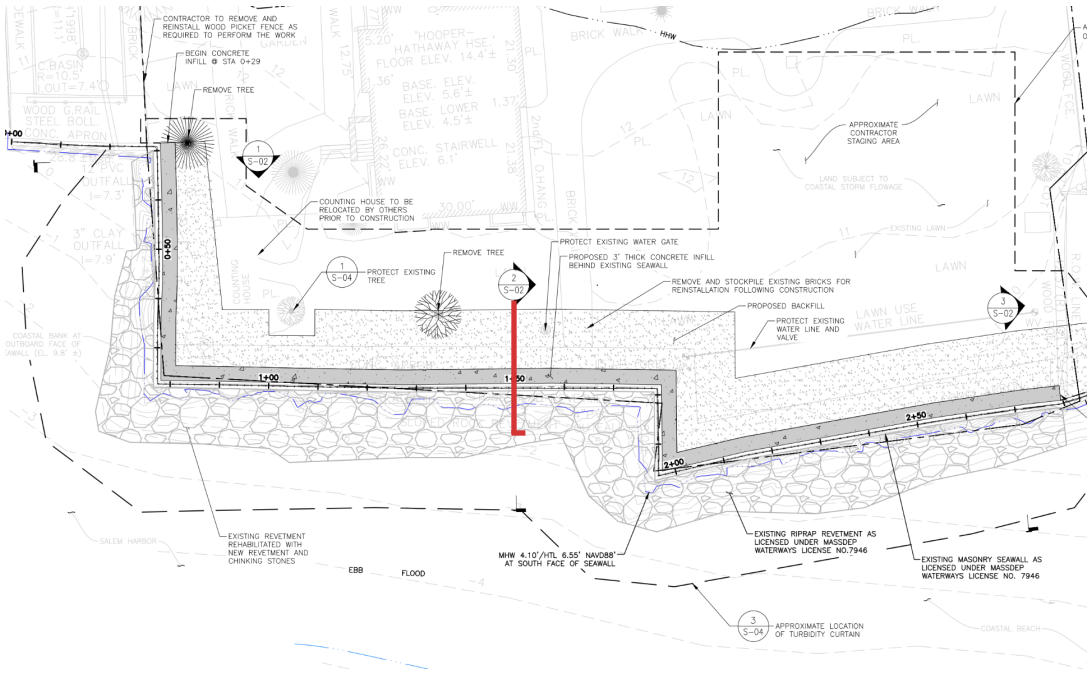
The project is also within the United States Amry Corps of Engineers jurisdiction and required a General Permit for Bank and Shoreline Stabilization (GP-2) and Maintenance of Existing Structures (GP-9); a Preconstruction Notification Form and supplemental information was submitted for review in June of 2024 is currently under review.

Structures that are located below the historic mean high-water mark require a MassDEP Chapter 91 license. The existing seawall is currently licensed under license #7946 with a 99-year license dated June 18th, 1999. The alternative selected is considered minimal, qualifying as a minor modification to the existing license and required an online notification with sufficient detail. The minor modification is currently under review by MassDEP.

PHASE III



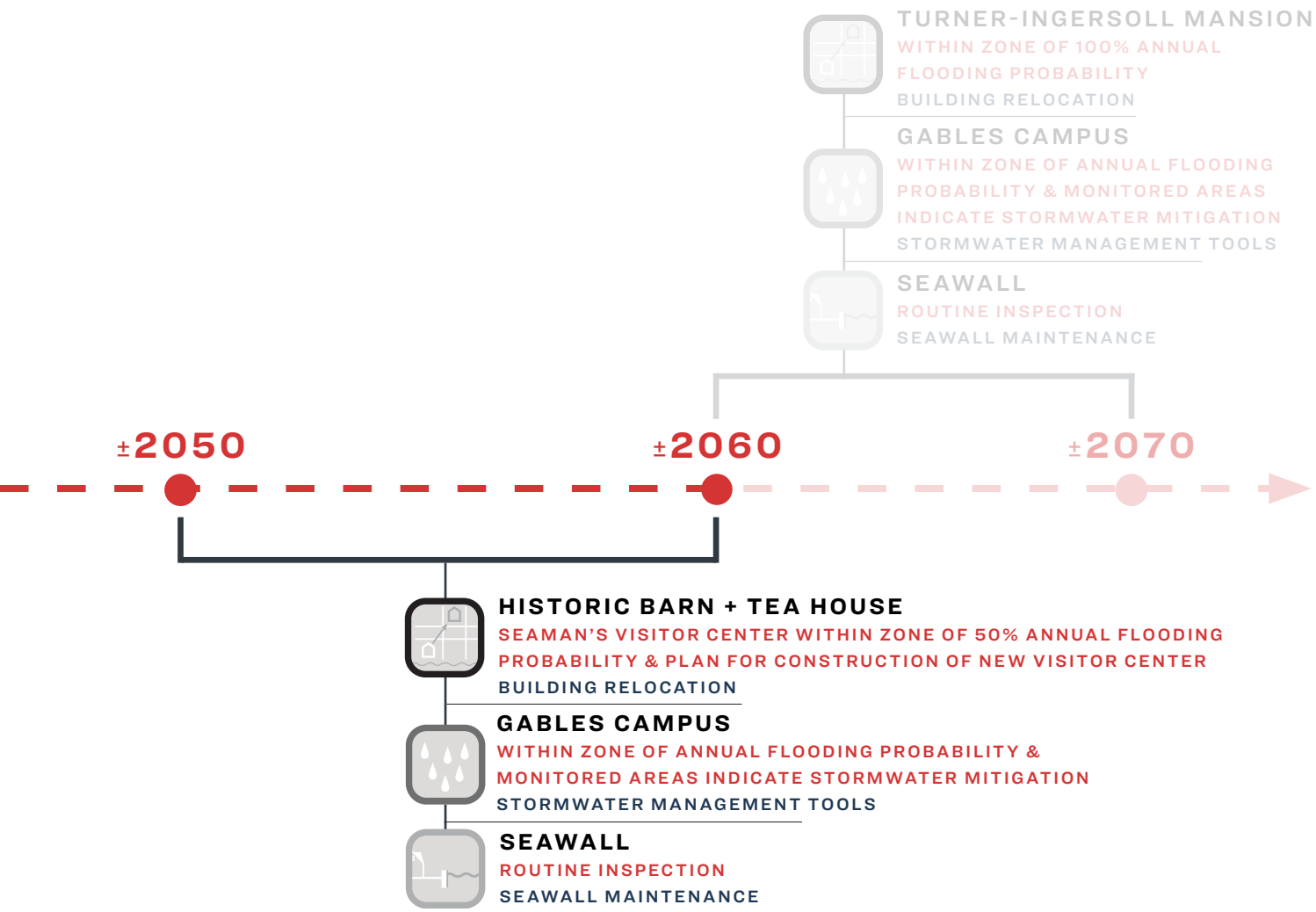
Proposed Seawall Section (shown red in plan below) by Collins Engineers



Proposed Structural Plan by Collins Engineers

View of playground at Counting House, looking over Salem Harbor.

MASTERPLAN - PHASE IV



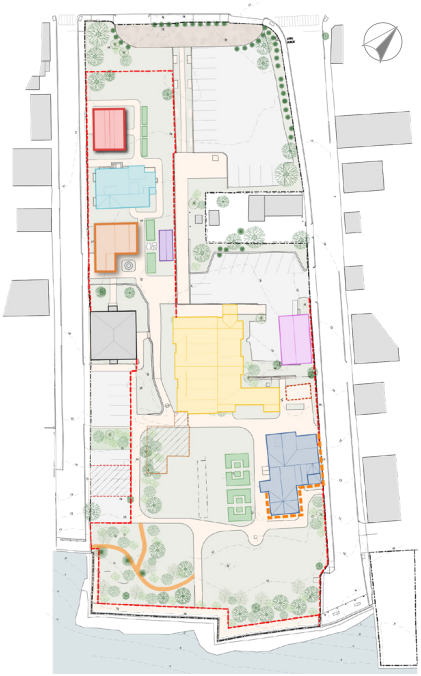
MASTERPLAN - PHASE IV

THE FOURTH PHASE OF THE ADAPTATION MASTERPLAN PROPOSES A NEW VISITOR CENTER WITH ENHANCED AMENITIES AND FLOOD MITIGATION MEASURES, EXPANDED TRAILS AND LIVING SHORELINE, AND THE RELOCATION AND REUSING OF THE HISTORIC BARN AND TEA HOUSE TO CREATE AN INVITING ENTRANCE ALONG DERBY STREET.

The new Visitor Center will incorporate necessary flood mitigation measures while maintaining its central role connecting the upper campus and the waterfront. It will expand onto a new event lawn in front of the Turner Ingersoll Mansion, providing visitors with scenic harbor views. Additionally, the loop trail and living shoreline at the existing event lawn will be expanded to enhance the visitor experience.

The historic barn and tea house will be preserved, relocated, and expanded to create an inviting entrance along Derby Street, with parking consolidated along Hardy Street. These structures will serve as a café, admissions and gift store, while the Retire Beckett House will transition into a museum interpretation and education center focusing on Maritime and Salem History. Ongoing site improvements and seawall maintenance will continue throughout this phase to ensure the campus's resilience and adaptability.

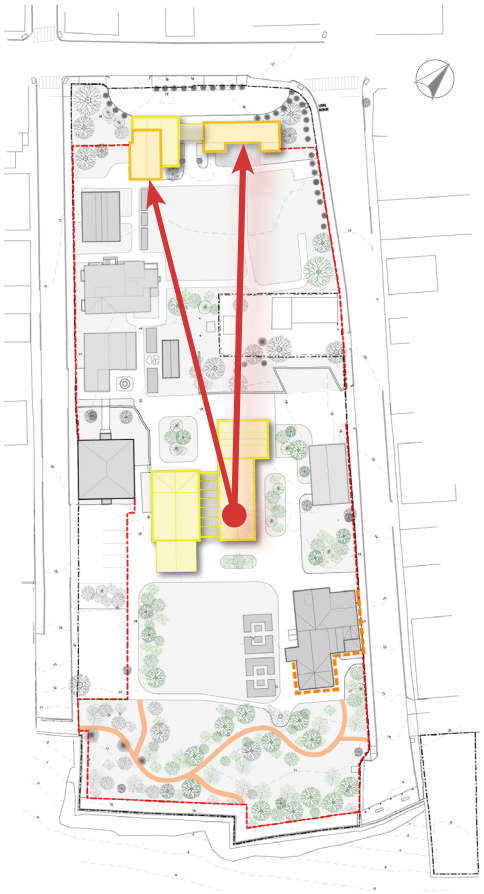
PHASE III



	TRIGGERS	ACTION ITEMS
1	Seaman's Visitor Center within zone of 50% annual flooding probability & plan for construction of new Visitor Center	Relocate Historic Barn & Tea House
2	Within zone of 50% annual flooding probability	New Visitor Center
3	Within zone of annual flooding probability & monitored areas indicate stormwater mitigation	Site Improvements
4	Routine inspection	Seawall Maintenance

PHASE IV

HISTORIC BARN & TEA HOUSE - RELOCATION



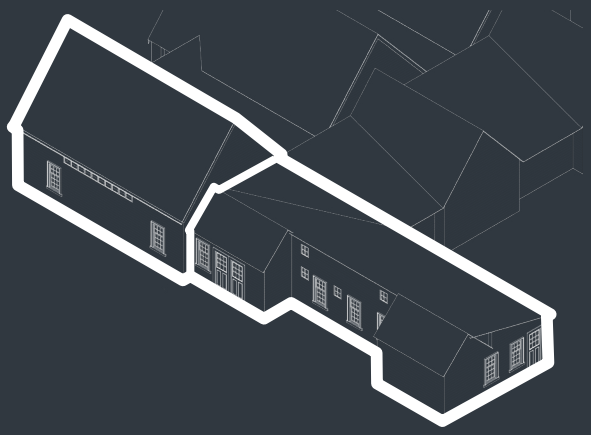
WHY RELOCATE THE HISTORIC BARN & TEA HOUSE?

With the consideration of demolition of the current Seaman's Visitor Center and building a new visitor center, the historic Barn and Tea House will be preserved. Despite modifications over the last decade, the two buildings are integral to the site's heritage. Therefore, the two buildings will be re-purposed and relocated to create an inviting entrance and fill in the top of the campus along Derby Street. Their relocation and expansion, with thoughtful new additions, will respect their historical significance while adapting them to modern use.

POTENTIAL FUTURE USE:

BARN – Located close to the street and the entrance/exit to the site, this location offers a prime opportunity for visitors and passersby to shop with The Gables Museum Store.

TEA ROOM – As an entryway to the site, this area can be re-purposed as an admissions center. Its history as a tea room also lends itself to the potential for small café service, should this not be located in the new visitor center.



NEW VISITOR CENTER

WHY BUILD A NEW VISITORS CENTER?

In response to increasing threats from flooding, storm surges, and higher groundwater profile, it is imperative to design a new visitor center that can withstand these environmental challenges. This also presents an opportunity to enhance the visitor experience by incorporating essential amenities such as meeting spaces, an auditorium, event support facilities, an exhibition hall, a café, and potential collection storage.

The new visitor center will remain in a similar location, maintaining its role as a central connection between the upper campus and the waterfront. To address water infiltration and flooding risks, the design will include advanced measures such as elevated foundations, waterproof materials, and strategic landscaping to mitigate stormwater.

A new event lawn will be established in front of the Turner Ingersoll Mansion, providing a new event lawn with harbor views. This gives an opportunity for the design of a covered outdoor event space, creating a connection between the visitor center and the event lawn.

By addressing environmental challenges and enhancing amenities, the new visitor center will not only ensure safety and resilience but also enrich the visitor and staff experience, making it a central hub of the campus.

SITE IMPROVEMENTS

IMPLEMENTATION AREAS

BIORETENTION

- Install Bioretention north of 42 Turner Street property
- Install Salt Tolerant Bioretention north of Turner-Ingersoll Mansion
- Install Salt Tolerant Bioretention on the south lawn near seawall

PERVIOUS PAVEMENT/PAVERS

- Install Pervious Pavement south of new Welcome Center

TREE TRENCH

- Install Tree Trench on the northeast corner of campus
- Install Tree Trench on the northeast corner of campus north of 42 Turner Street

SUBSURFACE SYSTEM

- Install Subsurface system in new north lawn area

ALTERED OR REMOVED

PERVIOUS PAVEMENT/PAVERS

Alter Pervious Pavers west of Visitor Center

- Remove Pervious Pavers north of Visitor Center
- Remove Pervious Pavement on east side of Upper Parking Area

TREE TRENCH

- Alter Tree Trench on the northwest corner of campus

SUBSURFACE SYSTEM

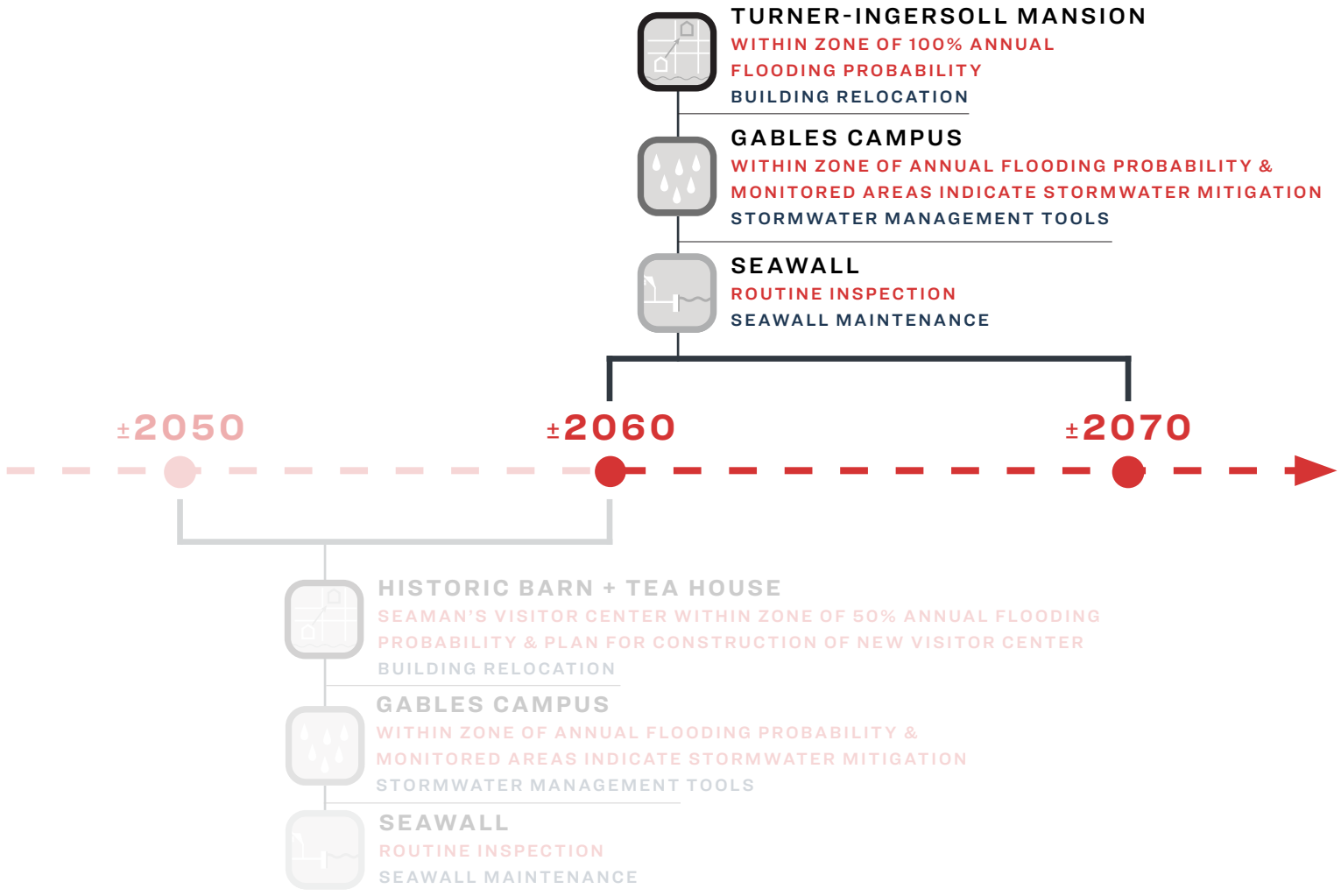
- Alter Subsurface system in Midblock Parking Area

PHASE IV

** Grayed improvements are continuous from previous phase.*

View of playground at Counting House, looking over Salem Harbor.

MASTERPLAN - PHASE V



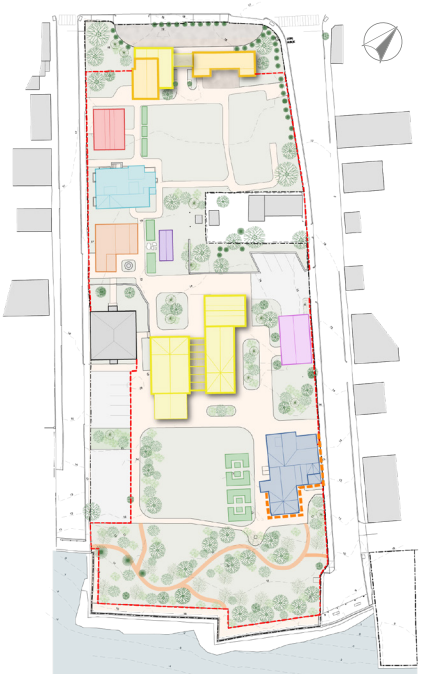
MASTERPLAN - PHASE V

THE FINAL PHASE OF THE MASTERPLAN INVOLVES THE CAREFUL RELOCATION OF THE TURNER-INGERSOLL MANSION TO PROTECT IT FROM ESCALATING FLOODING AND SEA-LEVEL THREATS, WHILE ENSURING THE PRESERVATION OF GREEN SPACES AND MAINTAINING THE CAMPUS'S HISTORICAL INTEGRITY.

During the intricate process of moving the mansion, its historic foundation will remain intact, serving as a tangible reminder of its storied past, inviting visitors to engage with its history through viewing and interpretation. As part of the relocation efforts, comprehensive site enhancements will be implemented to enhance stormwater management and mitigate flood risks effectively.

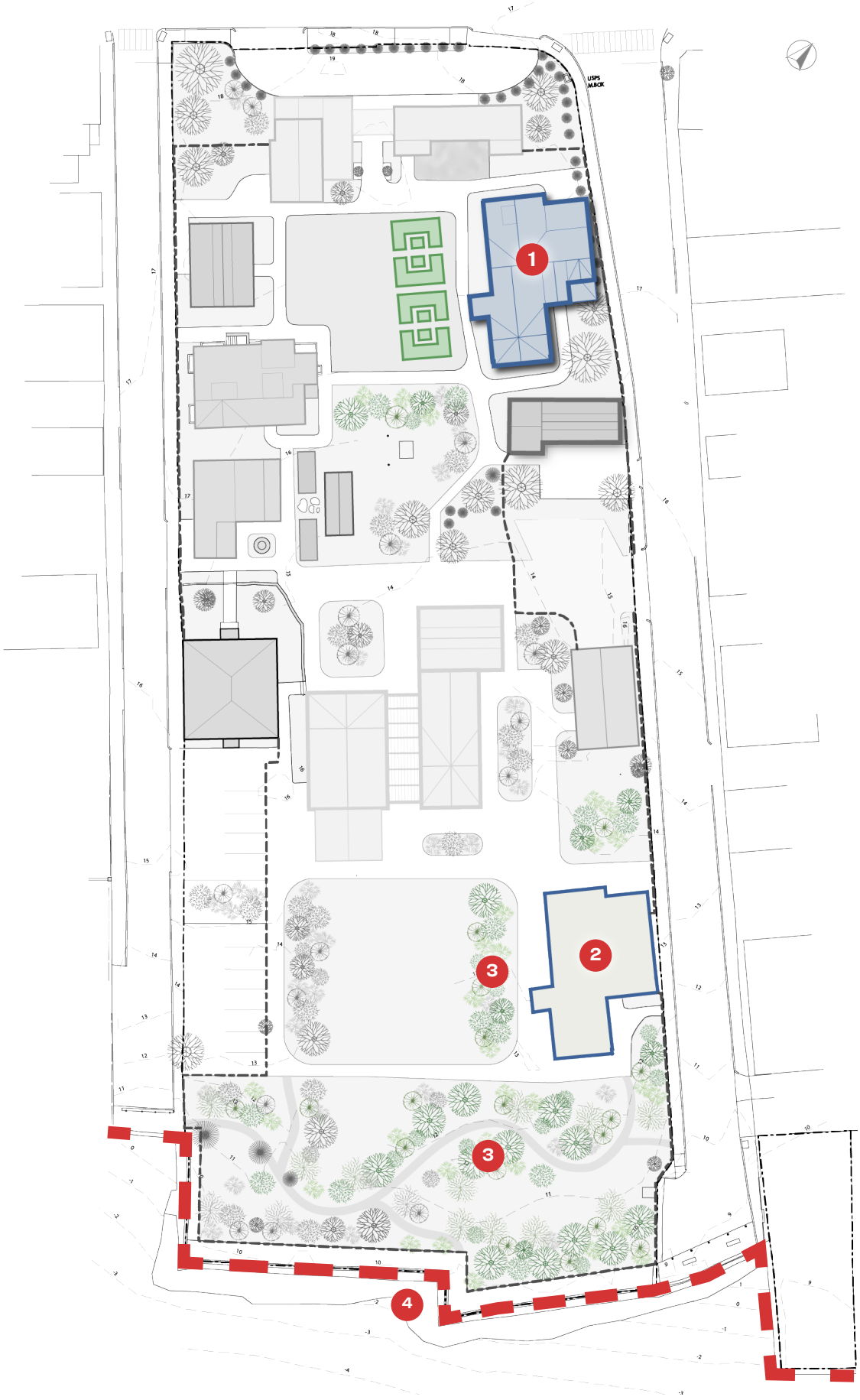
With all historically significant buildings now situated at higher elevations in the upper reaches of the museum campus, the landscape has undergone notable transformations. Despite these changes, the adaptation plan remains committed to preserving green spaces and maintaining a harmonious composition throughout the campus's evolution. Each transition is carefully considered to ensure the continued coherence and integrity of the site, honoring its rich heritage while adapting to the challenges of the future.

PHASE IV

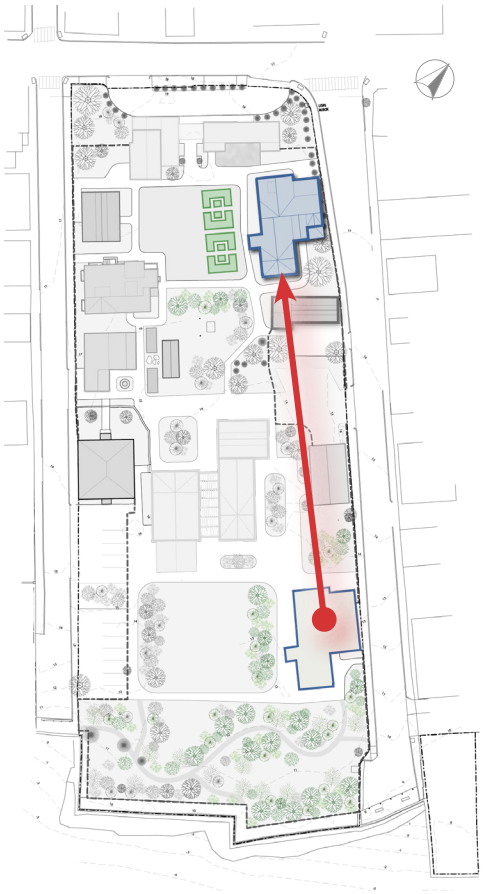


	TRIGGERS	ACTION ITEMS
1	Within zone of 100% annual flooding probability	Relocate Turner Ingersoll Mansion
2	Relocation of Turner-Ingersoll Mansion	Foundation Relic
3	Within zone of annual flooding probability & monitored areas indicate stormwater mitigation	Site Improvements
4	Routine inspection	Seawall Maintenance

PHASE V



TURNER-INGERSOLL MANSION - RELOCATION



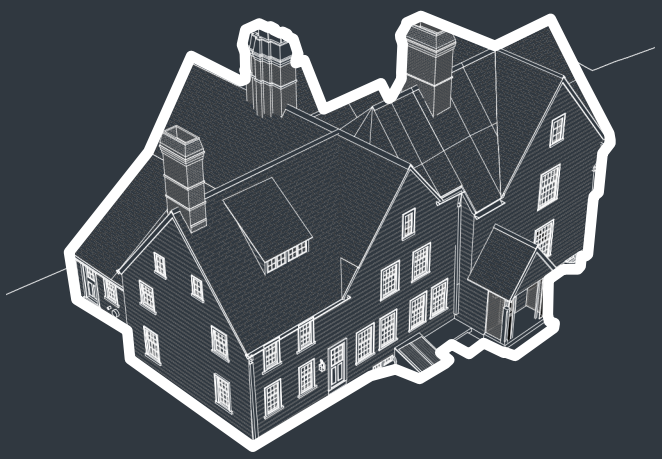
WHY ARE WE MOVING THE TURNER-INGERSOLL MANSION?

The relocation of the Turner-Ingersoll Mansion holds a more grave connotation than the relocation of any of the other historic properties, since the Mansion still sits in its original location on its historic foundation. However, by 2070, the coastal flooding will become too severe to protect the house against, with predicted annual storm flooding filling the basement and approaching the first floor, and 100-year storm flooding exceeding the first floor by 2'-0".

Ultimately, the design team and the Museum have decided that preserving the building itself is more important than keeping it in place. The intent is to preserve the Mansion in its original location for as long as possible with flood protections, and then moving it in Phase V. The foundation will be left in place and filled in, and the Mansion moved and placed on a new foundation. The building will maintain its orientation to Turner Street.

POTENTIAL FUTURE USE:

The Gables interpretation, as it stands today, focuses on what is referred to as the "cloverleaf" of themes: fame, fortune, and philanthropy. It is around these three stories that we focus our programming, exhibitions, and education.



The Mansion will likely need to be split into sections and moved in pieces (similar to how the Hawthorne Birthplace and Hooper Hathaway Houses were moved). The attic of the Mansion shows clear evidence of additions and changes to the building and may be indicative of opportune locations to break the building up for this endeavor.

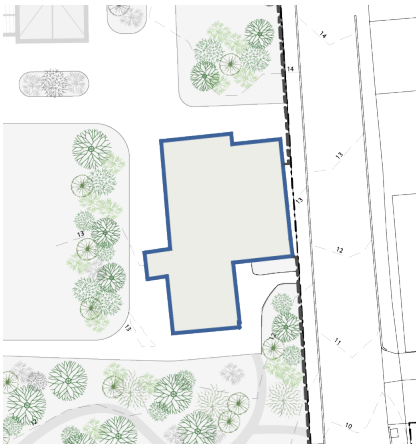
View of Turner-Ingersoll Mansion from Turner Street. Photo by Union

View of Turner-Ingersoll Mansion and Seaside Gardens.Photo by Union

The attic of the Turner-Ingersoll Mansion, with a model showing the various additions and expansions the building has undergone. Photo by Union

A partially exposed stone wall in Smale Waterfront Park, Cincinnati, OH. This is similar to the intent with the Turner-Ingersoll's remaining foundation after relocation. Photo by Union Studio.

TURNER-INGERSOLL MANSION - FOUNDATION RELIC



WHY RELOCATE THE TURNER-INGERSOLL MANSION BUT KEEP ITS HISTORIC SIGNIFICANT FOUNDATION AS A RELIC?

In response to environmental triggers, including recurrent flooding threats and water infiltration, it has become evident that the Turner Ingersoll Mansion requires relocation in the longer term to mitigate these risks effectively. The relocation of the building will be to a more suitable location with the House of the Seven Gables campus. This strategy aims to preserve the architectural integrity and historical significance of the building and of the campus while mitigating the risks posed by rising sea levels and storm surges. By relocating the building to higher ground, away from the vulnerable coastal areas, its structural integrity can be safeguarded for future generations to appreciate and admire.

In the process of relocating the Turner Ingersoll Mansion, careful consideration will be given to preserving a relic of its historic foundation at its original site. This relic will serve as a tangible reminder of the mansion's storied past and will be open to the visitors for viewing and interpretation. Visitors will have the opportunity to explore the remnants of the mansion's original foundation, gaining insight into its architectural design, its significant chimney foundation and historical significance.

STORMWATER MANAGEMENT

In conjunction with the relocation of the Turner Ingersoll Mansion, comprehensive site improvements and modifications will be undertaken to enhance stormwater management and mitigate flooding risks. These improvements will include the implementation of advanced stormwater management systems designed to efficiently channel and redirect runoff away from the building's original foundation. One proposed strategy involves the creation of strategically placed holes in the foundation floor and walls to facilitate the natural flow of water and prevent accumulation during heavy rainfall or flooding events.

SITE IMPROVEMENTS

IMPLEMENTATION AREAS

BIORETENTION

- Install second Salt Tolerant Bioretention on the south lawn near seawall
- Install second Salt Tolerant Bioretention on the south lawn
- Install Bioretention east of Counting House
- Install Bioretention/Tree Trench north of Counting House
- Install Bioretention north of Midblock Parking Lot

TREE TRENCH

- Install Tree Trench in Southern Parking area
- Install second Tree Trench in Southern Parking area

NATURAL BARRIER

- Install Natural Barrier on the south lawn near seawall

ALTERED OR REMOVED

DRYWELL

- Remove Drywell east of Visitor Center

PHASE V

- IMPLEMENTATION AREA
- BIO RETENTION AREA
- SALT TOLERANT BIO RETENTION AREA
- PERVIOUS PAVERS
- TREE TRENCH
- INFILTRATION CHAMBER
- NATURAL BUFFER

** Grayed improvements are continuous from previous phase.*

SECTION 5

Envisioning a Future for the Gables Campus

The past two years have been a study of past, present, and future for The House of the Seven Gables. The Gables has a rich history and a strong presence in Salem and historic preservation communities, protecting both of those from the climate crisis was the driving force behind the proposed changes to the campus that were outlined in this report. “Preservation” and “change” appear to be contrary to one another at first glance, yet one could not exist without the other. The Gables has been an ever-evolving site. The Turner-Ingersoll Mansion itself has changed through the years with its various residents. The property has changed dramatically since the Settlement Association’s inception by Caroline Emmerton over 100 years ago, with new buildings being moved to the site to save them from a variety of threats. Their lifespans have been extended infinitely by their new homes, and they’ve been given new life as historic artifacts and exhibits. The resulting campus is the one we know and love today – but it never has been, and never will be, in stasis.

That spirit of adaptation and evolution is one the project team hopes applies to this report as well. It provides a road map for The Gables team in the decades to come, with our best judgment of how to save these buildings based on the information we have now. The future will continue to change, scientists will continue to learn more about the climate, and engineers and architects will continue to develop ways to combat it. The strategies outlined in this report are not intended to remain frozen in time through the rest of the century, but rather, to provide a starting point for future members of this team. The House of the Seven Gables has never been a stranger to change – one could argue that change has been its strongest asset.

SAVING CRITICAL BUILDINGS

This report provides the House of the Seven Gables museum with a comprehensive and interdisciplinary managed retreat plan for the future protection of its campus. Based on the vulnerabilities identified and data gathered over the past two years, the plan includes both immediate, actionable site improvements and long-term actions mapped out through the phased masterplan. The timeline specifies action points and strategies that extend over the next several decades, ensuring a structured approach to adaptation.

As part of the implementation, all historically significant buildings have been relocated to lower vulnerability zones within the campus, ensuring their preservation for as long as possible. The remaining buildings in the medium vulnerability zone, which include the non-contributing Phippen House and the newly constructed Visitor Center and Maintenance Building, which will be designed to withstand major storms and flooding.

HIGH VULNERABILITY
MEDIUM VULNERABILITY
LOW VULNERABILITY

1. TURNER-INGERSOLL MANSION
2. HOOPER-HATHAWAY HOUSE
3. RETIRE BECKETT HOUSE
4. HAWTHORNE BIRTHPLACE
5. COUNTING HOUSE
6. NEW MAINTENANCE
7. NEW VISITOR'S CENTER
8. PHIPPEN HOUSE
9. TEA HOUSE & BARN
10. 42 TURNER STREET

NEXT STEPS FOR THE GABLES CAMPUS

To ensure the successful implementation of the managed retreat plan and the ongoing protection of The House of the Seven Gables campus, the following next steps are recommended for consideration:

- **Grants and Funding Opportunities:** Identifying and securing funding is crucial for implementing the adaptation plan. The museum should actively seek grants and financial opportunities from governmental and non-governmental organizations.

- **Reaching Out for Regulatory Advice and Agents:** Engaging with regulatory bodies ensures compliance with all relevant laws. The museum should consult with local, state, and federal agencies to obtain necessary permits and expert guidance. This will help navigate environmental and historic preservation regulations.

- **Emergency and Disaster Response Plan:** Updating the current emergency and disaster response plan is essential. This document should outline protocols for staff, volunteers, and visitors to follow during emergencies regarding major flooding and storms.

- **Ongoing Monitoring of Site Conditions:** Continuous monitoring of site conditions is vital. Implementing a program to track changes in groundwater levels, structural integrity, and seawall condition will provide essential data. This information will enable timely updates to the adaptation plan and timeline, ensuring its effectiveness.

- **Exhibits and Interpretation Uses for the Museum:** The museum should plan exhibits that highlight adaptation efforts and educate visitors about climate change and preservation. Integrating these exhibits into existing programs will enhance visitor engagement and awareness, showcasing the museum's proactive steps.

- **Continuing Collaboration with CZM and Salem Sound Coastwatch:** Continuing partnerships with the Coastal Zone Management (CZM) program and Salem Sound Coastwatch is crucial. By working closely with these organizations, the museum can enhance its adaptation strategies, benefit from community outreach, and contribute to broader regional conservation initiatives.

By considering these next steps, The House of the Seven Gables Settlement Association can being to ensure the effective implementation of its masterplan, secure necessary funding, and continue to protect and educate the public about this historic significant campus.

ENDNOTES

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Refer to subtasks for additional details on used sources.

CONTACT

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