

# A Master Conservation Plan for Bas Relief and Bas Relief Park

Provincetown, MA

Prepared for the

Town of Provincetown  
260 Commercial Street  
Provincetown, MA 02657

by

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## SUMMARY

### Park History

Bas Relief Park, located at 106 Bradford Street in Provincetown, MA, commemorated the signing of the Mayflower Compact on November 11, 1620 in Provincetown Harbor. The Bas Relief Bronze, *Signing of the Mayflower Compact*, was designed by Cyrus Dallin of Arlington, MA and cast by the Gorham Foundry in Rhode Island. It is the centerpiece of the .44 acre Park completed in 1921, in celebration of the Tercentennial of the historic event. The Park is owned by the Town of Provincetown, who is responsible for its maintenance, security, and programming.

### Project Background

The Town of Provincetown is preparing to celebrate the 400 year commemoration of the first landing of the Pilgrims in 1620. Conservation of the Bas Relief and restoration of Bas Relief Park is part of the Town's preparation for 2020.

### Project Goal

The goal of the *Bas Relief and Bas Relief Park Master Conservation Plan* is to compile a complete inventory and assessment of the Bas Relief and the existing site features in the park including the secondary monuments, and to make specific recommendations for ongoing conservation and management.

### Approach

RDLA led a team of consultants that included Building Conservation Associates [BCA], Rika Smith McNally & Associates and MacLeod Consulting, Inc. We visited the site to make our assessment of the Bas Relief and the park landscape. We researched archives relating to the *Signing of the Mayflower Compact* and Bas Relief Park. We worked directly with the Town and the Bas Relief Committee throughout the process to collect input.

Our team developed conservation and maintenance recommendations and improvements and prioritized budgets. The team also made specific suggestions for maintaining the Bas Relief bronze and stone and park landscape over time. All recommendations are consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (36 CFR 67 and 68, 1996).

### Program Goals

RDLA worked with the Bas Relief Committee and Town to identify the following Master Conservation Plan Goals for Bas Relief and Bas Relief Park.

- Provide recommendations for the stabilization and repair of the Bas Relief and the secondary monuments within the park.
- Create a park that reflects the image of a Town Green.

- Create a park that encourages passive recreational use of the grounds.
- Improve the security of the park and the safety of its users.
- Provide a future connection to the new Pilgrim Monument entrance at Bradford Street from the Bas Relief Park.
- Propose location for memorial honoring the Wampanoag Culture of Provincetown.

### **Recommendations**

Based on the park's history and the program outlined above, RDLA developed the following recommendations for the Master Conservation Plan:

- *Bas Relief Bronze:* Clean bronze and remove vestiges of wax, calcite and areas of corrosion. Repatinate and apply protective coating and wax. Clean secondary monuments and bronze plaques.
- *Bas Relief Stone:* Reset existing north post. Repair and install flashing in identified areas. Clean and repoint all stone. Repair damaged stone. Remove existing lights and their associated hardware. Fill joints between bronze and stone. Clean secondary monuments.
- *Bas Relief Stair & Paving:* Reset existing Bas Relief stairs and reset and replace brick and granite paving as needed.
- *Bas Relief Park:*
  1. *Site Preparation:* Selectively remove dead trees and invasive plant species behind the Bas Relief. Remove plant bed along Bradford Street and replace with lawn. Prune trees and mulch plant beds.
  2. *Paving:* Relocate existing path and secondary monuments to fall within property line. All brick paving set on concrete base.
  3. *Site Furnishing:* Replace existing site furnishings with a cohesive collection of historic-style benches and trash receptacles.
  4. *Signage:* Relocate directional signage off site. Install new historically appropriate signage. Install new interpretive signage at Park entrance. Install new commemorative marker for the Bas Relief.
  5. *Fencing:* Install new black metal ornamental fence; 4' height along western edge and 6' height behind Bas Relief. Install new post and chain fencing along sidewalk along Bradford Street.
  6. *Memorials:* Install new Wampanoag memorial.
  7. *Lighting:* Install accent lighting for Bas Relief.
  8. *Electrical:* Relocate and upgrade electrical service.
  9. *Lawns & Planting:* Relocate or remove existing plantings and install new plant material. Restore central lawn. Upgrade existing irrigation for lawn and new plantings.

### **Budget Projections**

RDLA and our consultants developed projections for each phase of the Master Conservation Plan and for the ongoing management. The estimate is intended to be used for fundraising purposes only.

### **Managing Bas Relief Park Landscape**

The Master Conservation Plan concludes with a section devoted to the long term care of the park and its landscape. It recommends maintenance practices for existing trees and turf, and strategies for controlling invasive plants. The section ends with a calendar for routine maintenance, guiding the city staff on a month by month basis.

## ACKNOWLEDGEMENT

In preparing this plan, the project team received a great amount of support from the Bas Relief Committee and the Town of Provincetown. The team especially thanks Michelle Jarusiewicz for her project management and direction.

David Gardner, Assistant Town Manager, Town of Provincetown

Michelle Jarusiewicz, Grant Administration / Housing Specialist, Town of Provincetown

Anthony Fuccillo, Tourism Director, Town of Provincetown

Eric Larsen, Deputy, DPW Director, Town of Provincetown

Stephen Borkowski, Provincetown Historical Commission

John Krajovic, Beautification Committee

John McDonagh, Former Executive Director Pilgrim Monument & Provincetown Museum



## HISTORY

### Beginnings – Before 1900

The indigenous residents of Cape Cod were the Nauset people, a subset of the Wampanoag Tribe, who lived off the land fishing, hunting and gathering foods. They were known to have moved between fixed sites in order to take advantage of seasonal changes in food sources and resources. Understandably hostile to the colonists at first, the Nauset later became their friends by helping to supply their food, converting to Christianity and showing loyalty to the King. Around the time of the landing of the Mayflower, there was a population of about 500 Nauset living on Cape Cod.

The first landing of the Mayflower in the New World occurred in Provincetown in 1620. The passengers aboard the Mayflower remained on board moored in Provincetown Harbor for 5 weeks allowing for several men to explore the land. As the land was sandy outwash, it was deemed unsuitable for farming so the Pilgrims sailed on to Plymouth. During the time in the harbor, the Mayflower Compact was drafted and signed, and several passengers died. The Mayflower Compact laid the foundation for democracy in the new world and was a precursor for the Declaration of Independence, signed 156 years later.



*"The Mayflower at sea, pilgrims signing the compact on board the Mayflower, Nov. 11th, 1620. Provincetown Harbor, Mass." Postcard from the The Tichnor Brothers Collection, ca. 1930–1945.*

The first permanent non-native settlement in Provincetown is believed to have occurred in 1680, but there is no evidence confirming this. Historical records indicate that the precinct of Cape Cod was established in 1714.

In 1852, the town of Provincetown built their first Town Hall on top of High Pole Hill. This prominent location was visible to the community, but required some effort to access as the townspeople had to ascend 86 feet in elevation. A fire destroyed the structure in 1877, and a new location for the Town Hall was selected at the bottom of the hill nestled between two central streets in town; Commercial Street and Bradford Street with its front door facing Commercial Street. This location was more easily accessed by foot and allowed for the town to later realize a different vision for High Pole Hill.

In 1892, the Cape Cod Pilgrim Memorial Association was created for the purpose of commemorating the Pilgrim's first landing in Provincetown in 1620. This association called Pilgrim Monument, is Cape Cod's oldest not-for-profit organization. One of their greatest achievements was the building of the Pilgrim Monument in honor of the historic landing of the Mayflower. The site selected for the monument was atop of High Pole Hill.

### Pilgrim Monument and Bas Relief Park 1900-1921

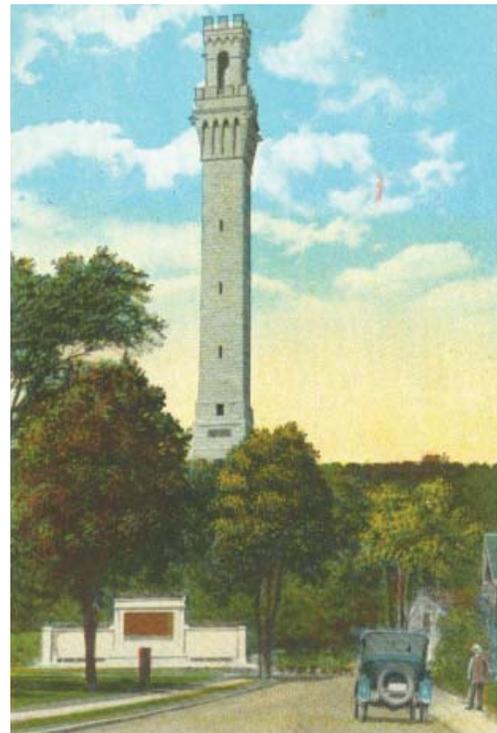
After the erection of Pilgrim Monument in 1910, the Town of Provincetown began to develop plans to create a memorial at the bottom of High Pole Hill to honor the signing of the Mayflower Compact. The Provincetown Tercentenary Commission was formed to oversee this effort. The land for the park and memorial, roughly 170 feet wide by 100 feet deep, was originally occupied by houses. The land for the park was donated to the Town by the Ryder family. On the land was a home that belonged to the Cook family, which was moved by the Town 400 feet to the west to accommodate plans for the park. The stables associated with the home were torn down, and new stables were built next to the relocated home.

Cyrus Edwin Dallin, a renowned American sculptor at the time, was commissioned to design the Bas Relief. Dallin was well known for his sculptures depicting Native Americans, but perhaps was most well-known for the equestrian statue of Paul Revere in Boston, Massachusetts which was a commission granted through a competition. During the development of his piece, *Signing of the Mayflower Compact*, Dallin stayed with the Cook Family sketching out ideas for the park and the relief with views of the land.

In 1921, the 16 by 9 foot bronze bas relief the *Signing of the Mayflower Compact* was completed. The relief was cast by the Gorham Corporation in Providence, Rhode Island, and represents the scene in the cabin of the Mayflower during the signing of the compact. The memorial bas relief is framed by a finished Rockport granite structure, seventy feet long by twenty feet high. Its graceful arc in plan allows for integral benches spanning either side of the bronze tablet.



*Bas Relief Postcard Undated. Assumed 1921*



*Postcard Undated. Assumed 1920  
View of Bas Relief and Pilgrim Monument.*

The Bas Relief is centered on the Pilgrim Monument and is the centerpiece of the park. There are two secondary monuments located to the east and west of the bas relief also commemorating the Pilgrims landing and the signing of the Compact. To the west there is a monument dedicated to the five pilgrims who perished aboard the Mayflower while it was anchored in Provincetown Harbor. To the east there is a monument dedicated to the men who signed the Compact. This granite and bronze monument was made by HP Smith and Co., Boston, Blake Manufacturing Company, Boston, cast the secondary plaques.



## LANDSCAPE ASSESSMENT

The following section provides an in depth analysis of the condition of Bas Relief Park's natural, built and functional landscape features including Edges, Access and Circulation, Views, Slopes and Drainage, Vegetation, Soils, Security, Site Furnishings and Utilities. Its purpose is to identify issues which require improvement.

### Edges

Bas Relief Park is located in central Provincetown on Bradford Street across from Town Hall. Two residential structures, dating back to the early 19th century, frame the western edge, High Pole Hill occupies the northern edge, a vacant lot belonging to the Pilgrim Monument is located along the eastern edge, and Bradford Street frames the southern edge of the park.

Bradford Street, Route MA 6A, spans the southern edge of the park with several parallel parking spaces along the street to the west. Route MA 6A, or the 'Old King's Highway', stretches along the length of Cape Cod hugging the bay side while winding its way through many of America's oldest villages. In Provincetown, there are approximately 4.5 miles of Route 6A which consists of Commercial Street for 1 mile, Bradford Street for 2.5 miles, and Province Lands Road for 1 mile. There are three pedestrian crossings bisecting Bradford Street providing accessible access points to Bas Relief Park. The public sidewalk along Bradford Street fronting the park is brick at approximately 5 feet in width.

The western park edge is flanked by two residential structures, located at 104 and 104A Bradford Street. The buildings are currently owned by The Provincetown Hotel at Gabriel's, which includes 2 additional structures located at 102 and 102 A Bradford Street. The structure located at 104 Bradford Street was built for local Captain Cook and his family and was originally located 400 feet to the east on Bradford Street. It was moved to accommodate the plans for Bas Relief Park. In 1920, the land for the park, owned by the Ryder family, was donated to the Town for the park, and the home, owned by the Cook family, was moved to its current location. The stable for the Cook's home was not moved but was torn down and rebuilt behind the home at 104 Bradford Street, currently 104A Bradford Street.



*Approach to Bas Relief Park on Bradford St. [6A] from the northeast.*

# LANDSCAPE ASSESSMENT EDGES



## LEGEND:

-  LACK OF CLEAR EDGE / SEPARATION FROM ADJACENT BUILDING
-  PUBLIC WALK EDGE
-  FENCING
-  ENCROACHMENT
-  PROPERTY LINE

## GRAPHIC SCALE



## BAS RELIEF PARK MASTER CONSERVATION PLAN Provincetown, Massachusetts



*Route 6A spans the southern edge of the park*

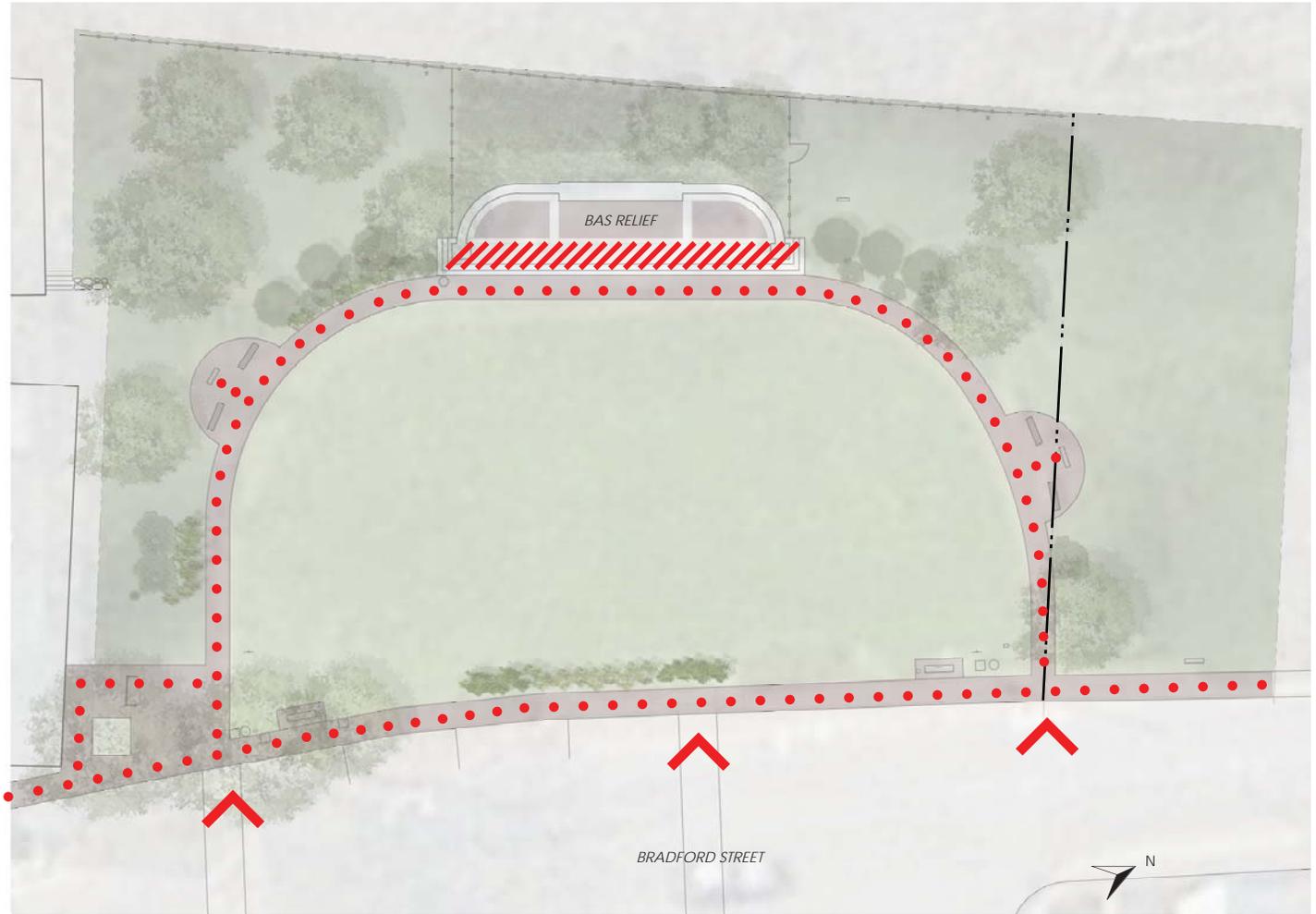
Over the years these structures have gone through the hands of many owners and have been operating as rooming houses since the 1970's. Along this edge, there is a general lack of separation between the inn and the park.

With an approximate high point elevation of 86' above mean sea level, High Pole Hill sits to the north of Bas Relief Park and the base of the hill creates the northern edge of the park. This hill is a significant geological feature, sitting within a larger area that is predominately flat and sandy. There is a chain link fence with a barbed wire top that provides a physical boundary along this edge. Replacement or alterations of this fence will need to be coordinated with the owner, the Pilgrim Monument Association. The fence is surrounded by overgrown invasive species. A vacant plot of land owned by Pilgrim Monument creates the edge to the east. A small portion of the park pathway, a secondary monument and a brick paved seating area encroaches over the property line.



*High Pole Hill at northern edge*

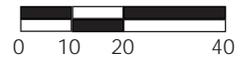
# LANDSCAPE ASSESSMENT ACCESS & CIRCULATION



LEGEND:

-  ENTRY @ CROSS WALK WITH ACCESSIBLE RAMP
-  ACCESSIBLE PEDESTRIAN CIRCULATION
-  INACCESSIBLE

GRAPHIC SCALE



## BAS RELIEF PARK MASTER CONSERVATION PLAN Provincetown, Massachusetts

### Access and Circulation

The park is accessed from Bradford Street and from painted crosswalks leading from Town Hall. The crosswalk paint is worn and should be refinished for improved visibility.

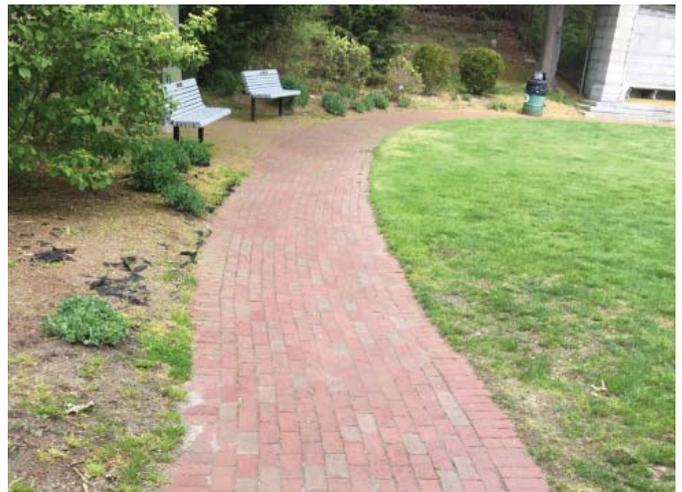
The formalized paths in the park are constructed of dry laid City Hall Paver brick, manufactured by the Styles and Hart Company of Bridgewater, MA. The internal 5' wide brick paths are generally flat and are in fair to good condition with some irregular jointing, delamination, cracking and heaving. Resetting is required. Joint spacing has increased as bricks have moved over the years. Vegetation is growing within some of the joints while others remain voids. Paver edging is not readily evident. This type of paving has a historic appearance, but due to its irregular shape and settlement may not be deemed accessible. Slight projections can become an impediment for poorly sighted individuals.

Informal cow paths have been worn through the central lawn by people walking from Bradford Street directly to the Bas Relief. The plant bed along Bradford Street does not act as an effective deterrent.

Three granite stairs provide access to the Bas Relief tablet. They exhibit staining, heaving and cracking in a couple of locations. The Bas Relief sits 18" above the park grade and is not ADA accessible. Significant alterations to the historic structure would be required to make the tablet accessible including the addition of ramps or the raising of the grade. This latter alternative would eliminate the stairs. The secondary monuments are accessible and are located to either side of the Bas Relief along the brick pathways.



*Crosswalk from Town Hall*



*Brick Path*

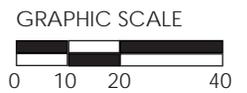


*Granite Stairs Leading to the Bas Relief*

LANDSCAPE ASSESSMENT  
MONUMENTS



KEY:



A. Bas Relief

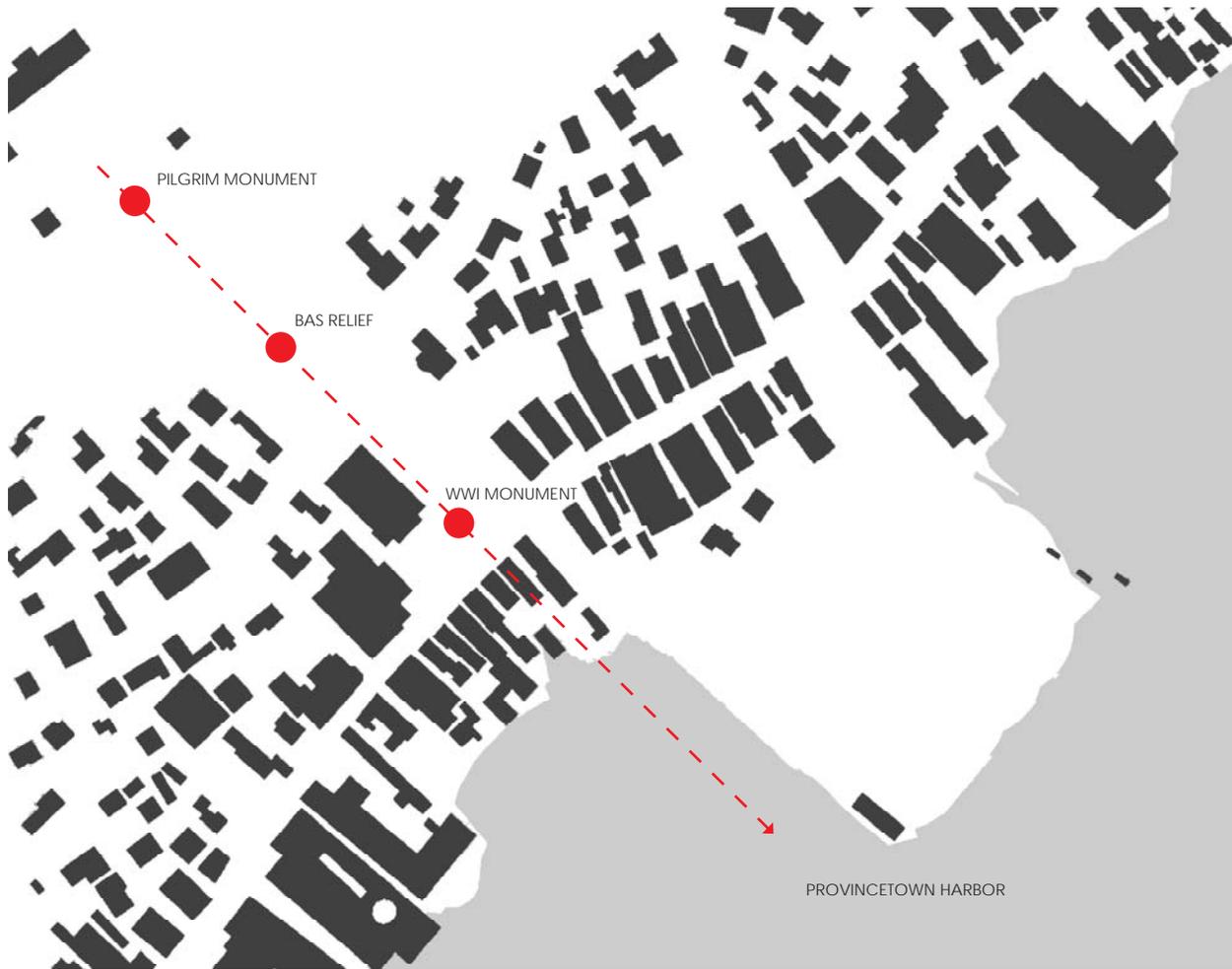


B. Perished Passengers of the Mayflower Monument



C. Signers of the Mayflower Compact Monument

BAS RELIEF PARK MASTER CONSERVATION PLAN  
Provincetown, Massachusetts



*Axial Relationship of Monuments*

### **Secondary Monuments**

Two smaller monuments flank the Bas Relief and are set within brick paved semicircular nodes. The Signers of the Mayflower Compact monument is located to the east of the Bas Relief and to the west is the monument for the Perished Mayflower Passengers honoring those who lost their lives aboard the ship. It is noted that there is interest in providing a memorial honoring the culture of the Wampanoag people.

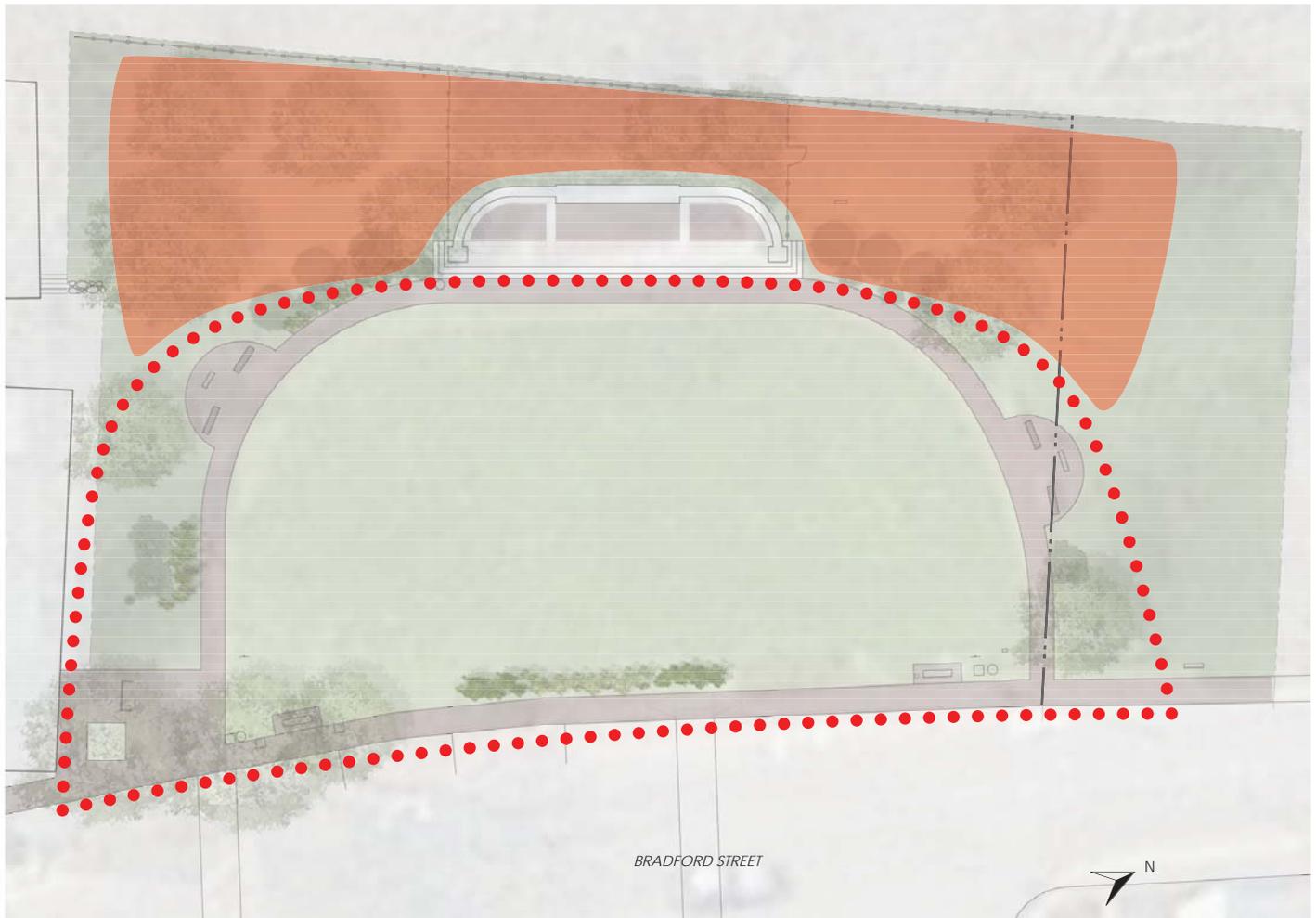
The slate monument for the Perished Mayflower Passengers is in good condition. Engravings in the slate are crisp and there are only minor chips observed in the surface. A concrete base was installed above the finish grade of the brick paving to assist in the support of the monument and is unsightly. There is some biological growth on the slate and it should be gently cleaned to

remove the growth. Chips should be repaired to limit any further delamination of the slate. Small granite monuments possibly demarcating property line locations are located along the fence at the base of High Pole Hill.

### **Axial Relationships**

The Bas Relief is situated on axis with the Pilgrim Monument atop High Pole Hill and the World War One Monument aside Town Hall. This axial relationship is important, but not visually apparent to visitors. Short views to the Bas Relief are evident from Bradford and Ryder Streets. The Bas Relief was meant to be viewed as a composition from a short distance.

# LANDSCAPE ASSESSMENT TOPOGRAPHY



LEGEND:

- ● ● 0-5% SLOPES
- >5% STEEP SLOPES



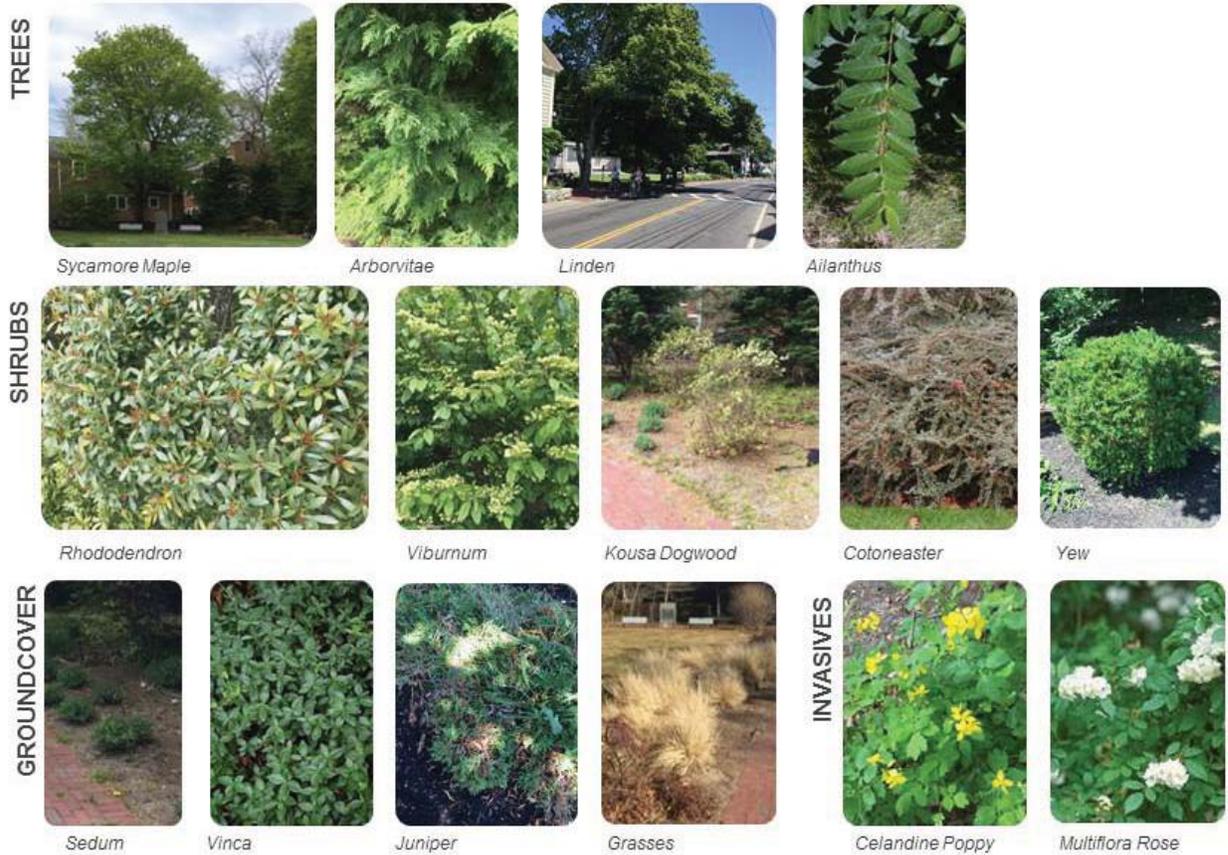
## BAS RELIEF PARK MASTER CONSERVATION PLAN Provincetown, Massachusetts



*Base of High Pole Hill at Rear of Bas Relief Park*

### **Topography**

Bas Relief Park sits at the base of High Pole Hill. The park is generally flat, but due to the presence of well-draining soils does not exhibit puddling or stormwater runoff problems. The rear portion of the park slopes significantly. The hillside is denuded of vegetation and ground cover due to the lack of sunlight reaching the ground plane caused by dense tree canopies. Sedimentation of the eroded areas sits at the base of the hill. There are no drainage structures evident within the park.



*Highlighted Plant Species*

**Vegetation**

Planting around the perimeter paths formally frames the park and Bas Relief. A variety of deciduous and evergreen trees are planted here with an understory of low shrubs and groundcovers. A plant bed consisting of ornamental grasses, cotoneaster and perennials creates a foreground to the Bas Relief Park along Bradford Street. The bed is full of weeds and has increased the maintenance needs for the Department of Public Works.

The landscape behind the Bas Relief is littered with debris such as broken glass and rubbish. Tree stumps have been left in place. Formerly felled trees have been cut and stacked behind the Bas Relief.

Trees in the park consist of Arborvitae, Linden, Maples and invasive Tree of Heaven. Many of the Arborvitae framing the Bas Relief are leaning, one-sided and cabled to prevent falling. Linden trees along Bradford Street are suckering and require pruning. A shade tree at the bicycle rack exhibits exposed roots causing the paving to heave.

A tree growing at the western end of the Bas Relief may be heaving its foundation as there seems to be some movement there. This tree should be removed to reduce further growth. Trees should be evaluated by a Certified Arborist to determine their safety requirements.



*Central Irrigated Lawn is in Good Condition*



*Cabled Arborvitae adjacent to Bas Relief*

Ornamental shrub form Kousa Dogwoods frame the Bas Relief and are exhibited with informational placards donated by the Regreening Committee and Trees for Town. They provide seasonal color for the park. Other shrubs in the park include Cotoneaster, Rhododendron, Viburnum, Yews and Inkberry. Yews have been clipped into round shapes.

Perennials including Sedum and ornamental grasses are planted in the perimeter plant beds. Plant beds are devoid of mulch and exhibit many areas lacking plant material. Vinca minor is growing behind the Bas Relief. Along Bradford Street, a bed with cotoneaster and ornamental grasses lies within the central lawn.

Landscape fabric is exposed in some of the plant beds where mulch has eroded. Plant beds are edged with plastic landscape edging, some of which has been dislodged from the ground.

Invasive plants include Japanese Knotweed, Tree of Heaven and thorny Multiflora Rose. These plants should be eradicated from the site and replaced with native plantings.

A central irrigated lawn creates a foreground to the Bas Relief and is in good condition. This grass panel, common in a Town Green, should be preserved.



*Soils are Well Drained but Surface is Denuded in Some Areas*



*Chain Link Fence with Barbed Wire*

### **Soils**

The soils in the park consist of urban fill and Hooksan. Both soils are well draining. Hooksan is a very deep, moderately well drained soil formed in thick sandy sediments adjoining tidal marshes and beaches. Hooksan soils typically have grayish-brown sand surface layers underlain by mottled pale yellow and light yellowish-brown sand and are located on vegetated coasts and sand dunes.

### **Security**

A 10 foot high chain link fence secures the back property line shared with the Pilgrim Monument. It has a barbed wire topper, is rusty and retains leaves and debris. Two 8 foot high chain link fences in similar condition secure the back of the Bas Relief, with a gate that provides access on the eastern side. These fences are effective in securing the property but are unsightly and do not fit the aesthetic context of a historic park.



*Bench & Cigarette Receptacle*



*Recycling Bin & Trash Receptacle*

### **Site Furnishings**

The park features a variety of site furnishings including a bike rack, benches, trash receptacles, cigarette receptacles, dog bag dispensers, recycling bins and a variety of signage. The furnishings lack a cohesive appearance, do not present an historic image and are randomly located.

A galvanized metal bike rack located at the western edge of the park is in good condition

The contemporary-style benches are composed of wood and steel. Visitors have been seen sleeping on the benches as they do not have armrests or a central armrest to discourage such use. The wood slats have been painted gray, some featuring added donor plaques.

Oil drums are utilized as trash receptacles. Receptacles along Bradford Street are decoratively painted and are covered with plastic dome lids. Ash urns are 18" vases filled with sand. Recycling bins are fabricated from sheet metal and finished in a bright green color.



*Variety of signs*

### **Signage**

A variety of signs exist within the park including dog regulations, directional signs, public parking locations and truck routes. A wooden sign for the Pilgrim Monument located on their property provides wayfinding for tourists. The park would benefit from a comprehensive signage program that creates consistent design standards, limits the quantity of signs and directs the appropriate location of signs in order to preserve the appearance of the park and views to the Bas Relief.



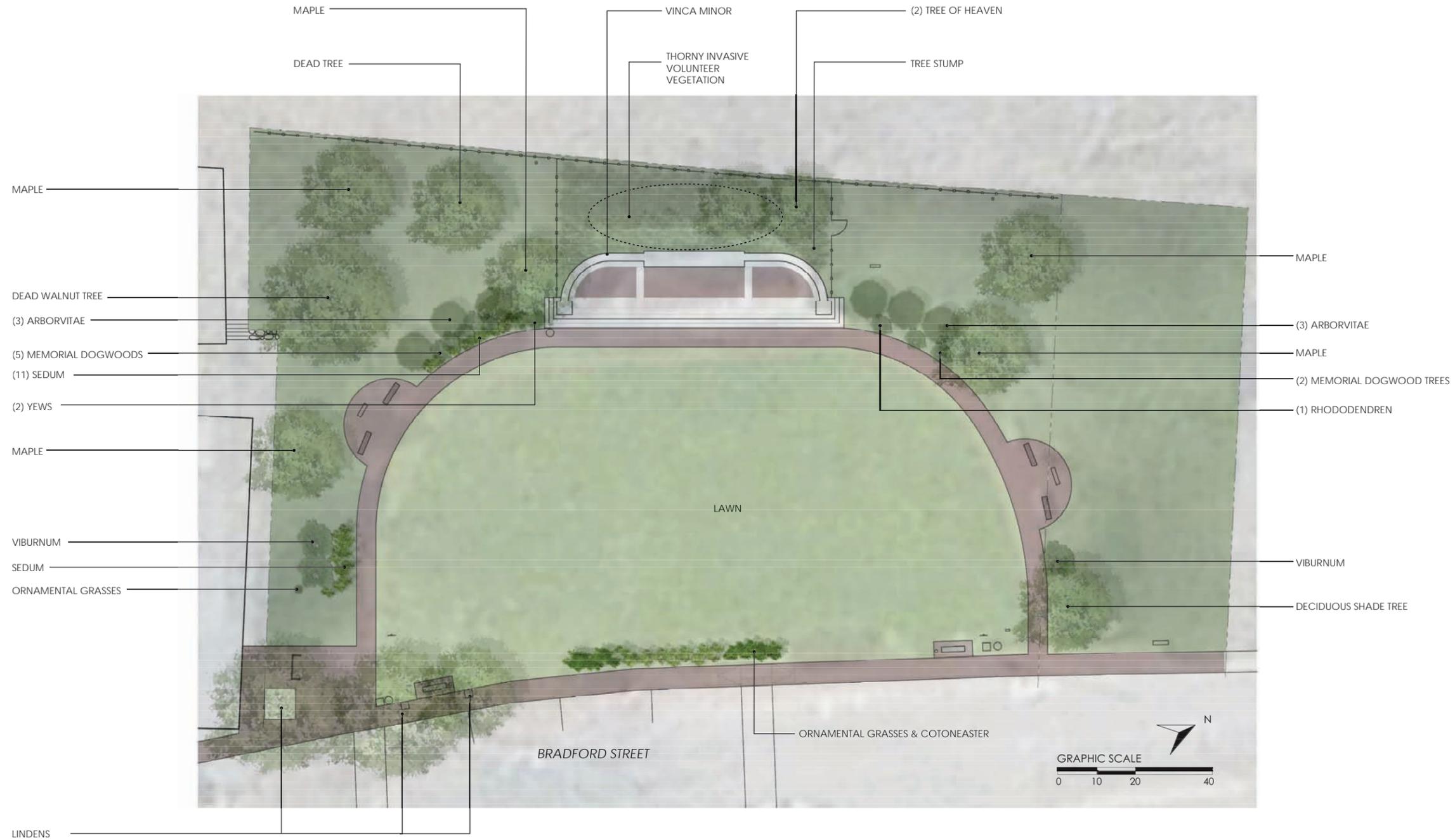
*Utility Box*

### **Utilities**

The existing wooden Electrical Box is located to the east of the Bas Relief behind the Arborvitae. The box is not water proof or code compliant. The box contains an electrical meter, irrigation controller, electrical panel and four receptacles. The box has a padlock to secure it, but was unsecured during the time of our visit.

Holiday lights installed on the Bas Relief are damaging the stone and should be removed. There are no other lights within the park.

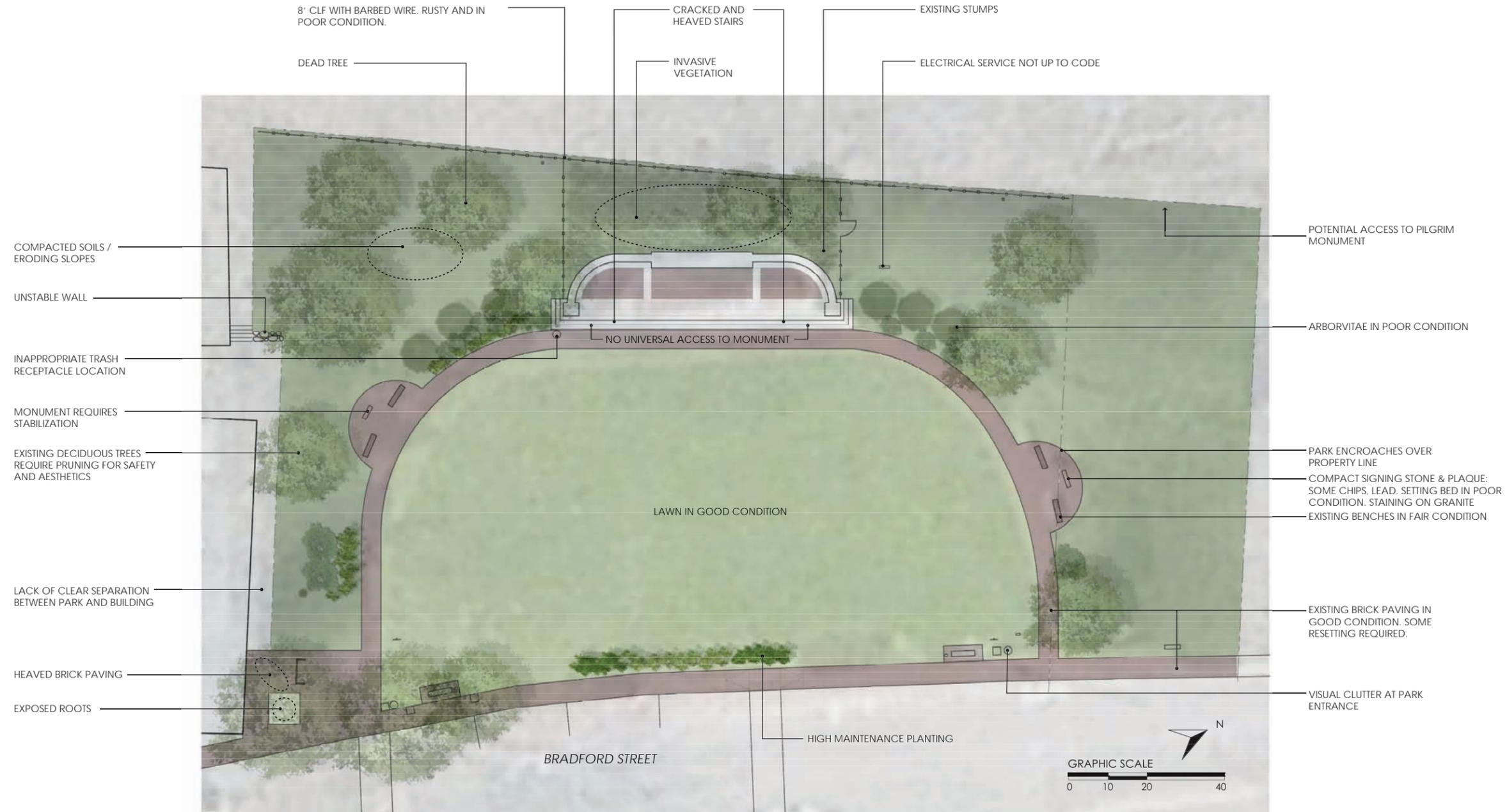
Landscape Assessment



EXISTING VEGETATION



Landscape Assessment



SITE ANALYSIS





## BRONZE ASSESSMENT

Provincetown Bronze Bas Relief by Sculptor Cyrus Dallin:  
Condition Report and Recommendations for Treatment

Date: November 4, 2016

Artwork: The Signing of the Contract  
Sculptor: Cyrus E. Dallin (American, 1861-1944)  
Date: 1921

Materials: Cast bronze

Foundry: Gorham Foundry, Providence, RI

Location: Bas Relief Park, 106 Bradford Street, Provincetown, Massachusetts

Set into granite monument exedra, most likely attached by bronze pins into granite

Dimensions: overall 16' wide by 9' height by 7" deep



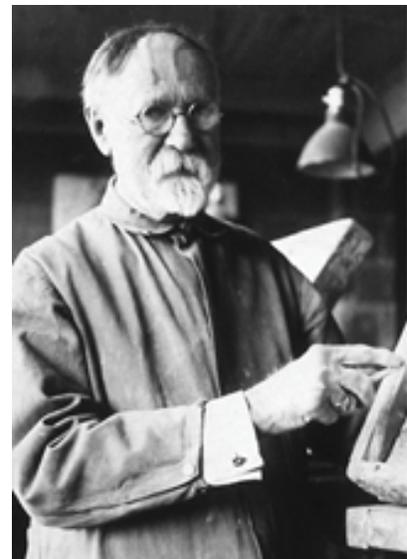
Conservation  
of Public Art

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### Brief Historical Notes

Cyrus Edwin Dallin, sculptor:

Cyrus E. Dallin was born in Springville, Utah in 1864 and came to Massachusetts to study with the noted sculptor T.H. Bartlett when he was 19. Dallin remained in the Boston area after his training ended, where he carried out commissions, exhibited sculpture, and won numerous sculpture prizes. He also taught at the Massachusetts Normal Art School (now the Massachusetts College of Art and Design) from 1900-1941, retiring at 80 years old. He became friends with other well-known American sculptors including Augustus Saint Gaudens and John Singer Sargent, and like them, spent time working in Paris. Among his most notable works are those of American Indians, such as Appeal to the Great Spirit, The Scout, and the Menotomy Indian Hunter. One of his most famous works is the statue of Paul Revere in the North End of Boston, which took many years of proposed versions before it was finally commissioned. Dallin also sculpted Massasoit, Chief of the Wampanoags in Plymouth, cast at the Gorham Foundry in 1920.



**Gorham Foundry:**

The Gorham Company, founded by Jabez Gorham in 1831 and initially located on Benefit Street in Providence, Rhode Island, began by manufacturing teaspoons and other small silver objects. In 1865, a separate ecclesiastical department was organized. Gorham made small cast bronzes in the 1860's but it was not until 1885 that the first large sculpture was made. The Gorham Bronze Division was founded in 1890, and became well known for its excellent fabrication methods. Some of the sculptors whose bronze works were cast at Gorham include: Cyrus Dallin, Daniel Chester French, Harriet Frishmuth, Anna Hyatt Huntington, Alexander P. Proctor, and Augustus Saint-Gaudens. The foundry buildings, in the Elmwood section of Providence, were razed in 1997. The Gorham Company archives are stored at the John Hay Library at Brown University and at the Smithsonian Archives of American Art.

**Foundry mark and artist signature**

**Left: Gorham Foundry mark on lower left corner of bronze.**

**Right: Cyrus E. Dallin's signature and date on lower right of bronze.**

## Original Color of the Bas Relief



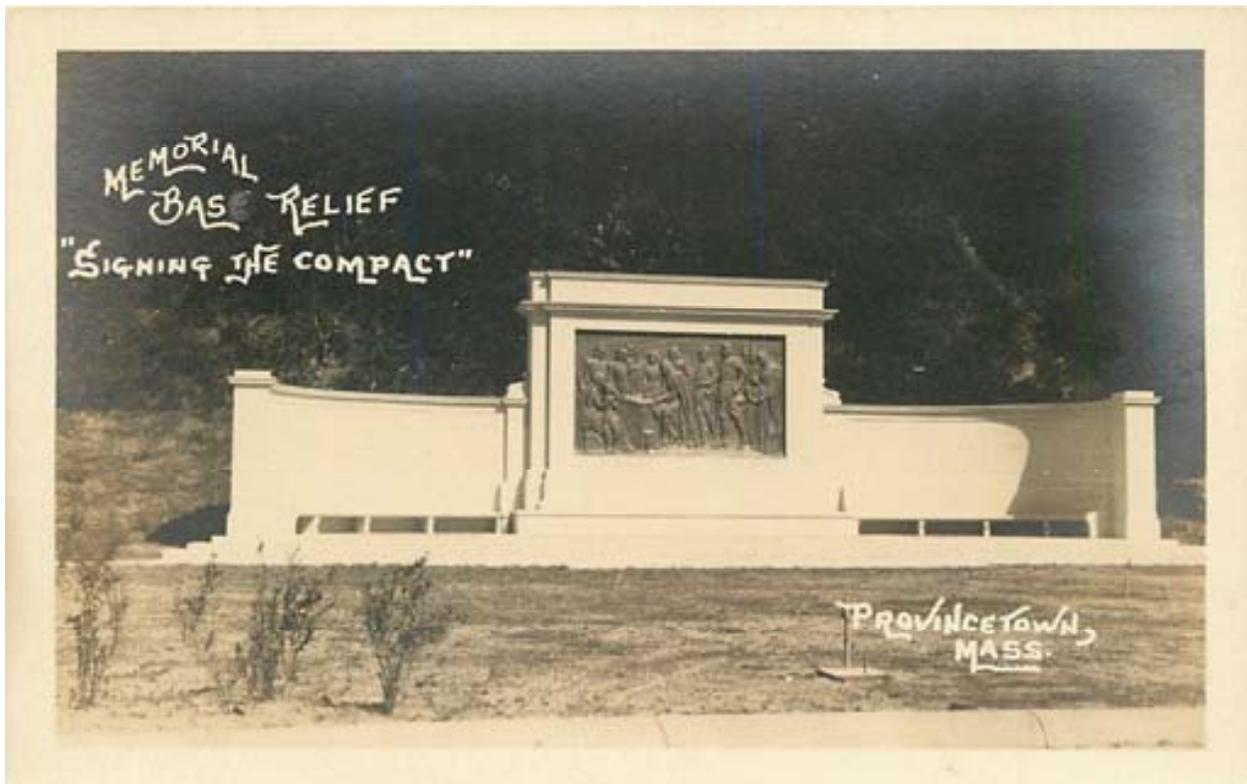
Photograph from the Gorham archives showing the recently completed Bas Relief (1921).

Research carried out for the Provincetown Bas Relief Master Plan Project at the John Hay Library revealed that the color of the bronzes cast by Gorham for Cyrus Dallin were brown, as evidenced in inventory and sales lists. Additionally, a photograph of the bas relief, taken when the work was complete but still at the foundry, clearly shows the bronze was a brown color, with a lustrous finish.

The photograph also shows that the relief, though certainly cast in sections, was brazed together and patinated as a single piece. The bas relief was likely transported to Provincetown by train, and attached by bronze pins to the granite blocks behind it.

Dallin would have made models in clay, then created a full scale version in clay. The foundry made a mold of the life size clay and cast it in plaster, and finally make a lost wax model to pour the bronze.

## Historic postcard showing original brown patina



An undated historic postcard, likely printed shortly after the installation, shows the original patina to be a dark brown. Gorham patinators created this color patina by heating the cast bronze with gas torches and applying a mixture of ferric nitrate and potassium permanganate, and possibly potassium sulfate, in water by brush to the entire surface.

## Sculpture technique



Left: The length of the bronze from the side, showing no bronze deformations. During the site assessment, the conservators tapped the surface every few inches with a steel tool, and no large areas of empty space or loose bronze pins were noted. Right: The side view of the young boy, thought to have been modeled after Dallin's son. Dallin's technique creates a greater illusion of depth by flattening out the face and sculpting details more than halfway around its circumference.

## Summary of General Conditions of Bronze Bas Relief:



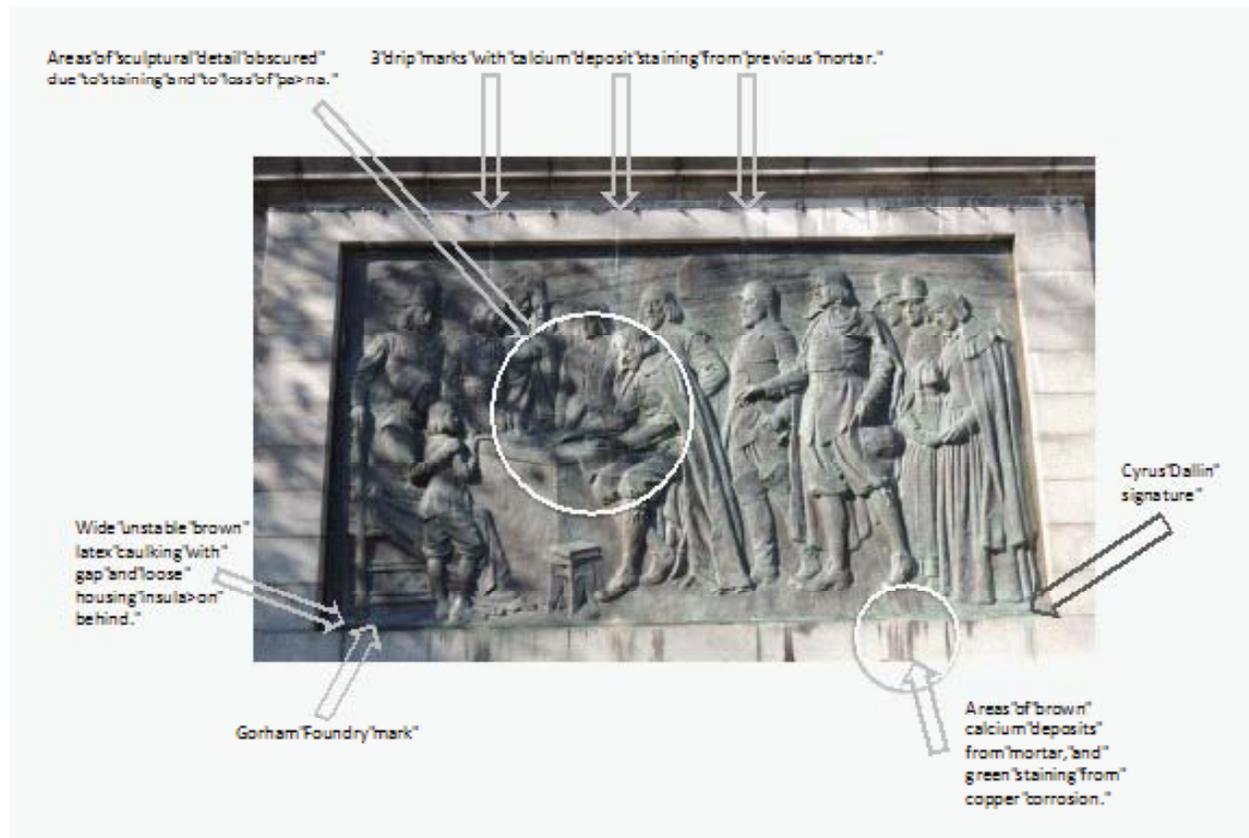
The Signing of the Compact is in overall good structural condition, with no cracks or metal deformations. However, the surface has severely suffered from past restorations, including complete overpainting with paint and bronze powders and loss of surface metal from an abrasive cleaning which has obscured some surface detail.

Numerous drip accretions of very hardened calcite from the original limestone mortar joints are present, as are other types of accretions and stains. There is a poor previous attempt at caulking the perimeter of the bronze with brown latex caulk, which is ineffective and unsightly.

There is copper corrosion caused by weather and salt air, including copper chloride (predominantly green-blue from salt), copper sulfate (predominantly green, from air pollution) and copper sulfide corrosion (predominantly black, also from air pollution). These corrosion products have combined with water and caused damage to the granite by staining the blocks and mortar below and adjacent to the bas relief.

The bronze will require careful cleaning, repatination to match the original color, a new protective coating, and a new stable and visually appropriate system of filling the gaps on the perimeter.

## Diagram of condition notes



## DETAILED CONDITIONS

### Effects of past restoration

The surface of the bronze appears to have been blasted with a fine media, removing what was left of the original patina. This “skinned” surface is explained by town records, particularly by the record indicating that in the mid-1970’s the bas relief was painted completely brown with some bronze powders to make it appear “gilded”. There was a strong negative reaction to this attempt at restoration, and in 1976 the town hired Stuart Dean Building Restoration and Maintenance of Boston to remove the paint. Solvent paint remover may have been used to start the process, but there is no doubt that to completely remove the restoration paint an air abrasive with an unknown grit was used, and the resulting surface appears blast cleaned, with some loss to sculptural detail. Since then, the bare metal has oxidized and started to corrode green. The bas relief may have been waxed at some point between that cleaning and now, as there are small vestiges of an old yellowed wax in some low areas.

### Surface loss from past abrasion and recent formation of green corrosion products



Left: Detail of William Bradford’s hand holding a quill pen. The surface has lost some definition from blast cleaning, and green corrosion is forming on upper surfaces.

Right: Detail of breeches with loss to patina and detail with more recent formation of green copper corrosion.



Left and right: details of patina loss and almost bare bronze from blast cleaning, and formation of recent green copper corrosion.



### **Staining on stone**

Above: Because of a lack of a protective surface coating and compromised lead packing, water run-off from the bronze has also stained the granite. Water has carried loose green and black corrosion products onto the granite blocks below.

### Calcite drips from mortar

Hardened calcite encrustations have occurred due to deteriorating limestone mortar from the granite blocks. These have been present for a number of years, and therefore will be more difficult to remove.



Left: Calcite drips on the figure of William Bradford. Right: Detail of calcite encrustation.

### Perimeter fill and caulking



Left to right: The perimeter left and right of the edges of the bas relief have 1 ¼" gaps, and a 3/8" gap on the top and bottom. The very wide gaps on the sides are unusual, and suggest that the stone monument was not made to exactly fit the plaque (or the bas relief was not cast to the correct dimension).

A very unsightly recent repair to these gaps was done with a poorly applied brown latex caulk, some of which covers the original bronze surface. This brown caulk is flexible and easily punctured, behind which appears to be a loose stuffing of house insulation (fiberglass on the left and cellulose insulation on the right). Beneath the insulation are vestiges of oakum, an historic tarred fiber used for caulking in ship building. The depth from the bronze surface to the back of the granite is 3". The oakum was likely used to fill the wider gaps on the sides, while the more traditional lead sheet was used on the top and bottom to pack the spaces and prevent water infiltration.

These caulking and insulation materials are inappropriate and unstable and will need to be removed. They should be replaced with new packed oakum and polymer modified mortar for the sides, and historically appropriate lead sheeting for the top and bottom edges.

### **Sources of water and electricity on site/testing of water quality**

120-volt electricity is available on site. Water for cleaning will be available either from municipal water or a well. If the water is available from a municipal water source, there is no need for testing for the conservation treatment. If the water is coming from a well, the water should be tested for both bacteria and heavy metals. National Testing Laboratories in Cleveland, Ohio is recommended for testing water samples.

## TREATMENT RECOMMENDATIONS

The goal of the proposed treatment is to clean the surface of the bas relief, return the bronze to its original patina color, apply a protective coating to the bronze, fill the perimeter gap with a stable material, and establish a maintenance program.

The work of this section consists of provision of all materials, labor, equipment and the like necessary and/or required for the complete execution of conservation treatment.

The town of Provincetown will provide a source of water (spigot, hydrant or other water source) and electricity.

Before the bronze conservation commences, the stone conservation team will have removed the latex caulking, household insulation, and oakum surrounding the periphery of the bronze bas relief.

### Pre-treatment site visit

The conservation team hired to carry out work to meet with town representatives before treatment to verify treatment with town representatives. Provide sample patina colors for review. Initiate plans for maintenance program with town representatives.

### Treatment of Bas Relief

1. Take before treatment high resolution photographs of all bronze components in JPEG or TIFF format.
2. Set up scaffolding to access all surfaces of the bronze bas relief.
3. Clean edges of the bas relief to remove any vestige of previous latex and silicone caulk, using Naptha, acetone/ethanol mixed 1:1, or mineral spirits.
4. Wash all surfaces with Nilodor's Professionals Edge Bio enzymatic digester to removal all bio-matter, then rinse with water.
5. Wash all surfaces of bronze with soft brushes with Orvus™ detergent (sodium lauryl sulfate) and water, then rinse with water.
6. Remove vestiges of previous old wax in interstices and inner surfaces of bronze with mineral spirits.
7. Remove calcite drips by applying a weak acetic acid (ph 5.5 in distilled water or white vinegar in water to ph 5.5) and gently mechanically remove calcite.
8. Mechanically reduce loose corrosion products over bronze surfaces with Orvus detergent and water using nylon pads, bronze wool, or small brushes.

9. Power wash bronze (low pressure, 800 psi, fan-shaped nozzle, 12-14 inches from surface) to complete removal of loose corrosion and dirt to achieve clean surface.
10. Protect all stone surfaces with heavyweight plastic sheeting secured with painters' tape and duct tape. Protective sheeting will extend out from the perimeter sides of the bas relief, and form a protective apron beneath extending 12" onto the granite flooring below.
11. Repatinate all bronze surfaces with aqueous chemical reagents and heat torches to appropriate historic color (ferric nitrate and potassium permanganate are recommended) to a medium dark brown tone.
12. Apply protective coat of Incralac (Acryloid B-44) in toluene to all bronze surfaces. Specifically, apply one brush coat and two-three spray coats to achieve an overall even layer approximately 1mm thick.
13. Wax bronze with a hard paste wax (Butcher's Bowling Alley Paste Wax) and buff with soft lint-free cloths or nylon fabric.
15. Supply a written report on the treatment to the Town of Provincetown with photographic documentation including digital images before, during, and after treatment images. Report will include all materials and methods used in treatment.
16. Provide written annual maintenance directions, and provide specific directions for graffiti or accretion removal from the bronze and other necessary maintenance cleaning.

*After the bronze bas relief conservation is complete, the stone conservation team will fill the peripheral gap on all edges of the bas relief as directed by the stone conservation specialist.*

## CONDITION OF SECONDARY PLAQUES

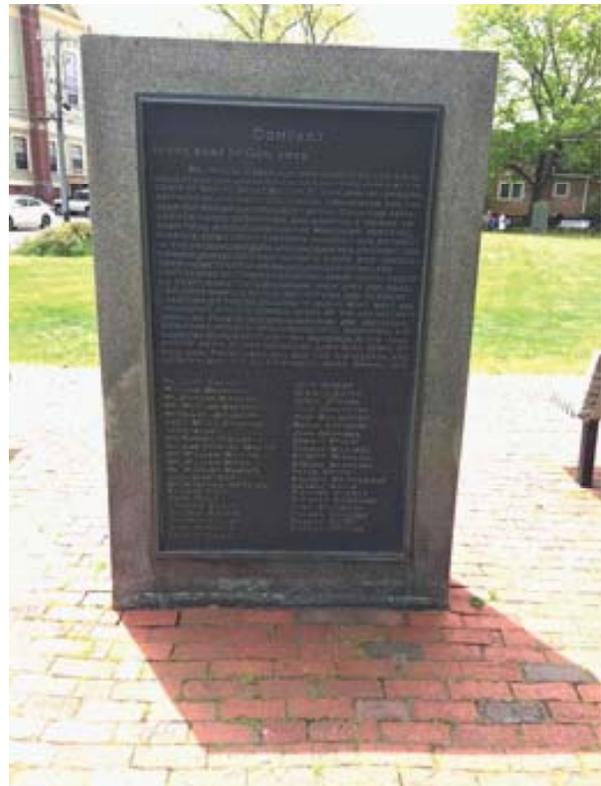
Dimensions of stone: 74”H x 48”W x 12”D

Dimensions of front plaque: 28”H x 36”W x ¾”D

Dimensions of small bas relief: 6 ½” H x 12 ½” W x 3/8”D

Dimensions of signer’s plaque on reverse: 60”H x 36” x ¾” D

The two secondary bronze plaques on the front and reverse of the side granite plinth, to the right of the Bas Relief, are in good structural condition and are well secured. The primary plaque on the front is a dedicatory plaque memorializing the signing of the Mayflower Compact, and includes a small bas relief (different from Cyrus Dallin’s bas relief). The plaque on the reverse of the plinth has the names of all 41 men who signed the Mayflower compact.



Left: secondary plaque on granite plinth to the right of the Bas Relief monument. The plaque is secured to the plinth. Water washing over the surface has picked up soil and corrosion products and to cause stains on the granite below. There are remnants of red crayon graffiti on the front of the plinth below the plaque. A protective coating on the bronze will prevent water run-off. Right: plaque on reverse with list of names of those who signed the Mayflower Compact.



The secondary granite and bronze monument was made by HP Smith and Co, Boston. The company was founded in 1874, and still exists although there are no archives since the 1950's. Blake Manufacturing Company, Boston, cast the secondary plaques, and a company fabricator likely made the small bas relief.



Left: detail of small secondary bas relief. Right: green copper corrosion on the sides of the front plaque due to the lack of a protective surface coating. Both plaques were originally dark brown.

## Recommendations for treatment of secondary plaques

1. Photograph both plaques before treatment in high-resolution JPEG format.
2. Wash all surfaces of bronze with Professional's Edge Enzyme digester in water to remove bio matter.
3. Wash twice with Orvus detergent (sodium lauryl sulfate) in water, using soft brushes, and thoroughly rinse. Towel dry.
4. Apply painter's tape and plastic sheeting to protect the granite plinth during treatment.
5. Remove any remains of previous wax with lint free cloths and naphtha.
6. Repair all areas of patina damage with Sennelier Raw Umber dried pigment using Golden MSA as a binder, followed by 3 spray coats of Incralac in toluene.
7. After complete drying, wax all surfaces with Butcher's Bowling Alley Paste Wax and buff.
8. Photograph after treatment.
9. Provide written report with maintenance directions and all JPEG images individually labeled.

## SPECIFIC CONSERVATION SUPPLIES AND PRODUCTS

Orvus™ Detergent (sodium lauryl sulfate). Available from Talas Online and other conservation materials suppliers.

Nilodor, Inc. Professional's Edge bio-enzymatic urine digester

Ferric Nitrate Reagent (crystal form). Available from Fisher Scientific or Aldrich Chemical.

Potassium Permanganate (powdered form). Available from Fisher Scientific or Aldrich Chemical.

Incralac (B-44) in solvent base. Available from Talas Online and other conservation materials suppliers.

Golden MSA colors and MSA resin in mineral spirits or TS-28 solvent. Available from Talas Online, other conservation materials suppliers, or art supply stores.

Sennelier Dry Pigments. Available online or from artist supply stores.

Butcher's Bowling Alley Paste Wax. Available online at [bwccompany.com](http://bwccompany.com).



Rika Smith McNally  
Principal, Rika Smith McNally Associates  
11/4/16



## STONE ASSESSMENT

In May of 2016, Building Conservation Associates, Inc. (BCA) surveyed the granite components of the Bas Relief in Provincetown, Massachusetts.

The structure was inspected from the ground, and by ladder to access the top of the granite walls. The conditions were documented using digital photographs and conditions notes compiled in an iPad program.



BUILDING CONSERVATION ASSOCIATES INC

The Bas Relief is titled Signing the Compact. The Bas Relief is the central feature of Bas Relief Park, located on Bradford Street in the center of Provincetown. The park and the Bas Relief were constructed in 1920, to commemorate the 300th anniversary of the Pilgrims' landing.

## EXISTING CONDITION ASSESSMENT

### Description

The Bas Relief is comprised of two parts – the bronze bas relief panel, and the granite structure that frames and supports it. The granite structure is seventy feet long and twenty feet high in the center. It is a tripartite structure with classical detailing. The central portion is rectangular in shape, has a double projecting cornice and holds the sixteen foot wide by nine foot high bronze bas relief. The two flanking sides are symmetrical and, in plan, form graceful curves that contain integral stone benches. The sides are lower than the central portion and have a simple cornice capstone. The structure sits on a base that is three steps up from the ground level of the park. The pavement is a combination of granite and brick. The back of the structure was designed to be partially buried in the slope of the hill.

The Bas Relief was constructed using large granite ashlar blocks set in mortar. The blocks have a honed finish and are laid in a running bond. There is little written about the granite structure, therefore the source of the granite, and the architect or engineer for the design, are unknown at this time. Due to the time period that the monument was constructed, there were likely structural steel pins, plates or anchors used in the construction to tie the stones together. The only visual evidence of steel is the lifting and displacement of some stones caused by the rusting and expansion of embedded steel or iron.

### Masonry Existing Condition

#### Granite

The granite structure that supports the bronze bas relief is generally in good condition with some cracks and spalls; atmospheric, calcite and bronze staining; rust jacking and minor displacement of stone; and mortar failure. This section discusses these conditions in more detail, showing representative locations of the failure described.



Fig. 1 East Elevation of Bas Relief.

### Cracks

There are isolated crack locations in the granite, across the structure. The majority of the cracks do not appear to indicate structural settlement or movement of the stone. A few of the cracks, however, do appear to be moving and are exhibiting associated displacement of stone.



Fig. 2. Crack at east wall, north wing, at back of bench.



Fig. 3. Crack at back corner of north pier.

### Spalls

There are several locations where the stone has spalled (a piece has cracked and dislodged from the surrounding stone and is missing).



Fig. 4. Spall at southwest pier.



Fig. 5. Large spall to left of bas relief panel.

### **Anchors and Attachments**

Ornamental string lights are attached to the monument by metal attachments and plastic fasteners affixed to the stone with epoxy. Both methods are causing damage to the stone. The metal attachments are rusting and causing staining of the surrounding stone. The epoxy has caused a stain where it was attached that will be difficult to remove.



Fig. 6. Ornamental light attachment with metal anchors. Note rusting.

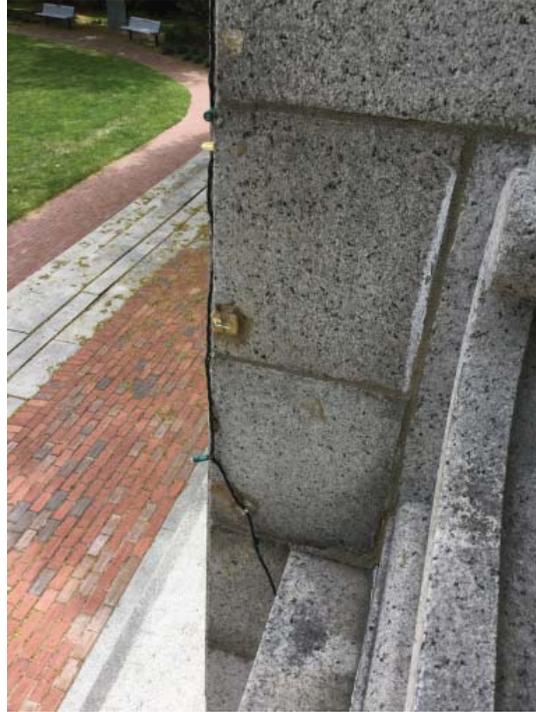


Fig. 7. Ornamental light attachment with epoxy anchor.

### **Staining**

#### **Atmospheric**

In general, the stone is soiled with atmospheric pollution. It is not necessarily causing damage to the stone, but the appearance of the structure would be greatly improved with a gentle cleaning of the stone. Soiling is apparent in the overall mottled appearance of the stone, with varying hues of light and dark.

### **Biological**

Locations that are not exposed to sunlight do not dry out adequately. Biological growth thrives in those environments and is occurring at the underside of the benches and on the back side of the structure. Biological growth can trap moisture, which can lead to accelerated weathering of the stone and mortar.



Fig. 8. Biological growth under bench. Typical condition along entire bench.

### **Polishing/Burnishing**

The front edge of the benches and the stairs have a dark hue to them, and the surface is slightly polished, or burnished. This is most likely caused by skateboards. The repeated skimming of the board and wheels against the stone polishes the surface over time.



Fig. 9. Polishing or burnishing of bench edge, possibly caused by skateboards.

### Calcite Deposits

The white calcite deposits on the stone are caused by water infiltration, through open mortar joints, to the core of the structure. As the water exits the structure through lower mortar joints, the lime and cement washed out of the mortar. It is deposited on the surface of the granite, leaving the white encrustation that is seen in many locations.



Fig. 10. Calcite staining at back of bench, coming through mortar joint and crack in stone.



Fig. 11. Calcite staining above bas relief, coming through mortar joint.



Fig. 12. Extensive calcite staining on back of monument indicating extensive water infiltration issues.

### Bronze Runoff

Water infiltration behind and over the surface of the bronze bas relief panel has caused bronze staining on the stone, below the bas relief.



Fig. 13. Bas relief showing bronze staining on stone.

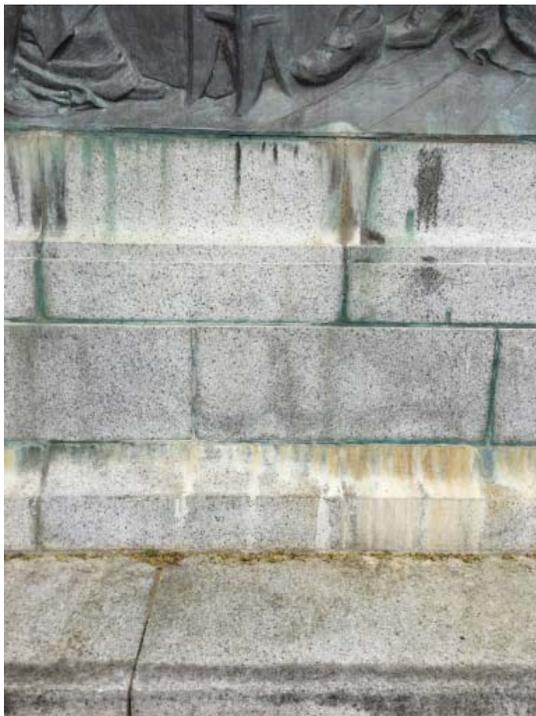


Fig. 14. Bronze staining below bas relief. Note staining of stone and mortar joints.

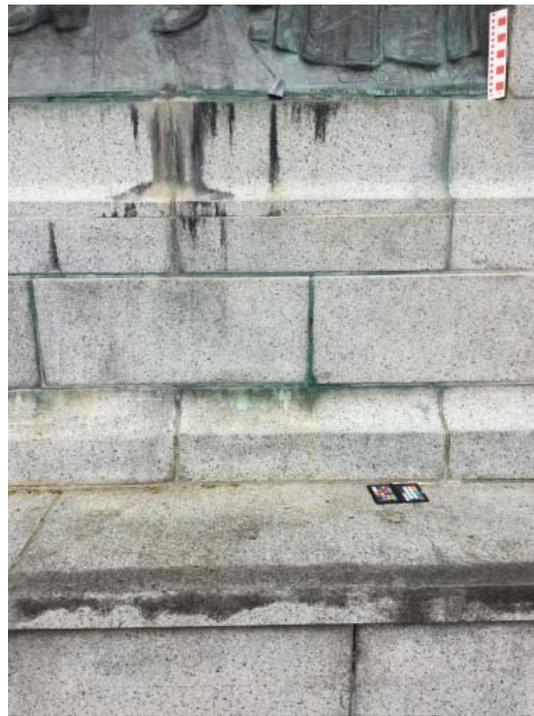


Fig. 15. Bronze staining below bas relief.

## Mortar

The mortar is in fair to poor condition, with many of the joints completely missing or deteriorated to the point of failure. Open mortar joints allow water to infiltrate the interior of the structure, accelerating the deterioration of the mortar and the stone. This occurs in several ways. As the water exits the structure, it washes the lime and cement components from the mortar, leaving behind a weaker mortar composed primarily of sand. In addition, the lime and cement washed out of the mortar is deposited on the surface of the granite, leaving the white encrustation (calcite deposit) that is seen in many locations. Water infiltration behind the bronze bas relief panel has caused bronze staining on the stone, below the bas relief. When water saturates the stone and mortar and the temperatures drop below freezing, the water trapped in the masonry expands as it freezes. This expansion has the force to spall or displace the stone. The location where most of the water is entering the core of the monument is through the mortar joints in the capstones.



Fig. 16. Open mortar joint at cap. Typical condition.



Fig. 17. Open mortar joint at capstone.

### Joint Between Bronze and Stone

There is a large joint between the bronze bas relief panel and the stone. This joint is currently filled with generations of different materials, including pink house insulation and multiple types of sealant, used to fill the cavity between the two dissimilar materials.



Fig. 16. Large gap at left filled with sealant and insulation. Horizontal joint filled with remnants of oakum and mortar.



Fig. 17. Large vertical joint filled with insulation and mortar. Joint is over 1 inch wide in locations.

## TREATMENT RECOMMENDATIONS

### Cracks

*The majority of the cracks are minor and do not appear to be moving or indicating structural settlement or movement of the structure. A few of the cracks do appear to be moving and are exhibiting associated displacement of stone. The non-moving cracks should be injected with grout to close the crack and stop water infiltration. At cracks that are moving, stainless steel pins should be installed across the crack to stop the movement. The pins should be installed with epoxy, and the crack repaired with grout.*

### Spalls

The spalls smaller than 1-inch square should be repaired with cementitious patching material. The spalls larger than 1-inch square should receive a Dutchman repair. A Dutchman repair is completed by squaring off the area where the spall occurs, fabricating a new piece of stone in the shape of the missing piece, and installing the new stone with stainless steel pins and epoxy. The replacement stone should match the existing in color, texture and pattern.

### Anchors and Attachments

The ornamental lights and their associated fasteners, both metal and plastic, should be removed. The metal fasteners should be removed from the joints and all rust staining cleaned from the surface. The plastic attachments should be removed and the epoxy used to fasten the plastic element to the stone should be cleaned from the granite.

### Staining

There are a lot of different types of stains on the surface of the granite. Granite is a very hard stone and is therefore less susceptible to damage during the cleaning process. The methods to remove the staining will vary depending on the type of staining, but may include chemical cleaners as well as mildly abrasive techniques. A series of mockups should be performed, prior to cleaning the monument, to determine the best method for cleaning the various soiling types from the stone.

#### *Atmospheric*

Atmospheric soiling can be removed with relatively gentle methods. Testing should always start with the most gentle, and move to increasingly aggressive methods only when necessary. A simple hot water wash may be enough, although a gentle detergent cleaner may be necessary.

#### *Biological*

Biological growth may be removed using a hot water or steam wash. If that is not effective, a masonry chemical cleaner formulated to remove biological growth can be used.

#### *Burnishing*

There is no simple way to reverse the polishing of the stone. If there is a desire to make it less pronounced, a micro abrasive blasting could be done to the areas of polish to make the surface less reflective.

### *Calcite Deposits*

The white calcite deposits have formed a strong bond to the stone and may be difficult to remove. A micro abrasive blasting will probably be the most effective. This will have to be closely watched to ensure that the surrounding stone is not damaged in the process.

### *Bronze Runoff*

The bronze runoff should be removed using a chemical poultice formulated for this type of stain removal. Poultices for bronze stain removal may be composed of a clay, talc or paper binder, mixed with ammonium chloride. The mixture is spread on the surface and acts to pull the stain out of the stone through capillary action.

### **Mortar**

The majority of the mortar joints are weakened or deteriorated. The granite structure should be repointed 100%. The existing mortar should be removed to a depth of at least 1 inch, or until sound mortar is reached. Due to the amount of water infiltration through the monument, and the amount of calcite staining, there may be locations where the mortar is not sound to much greater depths than 1 inch from the surface. New mortar should be installed and the joint profile tooled to match the original mortar joint profile. The existing mortar should be analyzed to determine the ratio of sand to cement to lime. New mortar should match the original in composition, texture and appearance. The installation of lead weathercaps on the horizontal joints can provide a more durable horizontal joint and greatly reduce the amount of water entering the structure over time.

### **Joint Between Bronze and Stone**

The material used to fill the gap between the bronze panel and the stone has to be able to accommodate the different rates of expansion and contraction of the bronze and the masonry. The best material for the horizontal joints at the top and bottom of the panel is oakum and pounded lead. Lead and oakum may also be able to be used on the vertical joints on either side of the panel. This method will have to be tested to determine if it is a viable use of the materials. If it is not possible to get the lead and oakum to conform to the large, vertical joints, oakum can be used as a backer rod, with latex modified mortar used on the surface of the joint.

### Opinion of Probable Cost

The budget numbers below assume that all of the work is completed in one phase of construction. Mobilization multiple times to the site for phased work would increase the overall cost of the work. Depending on the scheduling of the masonry and bronze panel restoration work, there may be some ability to share the scaffolding between the two trades, resulting in some cost savings for scaffolding.

Item	unit	unit amount	cost/unit	2016 cost	cost with inflation
SCAFFOLDING OR LIFT	SF	1200	\$ 9.00	\$ 10,800.00	
MASONRY REPOINTING	SF	2100	\$ 30.00	\$ 63,000.00	
DUTCHMAN REPAIRS	EA	10	\$ 1,500.00	\$ 15,000.00	
CRACK REPAIRS	EA	20	\$ 400.00	\$ 8,000.00	
LEAD WEATHERCAP	LF	80	\$ 110.00	\$ 8,800.00	
CLEANING	SF	2100	\$ 12.00	\$ 25,200.00	
CAULKING STONE TO BRONZE	LF	50	\$ 75.00	\$ 3,750.00	
REMOVE ANCHORS	EA	50	\$ 90.00	\$ 4,500.00	
RESET STONES	EA	10	\$ 750.00	\$ 7,500.00	
<b>Subtotal</b>				<b>\$ 146,550.00</b>	<b>\$ 146,550.00</b>
General Conditions 7%				\$ 10,258.50	\$ 10,258.50
Overhead & Profit 5%				\$ 7,327.50	\$ 7,327.50
Design Contingency 10%				\$ 14,655.00	\$ 14,655.00
Construction Contingency 10%				\$ 14,655.00	\$ 14,655.00
<b>Subtotal before inflation</b>				<b>\$ 193,446.00</b>	<b>\$ 193,446.00</b>
2017 Inflation (4%)					\$ 7,737.84
2018 Inflation (4%)					\$ 8,047.35
General Liability (.006)				\$ 1,160.68	\$ 1,255.39
Construction Managers Fee (3.5%)				\$ 6,770.61	\$ 7,323.09
<b>Construction Subtotal</b>				<b>\$ 216,032.29</b>	<b>\$ 232,464.67</b>
Permit Fee (1.5%)				\$ 3,240.48	\$ 3,486.97
Performance and Payment Bond (.007)				\$ 1,512.23	\$ 1,627.25
<b>TOTAL CONSTRUCTION BUDGET</b>				<b>\$ 228,716.28</b>	<b>\$ 246,157.37</b>



## STRUCTURAL ASSESSMENT

Refer to twenty-one annotated photographs showing conditions and two drawings sheets illustrating the Bas Relief and references to defects attached to this narrative.

**MacLeod Consulting, Inc.**

*structural engineering for architects and building owners*



### **Description**

Bas Relief is a stone structure sited at the foot of the harbor side of High Pole Hill. Pilgrim Bas Relief is at the top of this hill. It was built around 1920-1921.

Bas Relief is not listed in the Massachusetts State Register of Historic Places 1997. Additionally, it is not listed in the National Park Service Register of Historic Places. Possibly, it lies within an historic district. Whether or not this is a registered historic property, repairs should be carried out using The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating Restoring & Reconstructing Historic Buildings.

The Bas Relief is comprised of stone retaining walls with curved ends that are viewed from a stone and brick platform elevated three steps above the surrounding terrain. The center of the Bas Relief hosts a large bronze plaque. The curved walls are 20 inches thick by 10 feet tall. The center plaque host wall is 35 inches thick by 19 feet six inches tall. The back of the wall retains soil varying from zero to six feet above the platform. Stone benches are integrated in the walls.

### **General Assessment**

In general the stone units within the walls appear unmoved from their original placement. The height to thickness of the low walls is 6 and that of the center is 6.8. These are low ratios that favor the long-term stability of these walls. Given the lack of dislocation and settlement, one can assume the foundations are adequate.

A light gray black speckled granite laid up in ashlar style makes up the walls of this Bas Relief. Stone is dressed on both sides of the wall above grade. On the rear face, the face is rough below grade as seen where backfill has settled.

Stones at the ends of walls extend entirely through the wall creating a good through-wall bond. The stones are set in a running bond along the wall again creating a good in-plane bond. The setting mortar is unknown. It may be different than the pointing mortar. Additionally, individual stones may not be entirely bedded in mortar. They may have been set on shims. More bedding mortar would improve resistance to out of plane dislocation. As the stones appear well fixed in place, I suspect they are largely well bedded in mortar.

The brick and stone paving in the platform appear generally unmoved and serviceable. The stone treads and stone edging are migrating away from the Bas Relief. They are unrestrained in this direction. The platform paving is set in mortar. This suggests the paving is supported on a concrete bed. The brick pavers do not appear to have the wear of nearly a century. They are likely a replacement for original paving.

### **Liabilities**

Moisture penetration in masonry is not desirable. In this climate, trapped water can freeze. It expands about ten percent as water transitions to ice. This leads to expansive stresses that can move, crack, and spall stone as well as breaking mortar joints. Limiting moisture penetration will limit its destructive effects.

Some examples of moisture penetration are as follows:

1. Cracks and spalls. One spall at the left end of the center bench appears pried off its supporting stone probably from ice forming under. The vertical joint next to the spall likely channeled water to the slab underside. See drawing Note N and Photo 14. One coping stone is cracked, see Note K and Photo 19. A crack extends up through two stones at the right end on the right side. See Note A and Photo 16. A platform paving stone is cracked at the right end of the center bench, see Note N and Photo 14.
2. Efflorescence. In many areas of the walls, salts are forming where moisture moving through the walls is carrying salt compounds from the interior. The main means of water entering the walls is through head joints in water tables and coping and wherever mortar is missing in stone facing joints. Given that stone joints vary on the rear from those on the front, it is evident that the wall has internal collar joints in which water can seep down. In places where the downward flow is interrupted by bed joints, salt solutions exit the wall and dry forming the efflorescence buildup. See Note B and Photos 18, 20, and 21. The principal concern with efflorescence is that it indicates that moisture is readily seeping through the masonry.
3. Stains. Other compounds seeping out of the mortar joints are staining the stone face. Copper oxides are coming out of joints under the plaque. See Note J and Photos 11 and 12. A white substance is coming out of the bed joint under the water table over the plaque. It appears unlike other white salts on the wall. See Note I and Photo 13.
4. Mortar. Mortar is missing in some coping and bench seat head joints (see Note C and Photo 21) and in general in some other wall facing joints. Open joints permit water to seep into the wall. The pointing mortar appears to contain Portland cement. The setting mortar is unknown. Given the time period of original construction it most likely is a Portland cement mortar with some lime.
5. Paving. The brick and stone paving is set with mortared joints. This implies the paving is also bedded in mortar. This is one of several traditional methods of paving construction where the paving is pitched to shed water with paving units set mortar to act as a barrier to water. The brick pavers and first bordering stone trim paver (next to the brick) appear unmoved in their original setting position. Some of the mortar head joints have shrinkage cracks which will admit water. Most of the brick units are intact. Some have spalls. The next two lines of trim pavers and steps have drifted away from the wall. This drifting started a long time ago as evidenced by wide repointed joints between lines of trim. The joints in these dislocated stones are largely broken.

## Recommendations

Recommend remedial work is as follows:

1. Spalls and cracks. Broken stones can be repaired in one of three ways—replacement, Dutchman patch, or mortared patch. The particular source of water that caused the crack or spall should be corrected along with the stone repair.

a. Replacement requires finding matching stone and is appearance wise the best remedy.

b. Finding matching stone is needed in making a Dutchman patch which nevertheless will still be readily apparent appearance wise.

c. Patching with a mortar mix requires a high level of skill. The first challenge is to make a mortar mix that will make a good match to the parent stone. Mixing 30 percent Portland cement with 70 percent stone dust made from matching stone is a good start. Cathedral Stone can provide proprietary mixes to match the parent stone. The patch needs to be made in built up layers with stainless steel pins and wire reinforcement. The final layer needs to be tooled to imitate the face of the parent stone. The patch will be apparent.

Where stone replacement requires temporarily removing other stones for access, the patch options may make more economical sense. Where a stone can be directly replaced, that may make more economical sense.

2. Moisture mitigation.

a. Pointing. The extensive amount of joints with efflorescent warrants complete repointing. Mortars will contain Portland cement, lime, and sand commonly shown in proportions by volume (PC:L:S). The proportions of ingredients are standardized as types such as Type M, N, or O. Type M mortar (3:1:12) is a high strength mortar with excellent resistance to freezing. It is generally not easily worked for tooling. Type M is a traditional mortar used in the twentieth century for heavy stone masonry construction. Type N mortar (1:1:6) has moderate strength and freezing resistance and is more workable than Type M. It is commonly used in modern masonry veneer walls. Type O mortar (1:2:9) is a weak mortar meant for light indoor loads and not subject to freezing. Lime mortars were common in the 19th Century until American cement makers began Portland cement production in the late 1800's. Types M and N are suitable mortars for these repairs. Type O is not. Joints should be cut one-inch-deep with handheld saws of the type that will not overcut joints. Repoint in two passes with damp mortar well compacted in the joint. Tool joints slightly concave. Dress with bristle brushes or burlap rags to affect a weathered look. Washdown masonry to remove excess mortar. Before prescribing a final remedy, further investigation should include opening several bed joints and inspecting the method of support/bedding present.

b. Weeps. Moisture readily moves through the masonry within the joints. Adding corded weeps at regular intervals in intersections of bed and head joints will provide a controlled way for trapped moisture to exit masonry relieving pressures on mortar.

c. Weather caps. Head joints in coping and water tables are highly prone to rapid weathering as they face upwards making easy avenues for water to wick into mortar joints. Capping these joints with lead T-caps (WEATHERCAP<sup>®</sup>) will protect against these moisture attacks. T-caps are set in silicone sealant. They should be turned down from the horizontal surface about an inch to cover the stem placed in the head joint.

d. Terrain swale. Surface water running downhill onto the back of the wall can seep into the ground and continue to provide a source of moisture to enter the wall. Regrade the terrain behind the wall to include a swale that diverts runoff around the Bas Relief.

### 3. Paving.

a. Stone trim. Stone paving bordering benches and bordering brick appear adequately supported. Two rows of stone trim running parallel to the stairs need to be removed cleaning them free of existing mortar and reset in mortar with adequate pins to anchor them from drifting.

b. Brick. While the brick may still be serviceable, I recommend removing several for testing for absorption and freeze thaw to assess for continuation of service. Review maintenance records to establish when they were placed. Additionally, it appears the present brick was set to conform to the elevation of trim stone which is heaved in areas.

c. Treads. The stair treads are all dislocated. Remove them all, clean them, and reset in mortar. They may be supported on foundation stones or concrete. Consider rebuilding this support providing anchors to pin treads and pedestals to provide drainage space to remove water between the support and treads. Simply butt the ends together without mortar. Include a stone trench under the walkway to collect water away from the stair support. The problem of grade alignment between stairs and an undulating brick paving raises the question on whether reset stones should be a constant grade or follow that of the brick if the brick is not reset. The scope of replacement should be decided before the final report.

### 4. Stains. Consult with the team conservator for methods to clean stains.



1. Bas Relief viewed from front.



2. Right wing of Bas Relief.



3. Center mass of Bas Relief.



4. Left wing of Bas Relief.



5. U.S. Geodesic Survey benchmark located to the right side of the right wing.



6. View of stair treads and paving looking to the left. Treads have migrated away from the Bas Relief platform. Some heaving is evident.



7. View of stair treads and paving looking to the right. Treads have migrated away from the platform. Some heaving is evident.



8. Stone treads rising from brick walkway to stone and brick paved platform. Stones have migrated away from the Bas Relief and heaved. Most likely, they are supported on soil that has poor drainage and insufficient compaction.



9. End of bench slab broken left side of center mass.



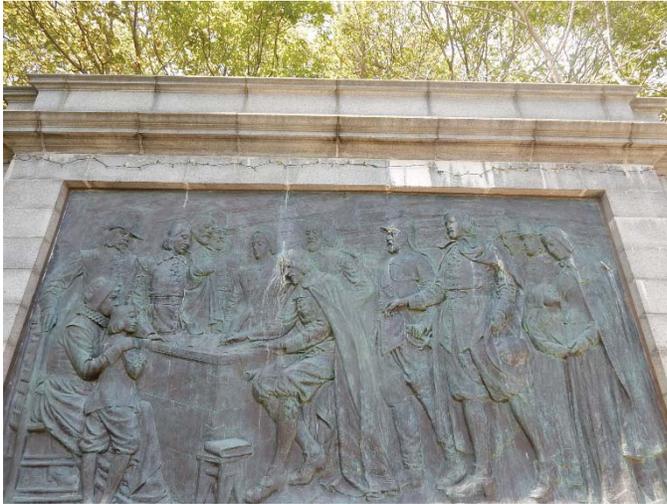
10. Broken bench slab (Photo 8) has the appearance of having been pried off the supporting stone under it. Most likely water seeped through the reentrant vertical joint into the bed joint of the bench slab. The water got trapped, froze in the winter, and thereby expanded prying at the slab.



11. Discoloration under the plaque from copper oxides transported through the stone joints. Water seeping inside the joints is likely transporting oxides from the back of the plaque where the surface is unlikely sealed. The dark stains could be the result of mastics behind the plaque or carbonation of the granite.



12. Close-up view of copper salts bleeding out of mortar joints. This suggests water is readily moving through joints.



13. Salts are bleeding out of stone joints above the plaque. A large white stain looks more like a coating material that bled out of the underside joint of the water table.



14. The paving stone under the bench corner is cracked.



15. Close up view of the pilaster at the leftmost end of the left wing. The bed joint has a gap between the mortar and stone. This gap suggests either the mortar shrank or the stone is tipped toward the platform. This pilaster is slightly out of plumb suggesting some past movement.



16. Crack in base stones at right most pilaster, next to Geodesic benchmark. The orientation of the crack suggests the wall is pushing the pilaster over the pilaster footing. The footing is resisting movement thereby tearing the base stone edges.



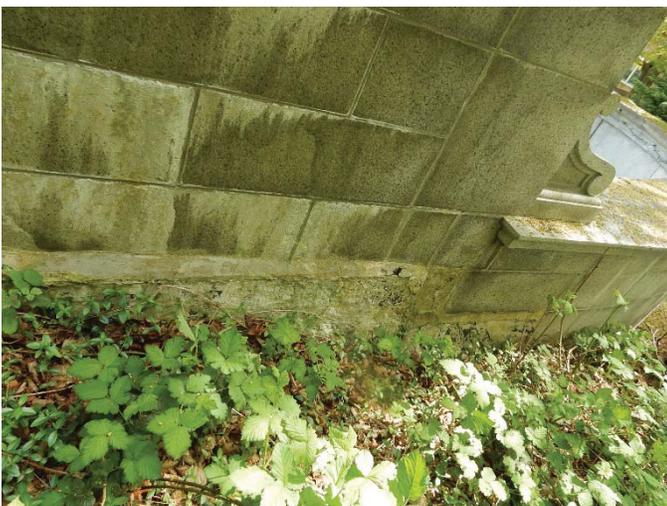
17. View of the left end of the monument. It is at the foot of High Pole Hill. The backside of the Bas Relief is backfilled to align with the slope of the hill.



18. Salts bleeding out of mortar joints. The source of the salts is likely from a beach sand or lime mixed in with the cement.



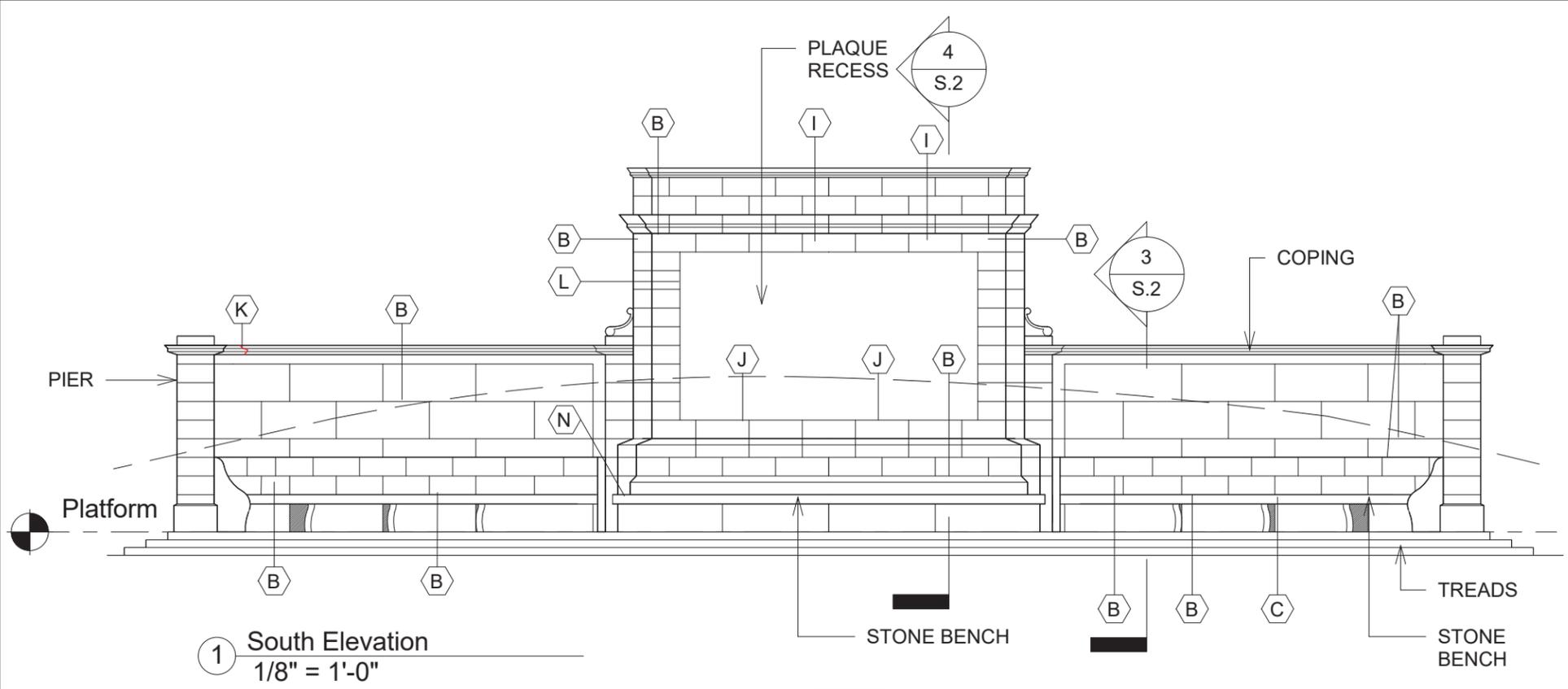
19. Cracked coping next to the pilaster at the end of the left wing. The cause is not readily apparent.



20. Salts bleeding out of the back of the center wall. Note the uncut stone facing that projects up from the backfilled portion of the wall.

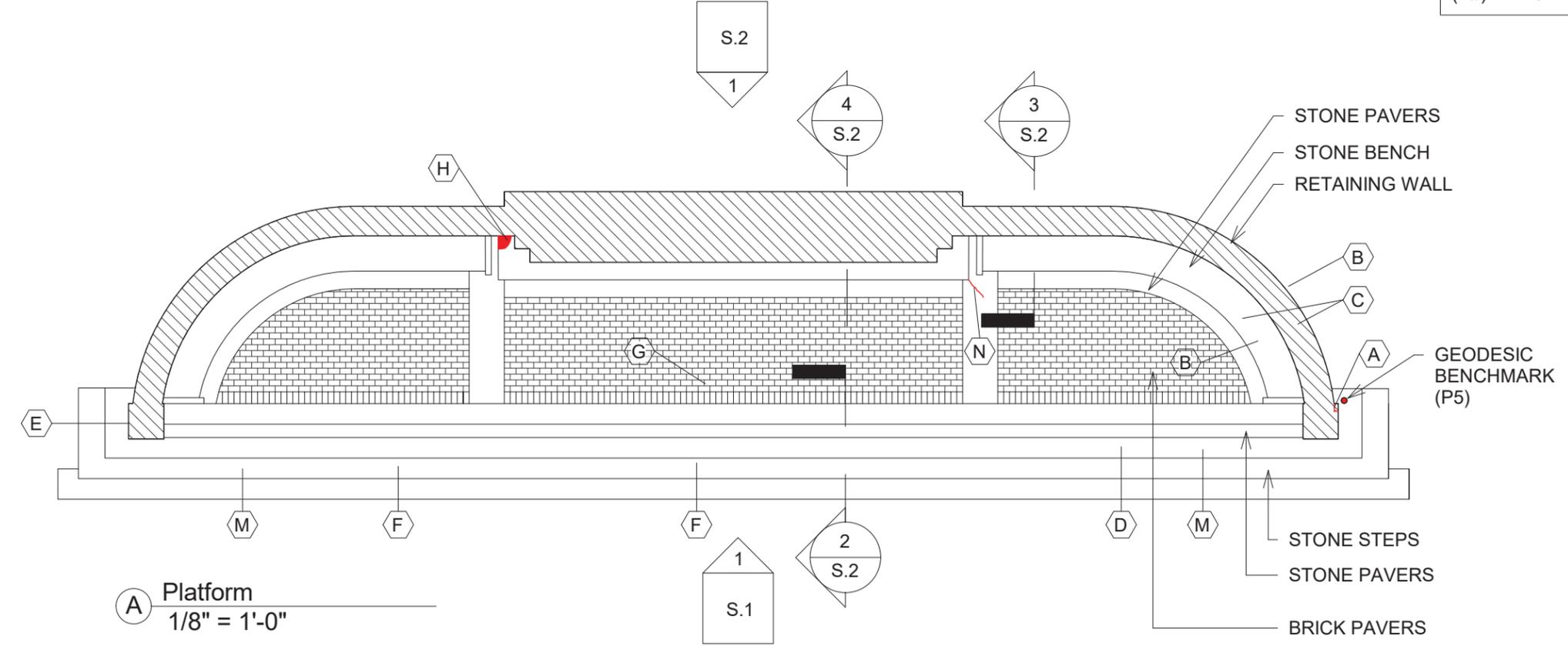


21. Back side of the right wing. Salts bleeding out of mortar joints. Note missing head joint mortar in coping. Metal flashing under coping turned down on supporting stone. On the front side, flashing is retained within bed joint.



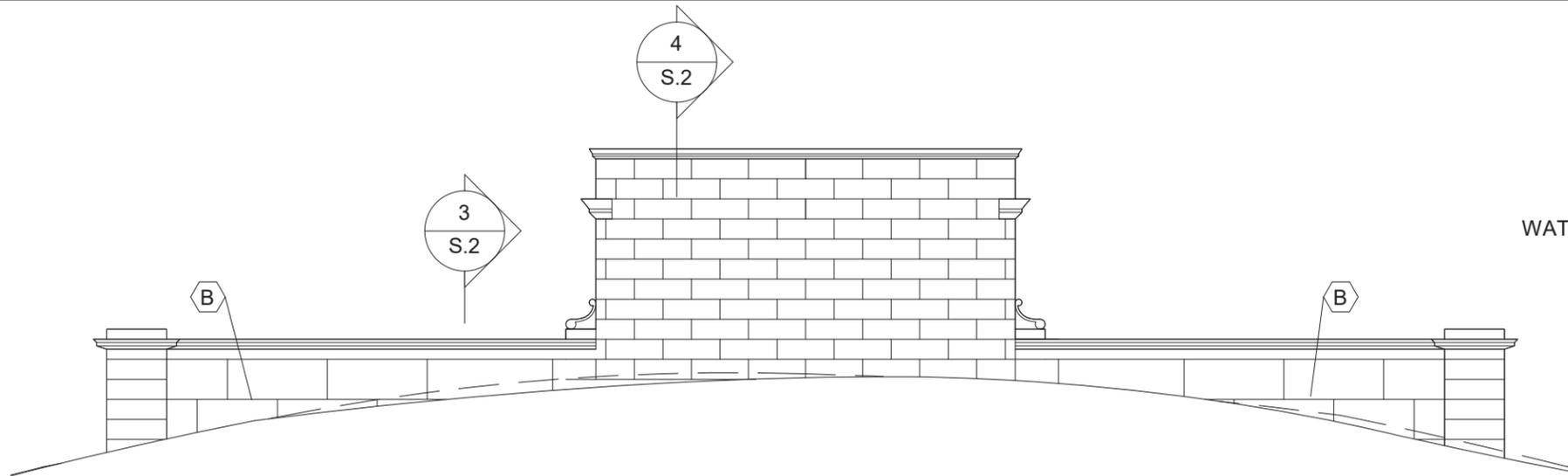
1 South Elevation  
1/8" = 1'-0"

- OBSERVATION KEY NOTES**
- A. CRACK IN WALL BASE. (P16)
  - B. SALTS EMANATING FROM JOINTS. (P18, 20, & 21)
  - C. SEAT/COPING HEAD JOINTS MISSING. (P21)
  - D. HEAD JOINT MORTAR MISSING BETWEEN TREAD SECTIONS. TREADS HAVE MIGRATED AWAY FROM PLATFORM. (P6, 7, & 8)
  - E. LOCAL MOVEMENT IN PILASTER. STONES LIFTED 3/32". WALL BOWED OUT. WALL 5/16" OUT OF PLUMB. (P15)
  - F. STONE TREADS HAVE SETTLED 1/2"±. (P6 & 8)
  - G. BRICK PAVERS HAVE DIPPED.
  - H. CORNER OF CENTER BENCH BROKEN OFF. (P9 & 10)
  - I. STAIN APPEARS AS IF PAINT. (P13)
  - J. COPPER OXIDE STAINS. (P11 & 12)
  - K. CRACKED COPING STONE. (P19)
  - L. SEALANT, NO BACKER ROD, SEALANT ATTACHED TO THREE FACES.
  - M. TREADS DRIFTED 1/2" TO 1". (P6 & 8) CRACKED STONE PAVER. (P14)
- (P#) DENOTES PHOTO NUMBER

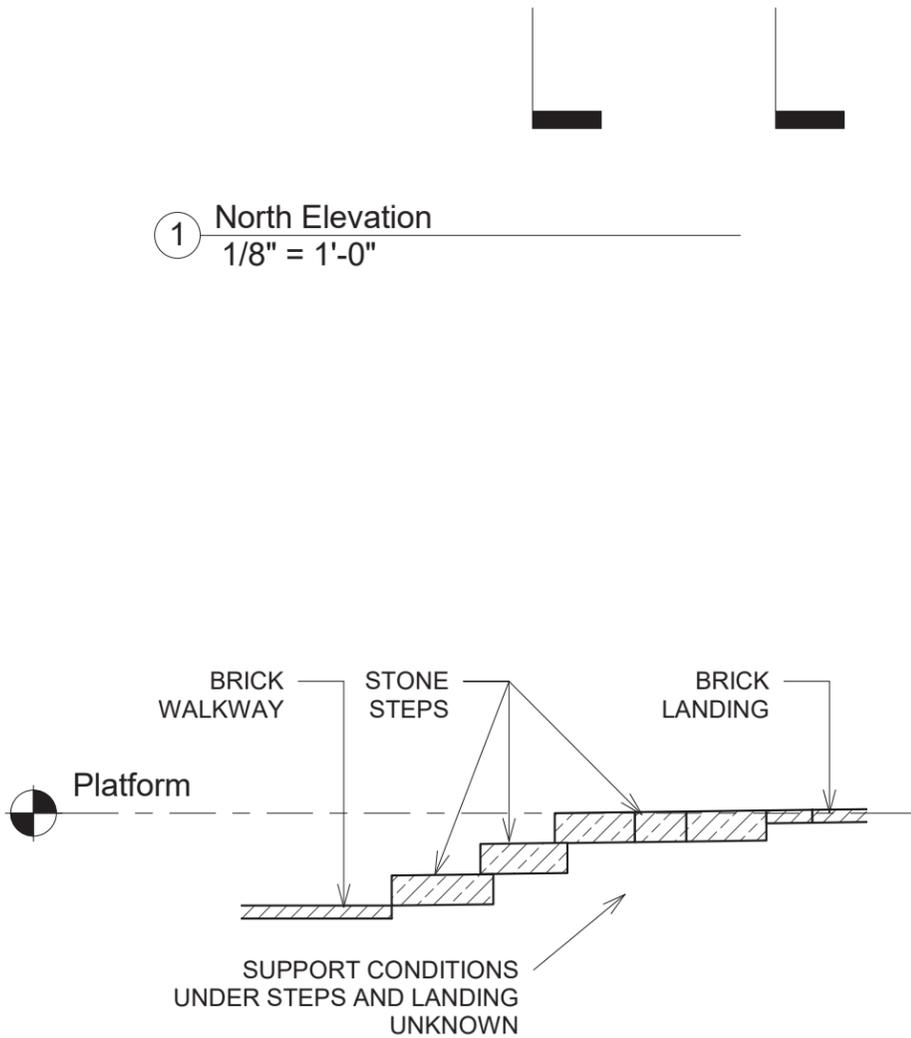


A Platform  
1/8" = 1'-0"

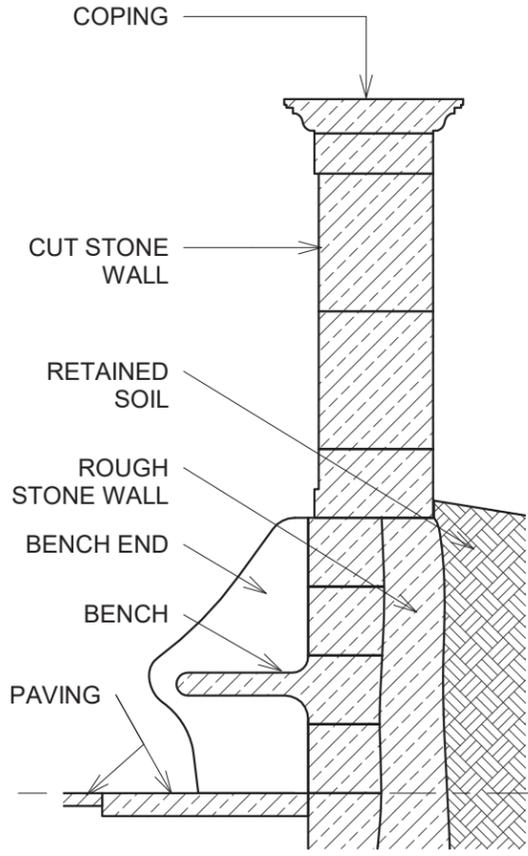
<b>SHEET TITLE</b> <b>Bas Relief Plan and Front Elevation</b>		<b>PROJECT</b> <b>Provincetown Bas Relief Park</b> <b>Master Conservation Plan</b>		DRAWING <b>S.1</b>
<b>CLIENT</b> Ray Dunetz Landscape Architecture 179 Green Street Boston, MA 02130		No. _____ Date _____		
<b>MacLeod Consulting, Inc.</b> 29 Woods Road Belmont, MA 02478 <i>structural engineering</i>		PROJECT NO: 2016.12 DATE: 06/20/16 FILE: DRAWN BY: AHM DESD BY: AHM		



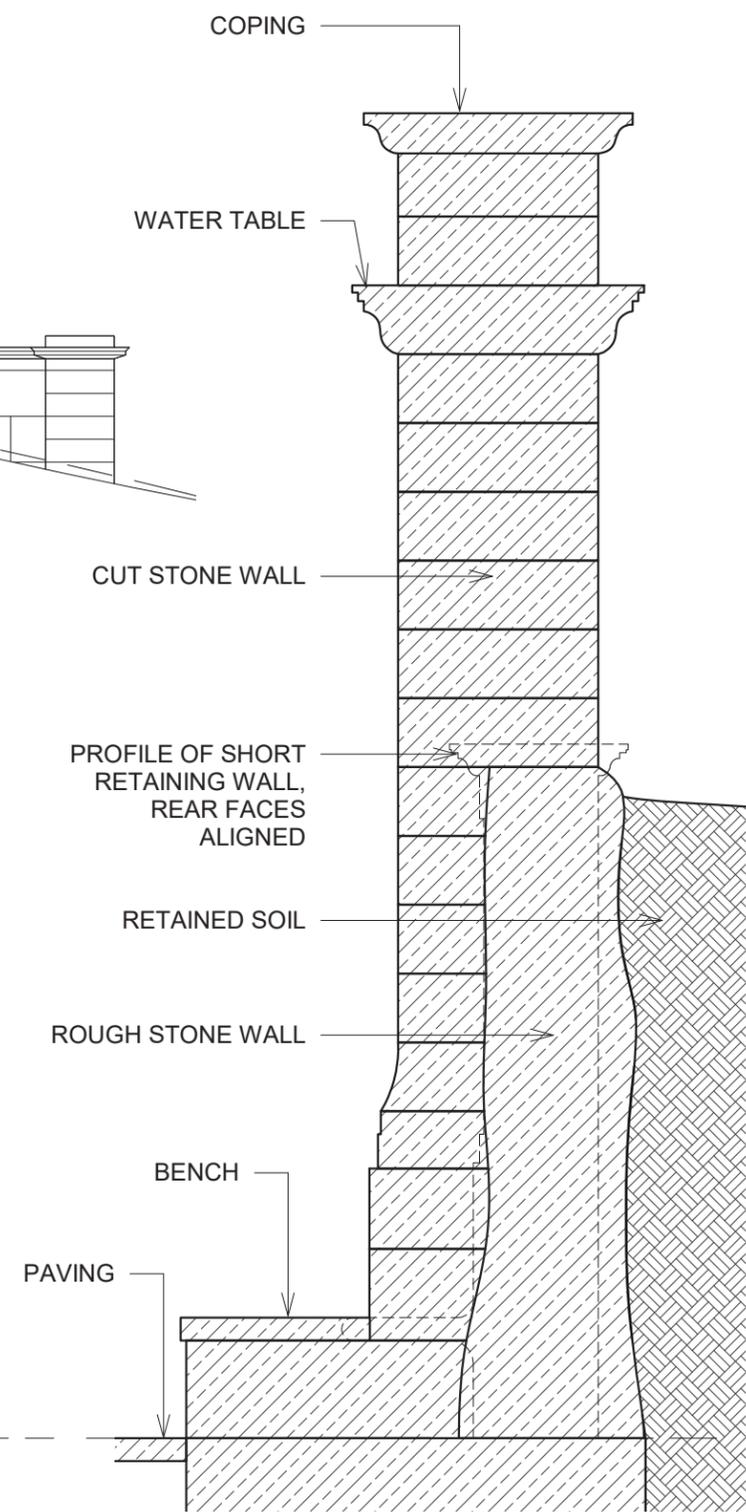
1 North Elevation  
1/8" = 1'-0"



2 Platform Steps  
3/8" = 1'-0"



3 Side Retaining Wall  
3/8" = 1'-0"

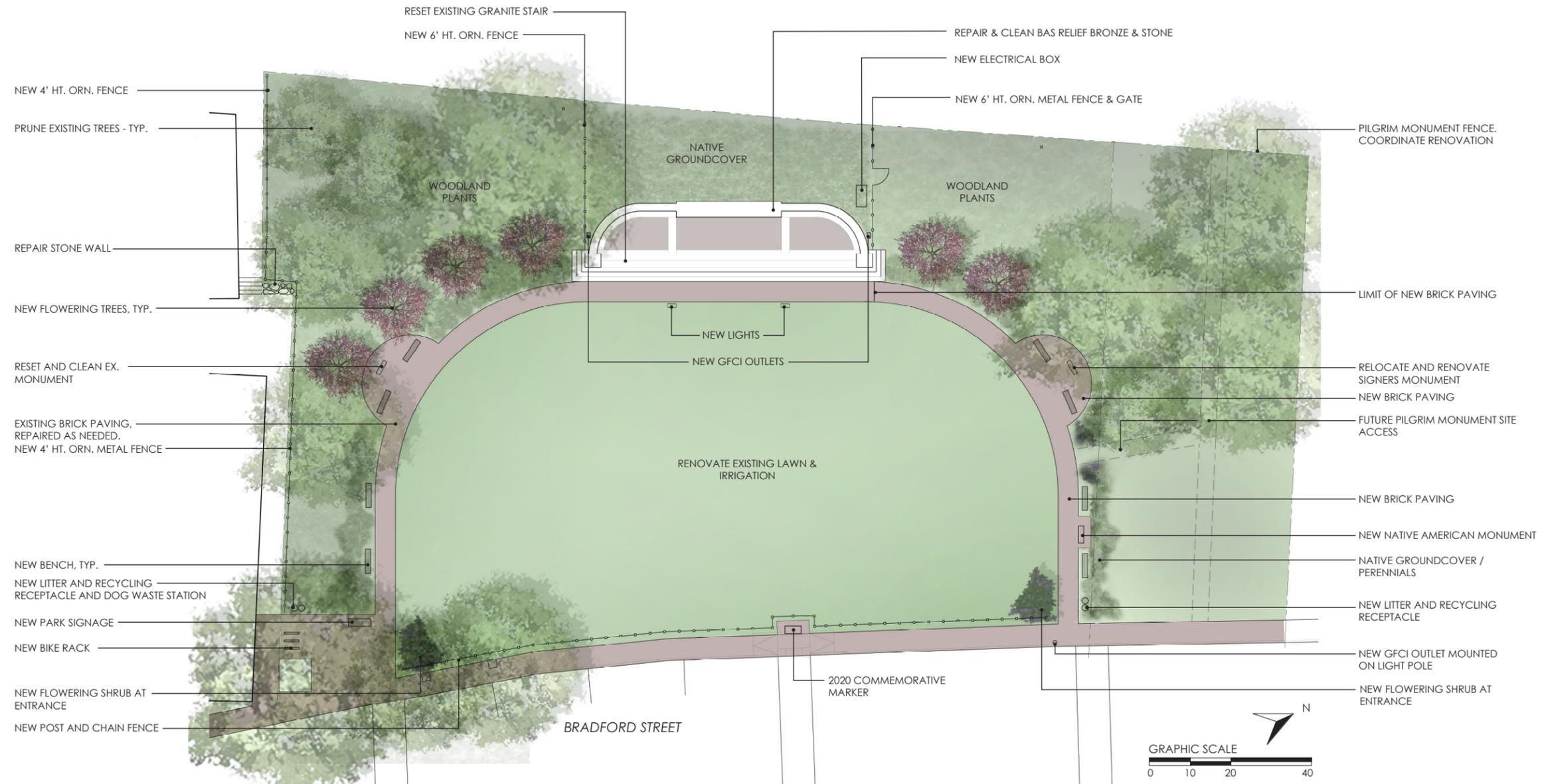


4 Center Retaining Wall  
3/8" = 1'-0"

SHEET TITLE <b>Bas Relief Rear Elevation and Sections</b>		PROJECT <b>Provincetown Bas Relief Park Master Conservation Plan</b>		DRAWING <b>S.2</b>
CLIENT <b>Ray Dunetz Landscape Architecture</b> 179 Green Street Boston, MA 02130		No.	Date	
<b>MacLeod Consulting, Inc.</b> 29 Woods Road Belmont, MA 02478 <i>structural engineering</i>	PROJECT NO: 2016.12 DATE: 06/20/16 FILE: DRAWN BY: AHM DESD BY: AHM			



Recommendations



MASTER PLAN



BAS RELIEF PARK MASTER CONSERVATION PLAN 2016

## RECOMMENDATIONS

Our team has developed the following specific recommendations for the Master Conservation Plan to restore and preserve Bas Relief and Bas Relief Park while addressing contemporary challenges. The Town will need to commission a topographical and property line survey to detail the implementation of these improvements.

### CONSERVATION OF BAS RELIEF

The Bas Relief and its full restoration and preservation is the focus of the Master Conservation Plan. The detailed reports from the consultants provide a step by step guide to performing and executing the work required to restore and preserve the bronze tablet, the granite structure, the stairs and the stone and brick paving which compose the Bas Relief.

#### Bronze

The goal of the conservation of the bronze tablet of the Bas Relief is to treat and clean the surface of the bronze to return it to its original patina color. A protective coating will be applied, and the perimeter gap will be filled with a stable materials. A maintenance program will be developed to outline the specific maintenance requirements to be carried out by the Town in the future. A written annual report on the treatment to the Town of Provincetown will include photographic documentation depicting before, during, and after treatment images. The report will include all materials and methods used in treatment.

#### Stone

The conservation of the stone structure that supports the bronze Bas Relief will address any cracks and spalls, remove and treat staining, reset and repoint where necessary. Flashing will be installed in identified areas to prevent any further water damage. The Christmas lights and their associated hardware will be moved. The secondary monuments will be cleaned. A maintenance program will be developed to outline the specific maintenance requirements to be carried out by the Town in the future. A written annual report on the treatment to the Town of Provincetown will include photographic documentation depicting before, during, and after treatment images. The report will include all materials and methods used in treatment.

#### Paving & Stairs

The granite stairs at the Bas Relief will be reset and repaired where needed. The brick and granite paving at this location will be cleaned, repaired and replaced as needed.

## CONSERVATION OF BAS RELIEF PARK

In addition to the conservation of the Bas Relief, the Master Conservation Plan addresses important issues of public safety, accessibility, and encroachment liability in the overall site design for Bas Relief Park. The design for Bas Relief Park realigns the eastern path leading the visitor to the Bas Relief in order for it to lie completely within the property. The Bas Relief will be framed with a series of flowering trees. The path realignment also provides an opportunity to locate an additional memorial honoring the Wampanoag people. The overall appearance of the park is improved and the historic character is enhanced with the refinishing and restoration of the secondary memorials, replacement of site furnishings, signage, new ornamental fencing and improved utilities. This overall design was developed through a series of meetings with the Town of Provincetown, and includes feedback from the Town and the Bas Relief Committee.

### Site Preparation

The site preparations needed for the Bas Relief Park landscape begin with clearing the site of invasive species and removing dead trees and any tree stumps. Existing views of the Bas Relief will be enhanced through selective pruning. The plant bed along Bradford Street will be removed, and the yellow paint will be removed from the granite curb at the ramp.

### Paving

Our goal with paving and circulation at Bas Relief Park, is to make all walks ADA accessible. The existing brick walks do not meet current ADA codes, due to the fact that they are set on a stone dust setting bed, and have been vulnerable to settlement and frost heave. Our recommendation is that new brick paving will be installed over a concrete base to control settlement and frost heave in order to ensure long term ADA compliance. The current walk width of 5 feet will remain as it is sufficient to meet ADA standards. In addition, the paving threshold at the crosswalks will be addressed with granite tactile warning pavers, also to comply with current ADA codes.

### Site Furnishing

The current array of site furnishings will be replaced with a suite of site furnishings that have a unified design that is both understated and historic in style. From the benches to the ash, trash and recycling receptacles, the furnishings should look and feel as though they belong to the park. The overall organization and placement of the receptacles will reinforce the structure of the park, and are located in discrete locations at the park entrances and adjacent to seating areas. The memorial placards on several benches should be salvaged and put back on the new benches.



*Historically Informed Bench, Bike Rack, and Litter Receptacle*

## Signage

The current signage of the park has a range of styles and aesthetics and does not create cohesion in the park. From the dogwood memorial placards, to the town wayfinding signs, the current signage strategy is often distracting as opposed to unifying. It is recommended that the wayfinding signage is moved across Bradford Street, and all other signage is removed. It is recommended that the restoration include signs explaining the historical importance of the Bas Relief. Such signs should be tastefully designed and carefully placed and could also include park rules and regulations and hours of operation. It is recommended that a plaque dedicated for the 2020 commemoration is installed along Bradford Street honoring the historic 400th anniversary of the landing of the Pilgrims.

## Fencing

The edges of the park are given greater definition with the introduction of an ornamental fence along the western edge and a post and chain fence along Bradford Street to the south. The western edge of the property will have new historically informed ornamental fencing painted black and will be 4 feet in height. The existing chain link fence with barbed wire on top located behind Bas Relief will be replaced with new historically informed ornamental fencing painted black and will be 6 feet in height. This will function to provide enhanced security within the park. It will limit access behind the Bas Relief to maintenance personnel. Along Bradford Street a low metal post and chain fence will help define the public edge to the park and restrict pedestrian circulation to the designated pathways.

## Memorials

Along the new eastern path a niche is designed to house a new memorial dedicated to the Wampanoag Culture of Provincetown. The artist designed memorial will be made of rough stone and will be coordinated by the Town.



*Granite Marker*



*Interpretive Sign*



*Historically Informed Post and Chain Fencing*



*Historically Informed Ornamental Metal Fence*

## **Lighting**

The lighting strategy in the conservation of Bas Relief Park is to accent and feature the Bas Relief. To achieve this, our recommendation is that low profile ground mounted up lighting to be installed in front of the Bas Relief to turn on automatically each day at dusk and will shut off at dawn. The street lights along route MA-6A provide sufficient lighting of the lawn and pathways so that additional landscape lighting is not recommended.

Holiday lighting and special occasion decorative lighting can be installed on the Bas Relief. This can be supported through electrical updates and new GFCI outlet locations, and by installing stainless steel anchors into the mortar joints of the Bas Relief. Epoxy should not be used, and anchors should not be installed into the granite. Proposed anchor locations should be staked out and approved by Town prior to installation.

## **Electrical**

The electrical box located to the east of the Bas Relief behind the arborvitae needs to be updated to meet current electrical codes. Our recommendation is that the existing box is replaced with a NEMA weatherproof enclosure, and located out of view behind the Bas Relief.

A platform for special events and special event lighting will be created through the installation of several GFCI power outlets. Each GFCI outlet will be easily accessible and safe, and will have a NEMA weatherproof enclosure. We recommend that three outlets are provided; one at Bradford Street at the base of the light pole, and two behind the Bas Relief on the east and west side, inside the fence and mounted on a wooden post.

## **Lawns & Planting**

The existing plantings in Bas Relief Park will be improved with the addition of new plants to create a low maintenance, cohesive pallet. This will help define the park and its edges while providing an appropriate and inviting setting for the Bas Relief.

1. **Lawn:** The central lawn will be extended to public walk providing an uninterrupted foreground to the Bas Relief. The lawn area will be repaired as needed and overseeded. The irrigation system will be upgraded to be more efficient with metering for rain events and automatic shut off controls.
2. **Perennials and Groundcovers:** The perennials and non-native groundcovers will be removed except for the vinca minor located behind the Bas Relief. Native groundcover plantings will be supplemented with more native groundcovers. Along the hillside to either side of the Bas Relief native shade tolerant woodland plantings are recommended to help slow storm water run off and minimize erosion. We recommend in these areas that slight grading modifications be made to help direct water away from the Bas Relief. Along the brick pathways, plant beds will include shrubs and perennials, preferably native species that have seasonal interest.
3. **Shrubs:** The shrubs along the pathways will be removed and replaced with native shrubs that have seasonal interest. Showy, flowering shrubs will be placed at the park entrances marking arrival.
4. **Trees:** The arborvitae flanking the Bas Relief will be removed. Small flowering trees will be added along the pathways leading up to the Bas Relief. These flowering trees will supplement the kousa dogwood trees, and will not have individual memorial placards as the existing dogwood trees do. The evergreen trees will be maintained and pruned to create safer conditions in the park.



## MANAGEMENT

This section of the Master Conservation Plan will help the Town of Provincetown care for the Bas Relief Park. It includes strategies for care of the plants, paths, fence, and Bas Relief and the secondary monuments. By following this guide, the Department of Public Works (DPW) crews will help ensure the long term health of this important historic resource.

In addition to the conservation and preservation of the Bas Relief, the most challenging management task facing the Town is the control of invasive species and the overall security in the park, particularly in the area just behind the Bas Relief. The plants have provided screening for illicit activities and the security fencing has deteriorated creating unsafe conditions. The Town must institute a policy of regularly clearing this area of suckering trees and shrubs and the removal of undesirable and/or invasive vines and plants.

### Management Log

Before the Town begins caring for the landscape, the Department of Public Works should set up a 'management log,' or ongoing record of inspections, repairs, and introduction of new features, listed by date. The log should include methods and materials employed, as well as names and contact information for any specialists employed for the care of Bas Relief Park. The log should be stored in both electronic and manual forms, in a secure location within the Town Hall.

### Plants

The Town should make every effort to eradicate invasive plants, and promote a plant community that supports biodiversity.

#### *Existing Plants: Trees*

Trees in the park consist of Arborvitae, Lindens, Maples and Tree of Heaven. Linden trees along Bradford Street are suckering and require pruning. Trees should be individually studied by a Certified Arborist to determine their safety requirements. The Town should maintain the existing shade trees, keeping limbs pruned to 10' above the ground to allow for open views through the park. Remove all invasive tree species including Tree of Heaven and Norway Maple, as well any dead trees and tree stumps.

#### *Existing Plants: Shrubs*

The Town should engage in an ongoing program of trimming desirable species of shrubs on a regular (twice per year) basis. Less desirable shrub species should be removed from the park. To undertake this removal, crews should first cut the plants to ground level, and then treat the stumps with an herbicide such as glyphosate (Round-Up) to control re-growth. This should be repeated on a twice per season basis.

### *Existing Plants: Turf*

Maintenance of lawn areas shall consist of keeping the grass in a healthy growing condition and shall include replacements, watering, weeding, cultivating, fertilizing, re-seeding as necessary to establish a uniform and knitted stand of the specified grasses and mowing. The lawn shall be mowed on schedule so that the grass stands at no more than 5" high. Mowing shall begin the first week of April or when first growth occurs and shall continue to mid-November or when growth ceases. Mow lawns to a height no less than 2 ½ inches. Core aerate and fertilize on an annual basis.

### *Existing Plants: General Management Guidelines*

The following guidelines apply to all future management (pruning, removal, protection) of existing trees, shrubs and ground covers:

- The lower limbs under 10' of all shade trees should be removed.
- The arborvitae should be removed.
- Invasive species; Japanese Knotweed, Tree of Heaven and multiflora rose should be removed. Cut to grade and if possible, roots removed.
- The vinca minor should be retained.
- Exposed stumps should be treated with a copper sulfate to ensure that re-growth does not occur.

### **New Plants:**

Native groundcover should be introduced as a means of controlling erosion. Species should include the following:

Allegheny pachysandra (*Pachysandra procumbens*)

Bearberry (*Arctostaphylos uva-ursi*)

Creeping phlox (*Phlox stolonifera*)

Foam flower (*Tiarella cordifolia*)

Trailing arbutus (*Epigaea repens*)

### **Pathways**

Town crews should regularly examine the brick walk to replace bricks that are chipped or have been displaced, and to ensure the drainage along the path is functioning properly.

### **Fences**

Town crews should regularly examine the fence, and make needed repairs on an ongoing basis and regular painting to avoid rust.

### **Bas Relief and Secondary Monuments**

The Town should regularly inspect Bas Relief and secondary monuments for any vandalism or any changes in appearance.

## Maintenance Schedule

January - March	<ul style="list-style-type: none"> <li>▪ If removing snow on the existing entrance surfaces, along the interior pathway, and at the bas relief monument and stair, minimize (or eliminate altogether) the use of salt.</li> </ul>
April	<ul style="list-style-type: none"> <li>▪ Inspect the monuments for damage that may have occurred over the winter. Consult a specialist about repairing any major damage.</li> <li>▪ Inspect fence for any damage that may have occurred over the winter. Straighten posts, patch paint on rails as needed.</li> <li>▪ Remove leaves and debris along fence line and against memorials.</li> <li>▪ Inspect all paths for loose bricks, or signs of improper drainage or resettlement. Replace bricks as needed.</li> </ul>
May	<ul style="list-style-type: none"> <li>▪ Inspect trees for damage that may have occurred over the winter and note any needs for pruning and removals.</li> <li>▪ Inspect shrubs and prune new growth.</li> </ul>
June	<ul style="list-style-type: none"> <li>▪ Conduct pruning of lower limbs of shade trees and any tree removal needed.</li> <li>▪ Mow turf to a height of no less than 2-1/2 inches. Do not mow during dry spells, and mow only when necessary.</li> </ul>
July	<ul style="list-style-type: none"> <li>▪ Continue mowing turf to a height of no less than 2-1/2 inches. Do not mow during dry spells, and mow only when necessary.</li> </ul>
August	<ul style="list-style-type: none"> <li>▪ Continue mowing turf to a height of no less than 2-1/2 inches. Do not mow during dry spells, and mow only when necessary.</li> </ul>
September	<ul style="list-style-type: none"> <li>▪ Continue mowing turf to a height of no less than 2-1/2 inches. Do not mow during dry spells, and mow only when necessary. Core aerate and fertilize.</li> <li>▪ Inspect the monuments for damage that may have occurred over the summer. Consult a specialist about repairing any major damage.</li> <li>▪ Inspect fence for any damage that may have occurred over the summer. Straighten posts, patch paint on rails as needed.</li> <li>▪ Bronze: carry out annual maintenance by washing and waxing.</li> <li>▪ Inspect all paths for loose bricks, or signs of improper drainage or resettlement. Replace bricks as needed.</li> </ul>
November-December	<ul style="list-style-type: none"> <li>▪ If removing snow on the existing entrance surfaces, along the interior pathway, and at the bas relief monument and stair, minimize or eliminate altogether the use of salt.</li> </ul>

## **Management Resources**

Culina, William, *Native Trees, Shrubs & Vines*. Framingham, MA: The New England Wildflower Society, 2002.

Dirr, Michael A., *Dirr's Hardy Trees and Shrubs, An Illustrated Encyclopedia*. Portland, OR: Timber Press, 1997.

Massachusetts Division of Fisheries and Wildlife  
Natural Heritage & Endangered Species Program  
1 Rabbit Hill Road  
Westborough, MA 01581

Massachusetts Office of Coastal Zone Management:  
251 Causeway Street, Suite 800  
Boston, MA 02114  
617-626-1200  
[www.mass.gov/czm](http://www.mass.gov/czm)

United States Department of Agriculture  
Natural Resources Conservation Service  
Barnstable Service Center  
270 Communication Way, Unit 1G  
Hyannis, MA 02601-1883  
(508) 771-6476



## BUDGET PROJECTIONS

The following are summary budget projections for the Conservation of the Bas Relief and Bas Relief Park. This section includes itemized budgets for each option. Please note these budgets are schematic and are to be used for fund-raising purposes only. More precise estimates will be provided during the future design process for each project.

Option 1: Conservation of Bas Relief and Bas Relief Park \$ 723,070  
*The full restoration of the Bas Relief will be executed including restoration of the stairs and paving associated with the Bas Relief. The Master Conservation Plan includes landscape design improvements that address issues of public safety, accessibility, and encroachment liability. The landscape improvements work in concert to improve the parks appearance and enhances its historic character.*

Option 2: Conservation of Bas Relief \$ 411,408  
*The full restoration of the Bas Relief will be executed including restoration of the stairs and paving associated with the Bas Relief.*

## Option 1

ITEM	QTY	UNIT	UNIT PRICE	SUBTOTAL	TOTAL
<b>Site Prep</b>					
Remove Ex. Brick Paving	2500	SF	\$ 2	\$ 3,750	
Remove Sedums, Cotoneaster, Orn. Grasses Etc	1	ALLOW	\$ 750	\$ 750	
Relocate Viburnums	2	EA	\$ 300	\$ 600	
Relocate Ex. Dogwoods and Plaque	4	EA	\$ 350	\$ 1,400	
Salvage Secondary Monuments	2	EA	\$ 1,000	\$ 2,000	
Remove 5 Arborvitae Trees	5	EA	\$ 750	\$ 3,750	
Remove 4-12"+ Cal. Trees and Stumps	4	EA	\$ 750	\$ 3,000	
Remove Existing Chain Link Fence + Gate	65	LF	\$ 8	\$ 520	
Remove 2 Tree Stumps	2	ALLOW	\$ 500	\$ 1,000	
Remove 2 Dead Trees	2	ALLOW	\$ 500	\$ 1,000	
Remove Invasive Species	1600	SF	\$ 1	\$ 1,600	
Prune Existing Trees	1	ALLOW	\$ 4,000	\$ 4,000	
Remove Plant Bed along Bradford St	1	ALLOW	\$ 500	\$ 500	
Clean Paint from Granite Curb along Bradford Street	1	ALLOW	\$ 300	\$ 300	
Salvage Ex. Benches and Pads	6	EA	\$ 150	\$ 900	
Salvage Ex. Trash Receptacles	4	EA	\$ 100	\$ 400	
Salvage Ex. Recycling Receptacles	4	EA	\$ 100	\$ 400	
Salvage Ex. Ash Receptacles	2	EA	\$ 100	\$ 200	
Salvage Ex Bike Rack	1	ALLOW	\$ 200	\$ 200	
Salvage Ex. Signage	1	ALLOW	\$ 200	\$ 200	
Remove Existing Electrical Box	1	ALLOW	\$ 750	\$ 750	
					\$ 27,220
<b>Paving and Surfacing</b>					
New Brick Paving on Concrete Base	2,500	SF	\$ 27	\$ 67,500	
Reset Existing Granite Stair	1	ALLOW	\$ 10,000	\$ 10,000	
Reset Existing Brick Paving at Bas Relief	450	SF	\$ 15	\$ 6,750	
Clean and Reset Existing Granite Paving at Bas Relief	200	SF	\$ 15	\$ 3,000	
					\$ 87,250
<b>Site Improvements</b>					
New 6' Benches and Concrete Bases	8	EA	\$ 2,000	\$ 16,000	
New Trash and Recycling Receptacles	2	EA	\$ 1,500	\$ 3,000	
6' Ht. Ornamental Fence and Gates	65	LF	\$ 150	\$ 9,750	
4' Ht. Ornamental Fence	175	LF	\$ 75	\$ 13,125	
Post and Chain Fence	160	LF	\$ 50	\$ 8,000	
New Signage	1	ALLOW	\$ 2,000	\$ 2,000	
New Bike Rack	1	EA	\$ 1,200	\$ 1,200	
					\$ 53,075
<b>Bronze</b>					
Pre-treatment	1	ALLOW	\$ 2,000	\$ 2,000	
Scaffold Rental	1	ALLOW	\$ 5,000	\$ 5,000	
Other Equipment Rental	1	ALLOW	\$ 800	\$ 800	
Treatment as Recommended	1	ALLOW	\$ 42,000	\$ 42,000	
Lodging and Per Diem 4 Member Team	1	ALLOW	\$ 4,180	\$ 4,180	
Supplies	1	ALLOW	\$ 2,000	\$ 2,000	
					\$ 55,980
<b>Masonry</b>					
Lift	1200	SF	\$ 9	\$ 10,800	
Masonry Repointing	2100	SF	\$ 30	\$ 63,000	
Dutchman Repairs	10	EA	\$ 1,500	\$ 15,000	





APPENDIX A:  
Chronology

## CHRONOLOGY

- 1620 Pilgrims landed in Provincetown, MA on the Mayflower. The Pilgrims spent 5 weeks exploring Cape Cod before they sailed on to Plymouth, MA.
- 1620 Mayflower Compact was drafted and signed in Provincetown Harbor.
- 1654 Purchase of the Cape land from the Nipmucks, a sub-tribe of the Wampanoags.
- 1680 First permanent settlement in Provincetown, MA.
- 1727 Provincetown was incorporated as a town.
- 1853 Town Hall built on High Pole Hill
- 1873 Bradford Street was built by lowering three hills and filling in a meadow and a salt creek.
- 1873 Public Library Built.
- 1877 Town Hall burned down.
- 1886 New Town Hall built on Bradford Street
- 1892 The Pilgrim Monument was founded as the Cape Cod Pilgrim Memorial Association, for the purpose of commemorating the Pilgrim's first landing in the New World in Provincetown. The Cape Cod Pilgrim Memorial Association would later build the Pilgrim Monument to honor this historic landing in Provincetown.
- 1907 President Theodore Roosevelt officiated at the laying of the cornerstone of what would be Pilgrim Monument.
- 1910 Completion and dedication of Provincetown's commemorative 252 foot granite Pilgrim Monument designed by Willard T. Sears, built on top of High Pole Hill. Pilgrim Monument is the tallest of all granite structures in the United States. President William H. Taft dedicated it at the dedication ceremony.
- 1910 Plans developed to create a park at the base of the hill with a memorial dedicated to the signing of the Mayflower Compact. Renowned sculptor Cyrus E. Dallin (1861-1944) was commissioned to create the memorial. The Ryder family, donated the land for the park to the Town.

- 1918 The end of World War I is marked with the signing of the Armistice. Celebrations in Provincetown happened at sunset around the Pilgrim Monument.
- 1921 The 16 foot by 9 foot bronze Bas Relief *Signing of the Mayflower Compact* by Cyrus Dallin was completed. The relief was cast by the Gorham Corporation in Providence, RI. The memorial bas relief is framed by a granite structure.
- 2003 Historic District Commission created overseeing the Provincetown Historic District.
- 2014 Community Preservation Coalition grant awarded to Town of Provincetown for the Restoration & Conservation of Bas Relief.
- 2015 Master Conservation Plan commissioned by the Town of Provincetown.

APPENDIX B:  
Bibliography

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