HAMLYN CONSULTING
690 Thousand Oaks Drive, Brewster, MA 02631 • Phone & Fax: (508) 258-3211

June 5, 2018

Provincetown Conservation Commission
Town of Provincetown
260 Commercial Street
Provincetown, MA 02657

Reference: Cape Cod Pilgrim Memorial Association, 1 High Pole Hill Road, Provincetown, MA
Notice of Intent for proposed funicular

Dear Commission Members:

Cape Cod Pilgrim Memorial Association filed a Notice of Intent for a proposed funicular at 1 High Pole Hill Road. Hamlyn Consulting was retained by 116 Bradford Street Condominium Trust, the abutter to the east of the project site, to assess the project's conformance with state and local wetlands statutes. The abutting residence is located less than 20 feet from the construction footprint, to include the 18-passenger funicular cab, funicular track, elevator pit, pavilion, ticket kiosk, retaining walls, drainage system, walkways and terrace.

From Google Maps 2018, street view[i]

Having reviewed the Site Plan, reference material, and the Town of Provincetown Wetlands Protection Bylaw and Provincetown Conservation Commission Local Regulations, I offer the following comments and concerns:

Resource area delineation

The Notice of Intent narrative states that the USGS surficial geology map identifies the soils as "glacially deposited stratified drift comprised mainly of loose to medium dense sand." To the contrary, Robert N. Odale in *Cape Cod and the Islands, The Geologic Story*, states that the glacial part of Cape Cod ends at High Head, just east of Pilgrim Lake in North Truro.

> *Longshore currents carried sand eroded from the glacial deposits northward and westward into deep water off the tip of glacial Cape Cod to form a recurved spit....The oldest beach deposits occur along Cape Cod Bay shore and they become progressively younger toward the Atlantic Ocean.*[ii]

In addition, the Soil Survey of Barnstable County, Massachusetts shows the soils to be classified as HoD – Hooksan sand, hilly:

> *This very deep, hilly, and steep excessively drained soil is on vegetated sand dunes along the coast....It is mapped in the Hooksan-Beaches-Dune land general soil map unit....This soil is generally unsuited to most nonfarm uses because of the slope, the very rapid permeability, and the susceptibility to erosion after the plant cover has been disturbed.*[iii]

Coastal dunes are defined under 310 CMR 10.28(2) as, "any natural hill, mound or ridge of sediment landward of a coastal beach deposited by wind action or storm overwash".[iv]

Provincetown is comprised of wind and water-deposited sand, from shore to shore, forming a contiguous coastal dune system. Where there has been development – roads, cemeteries, buildings, parking areas - the dunes have been leveled. However, the dune upon which the funicular is proposed still maintains its hilly and steep form. The removal of vegetation along the face of the dune will expose the loose sand and destabilize the landform, causing erosion of the slope and downgradient sedimentation, impacting the 116 Bradford Street property. It appears from the Site Plan that the 100-year flood elevation intersects the slope face, increasing the slope's vulnerability during storm and flood events.

Coastal dunes are significant to storm damage prevention, flood control and the protection of wildlife habitat. In accordance with the performance standards of 310 CMR 10.28(3) relative to this proposal, the project shall not have an adverse effect on the coastal dune by disturbing the vegetative cover so as to destabilize the dune, or cause any modification of the dune form that would increase the potential for storm or flood damage.

Inland flooding

There is historic documentation of extensive flooding in the proposed construction area.

March 2018 storm

The Site Plan shows 230 cubic yards of fill being placed in the existing containment area, which will shunt water to the 116 Bradford Street property. The Notice of Intent states that the proposed drainage is to address the roof run-off from the pavilion and the hardscape walkway areas to "limit the amount of stormwater entering adjacent properties". Neither the Site Plan nor the narrative addresses the placement of fill in an area already regularly flooded. The design should preclude, not "limit" (an undefined quantity) surface water flooding offsite. If the existing flooding is due to the inadequacy of the Town drainage systems or already saturated conditions, further subsurface water contributions will exacerbate the problem.

Does the flooded area meet the threshold to be isolated land subject to flooding? Is compensatory storage required? Even if the area is not large enough to be regulated as ILSF, the Commission should require that a proposed project not increase flooding issues for abutting properties.

Noncompliance with Provincetown Conservation Commission Local Regulations

Article 2 of the PCC Local Regulations

Article 2 of the PCC Local Regulations defines the 100-foot buffer zone to extend from wetland resource areas, including the coastal flood zone. The Article also requires an undisturbed 50-foot buffer between the resource area and the limit of the site disturbance. Furthermore, structures are required to be a minimum of 80 feet from the resource area to mitigate for landscaping and maintenance activities.

Coastal land subject to flooding is also defined as an unvegetated wetland in the Regulations.[v] Accordingly, a 100-foot buffer zone would apply to land subject to coastal storm flowage as being both as a flood zone and an unvegetated wetland.

Notwithstanding the coastal dune issue, there is no buffer zone to land subject to coastal storm flowage shown on the site plan, nor is there an undisturbed 50-foot buffer. The Applicant seeks to clear a large swath of vegetation adjacent to LSCSF, and construct a funicular. Hamlyn Consulting opines that the project also occurs within a coastal dune.

Section 12-6 of the Provincetown Wetlands Protection Bylaw
Section 12-6 of the Wetlands Bylaw states:

> *Any person filing a permit application with the Commission to provide copies of the application to the Conservation Agent, by certified mail or hand delivery, who is to distribute the copies to the appropriate regulatory boards. The Bylaw states, The Commission shall not take final action until the boards and officials have had 14 days from the receipt of notice to file written comments and recommendations with the Commission, which the Commission shall take into account but which shall not be binding on the Commission.*[vi]

Per a telephone conversation with Conservation Agent Tim Famulare, this was not done. Both the Applicant and the Commission are bound by the Bylaw without a mechanism for a waiver or variance.

Lack of a variance procedure in the Town Bylaw
There is no mechanism within the Town Bylaw or the Local Regulations to issue a variance for relief from the requirements of the regulations. Regulations to allow the issuance of a variance provide standards under which an Applicant can seek a waiver from the requirements of the law. Without a variance relief regulation, there is no criterion to assess whether or not a project that is noncompliant with the bylaw and/or regulations will provide the same or comparable environmental protection as the bylaw/regulations seek to ensure. Accordingly, there is no means for the Conservation Commission to issue approval for the disturbance of the 50-foot buffer zone.

Thank-you for your time and consideration. I can be reached at 508-258-3211 if you have any questions.

Yours truly,

Lynne Whiting Hamlyn
Environmental Consultant

cc: Paul Teixeira
James Veara, Esq.

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[i] Google Maps 2018. Oct. 2015 image capture, https://www.google.com/maps/@42.0518622,-70.1875411,3a,75y,309.87h,75.09t/data=!3m6!1e1!3m4!1skBWfh1OnKG-Ng5t7AjpWrA!2e0!7i13312!8i6656

[ii] Robert N. Odale, *Cape Cod and the Islands, The Geologic Story* (East Orleans: Parnassus Imprints, 1992), 203.

[iii] Peter C. Fletcher, *Soil Survey of Barnstable County, Massachusetts* (United States Department of Agriculture, 1993), 50 and Sheet 1.

[iv] 310 CMR 10.28, Department of Environmental Wetlands Protection Regulations, https://www.mass.gov/files/documents/2016/08/vy/310cmr10a.pdf (08-27-2017).

[v] Provincetown Conservation Commission Local Regulations, http://www.provincetown-ma.gov/DocumentCenter/Home/View/219 (09-08-2009).

[vi] Provincetown General By-Laws, Chapter 12, Wetlands Protection Bylaw, http://www.provincetown-ma.gov/DocumentCenter/Home/View/322 (April 2011).

Kathleen M. Browne
20 Alden Street, #2
Provincetown, MA 02657

June 5, 2018

Provincetown Conservation Commission
Provincetown, MA 02657

Dear Commission Members:

I write regarding the funicular project proposed by the Pilgrim Monument and Provincetown Museum that will be considered at your June 5th meeting. I completely support the efforts to enhance access to PMPM and improve both historians' ability to study the area's rich natural and cultural history and the museum's ability to educate visitors about past. Provincetown and the surrounding areas are unique in so many ways and the history of these areas should be celebrated, investigated, and communicated. I reviewed the available architectural renderings of the proposed design and find it to be appealing and aligned with the surrounding design, although I think the entire design is a bit large. While I support such efforts in general, I write to express a concern about the funicular project that, as a property owner and community member, I think should be addressed.

I am very concerned about the impact of the day to day functioning of the funicular on the stability of the hill on which it will be built. I am not an engineer of any sort; but I am a geologist, sedimentologist specifically. I know that big piles of sand are sculpted by natural processes and can be stable structures until some natural or artificial event causes them to fail. The documents submitted to your commission by Coastal Engineering Company confirm that the hill is composed "mainly of loose [to?] medium dense sand". Of course the hill under consideration is in fact stabilized in some places by vegetation and even to some degree the artificial structures already built on it. But the present artificial structures are not moving structures. I know that shaking a pile of loose sand grains can destabilize it. Perhaps the proposed improved vegetation surrounding the funicular will help in the immediate area? If so, what about more distant points on the hill? The aforementioned company mentions in their Letter of Intent to the township that a "…geotechnical analysis was conducted [to] determine the slope stability of the hill…". The results however are not noted in the narrative of the LOI and I could not find an attachment that shows results. It is also not clear if this analysis is relevant for distant parts of the same hill. We should all be concerned about whether the constant movement of a funicular will cause destabilization of the sand hill immediately surrounding the structure or at any distant point of the hill. Are there other studies from other sites that report on the short term and long term impact(s) of such structures on the stability of the surrounding landscape? If so, do any of those structures sit on a pile of sand, as opposed to rocky terrain? The setting in Provincetown is very unique and should not be ignored when determining the impact of such a structure. I would think that the Conservation Commission would be THE township organization to consider these issues and ensure good decisions are made with regard to preserving landscapes and preventing destabilizations for other residents nearby. Our property is situated on the northeast side of the hill. At some point in the past, the town permitted previous owners of our structure to excavate into the hillside and construct a retaining wall to hold back the inevitable shifting of the sand that can occur when such excavation is done. In fact, from Bradford Street uphill towards the cemetery area there are numerous properties with similar structures. All of these property owners should be ensured that the structure will not increase the destabilization of the back end of their properties. Even though these earlier hill side excavations themselves cause destabilization of the hill, the town approved the retaining wall structures as solutions to the

destabilization and thus their future stability must be considered with any new modifications of the area. If sometime in the future, destabilization of the hill behind our property occurs and can be attributed to the furnicular functions, who should we turn to to take on the responsibility of resolving the problem?

I have other concerns that are unrelated to the mission of the Conservation Commission and thus will direct them to another township group. For all my concerns, I am not convinced it would make sense to support the proposal until more is known and thus at this point in time do not support it. I applaud PMPM's efforts; we just need to make sure such efforts do not cause problems in the future, particularly for surrounding property owners.

Sincerely,

Kathleen M. Browne

SAFE HARBOR

ENVIRONMENTAL MANAGEMENT
HABITAT RESTORATION

Date: June 12, 2018 To: Provincetown Conservation Commission
From: Safe Harbor Environmental Services, PO Box 275, Provincetown MA
gordonpeabody@gmail.com **phone 508-237-3724**
Re: Pilgrim Monument and Provincetown Museum Environmental Management Plan specifically for steep slope stabilization, erosion control, restoration

I. Slope Information

1. Provincetown consists entirely of **Post Glacial, unconsolidated** sediments. These materials have settled and gravity compacted, during the past 2,000 years, most having a slender profile of overburden. These materials exhibit exceptional percolation properties.
2. This particular dune was among the first created in Provincetown, as the stable, Harbor shoreline (Dynamic Equilibrium, Graham Geise) allowed the landform to expand to the north. Abundant sand supply was delivered from the then Ocean beach, which is where the current Church Cemetery is now.
3. Now that this historic landform is no longer collecting sand or eroding to nourish the Ocean beach, it is no longer performing as a dune and cannot qualify for protection as such (Graham Geise CCS; Jim Mahala DEP)
4. Similar to parallel landforms along Bradford Street, this landform is stable.

II. Excavation protocol

1. Equipment access shall be as shown on site plan
2. Helical anchors shall be used to avoid excavation
3. Any overburden containing seed bank, root stock, native microorganisms and nutrients will be retained for revegetation.

III. Concrete protocol

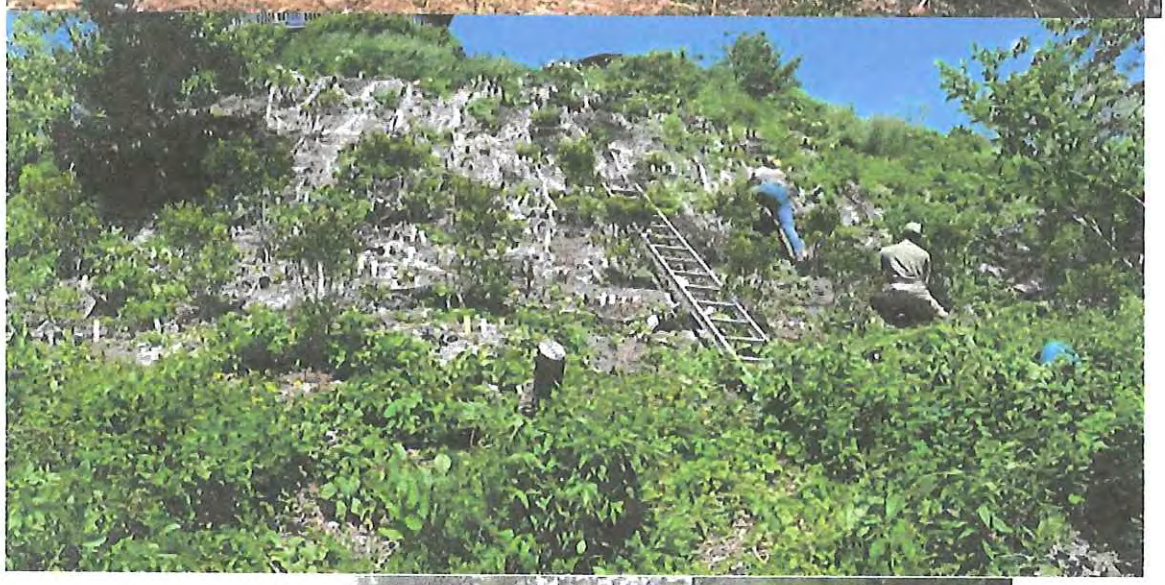
1. To protect slope ground water from caustic, high pH concrete percolate, poly liners shall be used beneath forms and to collect over pour.
2. Concrete shall be managed per Safe Harbor guidelines ***"Managing Concrete in Sensitive Areas"*** Safe Harbor 2018, 6 pages.

IV. Erosion Control

1. Raw areas shall be stabilized with jute netting secured by cornstarch ground staples.
2. Zero discharge performance standards shall be maintained with integrated biolog-silt fence erosion control systems, as described in, ***"Biolog-Silt fence Erosion Control System",*** Safe Harbor 2017 (7 pages).
3. The EC shall be as shown on the site plan of record.
4. A semi-permeable filter fabric shall be used as a silt fence.
5. The filter fabric shall be properly pressed (not dug) into the grade 4-6 in. using a lawn-edging tool.
6. The filter fabric shall be vertically stapled to additional oak stakes inserted every 5 ft.
7. Low impact jute netting/straw biologs shall be installed on the activity-area-side of the silt fence.
8. Biologs shall be 12-16 in. in diameter, as required to maintain zero discharge performance standards.
9. The biologs shall be secured with 6 in. cornstarch ground staples, every ft.
10. Anytime sediment buildup against the biolog exceeds 4 in. the load shall be removed by hand, to a location outside the LOW.
11. These erosion control systems shall be regularly inspected and serviced to maintain performance standards.
12. This system shall be inspected weekly and after storms.
13. Where EC systems intersect site access areas, necessary openings shall be reclosed at end of day.

V. Slope Restoration

1. Dedicated overburden shall be reused on site.
2. No changes to native species are proposed for the slope.
3. Invasive vegetation shall be removed using Safe Harbor protocols for working with invasive vegetation. Protocols are described in ***"The Dirty Dozen of Cape Cod, Third edition"*** Safe Harbor, 2017 (20 pages).
4. Specific, low impact protocols are modeled after successful, exceptionally steep Safe Harbor slope stabilization projects.
5. Stabilization and revegetation are ongoing, linked projects
6. Slopes shall be stabilized using Safe Harbor natural systems, as described in Safe Harbor Booklet ***"Stabilizing Steep and Very Steep Slopes Using Natural Systems"*** Safe Harbor, 2017 (15 pages).
7. exceptionally steep slope, using Safe Harbor's natural system.
8. Native plantings will be supervised by Safe Harbor, using established, Safe Harbor protocols.
9. End of growing season report shall be provided to the Commission
10. *FOLLOWING THREE IMAGES, DOCUMENT AN 8 MONTH TIME PERIOD:*



COASTAL engineering co.

260 Cranberry Highway
Orleans, MA 02653
508.255.6511 P 508.255.6700 F
Orleans | Sandwich | Nantucket
coastalengineeringcompany.com

TRANSMITTAL

To: Provincetown Conservation Commission
Attn: Tim Famulare, Agent
260 Commercial Street
Provincetown, MA 02657

Date: 6/14/18 **Project No.** C14394.08

Via: ☐ **1st Class Mail** ☐ **Pick up** ☒ **Delivery** ☐ **Fed Ex**

Phone:

Fax:

Subject: **Notice of Intent Application Filing Package**
Proposed Funicular & Site Improvements
Cape Cod Pilgrim Memorial Association
1 High Pole Hill Road
Provincetown, MA
Map 12-1 Parcel 27

No. of pages to follow:

☒ **Plans** ☐ **Copy of Letter** ☐ **Specifications** ☒ **Other**

We are sending the following items:

Copies	Date	No.	Description
10	6/14/18		Coastal Engineering Co., Inc., Response Letter to Questions Raised
10	10/19/18		Terracon Geotechnical Engineering Report (2 pages)
2	10/19/18		Terracon Geotechnical Engineering Report (complete report)
10			New England Wetland Plants, Inc., New England Erosion Control/Restoration Mix for Dry Sites
10	4/20/18		Hawk Design, Bradford Access Project
10	11/16/15		Coastal Engineering Co., Inc., Draft, Conceptual Site Plan Showing Proposed Walkway
10	6/23/15		Coastal Engineering Co., Inc., Plan Showing Existing Site Conditions
10	Rev. 6/14/18		Coastal Engineering Co., Inc., Plan Showing Proposed Site Improvements

These are transmitted as checked below:

☐ **for approval** ☒ **for your use** ☐ **as requested** ☐ **for review & comment** ☐

Remarks: Enclosed please find copies of the attached plans and documents for the referenced project. The public hearing is scheduled for the June 19, 2018 Conservation Commission meeting.

If you have any questions, please contact our office.

cc: Mass. DEP/SERO - Wetlands
Cape Cod Pilgrim Memorial Association
John A. Bologna, Project Manager
Jason R. Norton, Project Manager

By: Sarah Cole

D:\DOC\C14300\14394.08\Permitting\NOI\Revised Submittal #1\Transmittal Template.doc

NOTE: If enclosures are not as noted, please contact us at (508) 255-6511

June 14, 2018 Project # C14394.08

Conservation Commission
Attn: Tim Famulare, Agent
260 Commercial Street
Provincetown, MA 02657

By Hand Delivery

Re: **Response Letter to questions raised**
Proposed Funicular & Site Improvements
Cape Cod Pilgrim Memorial Association
1 High Pole Hill Road
Provincetown, MA
Map 12-1 Parcel 27

On behalf of our client, Cape Cod Pilgrim Memorial Association, this letter is intended to provide responses to questions and concerns raised by the abutter's wetland consultant as well as from various interested parties that submitted letters to the Provincetown Conservation Commission.

After reviewing all of the submitted information, there appears to be common "categories" that are hereby addressed in this letter. The 5 categories are as follows:

- Landform Characteristics
- Displacement of Inland Stormwater
- Erosion Control
- Slope Stability
- Provincetown Local Wetland By Law Regulations

Landform Characteristics

The neighbor's consultant is claiming that the landform at the subject site is characterized as a Coastal Dune and such should be subject to the Massachusetts Department of Environmental Protection Wetlands Protection Act (herein referred to as MADEP WPA) performance standards. Although we concur that the landform is considered as "Post Glacial" deposits primarily consisting of dune sands, we respectfully disagree that it functions as a Coastal Dune as defined in the MADEP WPA 310 CMR 10.28. By definition, a Coastal Dune means any natural hill, mound or

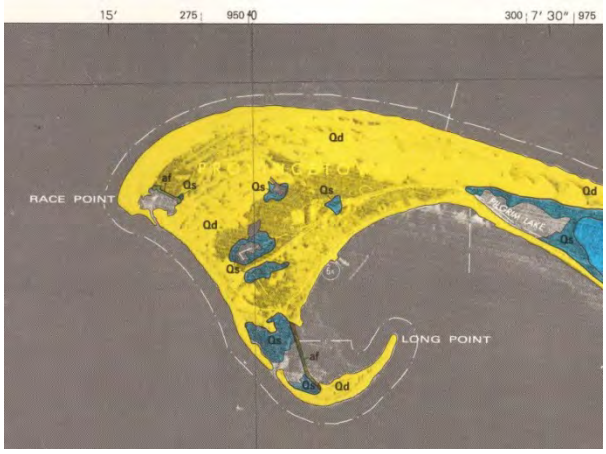


Figure 1 - Geologic Map of Cape Cod, Oldale & Barlow

ridge of sediment landward of a coastal beach deposited by wind action or storm overwash. Coastal dune also means sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control. The key phrase in this definition is "landward of a coastal beach", as this current landform does not border a Coastal Beach. Furthermore, the preamble of the Coastal Dune section states *"coastal dunes aid in storm damage prevention and flood control by supplying sand to coastal beaches. Coastal dunes protect inland coastal areas from storm damage and flooding by storm waves and storm elevated sea levels because such dunes are higher than the coastal beaches which they boarder. In order to protect this function, coastal dune volume must be maintained while allowing the coastal dune shape to conform to natural wind and water flow patterns. On retreating shorelines, the ability of the coastal dunes bordering the coastal beach to move landward at the rate of shoreline retreat allows these dunes to maintain their form and volume, which in turn promotes their function of protecting against storm damage or flooding."* Clearly this landform does not conform to natural wind and waterflow, it is not bordering a coastal beach and it does not have the ability to move landward at the rate of shoreline retreat. Therefore, we feel strongly that the project is not subject to the Coastal Dune performance standards set forth in the MADEP WPA because the landform does not function as a Coastal Dune and therefore cannot be considered as such.

<u>Displacement of Inland Stormwater</u>

The subject area does experience flooding in major rainfall events. There is a small depression on the property that holds rainwater in major storm events as evident in the referenced photo in the consultant's report. Most of the flooding is due to a combination of extreme high tides in conjunction with high rainfall rates in the area. The Town drainage gate cannot open and allow drainage through Ryder Street until the tide subsides, which backs up the drainage system along Bradford and Ryder. In addition, the proposal includes the implementation of a stormwater management system that is designed to infiltrate stormwater on site from the 25 year storm event, hence not "shunting" water to the adjacent properties.

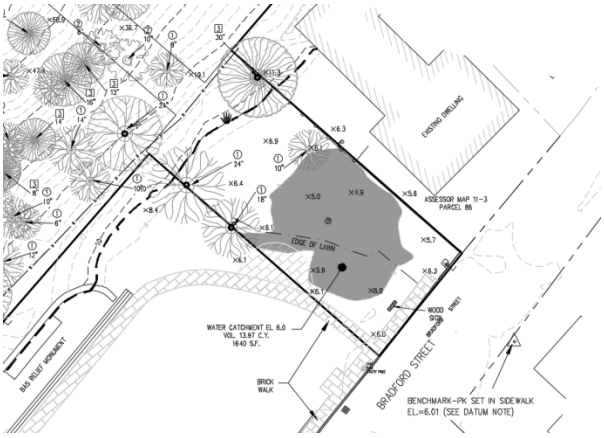


Figure 2 - Extent of contained flooding on site

The consultant also poses the question whether the property meets the threshold to be considered as Isolated Land Subject to Flooding (ILSF). The project is not subject to the standards set forth in the Provincetown Local Wetlands By Law, nor subject to the ILSF in CMR 10.57 as it does not store at least 1/8 acre feet of water to an average depth of six inches at least once a year (local by law) and does not store at least ¼ acre feet of water to an average depth of six inches at least once a year (state by law). As shown in Figure 2, the stored volume on site is approximately 14 CY over an area of 1,640 SF. That converts to 378 CF with an average depth of 2.76 IN. For comparision,

a 1/8 acre foot is approximately 5, 445 CF and the site holds 378 CF, well below the threshold of review. Defining an area that included the land area of 116 Bradford Street, Bas Relief Park and Bradford Street adjacent to those areas is approximately 28,283 SF. Estimating an average depth of 1 FT of floodwater within that defined control area calculates to 28,283 CF. Considering the displaced volume of water at the subject site, it would raise the "control" area approximately 0.013 FT or 0.16 IN which is a negligible change.

Erosion Control

Please refer to PM Environmental Management Plan specifically for steep slope stabilization, erosion control and restoration prepared by Safe Harbor Environmental Management and Habitat Restoration.

Slope Stability

Prior to submitting permit applications for the proposed Funicular system, an elaborate stairway design was considered as an alternative. As part of the design development process, a geotechnical report was conducted by Terracon Consultants, Inc. in 2015. The stairway concept plan has been submitted for the record and portrays a much more invasive system that would traverse up the landform to the base of the monument. The intent of the Geotechnical analysis was to determine effects on slope stability, in particular on the monument structure. This report clearly states that even with the more invasive system with heavier components (stone, etc.), that the total and differential settlement should be within tolerable limits. The report continues to state that the current and final soil slope satisfies a factor of safety of at least 1.3 for static loading and 1.1 for seismic loading conditions. The temporary condition, where an open excavation is necessary to construct the retaining wall, has a factor of safety slightly below 1.3 for static.

The report goes on to recommend the use of helical piers due to their low impact nature. *"Helical piers consist of hollow steel rods (cylindrical or square cross section) with attached helical plates that are designed to reduce disturbance of the in-place soils. Helical piers are rotated into the natural sand deposit to achieve a predetermined torque in the bearing soils."* Hence is why the subject project utilizes helical supports for the foundation system, which will be far less disturbance than the previously studied proposal of a stairway.

Provincetown Local Wetland By Law Regulations

The property along Bradford Street constitutes Land Subject To Coastal Storm Flowage, however it does not meet the definition of an Unvegetated Wetland under the Local Regulations or of a Coastal Dune under State Regulations.

While Article 2 establishes various buffer zones, undisturbed buffer zones and structure setbacks, it ends with the following language:

"…the Conservation Commission will consider any and all proposals for activity within the buffer zone on a site specific basis, disposing of each according to its merits and the degree to which wetlands interests have been protected and preserved at the locus"

Clearly, this language establishes a procedure for the Commission to consider and allow activities and structures within a buffer zone to a resource area. Historically, the Commission has not imposed these restrictive buffer zones on portions of Town like this that are subject to Coastal Storm Flowage. Otherwise, you have the nonsensical situation where construction activities could take place within the resource area but not in the buffer zones. Construction is specifically authorized within flood plan areas. To now impose these buffer zone requirements would render much of the Town unbuildable.

Commission, in fact, recently voted to remove this type of resource area from the buffer zone requirements of Article 2 for these very reasons.

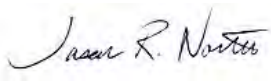
A question has been raised regarding compliance with Section 12-6 of the Wetlands By-law regarding the requirement for copies of a permit application to be distributed to other Town Boards. Section 12-6 of the Provincetown Wetlands By-laws places this responsibility on the Conservation Agent to determine which are the appropriate regulatory boards. In this case it is the Applicant's understanding that the Agent determined that the appropriate Boards were the Historic District Commission and the Planning Board, both of whom have jurisdiction in this matter. Since filings had already been made with those Boards, the Agent was certainly within his discretion to determine that the appropriate regulatory boards had the necessary information to advise the Commission of any comments and/or recommendations.

The lack of a variance procedure in the Wetlands Protection By-law is irrelevant to the Commission's ability to approve disturbance within the 50 foot buffer zone, alteration within the 100 foot buffer zone or a structure within the 80 foot buffer zone. As previously stated, Article 2 provides the Commission with the authority for and criteria applicable to the approval of such activities. The Commission must look at the merits of and the degree to which wetland interests have been protected at this site. We are confident that once you do so, you will find that the proposed activities are appropriate.

This is scheduled to be heard at the **June 19, 2018** public hearing. If you have any questions or require additional information, please give our office a call. Thank you.

Sincerely,

COASTAL ENGINEERING CO., INC.



Jay R. Norton

Senior Project Manager

Enclosures: as stated

cc: Mass. DEP/SERO - Wetlands
Cape Cod Pilgrim Memorial Association
John A. Bologna, Project Manager
Jason R. Norton, Project Manager *(w/ staking plan only)*

October 19, 2015

Coastal Engineering Company, Inc.
250 Cranberry Highway
Orleans, MA 02653

Attn: Mr. John Bologna, P.E.
P: (508) 255 6511 (ext. 565)
E: jbologna@coastalengineeringcompany.com

Re: Geotechnical Engineering Report
Pilgrim Monument
Provincetown, Massachusetts
Terracon Project No: J1155151

Dear Mr. Bologna:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above-referenced project. Services were performed in general accordance with our proposal dated August 4, 2015. This geotechnical engineering report presents the results of the subsurface exploration coordinated and monitored by Coastal Engineering Company and provides laboratory data and geotechnical recommendations related to soil strength parameters, global slope stability, and criteria for design of proposed retaining walls by others.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Anant S. Panwalker, PE
Geotechnical Project Manager

Lawrence J. Dwyer, PE
Principal

1.0 EXECUTIVE SUMMARY

A geotechnical exploration has been performed for the existing and proposed soil slope at the Pilgrim Monument in Provincetown, Massachusetts. Terracon's geotechnical scope of services included reviewing two test boring logs and samples prepared by Coastal Engineering along the top and bottom of an existing soil slope. Based on the information obtained from the borings, the slope soils are suitable for supporting the proposed walkway grading and retaining walls. The following geotechnical considerations were identified:

- Soil conditions generally consist of 2 to 4 feet of silty (loamy) sand over stratified drift comprised of poorly graded sand. Sand was encountered to 65 feet deep (approximately El 21 feet) at the top of the slope and to at least El -18 at the bottom of the slope, however the deposit contained more gravel at about El -14 feet. The stratified drift is generally loose to very loose relative density. Groundwater was noted at El 3 feet at the toe of the slope.

- The proposed retaining walls supporting the walkway cut into the slope may bear on a minimum 8-inch, thick layer of compacted structural fill or crushed stone (leveling course) placed above the natural sand proofrolled and compacted as discussed herein. Assuming proper site and subgrade preparation, total and differential settlement should be within tolerable limits.

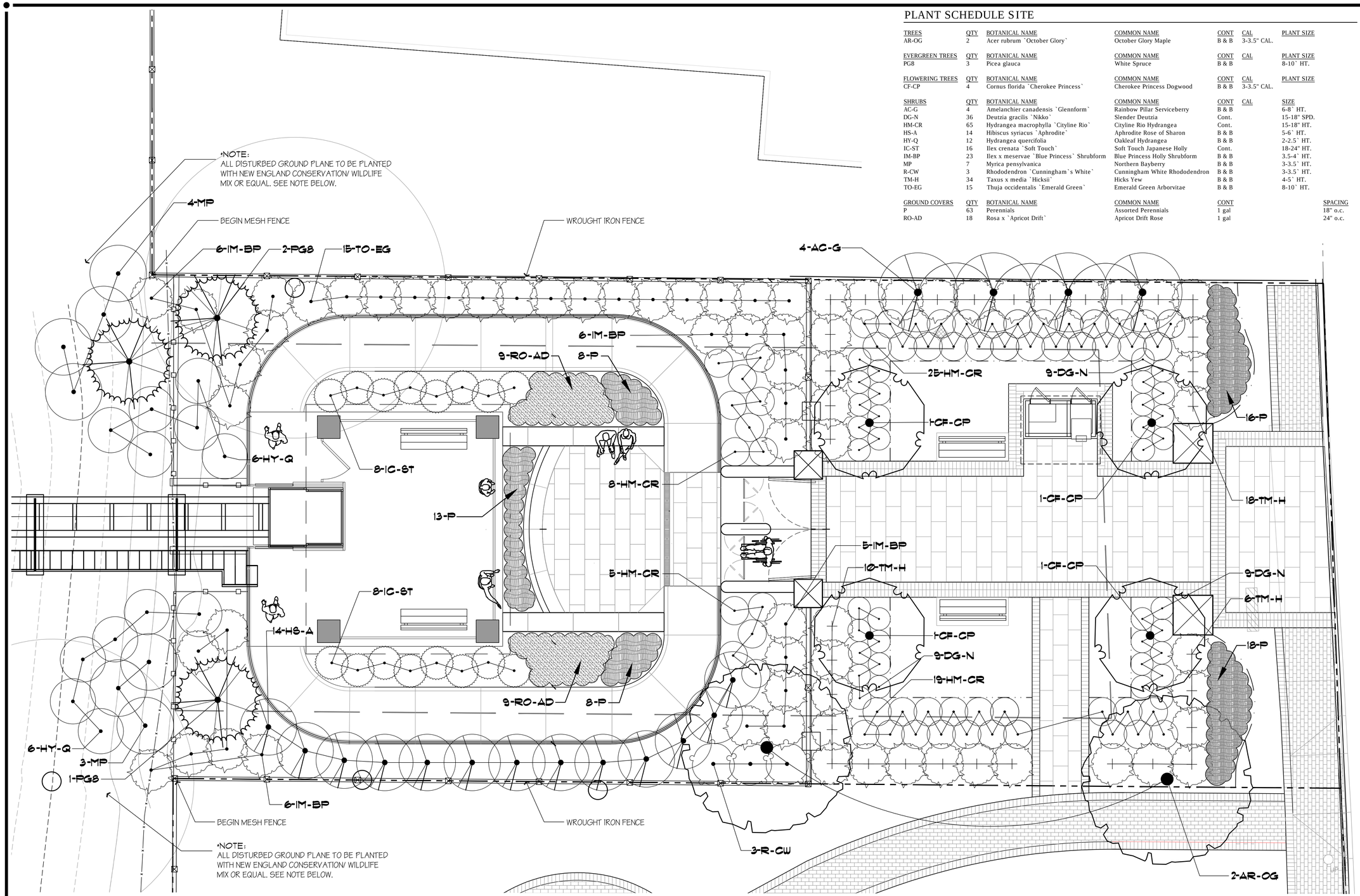
- Retaining wall options include mechanically stabilized earth walls, soil nailed walls with or without aesthetic facades, or conventional concrete cantilevered walls. We also considered stone filled basket type gravity walls, however the aesthetics may not be favorable.

- The current and final soil slope satisfies a factor of safety of at least 1.3 for static loading and 1.1 for seismic loading conditions. The temporary condition, where an open excavation is necessary to construct the retaining wall, has a factor of safety slightly below 1.3 for static. The permanent condition assumes that wall systems need to reinforce/improve soils 8 to 10 feet behind the wall.

- Earthwork on the project should be observed and evaluated for conformance of recommendations provided herein. The evaluation of earthwork should include observation and testing of compacted fill, wall installation, and other geotechnical conditions exposed during construction.

The geotechnical executive summary should be used in conjunction with the entire report for design and/or construction purposes. It should be recognized that specific details are not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The **General Comments** section should be read for an understanding of the report limitations.

For the complete Terracon Geotechnical Engineering Report, contact Tim Famulare, Conservation Agent, at tfamulare@provincetown-ma.gov or (508) 487-7000 x554.



PLANT SCHEDULE SITE

TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
AR-OG	2	Acer rubrum `October Glory`	October Glory Maple	B & B	3-3.5" CAL.	

EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
PG8	3	Picea glauca	White Spruce	B & B		8-10` HT.

FLOWERING TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
CF-CP	4	Cornus florida `Cherokee Princess`	Cherokee Princess Dogwood	B & B	3-3.5" CAL.	

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE
AC-G	4	Amelanchier canadensis `Glennform`	Rainbow Pillar Serviceberry	B & B		6-8` HT.
DG-N	36	Deutzia gracilis `Nikko`	Slender Deutzia	Cont.		15-18" SPD.
HM-CR	65	Hydrangea macrophylla `Cityline Rio`	Cityline Rio Hydrangea	Cont.		15-18" HT.
HS-A	14	Hibiscus syriacus `Aphrodite`	Aphrodite Rose of Sharon	B & B		5-6` HT.
HY-Q	12	Hydrangea quercifolia	Oakleaf Hydrangea	B & B		2-2.5` HT.
IC-ST	16	Ilex crenata `Soft Touch`	Soft Touch Japanese Holly	Cont.		18-24" HT.
IM-BP	23	Ilex x meservae `Blue Princess` Shrubform	Blue Princess Holly Shrubform	B & B		3.5-4` HT.
MP	7	Myrica pensylvanica	Northern Bayberry	B & B		3-3.5` HT.
R-CW	3	Rhododendron `Cunningham`s White`	Cunningham White Rhododendron	B & B		3-3.5` HT.
TM-H	34	Taxus x media `Hicksii`	Hicks Yew	B & B		4-5` HT.
TO-EG	15	Thuja occidentalis `Emerald Green`	Emerald Green Arborvitae	B & B		8-10` HT.

GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	CONT	SPACING
P	63	Perennials	Assorted Perennials	1 gal	18" o.c.
RO-AD	18	Rosa x `Apricot Drift`	Apricot Drift Rose	1 gal	24" o.c.

New England Conservation/Wildlife Mix

SPECIES: Virginia Wild Rye, (Elymus virginicus), Little Bluestem, (Schizachyrium scoparium), Big Bluestem, (Andropogon gerardii), Creeping Red Fescue, (Festuca rubra), Switch Grass, (Panicum virgatum), Partridge Pea, (Chamaecrista fasciculata), Deer Tongue, (Panicum clandestinum), Indian Grass, (Sorghastrum nutans), Ox Eye Sunflower, (Heliopsis helianthoides), Common Milkweed, (Asclepias syriaca), Spotted Joe Pye Weed, (Eupatorium maculatum), Grass Leaved Goldenrod, (Euthamia graminifolia), Blue Vervain, (Verbena hastata), New England Aster, (Aster novae-angliae), Early Goldenrod, (Solidago juncea).
Source: New England Wetland Plants.

CONSERVATION NOTES

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE DEP ORDER OF CONDITIONS IN ADDITION TO ALL LOCAL ORDINANCES.
2. NO HERBICIDES OR PESTICIDES SHALL BE USED ON SUBJECT PROPERTY.
3. THE LIMIT OF WORK LINE SHALL BE PERMANENTLY MARKED AFTER REMOVAL OF THE HAYBALE LINE OR OTHER APPROVED S.E.C. METHODS.
4. A BUFFER ZONE OF NATURAL VEGETATION SHALL BE LEFT UNDISTURBED OUTSIDE THE WORK LIMIT AREA.
5. ALL EXPOSED SOILS TO BE LOAMED AND SEEDED.
6. LANDSCAPE CONTRACTOR SHALL MEET WITH CONSERVATION AGENT PRIOR TO COMMENCEMENT OF ANY WORK.
7. A TEMPORARY AUTOMATED ABOVE-GROUND IRRIGATION SYSTEM MAY BE REQUIRED FOR THE FIRST TWO-THREE GROWING SEASONS (AFTER WHICH THE SYSTEM IS TO BE REMOVED).

Base plan information provided electronically by Coastal Engineering Company of Orleans, Massachusetts and Brown Lindquist Fenuccio & Raber Achitects, Inc of Yarmouthport, MA.

Hawk Design, Inc.
Landscape Architecture
Land Planning
Sagamore, MA
508-833-8800
info@hawkdesigninc.com

HAWK DESIGN, INC. 2018

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BROWN, LINDQUIST, FENUCCIO & RABER ARCHITECTS, INC.
A.D. MARX JR. STREET, SUITE 4
YARMOUTHPORT, MA 02675
PH 508-362-8300
FAX 508-362-2836
www.brownlindquist.com

COASTAL ENGINEERING COMPANY, INC.
300 Cranberry Row, Orleans, MA 02653
508-255-6168 FAX 508-255-1022

Date: 04.20.18

Revisions:

Num.	Date	Description
1.	06.07.18	Revised Planting Around New Funicular & Architecture

MASSACHUSETTS LICENSED LANDSCAPE ARCHITECT NO. 9757
4/20/18

Bradford Access Project

Provincetown, Massachusetts

Drawn By: JP | Checked By: DH

Submission Planting Plan

Scale: 1/4" = 1'-0"

Sheet: L1

NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002

PHONE: 413-548-8000 FAX 413-549-4000

EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

New England Erosion Control/Restoration Mix for Dry Sites

Botanical Name	Common Name	Indicator
Elymus canadensis	Canada Wild Rye	FACU+
Festuca rubra	Red Fescue	FACU
Lolium multiflorum	Annual Ryegrass	
Lolium perenne	Perrenial Ryegrass	
Schizachyrium scoparium	Little Bluestem	FACU
Panicum virgatum	Switch Grass	FAC
Sorghastrum nutans	Indian Grass	UPL

PRICE PER LB. $15.00 MIN. QUANITY 5 LBS. **TOTAL:** $75.00 APPLY: 35 LBS/ACRE :1250 sq ft/lb

The New England Erosion Control/Restoration Mix For Dry Sites provides an appropriate selection of native and naturalized grasses to ensure that dry and recently disturbed sites will be quickly revegetated and the soil surface stabilized. It is an appropriate seed mix for road cuts, pipelines, steeper slopes, and areas requiring quick cover during the ecological restoration process. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper soil-seed contact. Best results are obtained with a Spring or late Summer seeding. Late Spring through Mid-Summer seeding will benefit from a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering will be required. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free seed bed is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

OVERALL VIEW OF SITE

VIEW FROM TICKET KIOSK

VIEW FROM BRADFORD & RYDER STREET

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

PILGRIM MONUMENT
PROVINCETOWN MUSEUM

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OUTDOOR ENGINEERS
Outdoor Engineers, Inc - Inclined Lift Design

BROWN LINDQUIST FENUCCIO & RABER ARCHITECTS, INC.

CASHMAN
CONSTRUCTION MANAGEMENT

LOOKING NORTH FROM BAS RELIEF PARK

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

PILGRIM MONUMENT
PROVINCETOWN MUSEUM

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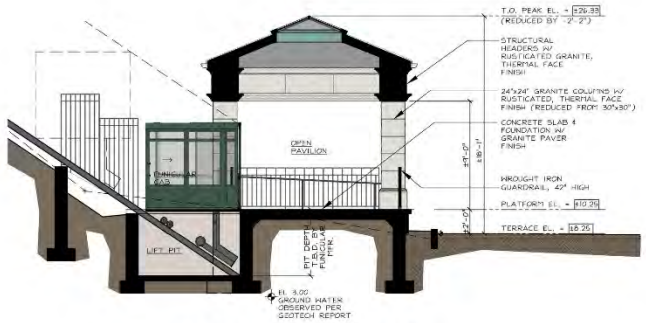
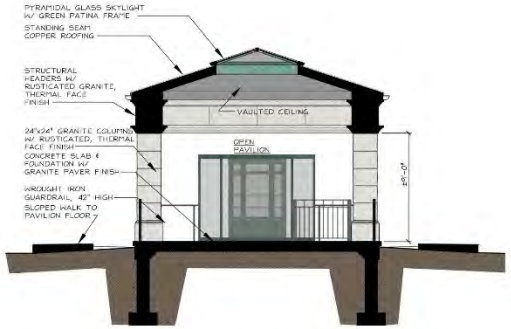
CASHMAN
CONSTRUCTION MANAGEMENT

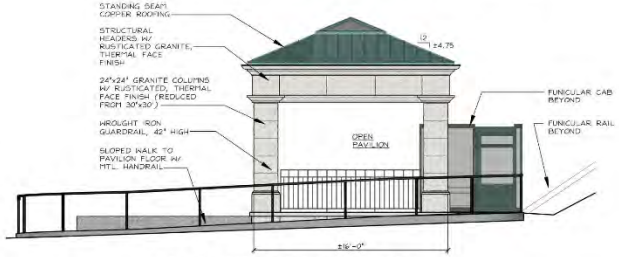


BUILDING SECTION A-A

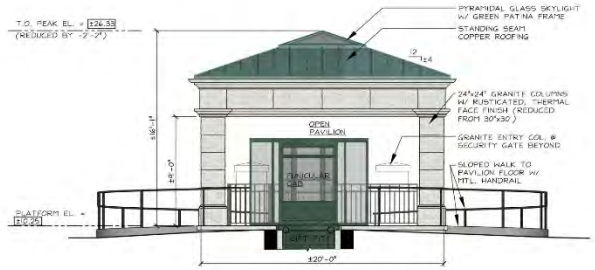


BUILDING SECTION B-B

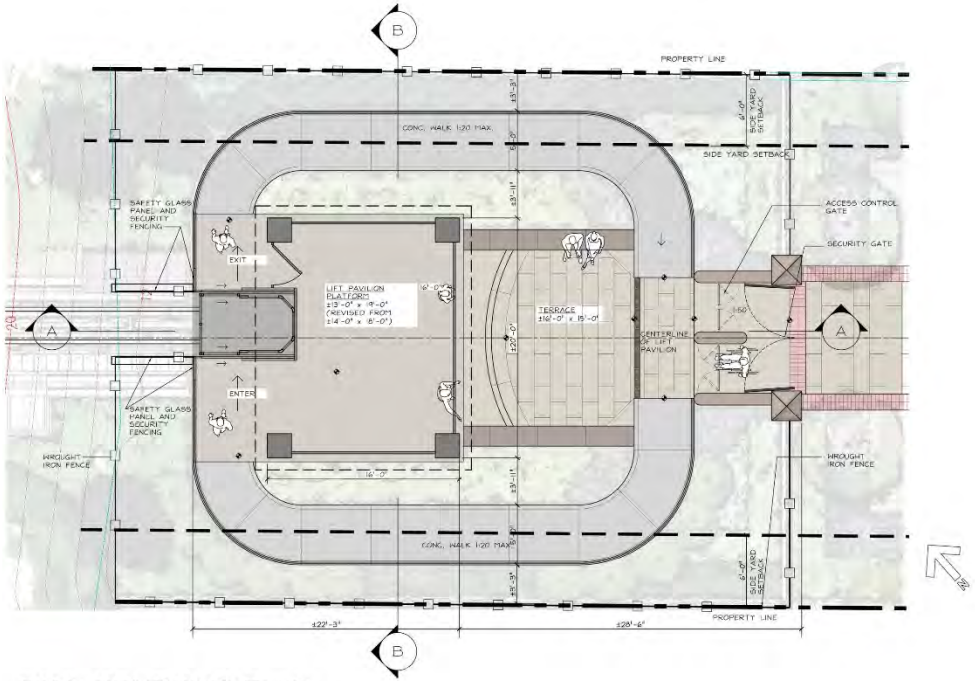
SOUTHEAST ELEVATION



NORTHEAST ELEVATION



NORTHWEST ELEVATION



PAVILION FLOOR PLAN
SCALE 1/4"=1'-0"

SOUTHWEST ELEVATION

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

PILGRIM MONUMENT
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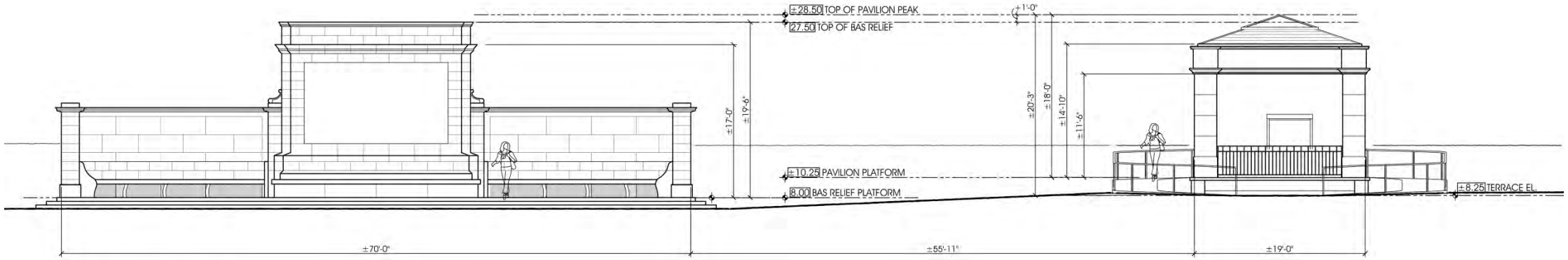
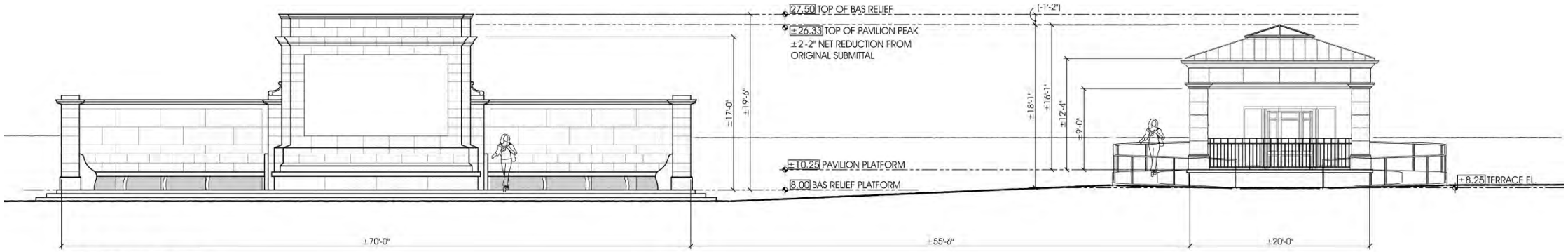


1 ORIGINAL HDC SUBMITTAL
SCALE 3/16" = 1'-0"



2 REVISED SUBMITTAL
SCALE 3/16" = 1'-0"

FRONT ELEVATION BAS RELIEF

FRONT ELEVATION FUNICULAR PAVILION

COMPARISON ELEVATION OF BAS REILIEF & FUNICULAR PAVILION

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

5/16/2018

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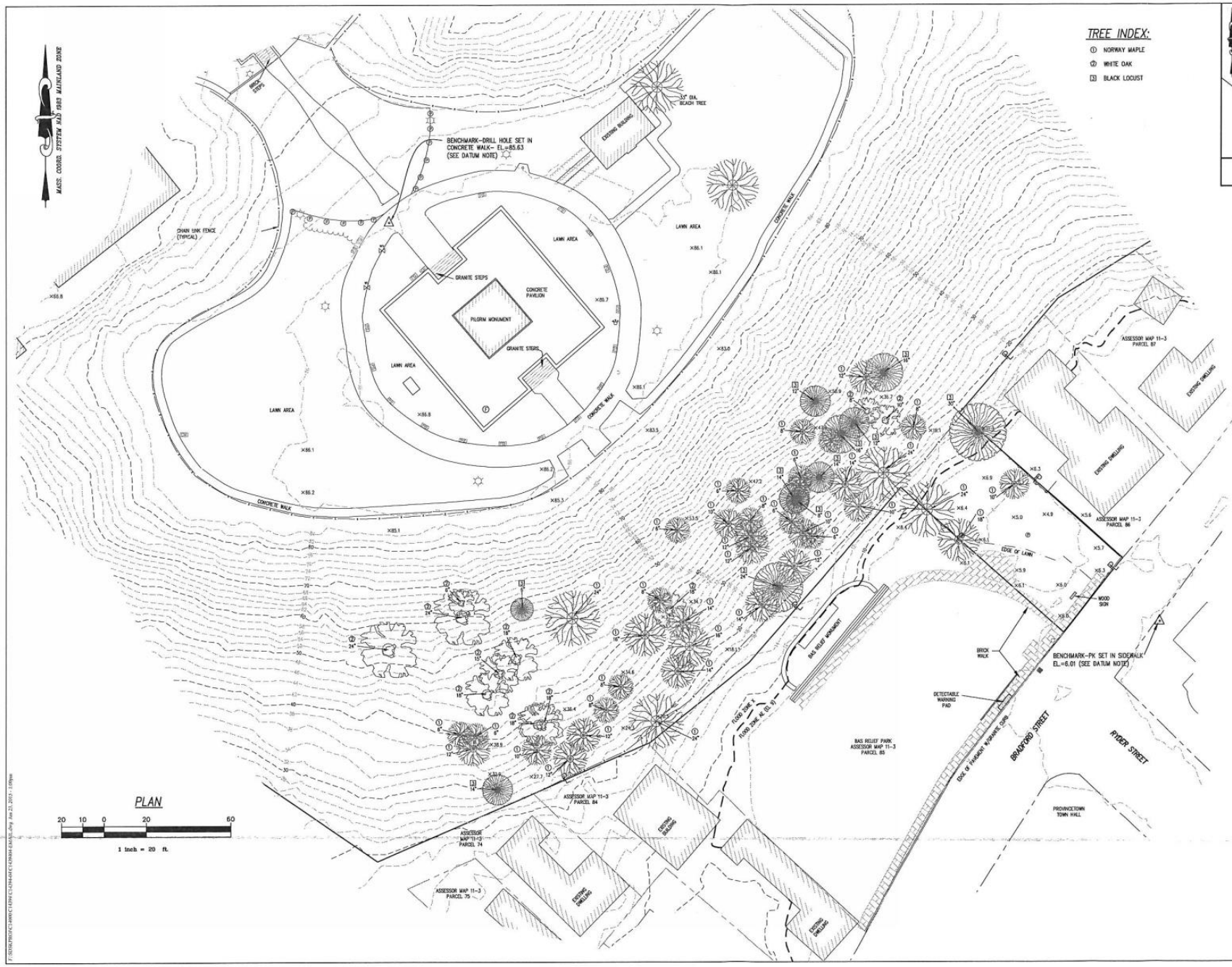
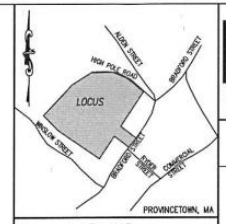
CASHMAN
CONSTRUCTION MANAGEMENT



TREE INDEX:

1. NORWAY MAPLE
2. WHITE OAK
3. BLACK LOCUST



KEY MAP
NO SCALE

PLAN REFERENCES:

ASSESSORS MAP 12-1, PARCEL 27

PLAN BOOK 8, PAGE 129

L.C.P. 16813A

A PORTION OF THE TOPOGRAPHIC DATA SHOW HEREON IS FROM NORTH EAST 2011 LIDAR TERRAIN DATA DOWNLOADED FROM NOAA WEBSITE JANUARY, 2015.
TOPOGRAPHIC DATA SHOWN WTHIN PAVED ACCESS DRIVE'S, EDGE OF PAVEMENT, BRICK WALKS AND MONUMENT AREA ON BRADFORD STREET, TAKEN FROM ON THE GROUND SURVEY.

FLOOD NOTE:

FLOOD ZONE AE (EL 9) AS SHOWN ON FEMA FIRM PANEL #25001C0112J & #25001C0116J DATED JULY 16, 2014

DATUM NOTE:

ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988)

LEGEND

EXISTING

- BOUND
- CATCH BASIN
- MANHOLE
- GAS VALVE
- WATER VALVE
- HYDRANT
- ELECTRIC METER
- PULL BOX
- LIGHTPOST
- MISC. SIGN
- POST
- UTILITY POLE
- CHAIN LINK FENCE
- CONTOUR

COASTAL ENGINEERING COMPANY, INC.
260 Cranberry Hwy. Orleans, MA 02653
508.255.6511 Fax: 508.255.6300

NO.	DATE	REVISIONS	BY

SEAL

PROJECT
CAPE COD PILGRIM MEMORIAL ASSOCIATION
ONE HIGH POLE HILL ROAD PROVINCETOWN, MA

SHEET TITLE
PLAN SHOWING EXISTING SITE CONDITIONS

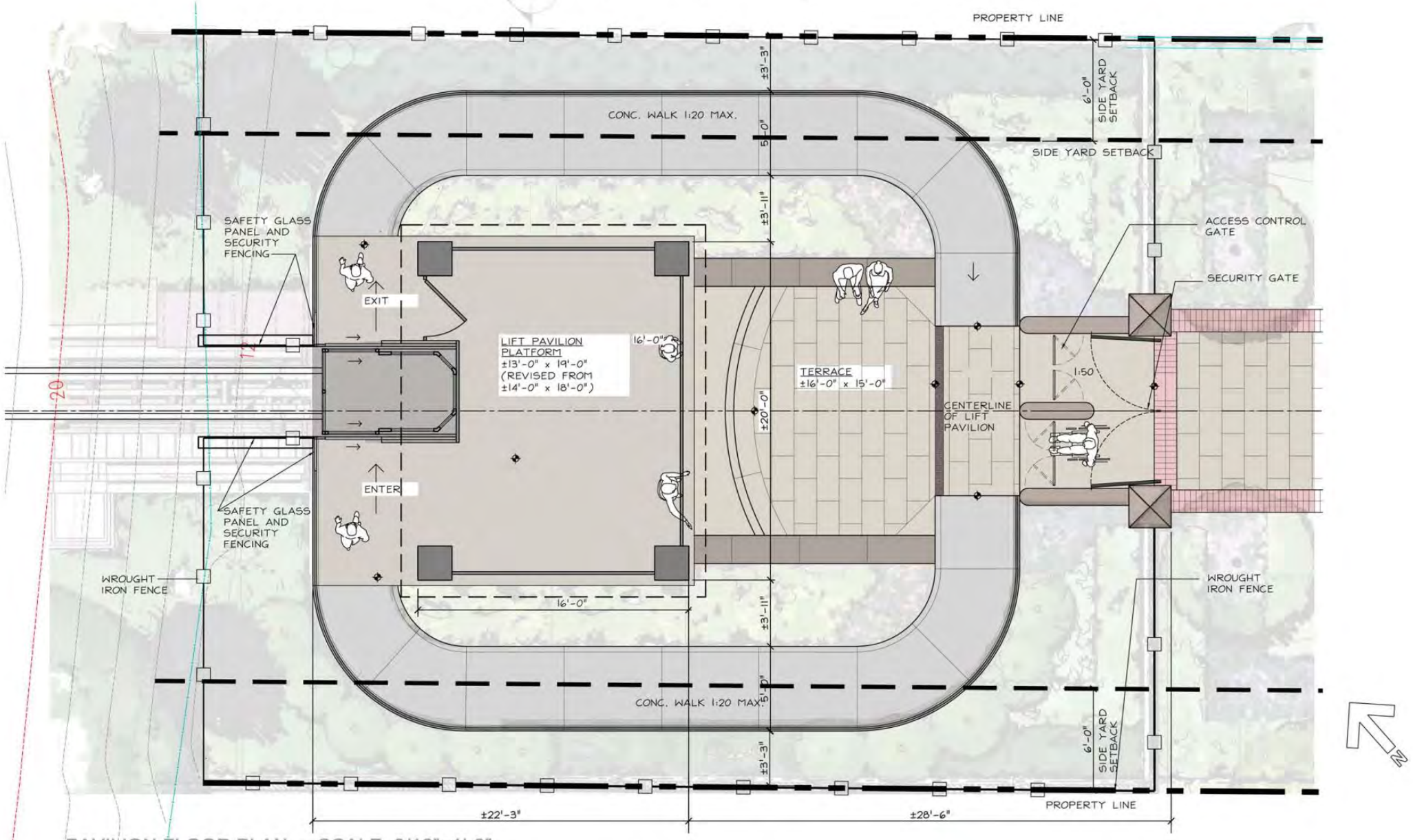
SCALE: AS NOTED
DRAWING FILE: C14394-04-C3D.dwg
DATE: 6-23-15
DRAWN BY: MAP
CHECKED BY:

C1.2.1

1 OF 1 SHEETS

PROJECT NO. C14394.04

Coastal Engineering Co., Inc. © 2015



PAVILION FLOOR PLAN - SCALE 3/16"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

5/16/2018

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CASHMAN CONSTRUCTION MANAGEMENT

SOUTHEAST ELEVATION
SCALE 1/4"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

5/16/2018

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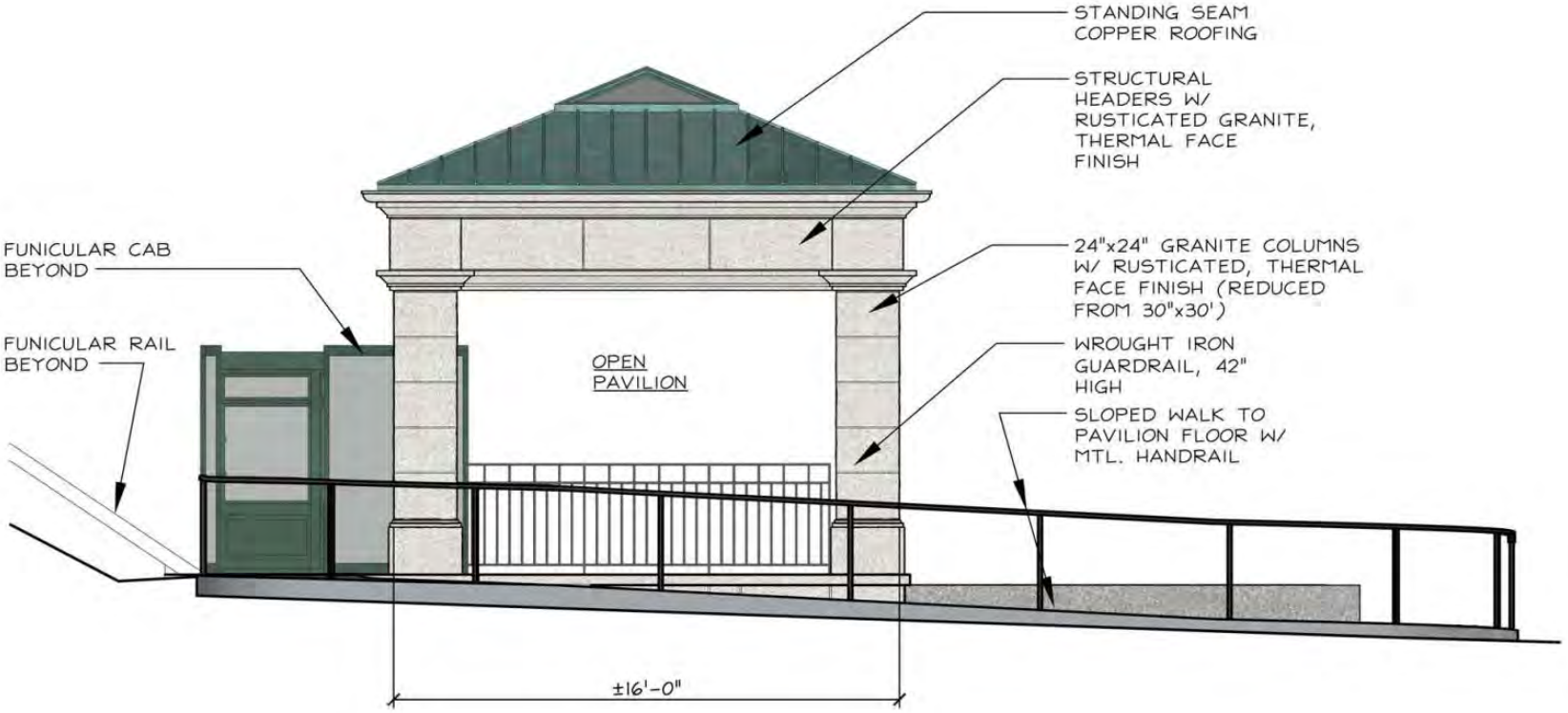
CASHMAN CONSTRUCTION MANAGEMENT



SOUTHWEST ELEVATION
SCALE 1/4"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA
5/16/2018

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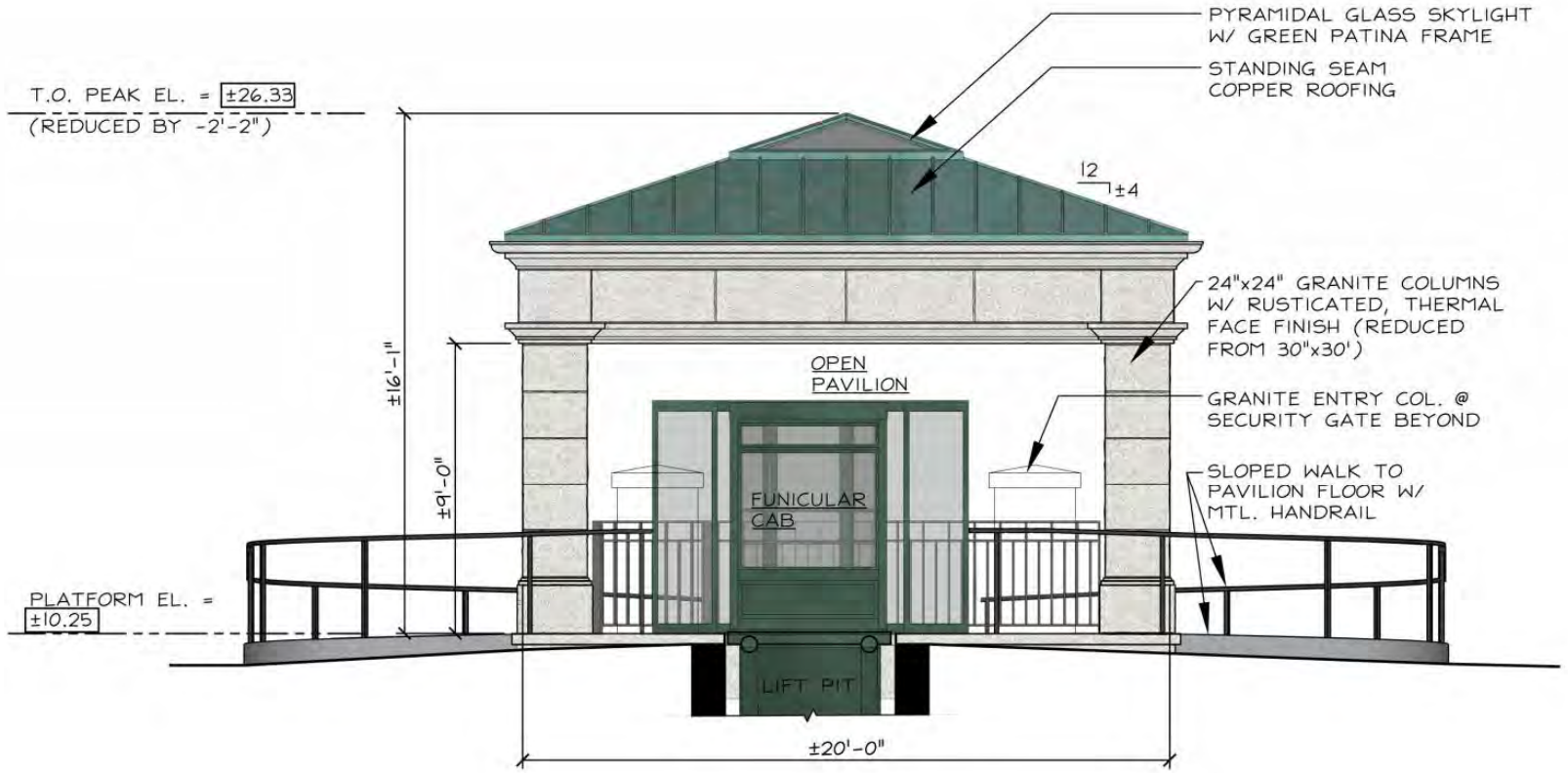
CASHMAN CONSTRUCTION MANAGEMENT



NORTHWEST ELEVATION
SCALE 1/4"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA
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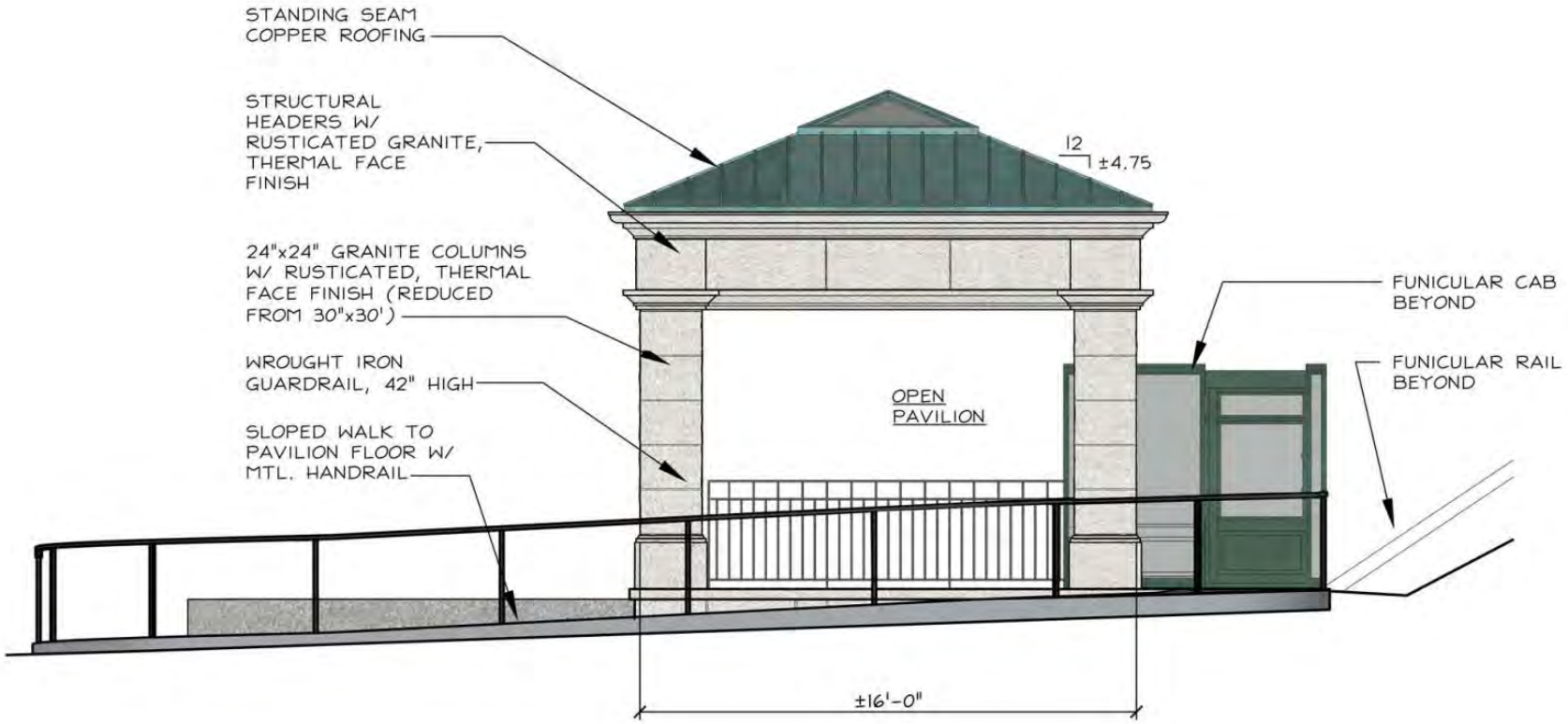

NORTHEAST ELEVATION
SCALE 1/4"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

5/16/2018

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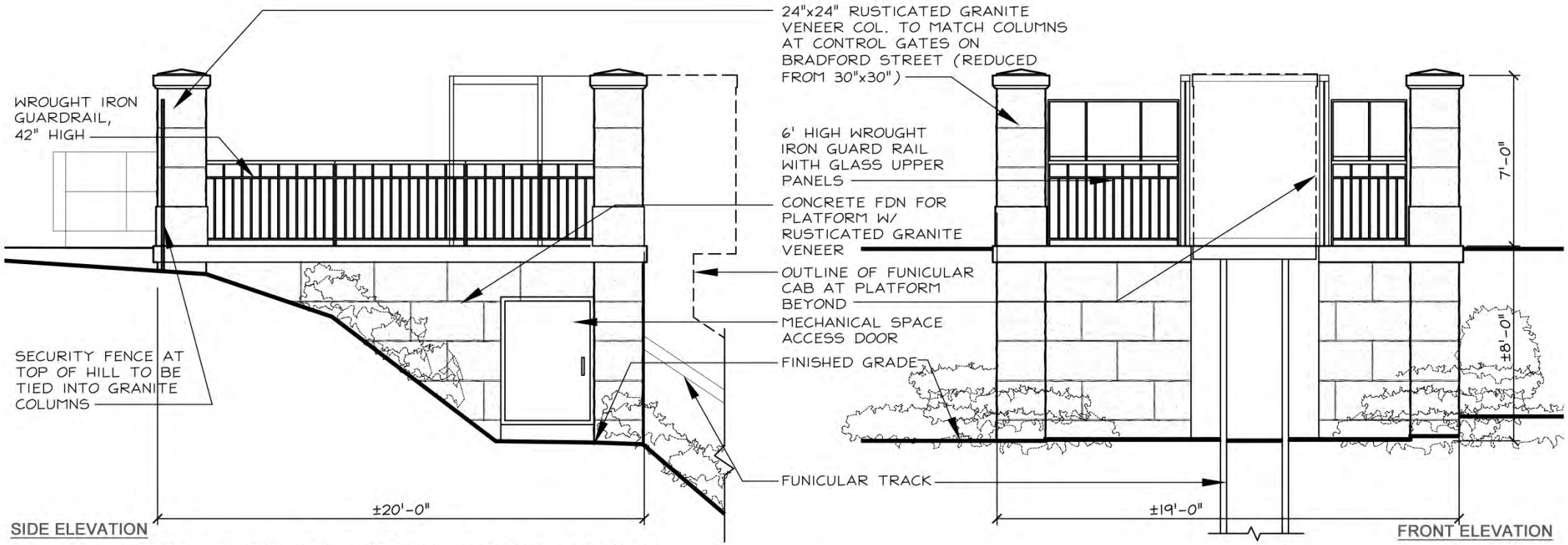
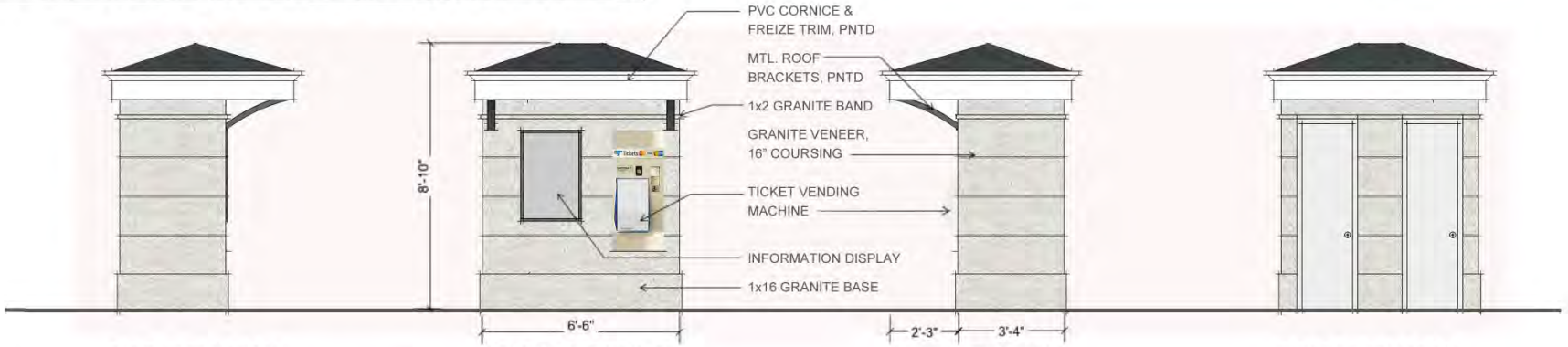


UPPER FUNICULAR PLATFORM - SCALE 1/4"=1'-0"



TICKET KIOSK ELEVATIONS - SCALE 1/4"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA
5/16/2018

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PROVINCETOWN MUSEUM

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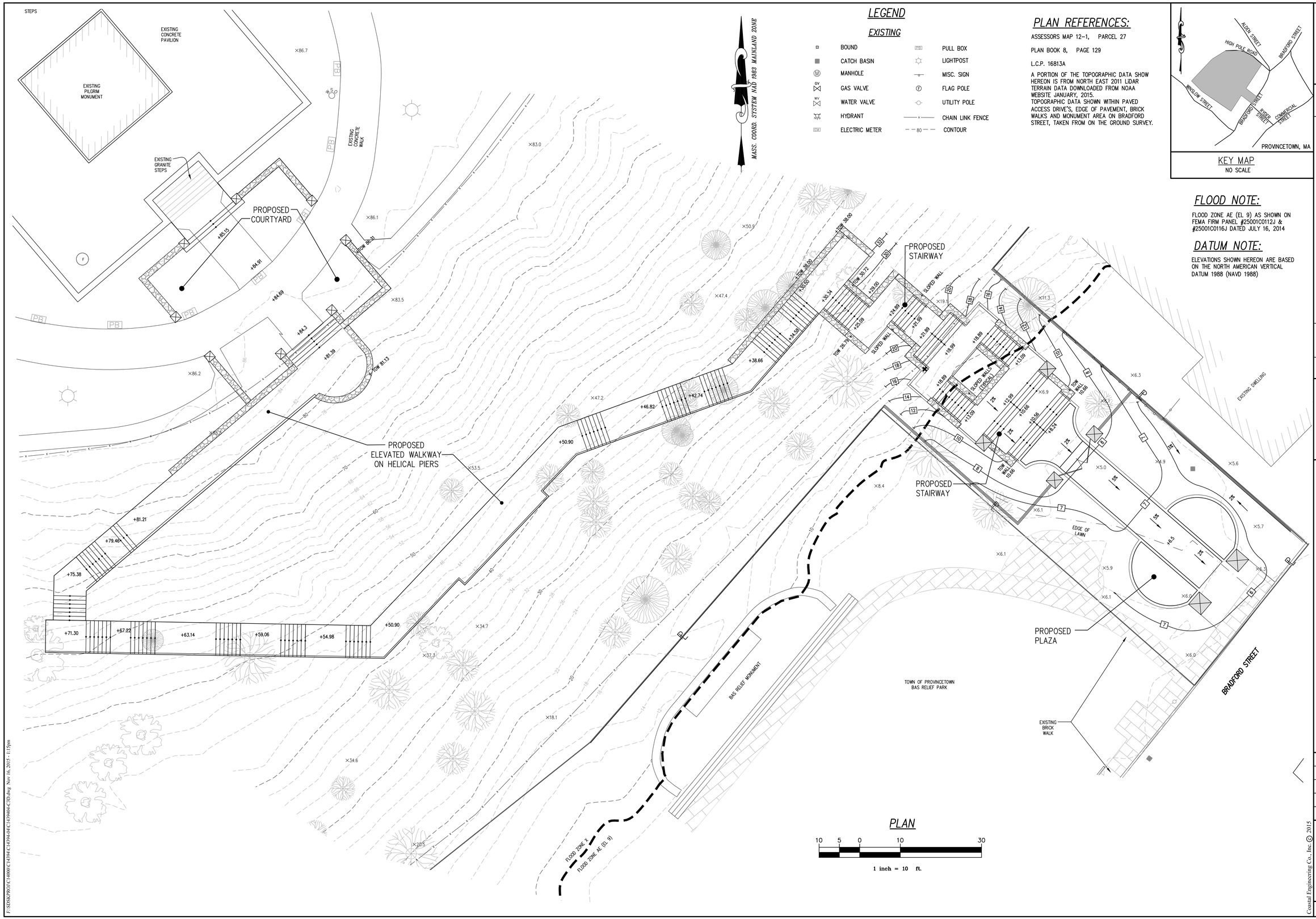

LEGEND

EXISTING

	BOUND		PULL BOX
	CATCH BASIN		LIGHTPOST
	MANHOLE		MISC. SIGN
GV	GAS VALVE		FLAG POLE
WV	WATER VALVE		UTILITY POLE
	HYDRANT		CHAIN LINK FENCE
EM	ELECTRIC METER	80	CONTOUR

PLAN REFERENCES:

ASSESSORS MAP 12–1, PARCEL 27

PLAN BOOK 8, PAGE 129

L.C.P. 16813A

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KEY MAP
NO SCALE

FLOOD NOTE:

FLOOD ZONE AE (EL 9) AS SHOWN ON FEMA FIRM PANEL #25001C0112J & #25001C0116J DATED JULY 16, 2014

DATUM NOTE:

ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 1988)

PLAN

10 5 0 10 30

1 inch = 10 ft.

COASTAL ENGINEERING COMPANY, INC.
260 Cranberry Hwy. Orleans, MA 02653
508.255.6511 Fax: 508.255.6700

NO.	DATE	REVISION	BY

SEAL

DRAFT

PROJECT
CAPE COD PILGRIM MEMORIAL ASSOCIATION
ONE HIGH POLE HILL ROAD PROVINCETOWN, MA

SHEET TITLE
CONCEPTUAL SITE PLAN
SHOWING PROPOSED WALKWAY

SCALE	AS NOTED
DRAWING FILE	C1439404-C3D.dwg
DATE	11-16-15
DRAWN BY	MAP/JLH
CHECKED BY	

C2.1.1

1 OF 1 SHEETS

PROJECT NO. C14394.04

Coastal Engineering Co., Inc. © 2015

F:\DISKPROJ\C14000\C14394\C14394-04\C1439404-C3D.dwg Nov 16, 2015 - 1:15pm

The following plans:

1. **Coastal Engineering Co., Inc., Plan Showing Existing Site Conditions, dated 6/23/15**
2. **Coastal Engineering Co., Inc., Plan Showing Proposed Site Improvements, rev. 6/14/18**

can be viewed at the link "Click here to view site plans." on the agenda for the 6/19/18 meeting of the Provincetown Conservation Commission.

May 30, 2018 Project #C14394.08

Conservation Commission **By Email**
Attn: Tim Famulare, Agent
260 Commercial Street
Provincetown, MA 02657

Re: **Notice of Intent Application Filing Package**
Proposed Funicular & Site Improvements
Cape Cod Pilgrim Memorial Association
1 High Pole Hill Road
Provincetown, MA
Map 12-1 Parcel 27

Dear Conservation Commission:

On behalf of our client, Cape Cod Pilgrim Memorial Association, we would like to request a continuance of a hearing that is scheduled for June 5, 2018.

The project team needs additional time to coordinate revisions that have been raised by Conservation & the neighbors.

Therefore, we respectfully request that you reschedule the above referenced project for your June 19, 2018 public hearing.

If you have any questions, please call our office.

Sincerely,

COASTAL ENGINEERING CO., INC.

Jason R. Norton

Jason R. Norton

cc: Jay Murphy, Attorney
Cape Cod Pilgrim Memorial Association

D:\DOC\C14300\14394.08\Permitting\NOI\2018-05-15-Continuance Hearing Ltr to CC #2.doc

May 15, 2018 Project #C14394.08

Conservation Commission **By Email**
Attn: Tim Famulare, Agent
260 Commercial Street
Provincetown, MA 02657

Re: **Notice of Intent Application Filing Package**
Proposed Funicular & Site Improvements
Cape Cod Pilgrim Memorial Association
1 High Pole Hill Road
Provincetown, MA
Map 12-1 Parcel 27

Dear Conservation Commission:

On behalf of our client, Cape Cod Pilgrim Memorial Association, we would like to request a continuance of a hearing that is scheduled for May 15, 2018. The project team needs time to respond to questions and comments raised today.

Therefore, we respectfully request that you reschedule the above referenced project for your June 5, 2018 public hearing.

If you have any questions, please call our office.

Sincerely,

COASTAL ENGINEERING CO., INC.

Jason R. Norton

Jason R. Norton

cc: Jay Murphy, Attorney
Cape Cod Pilgrim Memorial Association

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CON-18-084

COASTAL
engineering co.

May 1, 2018

Project # C14394.08

Conservation Commission
Attn: Tim Famulare, Agent
260 Commercial Street
Provincetown, MA 02657

By Hand Delivery

Re: **Notice of Intent Application Filing Package**
Proposed Funicular & Site Improvements
Cape Cod Pilgrim Memorial Association
1 High Pole Hill Road
Provincetown, MA
Map 12-1 Parcel 27

On behalf of our client, Cape Cod Pilgrim Memorial Association, we are submitting an original plus 7 copies of a Notice of Intent Application Filing Package, an original check for municipal filing, and 8 copies of the plan for the above referenced project. The following items are enclosed:

- Local By-Law Filing Application & Checklist
- Notice of Intent Application
- Project Description, Performance Standards Narrative, Construction Protocol
- NOI Wetland Fee Transmittal Form
- Copy of $237.50 check made payable to Commonwealth of MA - DEP for state share of DEP fee, (original sent directly to lockbox)
- Copy of $362.50 check made payable to Town of Provincetown for town share of DEP fee, bylaw fees and advertising fee
- Affidavit of Service, Abutter Notification Letter, Certified Abutter List, Assessor Map 12-1 identifying locus
- Provincetown USGS Map, identifying locus
- Coastal Engineering Company, Stormwater Management Report & Calculations, dated 4/30/18-(2) Copies
- Brown, Lindquist, Fenuccio & Raber Architects, Proposed Bradford Access Project for Pilgrim Monument & Provincetown Museum
- Coastal Engineering Company, Plan Showing Proposed Site Improvements & Details sheet, dated 4/30/18
- Hawk Design, Bradford Access Project, dated 4/20/18

Please schedule this for the **May 15, 2018** public hearing. If you have any questions or require additional information, please give our office a call. Thank you.

Sincerely,

COASTAL ENGINEERING CO., INC.

Sarah Cole

Sarah Cole

RECEIVED
MAY 01 2018
BY

Enclosures: as stated

cc: Mass. DEP/SERO - Wetlands
Cape Cod Pilgrim Memorial Association
John A. Bologna, Project Manager
Jason R. Norton, Project Manager *(w/ staking plan only)*

Town of Provincetown
260 Commercial Street
Provincetown, MA 02657
Ph: (508) 487-7020

Receipt No.: **14819**
Receipt Date: **05/03/2018**

RECEIPT

RECORD & PAYER INFORMATION

Record ID:	CON-18-000084
Record Type:	NOI - Notice of Intent
Property Address:	1 HIGH POLE HILL RD, Provincetown, MA
Description of Work:	Construction of proposed funicular (inclined elevator) and associated site improvements
Payer:	Coastal Engineering Co.
Applicant:	K. David Weidner Cape Cod Pilgrim Memorial Association P.O. Box 1125 Provincetown, MA 02657

PAYMENT DETAIL

Date	Payment Method	Reference	Cashier	Comments	Amount
05/03/2018	Check	37102	TFAMULARE		$362.50

FEE DETAIL

Fee Description	Invoice #	Quantity	Fee Amount	Current Paid
Category 2 Municipal Fee	14755	0.50	$250.00	$250.00
Municipal Differential	14755	1.00	$12.50	$12.50
Town By-Law Fee	14755	1.00	$100.00	$100.00
			$362.50	$362.50

PROVINCETOWN CONSERVATION COMMISSION
OFFICE OF COMMUNITY DEVELOPMENT
TOWN OF PROVINCETOWN
260 COMMERCIAL STREET
PROVINCETOWN, MASSACHUSETTS 02657

Telephone: (508) 487-7000 ext. 554
Fax: (508) 487-7040

Local By-Law Filing Application

Date: 5/1/18 Fee: $100.00

Project Street Address: 1 High Pole Hill Road

City/Town: Provincetown

State & Zip: MA, 02657 Parcel/Lot: 12-1-27

Applicant Name: K. David Weidner Ph.D., Executive Director

Home Phone:

Organization Name: Cape Cod Pilgrim Memorial Association

Mobile Phone:

Mailing Address: PO Box 1125

Business Phone: 508-487-1310

City/Town, Zip: Provincetown, MA 02657

Email Address:

Agent : ~~Responsible Party~~: Jason R. Norton

Home Phone:

Organization Name: Coastal Engineering Co., Inc.

Mobile Phone:

Mailing Address: 260 Cranberry Highway

Business Phone: 508-255-6511

City/Town, Zip: Orleans, MA 02653

Email Address: jnorton@coastalengineeringcompany.com

PROJECT TYPE

- [ ] New Residential Construction
- [ ] Residential Subdivision
- [ ] New or Expanded Deck
- [ ] Residention Additions
- [ ] Septic System
- [ ] Utilities
- [x] Commercial/Industrial
- [ ] Agriculture
- [ ] Patios or Hardscapes
- [ ] Other

Describe Other:

PROJECT DESCRIPTION

Area Description: Project located within Land Subject to Coastal Storm Flowage (AE Zone El 9)

Plan and/or Map References: Plan Showing Proposed Site Improvements Plan/Map Date: 4/30/18

Work Description: Proposed funicular (inclined elevator) and associated site improvements

AREA REVIEW

	Yes	No		Yes	No
Work within 100 ft of resource area?	x		Within 50 ft of resource area?	x	
Require excavation machinery?	x		Require uprooting vegetation?	x	
Require mowing to ground?		x	Require tree removal?	x	
Require pruning of trees?		x	Require cutting of shrubs?		x
Invasive Species Removal		x	Require planting?	x	

Determination:

PROVINCETOWN CONSERVATION COMMISSION
OFFICE OF COMMUNITY PLANNING
TOWN OF PROVINCETOWN
260 COMMERCIAL STREET
PROVINCETOWN, MASSACHUSETTS 02657
(508)487-7020

Local Bylaw, RDA and NOI Filing Checklist

Please submit this checklist along with your application to ensure your application is complete:
7 copies of the completed application, associated documents and plans collated into packets consisting of the following:

[x] **Application Form**: Local Bylaw Filing, Request for Determination of Applicability *OR* Notice of Intent (consult with Conservation Agent to confirm appropriate type of filing)

[x] **Certified Abutters List**: From the Assessor's Office ($25)

[x] **Abutter's Notification Form**: Completed copy sent to abutters, plus Certificates of Mailing (to be submitted to the Conservation Agent at the Public Hearing) – Certificate of Mailing Instructions online

[x] **Map**: Showing site locus

[x] **Site Plans:** 11"X17" drawn to scale (+ 1 copy 18"x 24" for NOI's) consisting of:
Existing Conditions – showing property boundaries, contour lines, existing structures, limit/edge of vegetation, trees greater than 8" inches diameter at breast height (dbh), wetland resource areas with 50 and 100 foot buffer zones, NHESP Estimated and/or Priority Habitat boundaries (if applicable)

Proposed plans – showing limit of work, location and type of erosion controls, site access and equipment staging area, vegetation to be removed including trees greater than 8" dbh, re-grading, existing structures to remain and proposed structures, landscaping, hardscaping, retaining walls, drainage structures, septic system, utilities

** This level of detail may not be applicable for small projects – confirm with Conservation Agent*

[x] **Project Narrative and Construction Protocol**: Identify wetland resource areas and measures taken to meet performance standards set forth in the Wetlands Protection Regulations, 310 CMR 10.00 and/or the Provincetown Wetlands Protection Bylaw, Chapter 12

[x] **Color Photographs of the Site**: Taken from various vantage points to show existing site conditions

[x] **Planting Plan**: Submit if project involves vegetation removal (Approved Plantings list available online)

N/A **MESA Project Review Checklist**: Include a copy if the project is within NHESP Estimated and Priority Habitat and is not exempt under 321 CMR 10.14

[x] **Fee:** NOI Wetlands Fee Transmittal Form (town portion of WPA fee + $100 local bylaw fee), local RDA Fee ($100) or Local Bylaw Filing Fee ($100)

By signing this, I confirm submission of all relevant materials listed above.

Jason R. Norton 4/30/18

Signature of Applicant Agent: Jason R. Norton, Coastal Engineering Co., Inc. Date

Project Address: 1 High Pole Hill Road

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Provincetown
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

1 High Pole Hill Road — a. Street Address
Provincetown — b. City/Town
02657 — c. Zip Code

Latitude and Longitude:
d. Latitude
e. Longitude

12-1 — f. Assessors Map/Plat Number
27 — g. Parcel /Lot Number

2. Applicant:

K. David — a. First Name
Weidner, Executive Director — b. Last Name
Cape Cod Pilgrim Memorial Association — c. Organization
PO Box 1125 — d. Street Address
Provincetown — e. City/Town
MA — f. State
02657 — g. Zip Code
h. Phone Number
i. Fax Number
j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Jason R. — a. First Name
Norton — b. Last Name
Coastal Engineering Co., Inc. — c. Company
260 Cranberry Highway — d. Street Address
Orleans — e. City/Town
MA — f. State
02653 — g. Zip Code
508-255-6511 — h. Phone Number
508-255-6700 — i. Fax Number
jnorton@coastalengineeringcompany.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

$500.00 — a. Total Fee Paid
$237.50 — b. State Fee Paid
$262.50 — c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

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A. General Information (continued)

6. General Project Description:

Proposed funicular & site improvements

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☒ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Barnstable	5499
a. County	b. Certificate # (if registered land)
c. Book	d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☐ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced

f. ☐ Riverfront Area

1. Name of Waterway (if available) - **specify coastal or inland**

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☐ No

3. ☒ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☒ Land Subject to Coastal Storm Flowage	3,961 +/- 1. square feet	

4. ☐ Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No

   If yes, include proof of mailing or hand delivery of NOI to:

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

   2018
   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

---

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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City/Town

C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing.

a. NHESP Tracking #

b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☐ Not applicable – project is in inland resource area only b. ☐ Yes ☒ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Provincetown
City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☒ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Provincetown
City/Town

D. Additional Information (cont'd)

3. ☐ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Plan Showing Proposed Site Improvements
a. Plan Title

Coastal Engineering Co., Inc.
b. Prepared By

Roger P. Michniewicz
c. Signed and Stamped by

Hawk Design,
BLFR Architects,

e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

37102
2. Municipal Check Number

4/27/18
3. Check date

37101
4. State Check Number

4/27/18
5. Check date

6. Payor name on check: First Name

Coastal Engineering Co., Inc.
7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Provincetown
City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

K. David Weidner — 27 APRIL 2018

1. Signature of Applicant K. David Weidner, Ph.D., Executive Director — 2. Date

3. Signature of Property Owner (if different) — 4. Date 4/30/18

5. Signature of Representative (if any) — 6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

COASTAL
engineering co.

Cape Cod Pilgrim Memorial Association Notice of Intent

PMPM Bradford Access Project

Proposed funicular (inclined elevator) from Bradford street area to upper property adjacent to the Pilgrim Monument.

4/26/2018

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Section A: Existing Conditions **2-6**

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FEMA Firmette 4

MORIS Map 5

Section B: Proposed Conditions **6-11**

Section C: Construction Sequence/Methods/Equipment **11-12**

Section D: Resource Area Impacts/Performance Standards Narrative **13-16**

Section E: Sedimentation Controls **16**

Section A: Existing Conditions

The subject site is located adjacent to Bradford Street and is bounded by 106 Bradford Street (the Bas Relief Park) to the West and 116 Bradford Street to the East at the base of the embankment that is situated adjacent to the Pilgrim Monument. The subject location is within the Cape Cod Pilgrim Monument Association parcel that includes the Monument, museum and parking area. This is a particular vacant piece of the parcel that has frontage on Bradford street and is located within a FEMA mapped AE Zone EL 9.

Existing vacant land – 1 High Pole Hill Road

The subject area does not contain any buildings, only ground cover, signs, fences and a few groves of vegetation and trees.

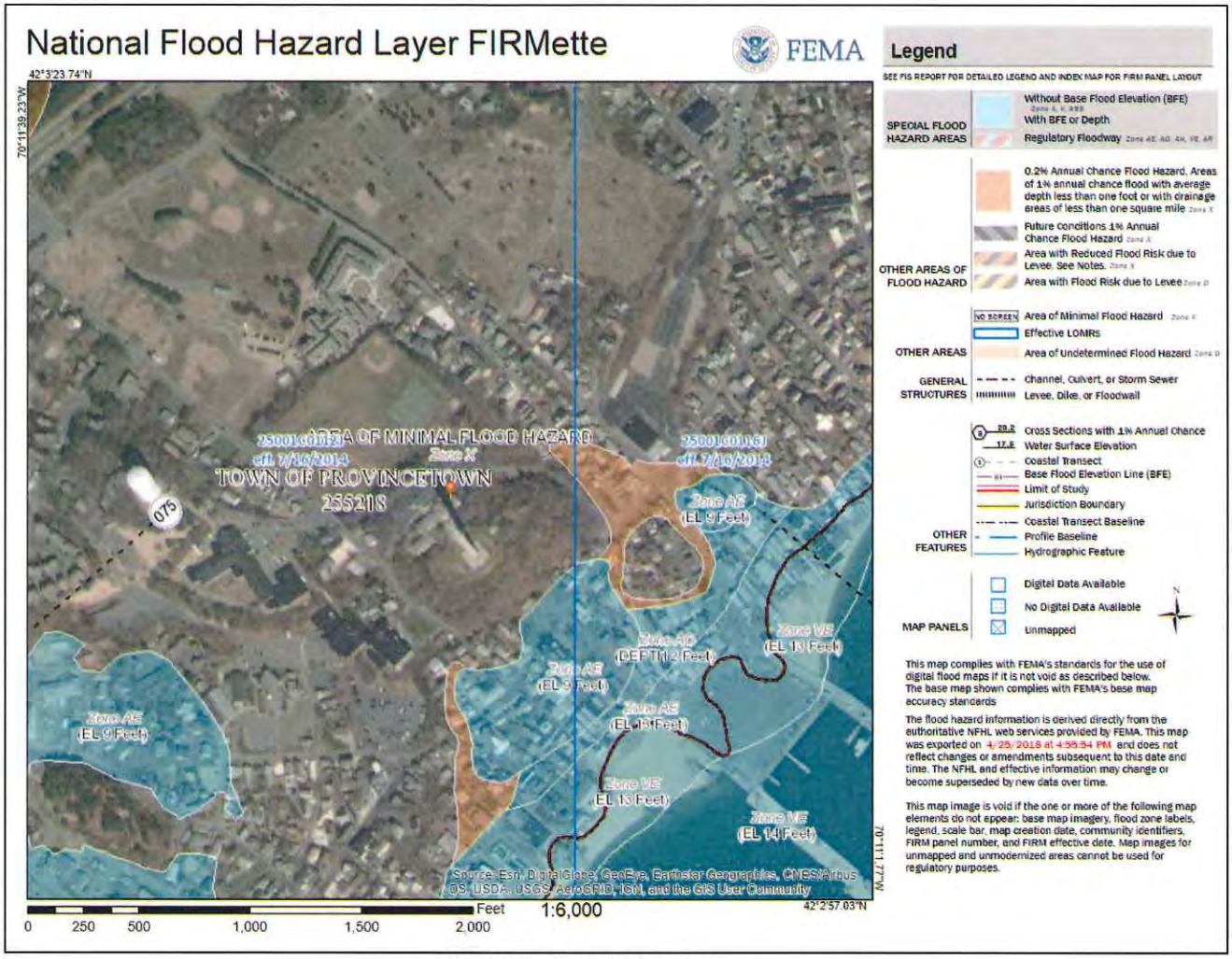
Bas Relief Park to the west (Pilgrim Monument in background)

Rear of subject property

Rear of subject property

FEMA

The FEMA flood zone on the subject property includes an (AE) zone with a base flood elevation (BFE) of 9 feet NAVD88.



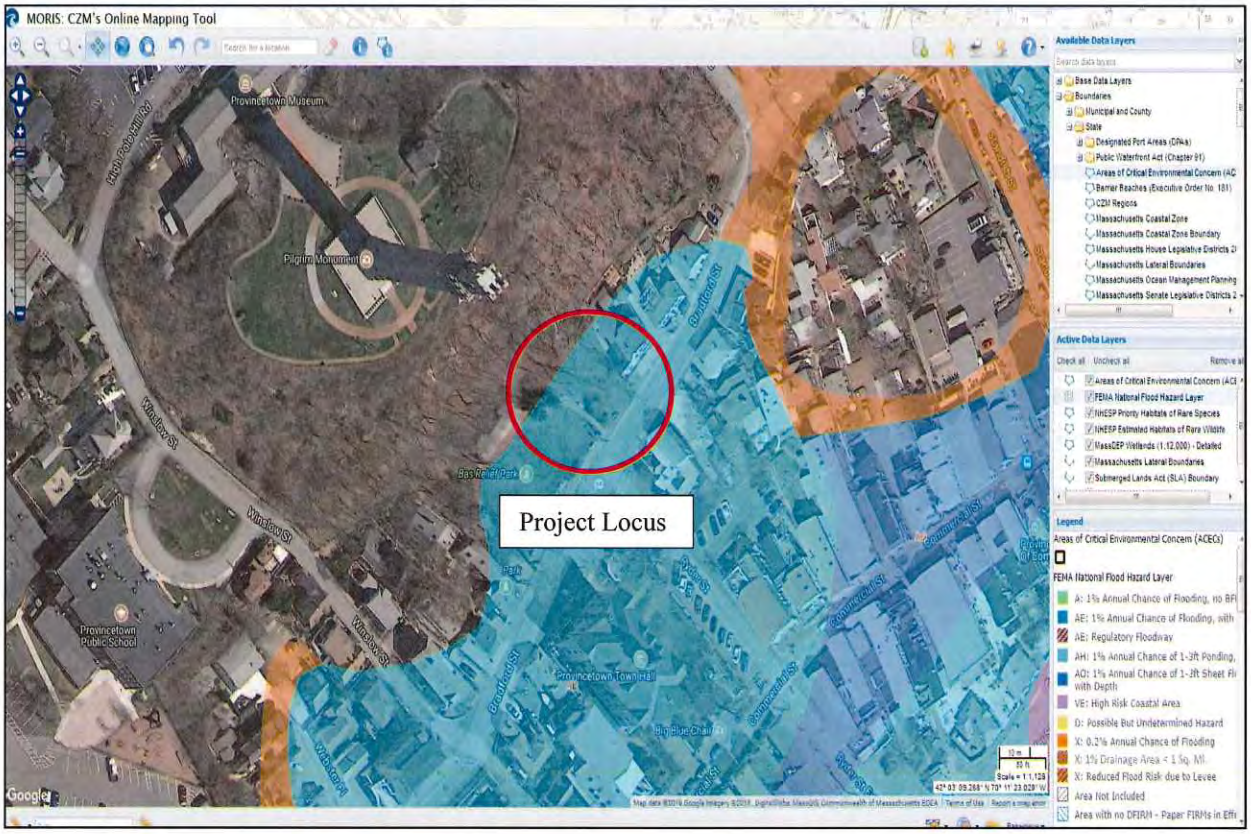
FEMA Designated Zones

Resource Area

The proposed project is located within Land Subject to Coastal Storm Flowage based on the Massachusetts Online Viewer GIS[1] (MORIS) map and the Massachusetts Department of Environmental Protection (DEP) Wetland Regulations[2] (310 CMR 10) as shown below. Please note that the property is not located within NHESP jurisdiction, ACEC or any other resource area.

[1] Massachusetts Online Viewer, GIS Mapping Database. http://maps.massgis.state.ma.us/map_ol/moris.php Accessed April 25, 2018.

[2] 310 CMR Department of Environmental Protection, 310 CMR 10.00: Wetlands Protection, http://www.mass.gov/eea/docs/dep/service/regulations/310cmr10a.pdf. Online Copy Accessed April 25, 2018.



10.04:

<u>Land Subject to Coastal Storm Flowage</u> means land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater.

Please refer to Section D "Resource Area Impacts/Performance Standards Narrative" where the Provincetown General By-Law Chapter 12 "Wetlands Protection Bylaw" is addressed.

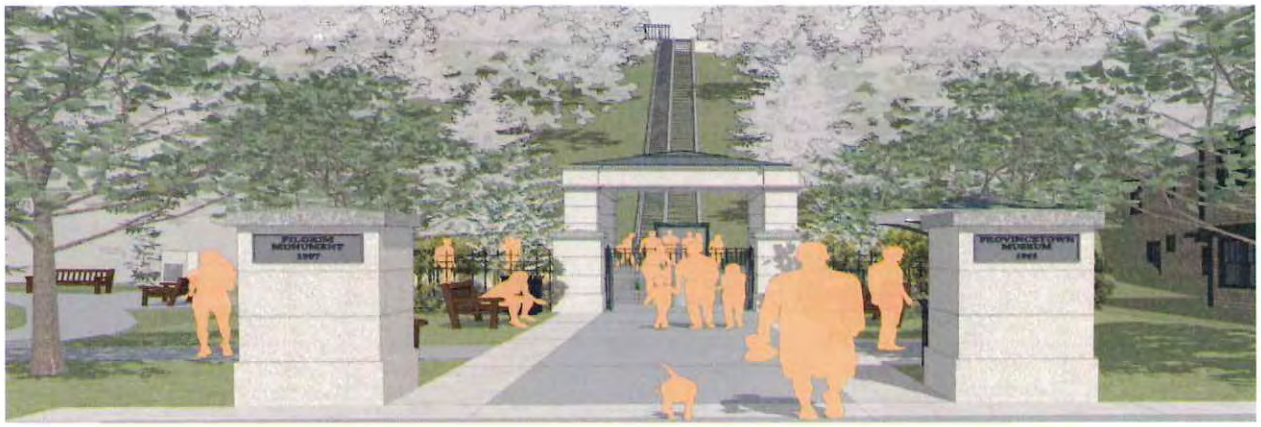
Section B: Proposed Conditions

The proposed project has multiple elements including site engineering, a proposed pavilion structure and landscape architecture features as follows:

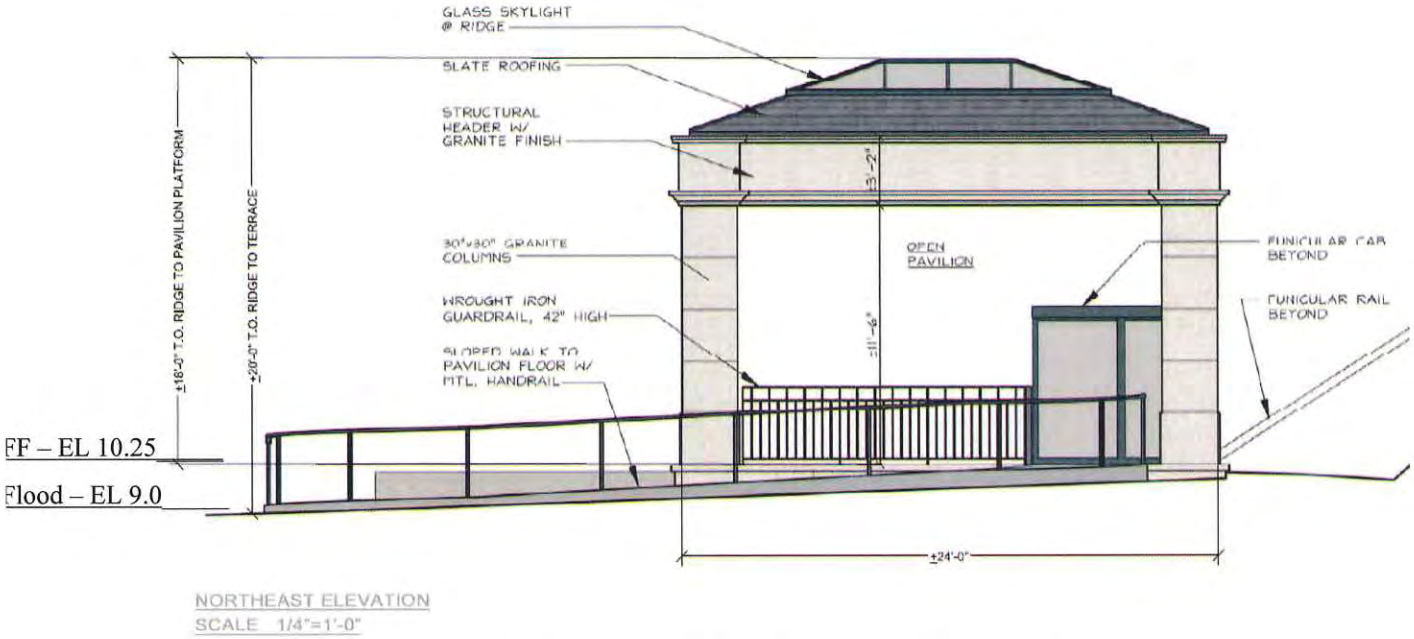
Funicular System. The proposed funicular (inclined elevator) is designed to carry approximately 18 passengers. The track is comprised of a double rail system made from a round steel profile that is hot dipped galvanized for corrosion protection. The funicular operates by means of a tension gear motor with integrated brake and traction sheave with a 2-4 rope drive. The driving unit is installed on a welded frame and will be located in the machine room which will be positioned at the top of the hill. At the base of the funicular at the pavilion structure, there will be an elevator pit where the track will terminate. There will also be emergency stairs attached to the west side of the track in the event of malfunctions and routine maintenance. Approximately 14' of width of clearance will be required for the track system up the hill. For the foundation of the funicular track, helical anchors will be used as it has low impacts on the slope stability of the hill. A geotechnical analysis was conducted determine the slope stability of the hill and to also determine the material makeup of the slope. Based on the USGS surficial geology map, it identifies the soils as glacially deposited stratified drift comprised mainly of loose to medium dense sand. The test borings from the study also correlate to the USGS map as medium sand.

Similar funicular systems

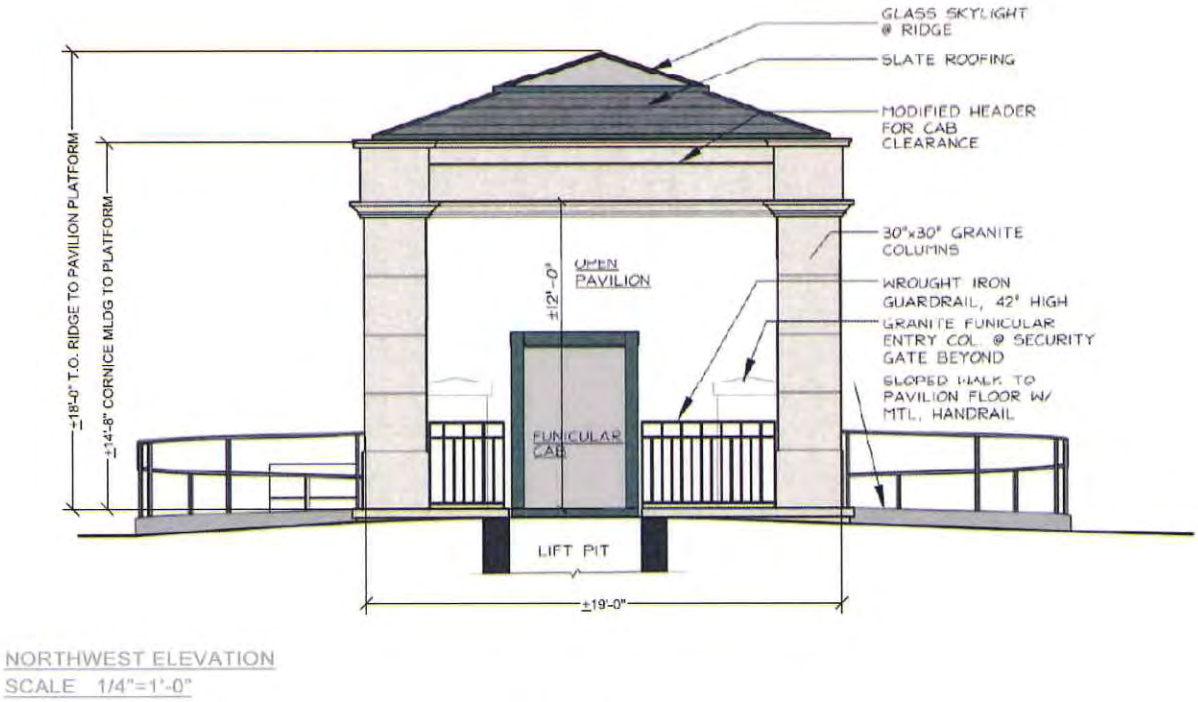
Pavilion Structure. The pavilion structure at the base of the hill will act as the launching pad or "station" for the funicular cab. It will be supported by granite columns and will be open to the environment. The pavilion takes up a footprint of approximately 456 SF and will be positioned above the Base Flood Elevation at 10.25 Please refer to architectural details submitted by Brown Lindquist Fenuccio and Raber Architects for further information.



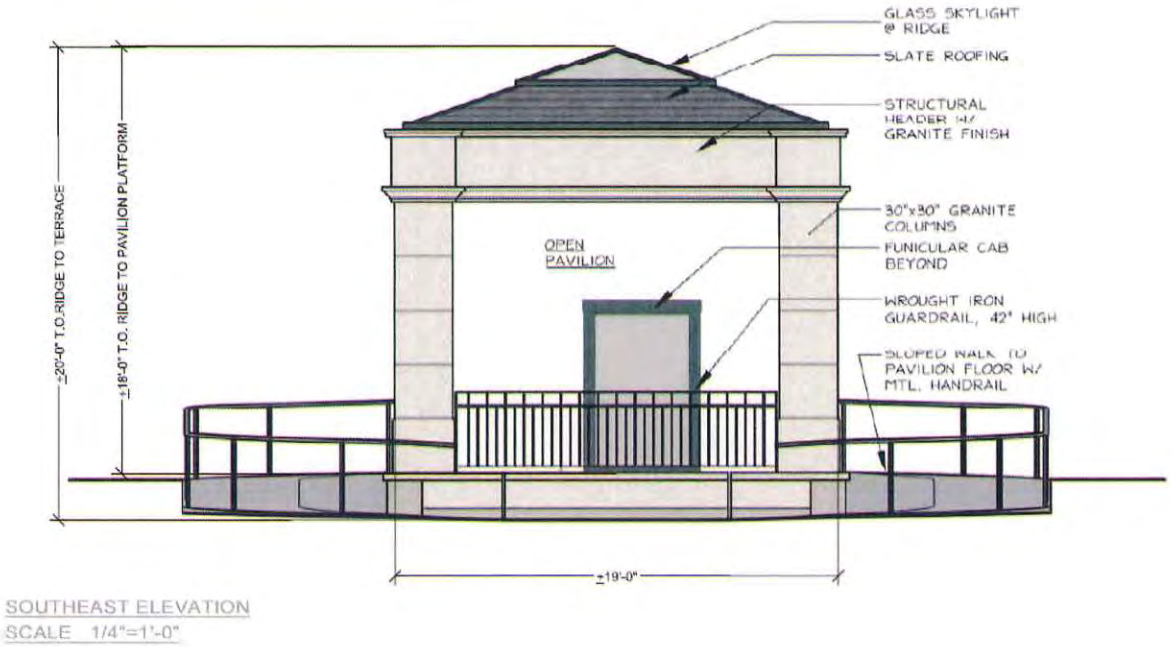
Aerial sketchup model of proposed pavilion and site features



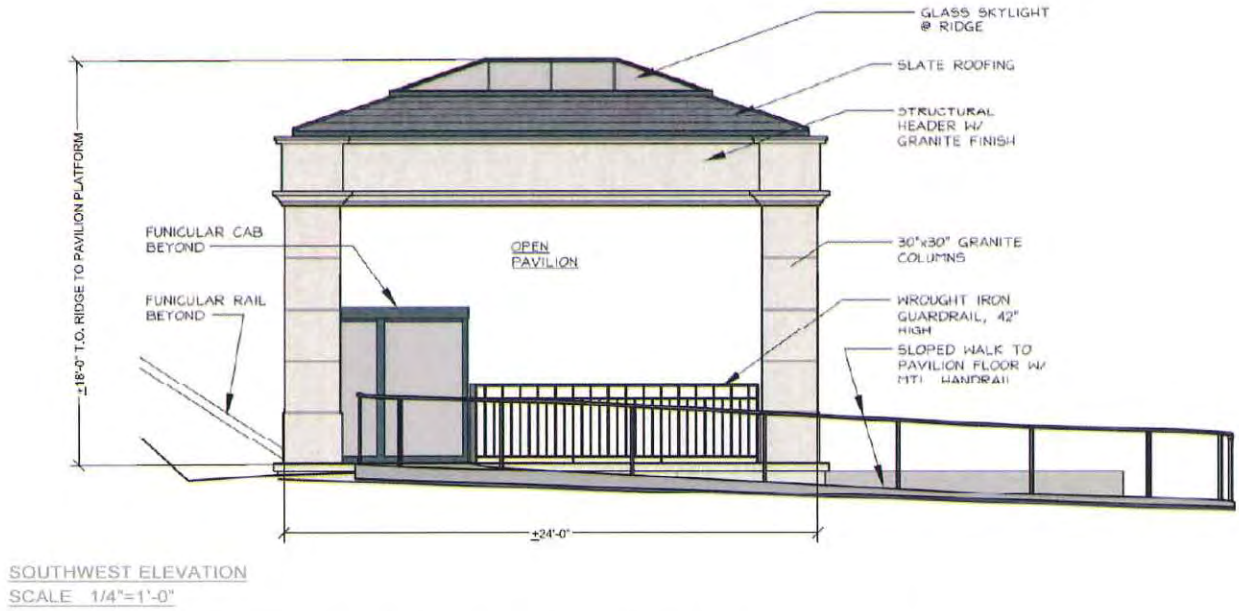
Northeast elevation of proposed pavilion structure



Northwest elevation of proposed pavilion structure

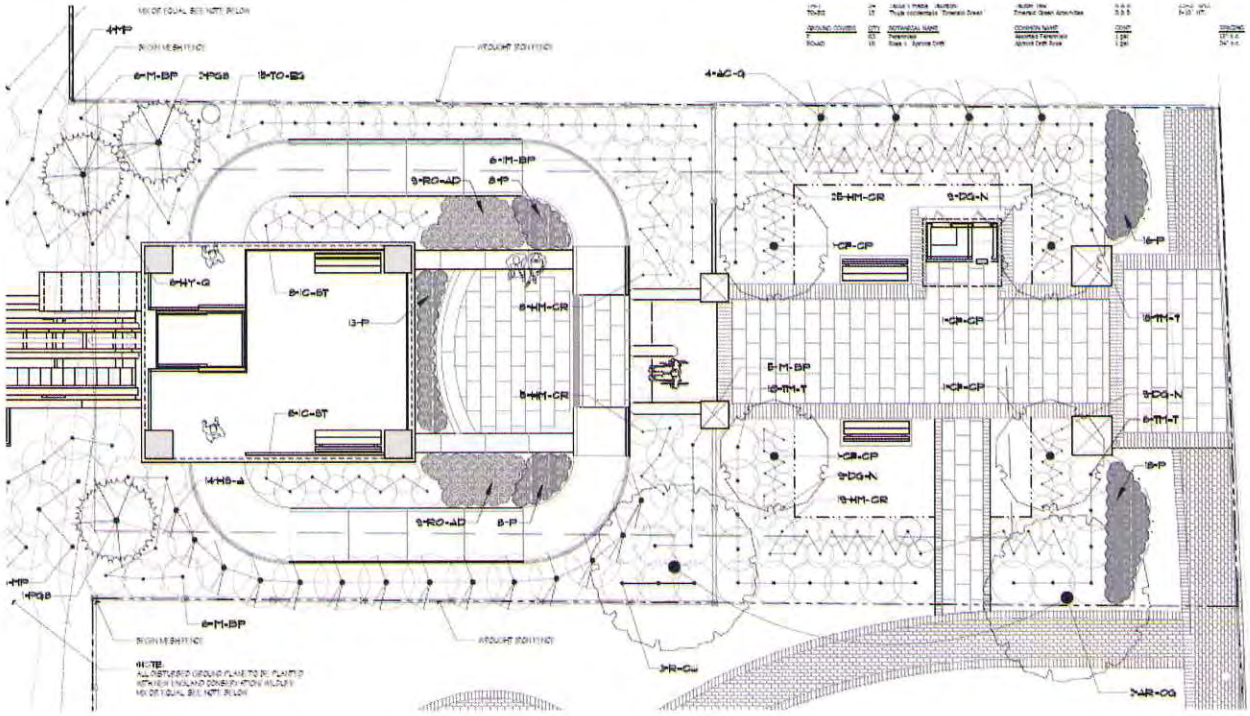


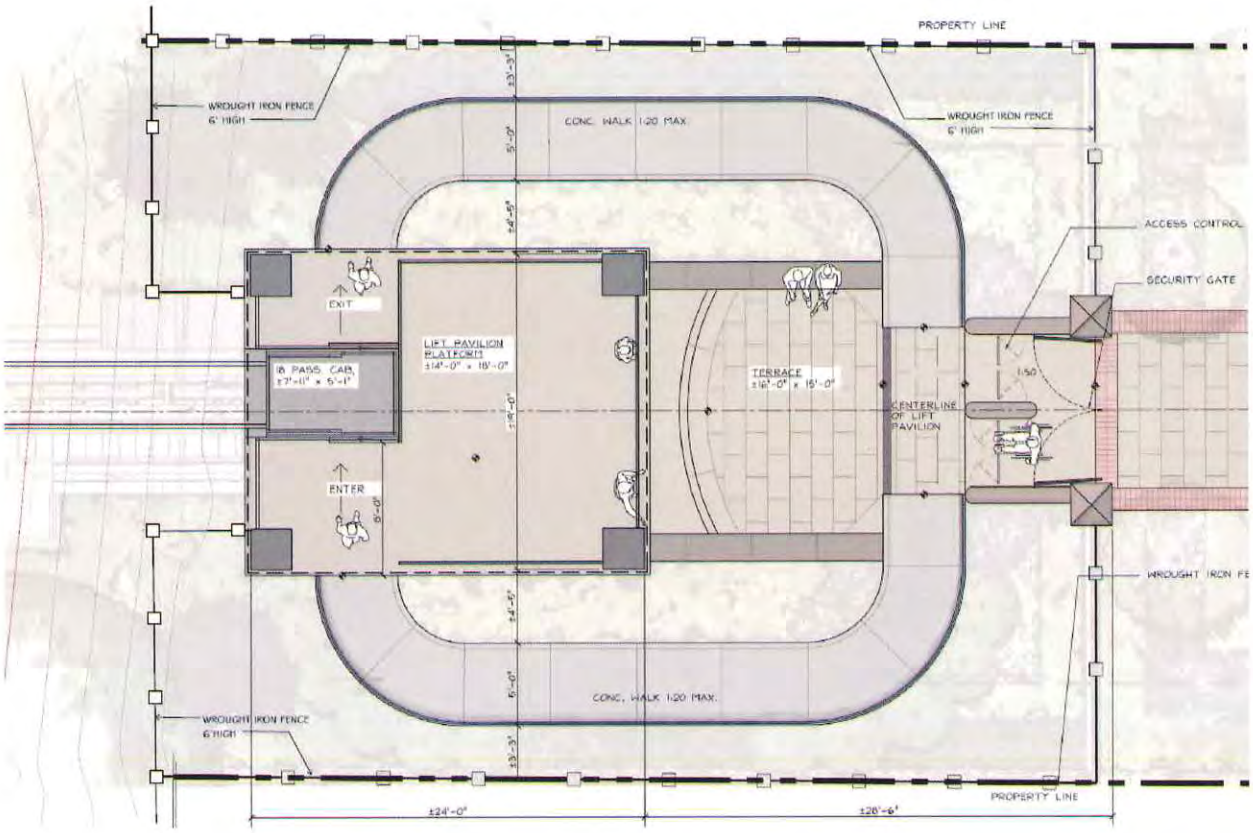
Southeast elevation of proposed pavilion structure



Southwest elevation of proposed pavilion structure

Site Features. The proposal includes redeveloping the site to include native and ornamental vegetation, new hardscapes for walkways and some sitting areas. Please refer to the vegetation plan submitted by Hawk Design for more information related to the hardscape and vegetation areas.





Drainage. To limit the amount of stormwater entering adjacent properties, a stormwater management system has been designed to accommodate roof runoff from the pavilion structure, as well as runoff from the hardscape walkway areas. As proposed, there will be a perimeter drain trench surrounding the pavilion that will convey water via PVC pipe to an underground CULTEC collection system below the lawn area as shown on the attached site plan. In addition, the walkways will have various French drain collector systems that will convey the water to the same underground storage area. A stormwater management report has been formulated and is also included with this Notice of Intent submittal.

Section C: Construction Sequence/Methods/Equipment

Pre-Construction

Prior to the start of any work there will be an on-site meeting to review the Order of Conditions and to assure the Conservation Agent that the work will be done as specified. The construction start date to occur upon completion of all pre-construction requirements outlined in the specifications and Order of Conditions, as well as any pre-construction requirements outlined during the pre-construction meeting.

The on-site pre-construction meeting will include a discussion on access and means of construction with the following individuals represented:

- Construction Contractor
- Coastal Engineering Co. Engineer(s)
- Provincetown Conservation Commission Agent or Representative

To be discussed during this meeting:

- Existing conditions
- Necessary precautions to be taken by the Contractor
- Necessary post-work operations and conditions
- Procedure for post-work site and access inspection

Pre-Construction Requirements for Contractor

- Proof and Certification of Insurance Coverage
- Waiver, Release and Indemnification
- Posting of DEP sign
- Issuance of Construction Access Permit by Town (if required)

Pre-Construction Requirements for Owner or Engineer Representative

- Pre-construction photographs of the access and staging area, access route, and project locus.

Access and Staging Areas

The access will be from the applicants property, or as agreed upon by owners, engineers, and Conservation Commission Agent.

Equipment

During the course of the work the following equipment have the potential to be needed in the project and access areas:

- Excavator, front end loader, crane
- Delivery Truck for delivering materials
- Hand tools, shovels

Work Completion

Upon completion of the work, the access way and staging areas are to be returned to their pre-construction conditions.

The Contractor is to notify the Engineer for a meeting with the parties taking part in the pre-construction meeting, prior to removal of equipment. Deficiencies will be identified to the Contractor and addressed with a plan and follow through until conditions are approved by the Engineer.

Post-Construction Photographs

The Owner or Owner's representative shall supply the Conservation Commission with post-construction photographs of the access and staging area and the project locus documenting completed work and clean-up.

Section D: Resource Area Impacts/Performance Standards

I. Provincetown Wetlands Protection Bylaw

12-7-4. Practicable alternatives. In the review of areas within 100 feet of rivers and streams, no permit issued hereunder shall permit any activities unless the applicant, in addition to meeting the otherwise applicable requirements of this bylaw, has proved by a preponderance of the evidence that (1) there is no practicable alternative to the proposed project with less adverse effects, and that (2) such activities, including proposed mitigation measures, will have no significant adverse impact on the areas or values protected by this bylaw. The Commission shall regard as practicable an alternative, which is reasonably available and capable of being done after taking into consideration the proposed property use, overall project purpose (e.g., residential, institutional, commercial, or industrial purpose), logistics, existing technology, costs of the alternatives, and overall project costs.

One alternative to the project would be to construct the pavilion structure on pilings, including the handicap accessible walkways. In that scenario, the handicap accessible walkways would have to become a pile supported structure vs what is currently proposed as an at grade sloping walkway. This alternative would not be aesthetically pleasing as it would expose the elevator machine room and associated foundations. Lastly, not only would the handicap walkway require pilings, the entire walkway leading to the funicular pavilion, including the kiosk center would require an elevated structure. These alternatives would not act seamlessly with the proposed vegetation plan and would become problematic.

12-7-5. Avoidance of wetlands loss or alteration. To prevent wetlands loss, the Commission shall require applicants to avoid wetlands alteration wherever feasible; shall minimize wetlands alteration; and, where alteration is unavoidable, shall require full mitigation. The Commission may authorize or require replication of wetlands as a form of mitigation, but only with adequate security, professional design, and monitoring to assure success, because of the high likelihood of failure of replication.

There is a substantial vegetation plan submitted by Hawk Design that incorporates the use of native and ornamental plantings to better serve as a wildlife habitat and increase aesthetics of the property.

12-9-2. Consistency with Wetlands Protection Act. Except as otherwise provided in this bylaw or in regulations of the Commission, the definitions of terms in this bylaw shall be as set forth in the Wetlands Protection Act (G.L. Ch. 131 §40) and Regulations (310 CMR 10.00).

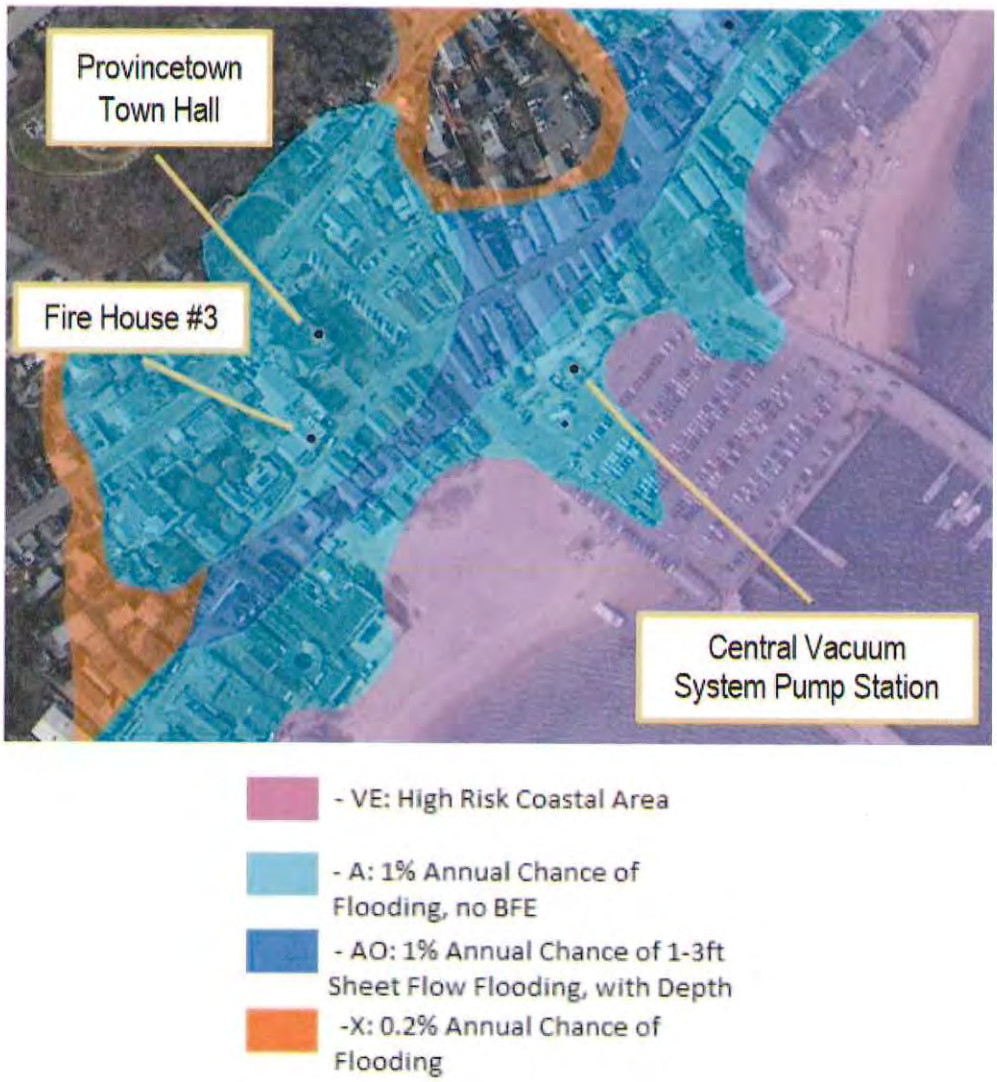
There are no performance standards for Land Subject to Coastal storm flowage (LSCSF) in the Wetland Protection Act.

12-12-1. Preponderance of Evidence. The applicant for a permit shall have the burden of proving by a preponderance of the credible evidence that the work proposed in the permit application will not have unacceptable significant or cumulative effect upon the resource area values protected by this bylaw. Failure to provide adequate evidence to the Commission supporting this burden shall be sufficient cause for the Commission to deny a permit or grant a permit with conditions.

The proposed project will require filling approximately 230 CY within Land Subject to Coastal Storm Flowage to accommodate the required grades for the funicular system and associated handicap accessible walkways. Since this is a tidal environment, there will be no significant or cumulative effects on the resource areas or surrounding properties as the displacement of material will not increase the elevation of the water in a flooding event. To put it into perspective, a controlled area in downtown Provincetown was

studied to portray the infinitesimal amount of the effects of the displacement of the 230 CY of material within the LSCSF.

Figure 3-1: FEMA FIRM Map - Town Assets Within Floodplain Zones



Picture taken from Woodard & Curran's report *"Increasing Coastal Resiliency and Reducing Infrastructure Vulnerability by Mapping Inundation Pathways"* dated June 2016

The above picture represents the FEMA firm map overlay of the 1% chance annual flood (100 year). This area was used as the control for the comparison of the volume of material displacement at the current site.

Google Earth imagery depicting control area

Estimating an area based on the Woodard & Curran image, a square footage was determined in the amount of 996,947 SF as shown in the above image.

Google Earth imagery depicting control area with subject parcel highlighted in BLUE

As previously stated, the current proposal involves filling of approximately 230 CY of material. Over the subject site, that equates to an average depth of approximately 1.5 FT. When extrapolating that depth over the entire control area of 996,947 SF, it results in a depth of approximately 0.00622 FT or 0.0747 IN which is about 5/64". This comparison clearly portrays that if this area were contained (which it is not because it's tidal and open to the ocean), that it has infinitesimal to no impacts. Therefore, by a preponderance of evidence, this representation explains that there will be no significant or cumulative effects caused by the project.

MASS DEP Performance Standards

Not applicable as the only resource area is Land Subject to Coastal Storm Flowage and there are no performance standards for this in the Wetlands Protection Act.

Section E: Sedimentation Controls

To act as a limit of work and also to aid in minimizing sedimentation to neighboring properties, a sedimentation barrier consisting of silt fencing and haybales (or as approved and agreed on by the Conservation Agent and Engineer) will be installed in areas subject to downstream sedimentation along the work limit line shown on the site plan.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Applicant Information

1. Location of Project:

1 High Pole Hill Road	Provincetown
a. Street Address	b. City/Town
37101	$237.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

K. David	Weidner, Executive Director
a. First Name	b. Last Name

Cape Cod Pilgrim Memorial Association
c. Organization

PO Box 1125
d. Mailing Address

Provincetown	MA	02657
e. City/Town	f. State	g. Zip Code

h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name

c. Organization

d. Mailing Address

e. City/Town	f. State	g. Zip Code

h. Phone Number	i. Fax Number	j. Email Address

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

B. Fees

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Cat 2j (any other activity)	1	$500.00	$500.00

Step 5/Total Project Fee: $500.00

Step 6/Fee Payments:

Total Project Fee:	$500.00 a. Total Fee from Step 5
State share of filing Fee:	$237.50 b. 1/2 Total Fee **less** $12.50
City/Town share of filling Fee:	$262.50 c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

COASTAL
engineering co.

Project #: C14394.08

AFFIDAVIT OF SERVICE

Massachusetts Wetlands Protection Act

M.G.L., CH 131, Sec. 40

I, Sarah Cole, of Coastal Engineering Co., Inc. hereby certify under the pains and penalties of perjury that on May 1, 2018 I sent notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131 Section 40 and the Department of Environmental Protection's Guide to Abutter Notification dated April 8, 1994 in connection with the following matter:

A Notice of Intent was filed under the Massachusetts Wetlands Protection Act and the Provincetown Wetlands Protection By-law, by Cape Cod Pilgrim Memorial Association with the Provincetown Conservation Commission on May 1, 2018 for property located at 1 High Pole Hill Road Map 12-1 Parcel 27 in Provincetown, MA. The project is for the proposed funicular and site improvements.

The form of the notification and a list of the abutters to whom the notice was given and their addresses are attached to this Affidavit of Service.

Very truly yours,

COASTAL ENGINEERING CO., INC.

Sarah Cole

Enclosures

cc: Mass. DEP/ SERO – Wetlands
Provincetown Conservation Commission
Cape Cod Pilgrim Memorial Association

D:\DOC\C14300\14394.08\Permitting\NOI\Affidavit.doc

PROVINCETOWN CONSERVATION COMMISSION
OFFICE OF COMMUNITY PLANNING
TOWN OF PROVINCETOWN
260 COMMERCIAL STREET
PROVINCETOWN, MASSACHUSETTS 02657
(508)487-7020

Notice to Abutters

The Provincetown Conservation Commission will hold a Public Hearing at 6:30 p.m. on Tuesday,

DATE (mm/dd/yyyy): 05/15/2018

to take place in the Judge Welsh Hearing Room, Town Hall, 260 Commercial Street, Provincetown, MA.

In accordance with the Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and/or the Provincetown General Bylaw, Chapter 12, Wetlands Protection Bylaw, the following application has been filed with the Provincetown Conservation Commission:

[x] **Notice of Intent (NOI)**

[ ] **Request for Determination of Applicability (RDA)**

[ ] **Local Bylaw Filing**

[ ] **Amended Order of Conditions** seeking an amendment to an already issued and active Order of Conditions under DEP File # _____

[ ] **Extension of an Order of Conditions** seeking an extension to an already issued and active Order of Conditions under DEP File #: _____

PROJECT ADDRESS: 1 High Pole Hill Road

APPLICANT &/OR OWNER: Cape Cod Pilgrim Memorial Association

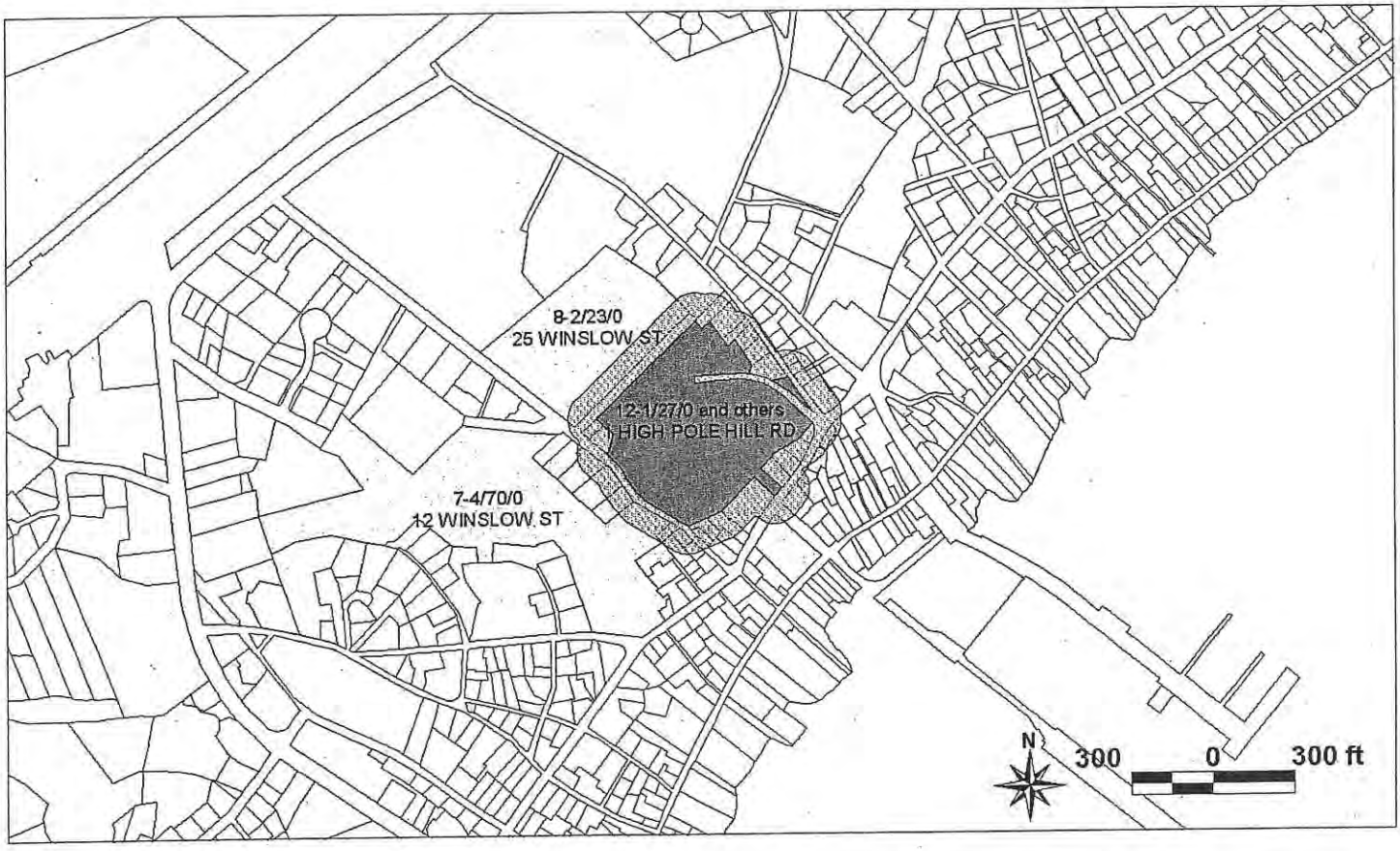
DESCRIPTION OF WORK BEING PROPOSED:

Proposed funicular (inclined elevator) and associated site improvements.

You have received this notice because you have been identified as an abutter of the property noted above. This project application and all related documents and plans will be posted on the Town website www.provincetown-ma.gov under Agendas and Minutes no later than the Thursday before the Public Hearing. Documents and plans can also be viewed at the Community Planning office located in the lower level of Town Hall, Monday through Thursday, between 8:30 am and 4:30 pm, and Friday between 8:30 am and 11:30 am. If you are unable to attend the Public Hearing, opinion letters may be sent no later than 24 hours in advance of the hearing to: Timothy Famulare at Town Hall, 260 Commercial Street Provincetown, MA 02657 or by email at tfamulare@provincetown-ma.gov.

TOWN OF PROVINCETOWN, MA
BOARD OF ASSESSORS
260 Commercial Street

Abutters List Within 100 feet of Parcel 12-1/27/0 and others

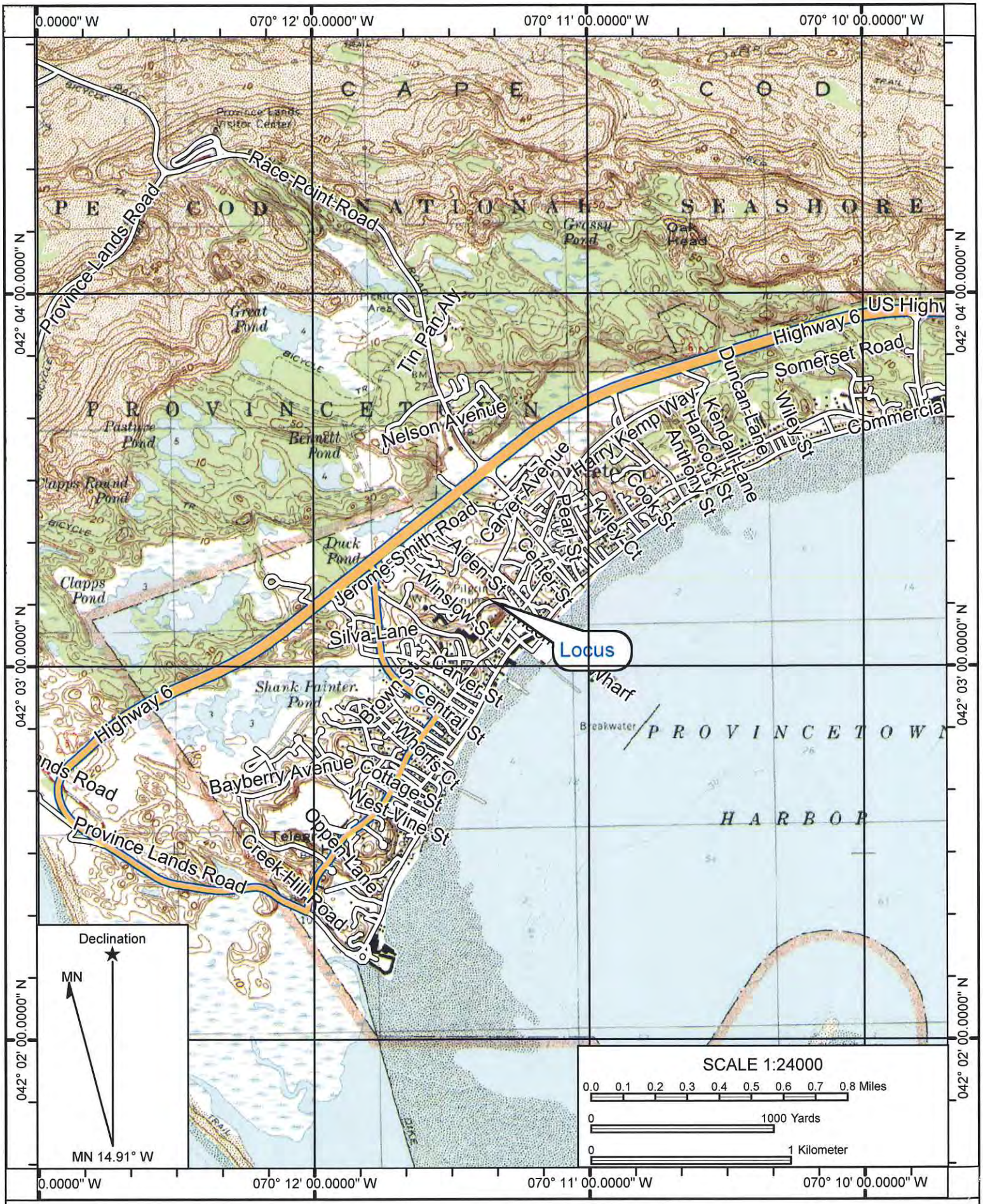


Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
1562	7-4-70-0-E	TOWN OF PROVINCETOWN SCHOOL COMMITTEE	12 WINSLOW ST	260 COMMERCIAL STREET	PROVINCETOWN	MA	02657
1563	7-4-71-0-R	EASTMAN LESTER JR ET AL DAVID P DAMON	14 WINSLOW ST	188 EXETER RD	HAMPTON FALLS	NH	03844
1564	7-4-72--001-R	CORDEIRO DARLENE	16-U1 WINSLOW ST	16 WINSLOW ST #1	PROVINCETOWN	MA	02657
1565	7-4-72--002-R	DIXON ROBERT K ET UX LINDA C DIXON	16-U2 WINSLOW ST	16-U2 WINSLOW ST	PROVINCETOWN	MA	02657
1566	7-4-72--003-R	REELE DEIBY O WILLIAM R WILSON	16-U3 WINSLOW ST	100 ALDEN ST #301	PROVINCETOWN	MA	02657
1567	7-4-72--004-R	ROUSSEAU ELLEN G	16-U4 WINSLOW ST	27 PEARL ST	PROVINCETOWN	MA	02657-1503
1568	7-4-72--005-R	SAUL JANE	16-U5 WINSLOW ST	16 WINSLOW ST #5	PROVINCETOWN	MA	02657
1570	7-4-74-0-R	CLAUDIA J MARTIN	18 WINSLOW ST	C/O PAULA M BARBOSA 683 MAIN ST - PO BOX 568	FALMOUTH	MA	02540
1571	7-4-75-0-R	MILLS DAVID A	20 WINSLOW ST	10 SYLVAN STREET	DANVERS	MA	01923
1649	8-2-21-0-R	FAIR KATHRYN E ET AL DEBORAH CONDON	15 WINSLOW ST	15 WINSLOW ST	PROVINCETOWN	MA	02657
1650	8-2-22-0-R	OCONNOR MICHAEL T ET AL MICHAEL C HARRIS	17 WINSLOW ST	5302 BRIDGE AVE	CLEVELAND	OH	44102
1651	8-2-23-0-E	TOWN OF PROVINCETOWN BOARD OF SELECTMEN	25 WINSLOW ST	260 COMMERCIAL ST	PROVINCETOWN	MA	02657
1970	11-3-65--00A-R	TABENKEN DAVID B	8-UA WEBSTER PL	10 EAST SPRINGFIELD ST UNIT #2	BOSTON	MA	02118
1971	11-3-65--00B-R	CIAGLO GREGORY	8-UB WEBSTER PL	8-UB WEBSTER PL	PROVINCETOWN	MA	02657
1972	11-3-66--001-R	BOWEN ALBERT L JR	7-U1 WEBSTER PL	226 BRADFORD ST	PROVINCETOWN	MA	02657

Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
1973	11-3-66--002-R	PHAKOS GINGER ET AL JOHN F CUSACK	7-U2 WEBSTER PL	288 PEARL ST	CAMBRIDGE	MA	02139-4716
1974	11-3-66--003-R	CHARTIER-PETRELIS MATTHEW JOSEPH CHARTIER-PETRELIS	7-U3 WEBSTER PL	15 DOW ST #3	SOMERVILLE	MA	02144
1988	11-3-71-0-R	ZULETA MAURICIO L	6 WINSLOW ST	29 SPRING PARK UNIT 1	JAMAICA PLAIN	MA	02130
1989	11-3-72-0-R	NIERATKA ERNEST ET AL PYE EDITH AKA EDITH NIERATKA	8 WINSLOW ST	8 WINSLOW ST	PROVINCETOWN	MA	02657
1990	11-3-73-0-R	HUSSON-COTE JAMES J JR ET AL JOHANNES HUSSON-COTE	10 WINSLOW ST	10 WINSLOW ST	PROVINCETOWN	MA	02657
1991	11-3-74-0-R	TEPPER E CLOTHIER	3 WINSLOW ST	3 WINSLOW ST	PROVINCETOWN	MA	02657
1992	11-3-75-0-R	ZHAO-WEINER YI	5 WINSLOW ST	5 WINSLOW ST	PROVINCETOWN	MA	02657
1993	11-3-76-0-R	STEELE DUANE A ET UX MARY JO AVELLAR	100 BRADFORD ST	100 BRADFORD ST	PROVINCETOWN	MA	02657
1998	11-3-81-0-E	TOWN OF PROVINCETOWN	260 COMMERCIAL ST	260 COMMERCIAL ST	PROVINCETOWN	MA	02657
2000	11-3-83-0-R	PROVINCETOWN PURCHASE TR ELIZABETH G BROOKE TTEE	102 BRADFORD ST	102 BRADFORD ST	PROVINCETOWN	MA	02657
2003	11-3-84-1-001-R	LIN YIHSIN JOHN ET AL PAUL CARACCIOLO	104-A U1 BRADFORD ST	170 W BROADWAY UNIT 402	SOUTH BOSTON	MA	02127
2004	11-3-84-1-002-R	VAIRINHOS FRANKLIN	104-A U2 BRADFORD ST	39 MARSHALL ST	WATERTOWN	MA	02472
2005	11-3-84-1-003-R	PROVINCETOWN PURCHASE TRUST II ELIZABETH BROOKE TTEE	104-A U3 BRADFORD ST	102 BRADFORD ST	PROVINCETOWN	MA	02657
2006	11-3-84-1-004-R	PROVINCETOWN PURCHASE TRUST II ELIZABTH BROOKE TTEE	104-A U4 BRADFORD ST	102 BRADFORD ST	PROVINCETOWN	MA	02657
2007	11-3-84-1-005-R	VALENTI HOPE M ET AL DIANE BLISS	104-A U5 BRADFORD ST	66 HILLSIDE AVE	BRIDGEWATER	NJ	08807
2008	11-3-84-1-006-R	MCCOLLOUGH DAWN M	104-A U6 BRADFORD ST	82 N MAIN ST #3220	NATICK	MA	01760
2009	11-3-84-1-007-R	BROME DEBORAH V	104-A U7 BRADFORD ST	175 WILLOUGHBY ST #11C	BROOKLYN	NY	11201
2010	11-3-84-2-008-R	VALENTI HOPE M	104-U8 BRADFORD ST	66 HILLSIDE AVE	BRIDGEWATER	NJ	08807
2011	11-3-84-2-009-R	PROVINCETOWN PURCHASE TR II ELIZABETH G BROOKE ET AL TTEES	104-U9 BRADFORD ST	104-U9 BRADFORD ST	PROVINCETOWN	MA	02657
2012	11-3-84-2-010-R	CHRISTY KIMBERLY A	104-U10 BRADFORD ST	1604 WETHERSFIELD RD	AUSTIN	TX	78703
2013	11-3-84-2-011-R	104 REALTY TR DAREN & BROOKE TTEE	104-U11 BRADFORD ST	104-U11 BRADFORD ST	PROVINCETOWN	MA	02657
2014	11-3-84-2-012-R	REYES GERARDO F	104-U12 BRADFORD ST	39 BEECH ST	MAYWOOD	NJ	07607
2015	11-3-84-2-013-R	SHELTONS BEND LLC	104-U13 BRADFORD ST	27 WATSONS CT	PROVINCETOWN	MA	02657
2016	11-3-84-2-014-R	VALENTI HOPE M	104-U14 BRADFORD ST	66 HILLSIDE AVE	BRIDGEWATER	NJ	08807
2017	11-3-84-2-015-R	PROVINCETOWN PURCHASE TR II ELIZABETH G BROOK ET AL TTEES	104-U15 BRADFORD ST	102 BRADFORD ST	PROVINCETOWN	MA	02657
2018	11-3-84-2-016-R	BICKO ZDENEK ET AL JOHN D AMARAL	104-U16 BRADFORD ST	357 VARICK ST #525-B	JERSEY CITY	NJ	07302
2019	11-3-85-0-E	TOWN OF PROVINCETOWN BOARD OF SELECTMEN	106 BRADFORD ST	260 COMMERCIAL ST	PROVINCETOWN	MA	02657
11003	11-3-86-1-001-R	HOTSPOT LLC RICHARD P TREVINO MGR	116-U1 BRADFORD ST	15 WORCESTER SQ #4	BOSTON	MA	02118
11004	11-3-86-1-002-R	TEIXEIRA PAUL ET AL LEE J KUGLER	116-U2 BRADFORD ST	62 ELEANOR ST	CHELSEA	MA	02150
11005	11-3-86-1-003-R	FIELD III JOEL M	116-U3 BRADFORD ST	406 W 44TH ST #21	NEW YORK	NY	10036
2021	11-3-87-0-R	118 BRADFORD ST REALTY TR KEVIN BAZARIAN ET AL TTEES	118 BRADFORD ST	P O BOX 5	PROVINCETOWN	MA	02657
2022	11-3-88-0-R	SCHIFFMAN MARK E	120 BRADFORD ST	PO BOX 212	PROVINCETOWN	MA	02657
2023	11-3-89-1-001-R	AKHTAR AYAZ ET UX AKHTAR SAIMA	127-U1 BRADFORD ST	45 CENTRAL STREET	SOUTH WEYMOUTH	MA	02190
2024	11-3-89-1-002-R	CONKLIN DALE E	127-U2 BRADFORD ST	PO BOX 1542	PROVINCETOWN	MA	02657-5542
2025	11-3-89-1-003-R	LIPTON JOHN R	127-U3 BRADFORD ST	1387 WASHINGTON ST #201	BOSTON	MA	02118-2024
2026	11-3-89-1-004-R	SVETZ WILLIAM J	127-U4 BRADFORD ST	17 EVERETT ST	DORCHESTER	MA	02122
2027	11-3-89-2-005-R	CUENCAS RICHARD A	127-U5 BRADFORD ST	127-U5 BRADFORD ST	PROVINCETOWN	MA	02657
2028	11-3-90-0-R	CULVER JOHN D	288-C COMMERCIAL ST	PO BOX 228	PROVINCETOWN	MA	02657
2029	11-3-91-0-R	CULVER JOHN D ET AL PETER B WARNOCK	123 BRADFORD ST	PO BOX 228	PROVINCETOWN	MA	02657
2030	11-3-92-0-R	119 BRADFORD ST REALTY TRUST ANTHONY E JOSEPH TTEE	119 BRADFORD ST	119 BRADFORD ST	PROVINCETOWN	MA	02657
2031	11-3-93-0-R	DAVIS KAOLIN	284-A COMMERCIAL ST	284A COMMERCIAL ST	PROVINCETOWN	MA	02657

Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
2032	11-3-94-0-R	THE PALETTE FUND	115 BRADFORD ST	115 BRADFORD ST	PROVINCETOWN	MA	02657
2051	11-3-103-0-R	HOWARD ANN B ET AL EMILIE J MARKS	294-A COMMERCIAL ST	294A COMMERCIAL ST	PROVINCETOWN	MA	02657
2145	12-1-23-0-R	BRADBURY ALLAN	133 BRADFORD ST	100 EAST MOORE ST	HACKETTSTOWN	NJ	07840
2146	12-1-25--001-R	PERRY SCOTT ET AL ALAN CANCELINO	129-U1 BRADFORD ST	104 WEST 17TH ST #4-W	NEW YORK	NY	10017
2147	12-1-25--002-R	BRASS KEY HOSPITALITY GRP LLC	129-U2 BRADFORD ST	67 BRADFORD ST	PROVINCETOWN	MA	02657
2148	12-1-26-0-E	TOWN OF PROVINCETOWN BOARD OF SELECTMEN	122 BRADFORD ST	260 COMMERCIAL ST	PROVINCETOWN	MA	02657
2149	12-1-27-0-R	CAPE COD PILGRIM MEMORIAL ASSN	1 HIGH POLE HILL RD	PO BOX 1125	PROVINCETOWN	MA	02657
2150	12-1-27-X-E	CAPE COD PILGRIM MEMORIAL ASSN	1 HIGH POLE HILL RD	PO BOX 1125	PROVINCETOWN	MA	02657
2152	12-1-28-1-001-R	PAGE STEVEN	10-U1 ALDEN ST	P O BOX 426	PROVINCETOWN	MA	02657
2153	12-1-28-1-002-R	YATES ERIK J	10-U2 ALDEN ST	307 WEST 126TH ST APT 2-A	NEW YORK	NY	10027
2154	12-1-29-0-R	BROWN CATHERINE M	12 ALDEN ST	5 CITY TER NORTH	NEWBURGH	NY	12550-3406
2155	12-1-30-0-R	RENCUS TAL	16 ALDEN ST	373 COMMONWEALTH AVE #301	BOSTON	MA	02115
2156	12-1-31-0-R	HOPKINS KHRISTINE C ET AL CLARENCE D BEAL III	18 ALDEN ST	18 ALDEN ST	PROVINCETOWN	MA	02657
4114	12-1-32--001-R	STEINBERG MARJORIE J ET AL PATTI S BUXSER	20-U1 ALDEN ST	20-U1 ALDEN ST	PROVINCETOWN	MA	02657
4115	12-1-32--002-R	STIEBER TRACY ET UX KATHLEEN M BROWNE	20-U2 ALDEN ST	1 TIMBERLANE DR	PENNINGTON	NJ	08534
4116	12-1-32--003-R	APPLEBY-MARTIN REALTY TR APPLEBY LAURIE H ET AL TTEES	20-U3 ALDEN ST	30 CERDAN AVE	WEST ROXBURY	MA	02132
4117	12-1-32--004-R	WELLINGTON DAVID S ET AL JOSHUA T NUNNELEY	20-U4 ALDEN ST	26 JONES AVE	PAWTUCKET	RI	02861
9250	12-1-32-Z-P01-R	THE BOATWORKS BUILDING LLC	20-P1 ALDEN ST	C/O WILLIAM A BONN 501 ALHAMBRA CIR	CORAL GABLES	FL	33134
9251	12-1-32-Z-P02-R	THE BOATWORKS BUILDING LLC	20-P2 ALDEN ST	C/O WILLIAM A BONN 501 ALHAMBRA CIR	CORAL GABLES	FL	33134
9252	12-1-32-Z-P03-R	JOHN H BASILE LIVING TR JOHN H BASILE TTEE	20-P3 ALDEN ST	400 STUART ST UNIT 16H	BOSTON	MA	02116
9253	12-1-32-Z-P04-R	HEROPOULOS JOHN A ET AL RICHARD B CROOK	20-P4 ALDEN ST	107 WINTHROP AVE	QUINCY	MA	02170
9254	12-1-32-Z-P05-R	333R COMMERCIAL STREET LLC	20-P5 ALDEN ST	61 FOREST ST	NEEDHAM	MA	02492
9255	12-1-32-Z-P06-R	DEMAIO CHRISTOPHER S	20-P6 ALDEN ST	6 LUCILLE BLVD	NEW YORK	NY	10956
9256	12-1-32-Z-P07-R	COOPIOUS LLC	20-P7 ALDEN ST	107 LOKER ST	WAYLAND	MA	01778
9034	12-1-33--001-R	CHASE EDWARD M ET AL SAMUEL R MONIRI	22-U1 ALDEN ST	335 WEST SECOND ST #22	SOUTH BOSTON	MA	02127
9036	12-1-33--002-R	SMITH WAYNE A	22-U2 ALDEN ST	2500 NE 135TH ST PH2	NORTH MIAMI	FL	33181
9038	12-1-33--003-R	CONNOLLY WILLIAM ET AL RICHARD A SILVA	22-U3 ALDEN ST	335 WEST 2ND ST #14	BOSTON	MA	02127
9040	12-1-33--004-R	SILVA RICHARD A ET AL WILLIAM CONNOLLY	22-U4 ALDEN ST	335 WEST 2ND ST #14	BOSTON	MA	02127
10771	12-1-34-1-001-R	MCKINNEY ANDREW M	26-U1 ALDEN ST	37 E CONCORD ST UNIT 4	BOSTON	MA	02118
10772	12-1-34-1-002-E	PROVINCETOWN HOUSING AUTHORITY	26-U2 ALDEN ST	44 HARRY KEMP WAY	PROVINCETOWN	MA	02657
10773	12-1-34-1-003-E	PROVINCETOWN HOUSING AUTHORITY	26-U3 ALDEN ST	44 HARRY KEMP WAY	PROVINCETOWN	MA	02657
10774	12-1-34-1-004-E	PROVINCETOWN HOUSING AUTHORITY	26-U4 ALDEN ST	44 HARRY KEMP WAY	PROVINCETOWN	MA	02657
10775	12-1-34-1-005-R	J&C ROYAL PALM LLC	26-U5 ALDEN ST	8805 TAMIAMI TRAIL SUITE #361	NAPLES	FL	34108
10776	12-1-34-1-006-R	MA PATRICIA ET AL SUZANNA A MELOTTI	26-U6 ALDEN ST	1690 WASHINGTON ST #4	BOSTON	MA	02118
10777	12-1-34-1-007-R	BADASH DAVID W ET VIR CALEB EIGSTI	26-U7 ALDEN ST	26-U7 ALDEN ST	PROVINCETOWN	MA	02657
10778	12-1-34-1-008-R	IRWIN JAMES R	26-U8 ALDEN ST	420 WEST 23RD ST #9-A	NEW YORK	NY	10011-2174
10779	12-1-34-1-009-R	BROWNING BARBARA ET UX KIMBERLY D WARD	26-U9 ALDEN ST	22 HILLCROFT RD	JAMAICA PLAIN	MA	02130
10796	12-1-34-Z-004-R	FERRARI LLC	26-P4 ALDEN ST	342 COMMERCIAL ST #1	PROVINCETOWN	MA	02657
10805	12-1-34-Z-P01-R	MARINO JEAN	26-P1 ALDEN ST	14 CENTER ST	PROVINCETOWN	MA	02657
10802	12-1-34-Z-P02-R	ABATTO JACQUES	26-P2 ALDEN ST	PO BOX 170780	BOSTON	MA	02117
10795	12-1-34-Z-P03-R	SMITH WAYNE A	26-P3 ALDEN ST	2500 NE 135TH ST PH2	NORTH MIAMI	FL	33181

Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
10797	12-1-34-Z-P05-R	DESIMONE DIANA E	26-P5 ALDEN ST	10 UPPER TERRACE	MEREDITH	NH	03253
10798	12-1-34-Z-P07-R	RODRIGUEZ-VILLALOBOS J ET AL CHRISTOPHER J LAPIN	26-P7 ALDEN ST	34 CLARENDON ST	BOSTON	MA	02116
10803	000012-10000000000(						
10804	12-1-34-Z-P11-R	JORDAN TERRELL	26-P11 ALDEN ST	31 EAST CONCORD ST	BOSTON	MA	02118
10799	12-1-34-Z-P17-R	MICHAUD ANNA Y	26-P17 ALDEN ST	29 ALDEN ST U2	PROVINCETOWN	MA	02657
10800	12-1-34-Z-P18-R	SNOW SEBASTIAN ET UX DAWN SNOW	26-P18 ALDEN ST	45 CHASKE AVE	AUBURNDALE	MA	02466
10801	12-1-34-Z-P19-R	OGATA BURTON	26-P19 ALDEN ST	241 PERRYVILLE RD	REHOBOTH	MA	02769
2173	12-1-42-0-R	RUESCH DEVON	11 ALDEN ST	P.O. BOX 1877	PROVINCETOWN	MA	02657
2174	12-1-43-0-R	TARANTOLA WILLIAM ET AL PATRICK J PERRI	9 ALDEN ST	16 DOUGAL LN	EAST NORTHPORT	NY	11731
2175	12-1-44-0-R	BREITHAUPT NANCY	7 ALDEN ST	87 WINCHESTER CT	READING	PA	19606
2176	12-1-45-0-R	ADAMS BERTHA L (LIFE ESTATE) DOROTHY/ERNEST/JOHN ADAMS	5 ALDEN ST	5 ALDEN ST	PROVINCETOWN	MA	02657
2177	12-1-46-0-E	TOWN OF PROVINCETOWN BOARD OF SELECTMEN	126 BRADFORD ST	260 COMMERCIAL ST	PROVINCETOWN	MA	02657
2178	12-1-47-0-R	MILAN REALTY LLC	128 BRADFORD ST	C/O MUKESH PATEL ET AL 120 HANNAH NILE WAY	BRAINTREE	MA	02184
2179	12-1-48-0-R	MILAN REALTY LLC	130 BRADFORD ST	C/O MUKESH PATEL ET AL 120 HANNAH NILE WAY	BRAINTREE	MA	02184
2181	12-1-50-0-R	SCALES CHRISTOPHER	12-A STANDISH ST	12-A STANDISH ST	PROVINCETOWN	MA	02657
2182	12-1-51-0-R	PETERSON PATRICK M ET UX JEANNE A PETERSON	14-A STANDISH ST	21 1/2 INMAN ST	CAMBRIDGE	MA	02139



Name: PROVINCETOWN
Date: 03/21/18
Scale: 1 inch = 2,000 ft.

Location: 042° 03' 10.2897" N, 070° 11' 21.3258" W
C14394.08, Cape Cod Pilgrim Memorial Association
1 High Pole Hill Road, Provincetown

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Datum: NAD27

FILE NO. C14394.08

STORMWATER MANAGEMENT REPORT

for

Proposed funicular system
& associated site improvements

1 High Pole Hill Road
Provincetown, Massachusetts

April 30, 2018

Prepared for:

Cape Cod Pilgrim Memorial Association
PO Box 1125
Provincetown, MA 02657

Prepared by:

COASTAL ENGINEERING CO., INC.
260 Cranberry Highway
Orleans, MA 02653

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- **STORMWATER MANAGEMENT STANDARDS**

- **APPENDICES**

  A MA DEP Checklist for Stormwater Report
  B Operations & Maintenance Information
  C Stormwater Management Log
  D Soils maps & FEMA Firmette
  E Drainage Calculations Report

Stormwater Management Standards

Project Narrative

The project site consists of one parcel that is owned by the Cape Cod Pilgrim Memorial Association. The upper site consists of the Pilgrim Monument and Provincetown Museum with associated parking and gathering areas. The lower portion of the lot that fronts on Bradford street is the locus for the subject project. It is currently an undeveloped area of the lot which consists of various groundcover and vegetation, including a few fences and signage. The majority of this area is located within Land Subject to Coastal Storm Flowage as it is located below the Base Flood Elevation of 9.0 NAVD 88.

The project consists of constructing a funicular (inclined elevator) that will bring passengers up the side of the hill to the upper portion of the lot where the Pilgrim Memorial and Provincetown Museum are located. A granite column supported pavilion is proposed as the launching pad or "station" where the entering and exiting will occur for the funicular uses. The site will be raised slightly to accommodate the pavilion landing area to be above the BFE at elevation 10.25. The remainder of the site leading to Bradford street will include paved walkway surfaces that will comply with ADA handicap accessibility. Native vegetation and ornamental shrubs will be implemented throughout the site.

This project is classified as a Redevelopment Project under the Massachusetts Stormwater Management Guidelines because the site has already been developed with structures and other less pervious improvements. The guidelines require that site improvements be made to contain stormwater runoff on the site for percolation into the ground if a new project, or reduce the stormwater runoff to the maximum extent practicable if the project is determined to be a Redevelopment Project.

Therefore the project has implemented drainage measures to reduce the stormwater runoff to adjacent sites to the maximum extent practicable by means of a shallow underground infiltration system comprised of cultec chambers and stone. There will be approximately a 2' separation distance between the bottom of the system to the groundwater elevation of 3.0 NAVD 88. A perimeter drip trench will be installed around the proposed pavilion and piped via 4" PVC piping to the cultect chambers. There are also (2) two sets of French drains that will collect stormwater from the walkways that will also be piped to the manifold of the cultec chamber system. Calculations for this system, including pre and post flows are attached to this stormwater management report. The soils of the site have been studied and have been determined to be coarse medium sand yielding a high infiltration rate.

The accompanying plan and design specifications show the Best Management Practices (BMP) proposed for the project.

Below are the descriptions of the extent to which the DEP Stormwater Management Standards have been met.

Standard 1: No New Untreated Discharges

This is a redevelopment project and there are no new untreated discharges proposed for this project.

Standard 2: Peak Rate Control and Flood Prevention

Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

Standard 3: Recharge to Groundwater

The soils analysis indicates a soil type ***612D*** ***(Hooksan Sand)*** *which is used in the recharge calculations provided. The sizing of storm water infiltration components is based on the 25-year storm event and the SCS TR-20 method and run-off from the site is directed to infiltration components to the maximum extent*

practicable and complies with BMPs. Recharge BMPs have been designed to infiltrate the required recharge volume (see Appendix E Drainage Calculations Report) to the maximum extent practicable.

Standard 4: Water Quality
There are good housekeeping practices proposed such as routine inspection and maintenance of the stormwater management system. Spill prevention and response is through the Fire and Police Departments of the Town of Provincetown. The maintenance of the proposed stormwater management system will be performed by an entity/designee appointed by the Cape Cod Pilgrim Memorial Association, Lastly, there is an inspection and maintenance schedule proposed in the accompanying O & M Manual.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)
There are no proposed high potential pollutant loads.

Standard 6: Critical Areas
The proposed stormwater management system has been designed to the maximum extent practicable.

Standard 7: Redevelopments and Other Projects Subject to the standards only to the maximum extent practicable
We have met the associated standards 2 and 3 (see the attached plan and Appendix E Drainage Calculations Report). We have met the minimum required recharge standards and the post-development of the site will have improved conditions from the pre-development conditions. This standard is met by the proposed system as designed in accordance with the Massachusetts Stormwater Handbook. The infiltration rate at the site is greater than 2.4 inches per hour and site run-off will be further contained.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control
Silt fences are proposed along the property sidelines and along the clearing edges to act as a limit of work. The contractor is responsible for compliance during construction. The proposed inspection and maintenance schedule during construction will be daily and conducted by the contractor. Attached is a typical inspection and maintenance log form.

Standard 9: Operation and Maintenance Plan
A long-term O&M Plan is submitted in Appendix B.

Standard 10: Prohibition of Illicit Discharges
To the best of our knowledge, there are no existing illicit discharges at the site and the proposed very public nature of the proposed project does not facilitate any type of illicit discharges at the site.

Appendix A
MA DEP
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

---

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

COMMONWEALTH OF MASSACHUSETTS
ROGER PAUL MICHNIEWICZ
CIVIL
No. 40420
REGISTERED PROFESSIONAL ENGINEER

4-30-18

4-30-18

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☒ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☒ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B
Operations & Maintenance Information

OPERATIONS AND MAINTENANCE REPORT

for

Proposed funicular system
& associated site improvements

1 High Pole Hill Road
Provincetown, Massachusetts

April 30, 2018

Prepared for:

Cape Cod Pilgrim Memorial Association
PO Box 1125
Provincetown, MA 02657

Prepared by:

COASTAL ENGINEERING CO., INC.
260 Cranberry Highway
Orleans, MA 02653

Table of Contents

Park Facility Description

Responsible Party for Operation and Maintenance of Facility

Schedule of Inspection and Maintenance of System

Source Control Best Management Practices

O & M Log Form

Facility Description

Project Narrative

The project site consists of one parcel that is owned by the Cape Cod Pilgrim Memorial Association. The upper site consists of the Pilgrim Monument and Provincetown Museum with associated parking and gathering areas. The lower portion of the lot that fronts on Bradford Street is the locus for the subject project. It is currently an undeveloped area of the lot which consists of various groundcover and vegetation, including a few fences and signage. The majority of this area is located within Land Subject to Coastal Storm Flowage as it is located below the Base Flood Elevation of 9.0 NAVD 88.

The project consists of constructing a funicular (inclined elevator) that will bring passengers up the side of the hill to the upper portion of the lot where the Pilgrim Memorial and Provincetown Museum are located. A granite column supported pavilion is proposed as the launching pad or "station" where the entering and exiting will occur for the funicular uses. The site will be raised slightly to accommodate the pavilion landing area to be above the BFE at elevation 10.25. The remainder of the site leading to Bradford street will include paved walkway surfaces that will comply with ADA handicap accessibility. Native vegetation and ornamental shrubs will be implemented throughout the site.

This project is classified as a Redevelopment Project under the Massachusetts Stormwater Management Guidelines because the site has already been developed with structures and other less pervious improvements. The guidelines require that site improvements be made to contain stormwater runoff on the site for percolation into the ground if a new project, or reduce the stormwater runoff to the maximum extent practicable if the project is determined to be a Redevelopment Project.

Therefore the project has implemented drainage measures to reduce the stormwater runoff to adjacent sites to the maximum extent practicable by means of a shallow underground infiltration system comprised of cultec chambers and stone. There will be approximately a 2' separation distance between the bottom of the system to the groundwater elevation of 3.0 NAVD 88. A perimeter drip trench will be installed around the proposed pavilion and piped via 4" PVC piping to the cultect chambers. There are also (2) two sets of French drains that will collect stormwater from the walkways that will also be piped to the manifold of the cultec chamber system. Calculations for this system, including pre and post flows are attached to this stormwater management report. The soils of the site have been studied and have been determined to be coarse medium sand yielding a high infiltration rate.

Owner and Responsible Party

The owner and responsible party for the operation and maintenance of the park facility at 1 High Pole Hill Road, Provincetown, MA is the following:

Owner: Cape Cod Pilgrim Memorial Association

Operator: K. David Weidner, PhD, Executive Director

Schedule of Inspection and Maintenance of Facility

1. The stormwater management system requires regular attention in order to ensure the effectiveness of the facility. It is recommended that the facility be inspected annually by a professional engineer in order to ensure that the facility is properly maintained. Any deterioration threatening the structural integrity of the facilities shall be immediately repaired.

2. Drainage system shall be inspected quarterly and as needed on a regular basis to ensure proper functioning and operation. A detailed maintenance logbook shall be kept on site detailing the date of inspection, condition of system, date and type of cleaning performed and date and type of repairs performed.

Source Control Best Management Practices

1. Trash containers shall be covered. If leaks are found the container shall be replaced.

2. Any trash container area shall be kept clear of debris.

3. Proposed walkways shall be regularly maintained and swept as required to alleviate siltation and/or debris from entering the infiltration areas.

Appendix C
Stormwater Management Log

O & M Log Form

Inspector Initials	Item Inspected

Date	Time	Condition			
		Good	Clean-out Needed	Repair Needed	Repaired Date

Appendix D
Soils Map & FEMA Firmette

United States Department of Agriculture
Natural Resources Conservation Service

ontact Us | Subscribe | Archived Soil Surveys | Soil Survey Status | Glossary | Preferences | Link | Logout | Help

Area of Interest (AOI) | Soil Map | Soil Data Explorer | Download Soils Data | Shopping Cart (Free)

Search

Map Unit Legend

	Plymouth-Nantucket complex, rolling, very bouldery		
600	Pits, sand and gravel	1,628.4	0.2
602	Urban land	3,757.2	0.5
607	Water, saline	35,561.6	5.1
608	Water, ocean	392,619.4	56.7
610	Beaches	5,220.3	0.8
611	Dune land	984.1	0.1
612C	Hooksan sand, 3 to 15 percent slopes	6,190.6	0.9
612D	Hooksan sand, 15 to 35 percent slopes	2,381.7	0.3
613C	Hooksan-Dune land complex, 15 to 35 percent slopes	3,341.6	0.5
652	Dumps, landfill	367.3	0.1
665	Udipsamments, smoothed	4,623.8	0.7
Totals for Area of Interest		**692,159.2**	**100.0**

Legend

Soil Map

Scale (not to scale)

National Flood Hazard Layer FIRMette

FEMA

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth
- Regulatory Floodway Zone AE, AO, AH, VE, AR

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/25/2018 at 4:55:54 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Barnstable County, Massachusetts

612D—Hooksan sand, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2x1kq
Elevation: 0 to 190 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hooksan and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hooksan

Setting

Landform: Dunes
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Crest, base slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy eolian deposits

Typical profile

C1 - 0 to 20 inches: sand
C2 - 20 to 30 inches: sand
C3 - 30 to 64 inches: sand

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very high (14.17 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Succotash

Percent of map unit: 8 percent
Landform: Spits, dunes, barrier flats
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Linear
Hydric soil rating: No

Beaches

Percent of map unit: 5 percent
Landform: Beaches
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: Unranked

Dune land

Percent of map unit: 5 percent
Landform: Dunes
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope, base slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Unranked

Sandyhook

Percent of map unit: 2 percent
Landform: Back-barrier flats, back-barrier beaches
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Tidal Salt High Marsh mesic very frequently flooded (R144AY002CT), Tidal Salt Low Marsh mesic very frequently flooded (R144AY001CT)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Barnstable County, Massachusetts
Survey Area Data: Version 14, Oct 6, 2017

Appendix E
Drainage Calculations Report

Summary for Subcatchment 1S: Pre-Development

[49] Hint: Tc<2dt may require smaller dt

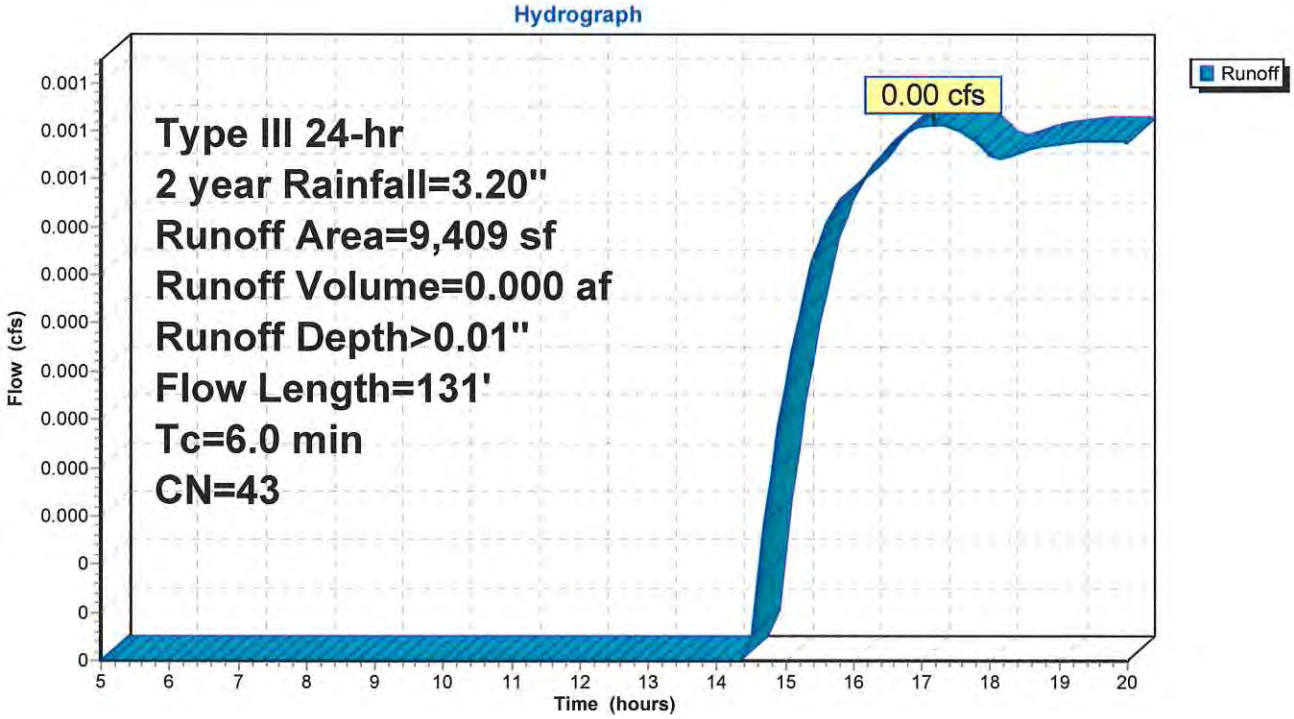
Runoff = 0.00 cfs @ 17.17 hrs, Volume= 0.000 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
9,409	43	Woods/grass comb., Fair, HSG A
9,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	131		0.36		**Direct Entry, Over pavement**

Subcatchment 1S: Pre-Development



Summary for Subcatchment 1S: Pre-Development

[49] Hint: Tc<2dt may require smaller dt

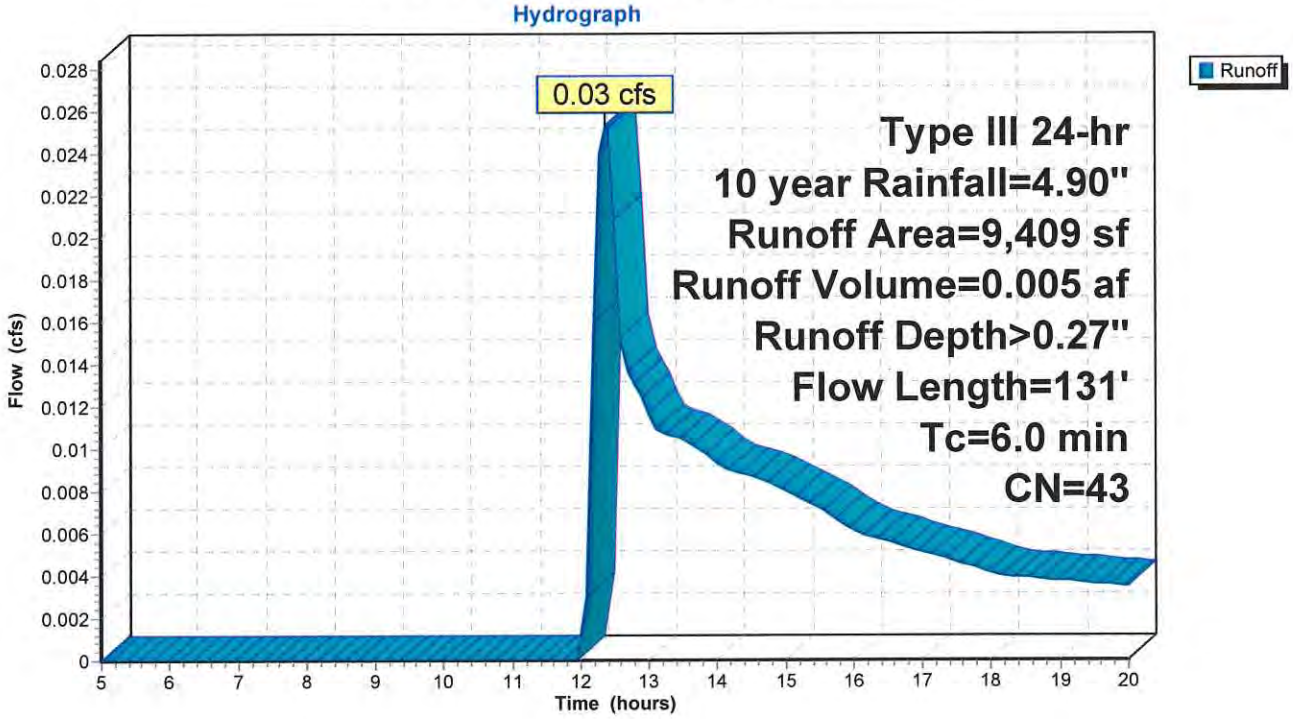
Runoff = 0.03 cfs @ 12.37 hrs, Volume= 0.005 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 year Rainfall=4.90"

Area (sf)	CN	Description
9,409	43	Woods/grass comb., Fair, HSG A
9,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	131		0.36		**Direct Entry, Over pavement**

Subcatchment 1S: Pre-Development



Summary for Subcatchment 1S: Pre-Development

[49] Hint: Tc<2dt may require smaller dt

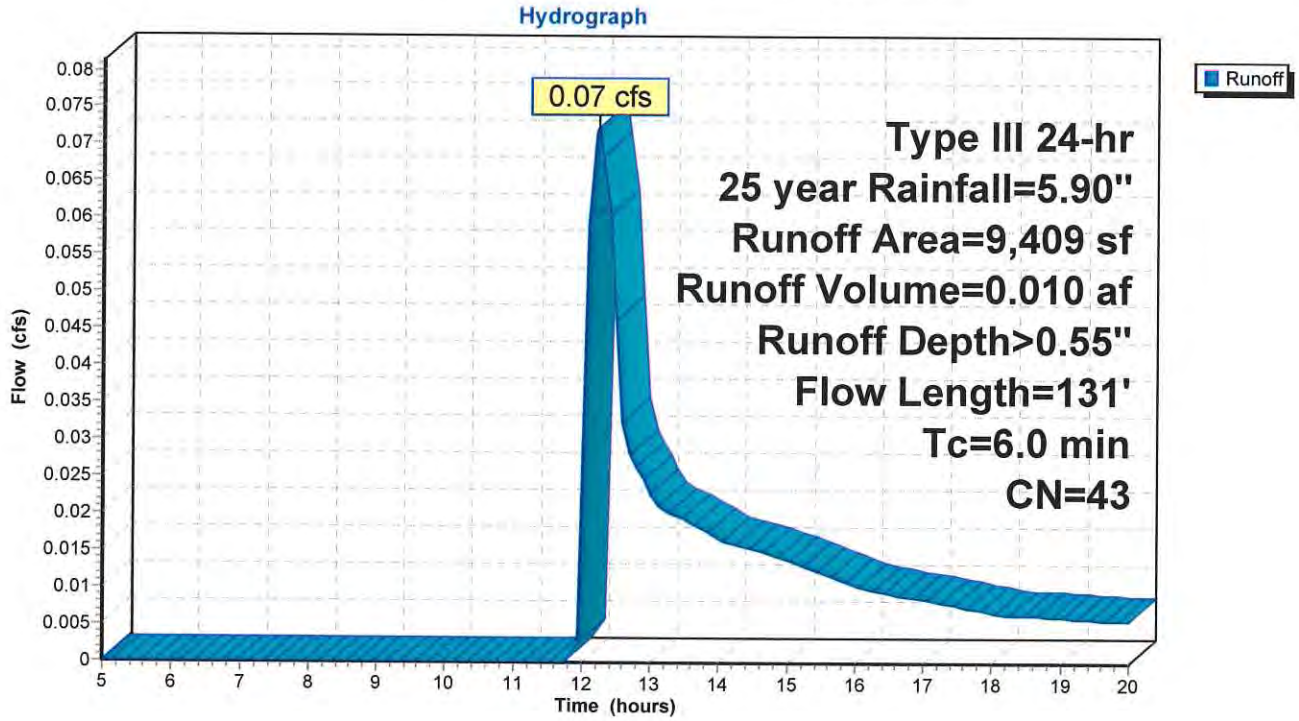
Runoff = 0.07 cfs @ 12.23 hrs, Volume= 0.010 af, Depth> 0.55"

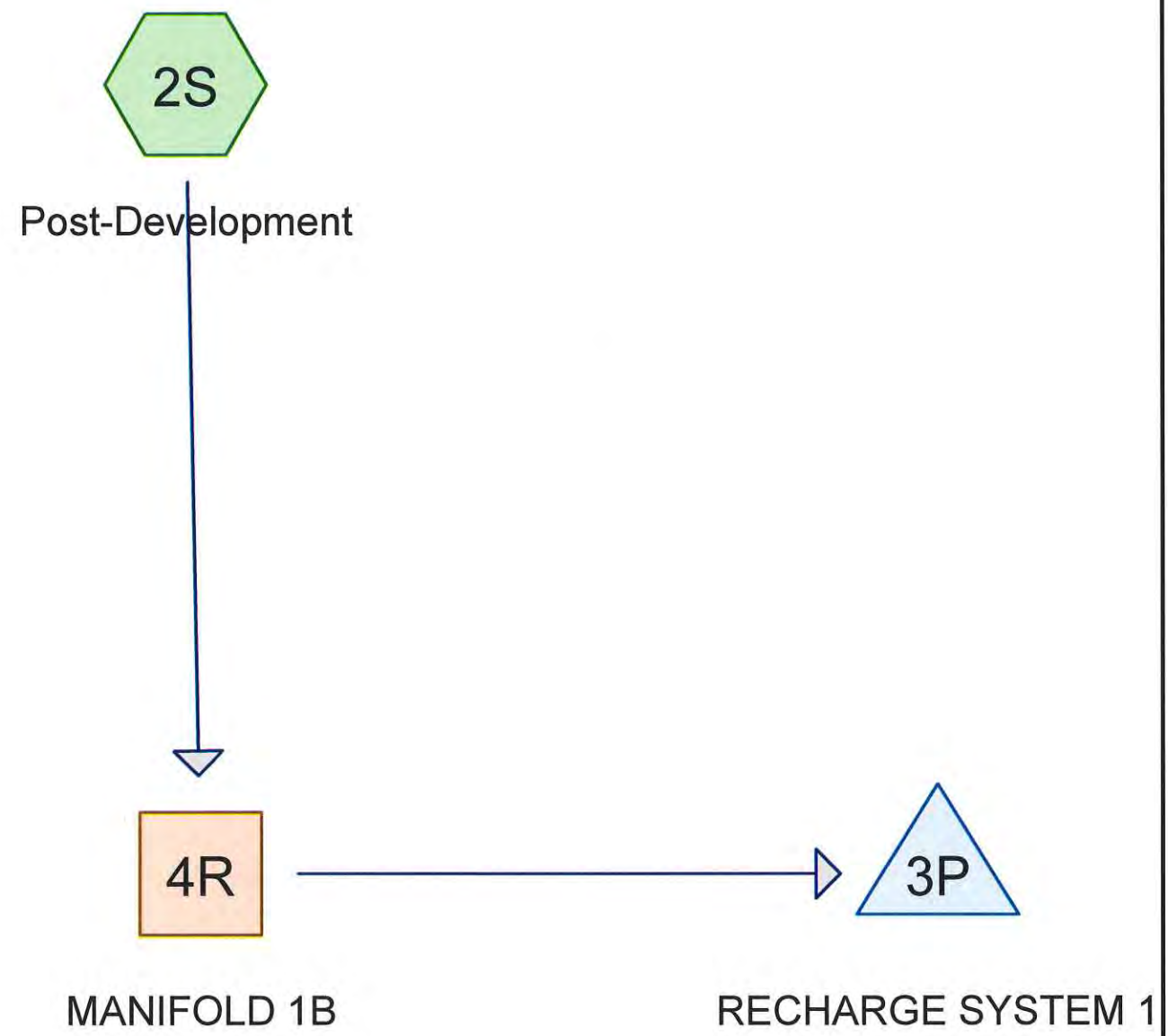
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 year Rainfall=5.90"

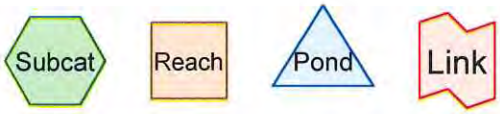
Area (sf)	CN	Description
9,409	43	Woods/grass comb., Fair, HSG A
9,409		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	131		0.36		**Direct Entry, Over pavement**

Subcatchment 1S: Pre-Development







Routing Diagram for C14349.08 hydroCAD
Prepared by {enter your company name here}, Printed 4/26/2018
HydroCAD® 10.00-18 s/n 04240 © 2016 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.038	98	Paved parking, HSG A (2S)
0.178	43	Woods/grass comb., Fair, HSG A (2S)
0.216	**53**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.216	HSG A	2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.216		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.038	0.000	0.000	0.000	0.000	0.038	Paved parking	2S
0.178	0.000	0.000	0.000	0.000	0.178	Woods/grass comb., Fair	2S
0.216	**0.000**	**0.000**	**0.000**	**0.000**	**0.216**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	4R	9.49	9.29	10.0	0.0200	0.012	4.0	0.0	0.0

Time span=5.00-20.00 hrs, dt=0.10 hrs, 151 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Post-Development Runoff Area=9,409 sf 17.38% Impervious Runoff Depth>0.16"
Flow Length=131' Tc=6.0 min CN=53 Runoff=0.01 cfs 0.003 af

Reach 4R: MANIFOLD 1B Avg. Flow Depth=0.02' Max Vel=1.01 fps Inflow=0.01 cfs 0.003 af
4.0" Round Pipe x 6.00 n=0.012 L=10.0' S=0.0200 '/' Capacity=1.75 cfs Outflow=0.01 cfs 0.003 af

Pond 3P: RECHARGE SYSTEM 1 Peak Elev=5.81' Storage=1 cf Inflow=0.01 cfs 0.003 af
Outflow=0.01 cfs 0.003 af

Total Runoff Area = 0.216 ac Runoff Volume = 0.003 af Average Runoff Depth = 0.16"
82.62% Pervious = 0.178 ac 17.38% Impervious = 0.038 ac

Summary for Subcatchment 2S: Post-Development

[49] Hint: Tc<2dt may require smaller dt

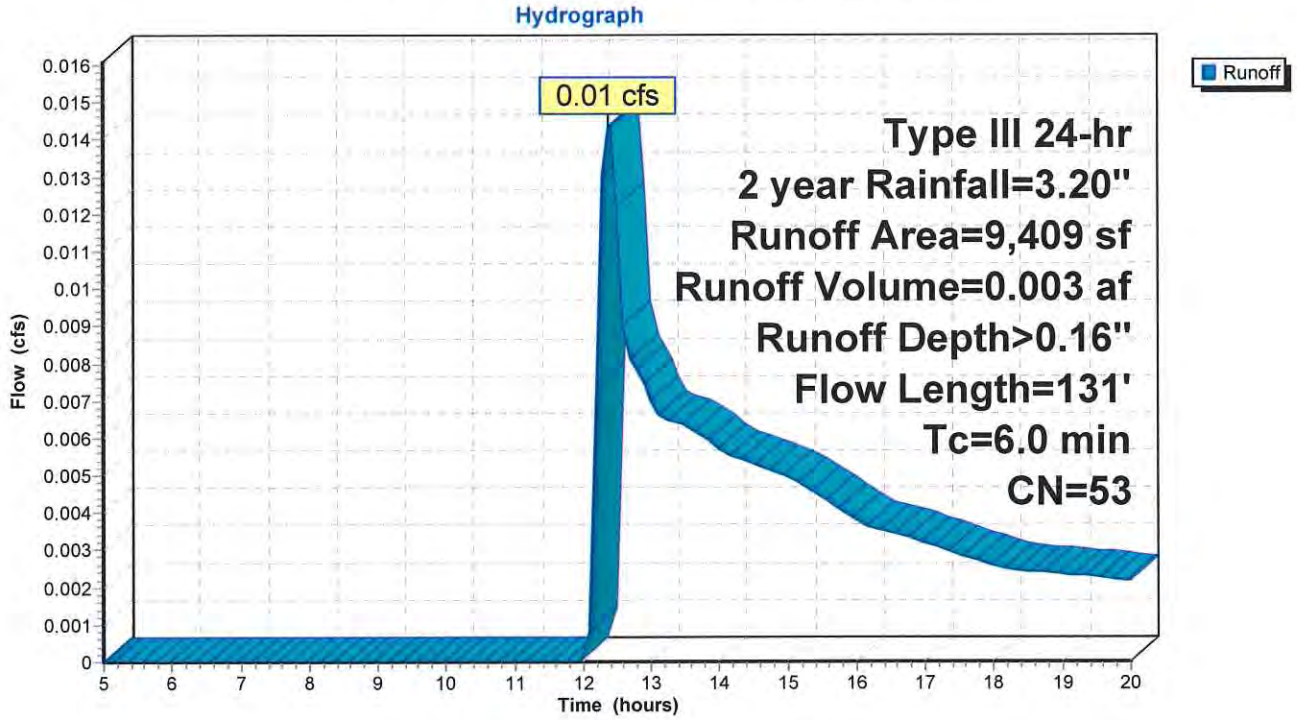
Runoff = 0.01 cfs @ 12.39 hrs, Volume= 0.003 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 year Rainfall=3.20"

Area (sf)	CN	Description
7,774	43	Woods/grass comb., Fair, HSG A
1,635	98	Paved parking, HSG A
9,409	53	Weighted Average
7,774		82.62% Pervious Area
1,635		17.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	131		0.36		**Direct Entry, Over pavement**

Subcatchment 2S: Post-Development



Summary for Reach 4R: MANIFOLD 1B

[52] Hint: Inlet/Outlet conditions not evaluated

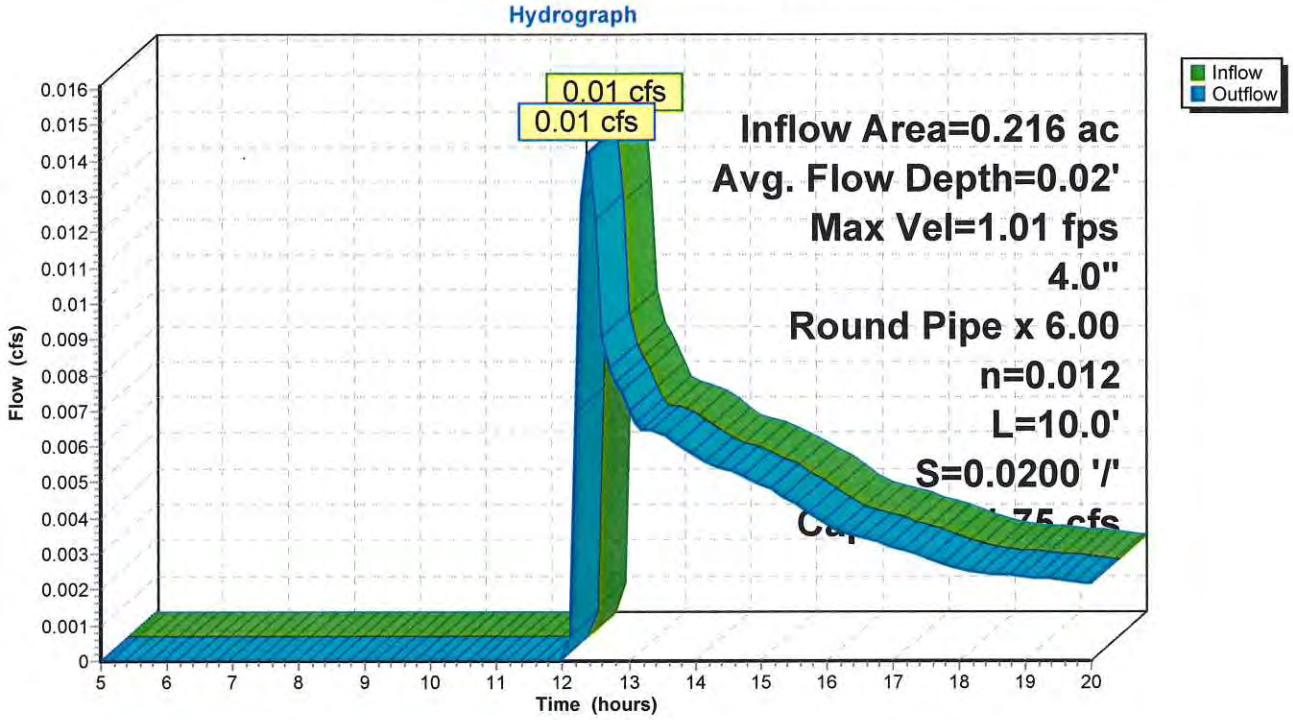
Inflow Area = 0.216 ac, 17.38% Impervious, Inflow Depth > 0.16" for 2 year event
Inflow = 0.01 cfs @ 12.39 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 12.39 hrs, Volume= 0.003 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.01 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 0.2 min

Peak Storage= 0 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 0.33' Flow Area= 0.5 sf, Capacity= 1.75 cfs

A factor of 6.00 has been applied to the storage and discharge capacity
4.0" Round Pipe
n= 0.012
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 9.49', Outlet Invert= 9.29'

Reach 4R: MANIFOLD 1B



Summary for Pond 3P: RECHARGE SYSTEM 1

Volume above grates of SC1 and SC2 between elevations 9.75 (grate elevs) and 10.2 or (max. elevation around impounded area) is shown for Custom Stage Data and is used for attenuation of 100-year event.

Inflow Area =	0.216 ac, 17.38% Impervious, Inflow Depth > 0.16" for 2 year event			
Inflow =	0.01 cfs @ 12.39 hrs, Volume=	0.003 af		
Outflow =	0.01 cfs @ 12.41 hrs, Volume=	0.003 af, Atten= 0%, Lag= 1.2 min		
Discarded =	0.01 cfs @ 12.41 hrs, Volume=	0.003 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 5.81' @ 12.41 hrs Surf.Area= 252 sf Storage= 1 cf

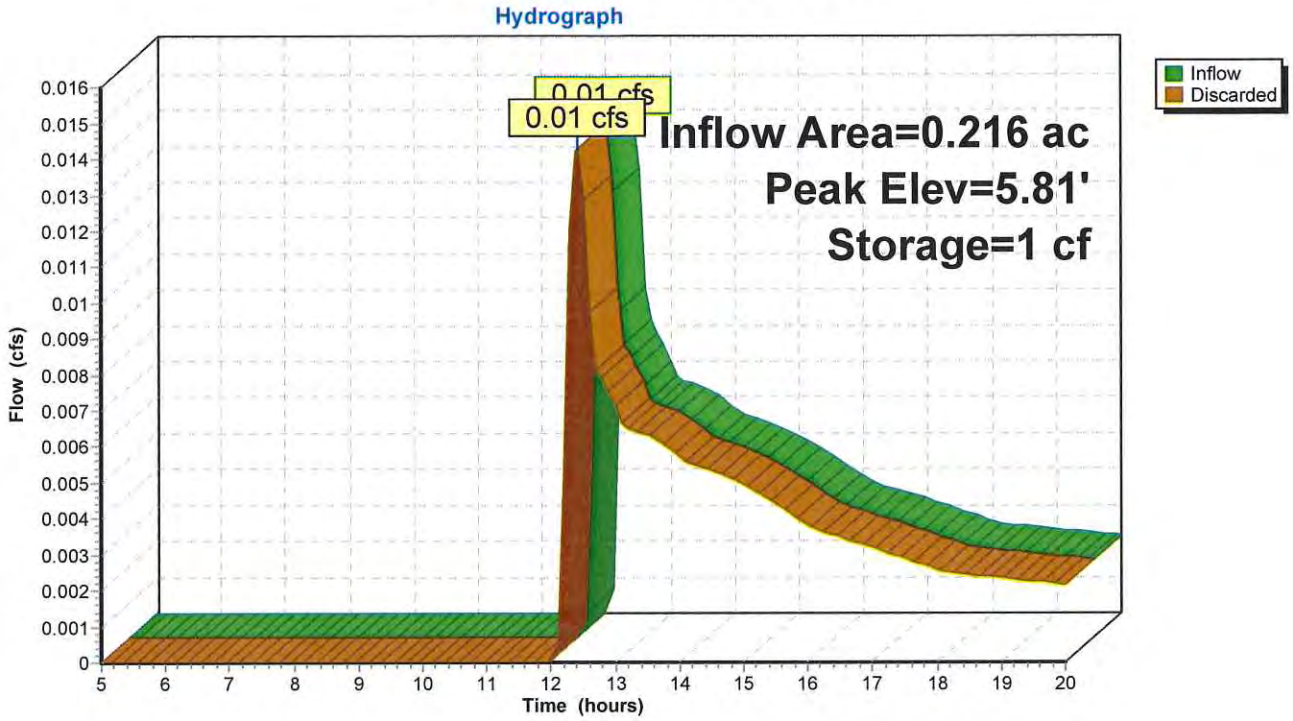
Plug-Flow detention time= 1.1 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (902.4 - 901.6)

Volume	Invert	Avail.Storage	Storage Description
#1	5.80'	188 cf	**9.00'W x 28.00'L x 3.21'H Excavation** 809 cf Overall - 340 cf Embedded = 469 cf x 40.0% Voids
#2	6.30'	340 cf	**Cultec R-280** x 8 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
		528 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	5.80'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.41 hrs HW=5.81' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Pond 3P: RECHARGE SYSTEM 1



Time span=5.00-20.00 hrs, dt=0.10 hrs, 151 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Post-Development Runoff Area=9,409 sf 17.38% Impervious Runoff Depth>0.72"
Flow Length=131' Tc=6.0 min CN=53 Runoff=0.14 cfs 0.013 af

Reach 4R: MANIFOLD 1B Avg. Flow Depth=0.06' Max Vel=1.99 fps Inflow=0.14 cfs 0.013 af
4.0" Round Pipe x 6.00 n=0.012 L=10.0' S=0.0200 '/' Capacity=1.75 cfs Outflow=0.14 cfs 0.013 af

Pond 3P: RECHARGE SYSTEM 1 Peak Elev=6.49' Storage=94 cf Inflow=0.14 cfs 0.013 af
Outflow=0.05 cfs 0.013 af

Total Runoff Area = 0.216 ac Runoff Volume = 0.013 af Average Runoff Depth = 0.72"
82.62% Pervious = 0.178 ac 17.38% Impervious = 0.038 ac

Summary for Subcatchment 2S: Post-Development

[49] Hint: Tc<2dt may require smaller dt

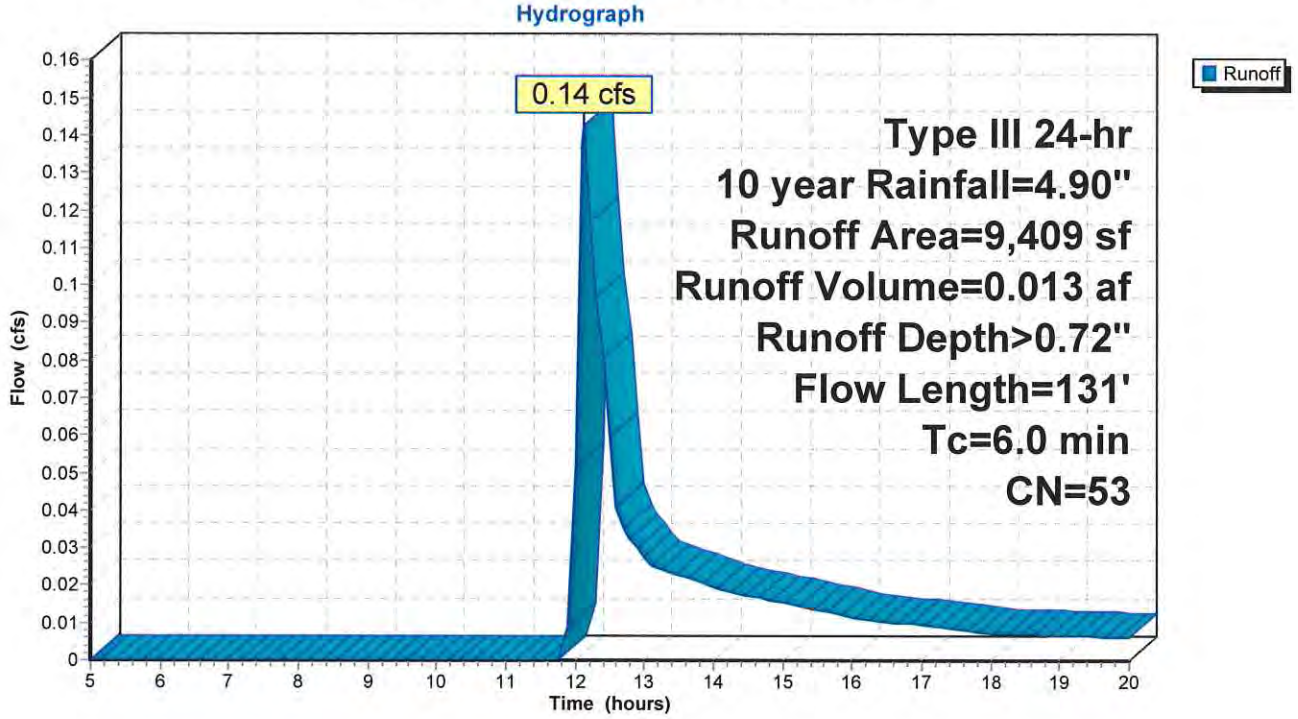
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 0.013 af, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 year Rainfall=4.90"

Area (sf)	CN	Description
7,774	43	Woods/grass comb., Fair, HSG A
1,635	98	Paved parking, HSG A
9,409	53	Weighted Average
7,774		82.62% Pervious Area
1,635		17.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	131		0.36		**Direct Entry, Over pavement**

Subcatchment 2S: Post-Development



Summary for Reach 4R: MANIFOLD 1B

[52] Hint: Inlet/Outlet conditions not evaluated

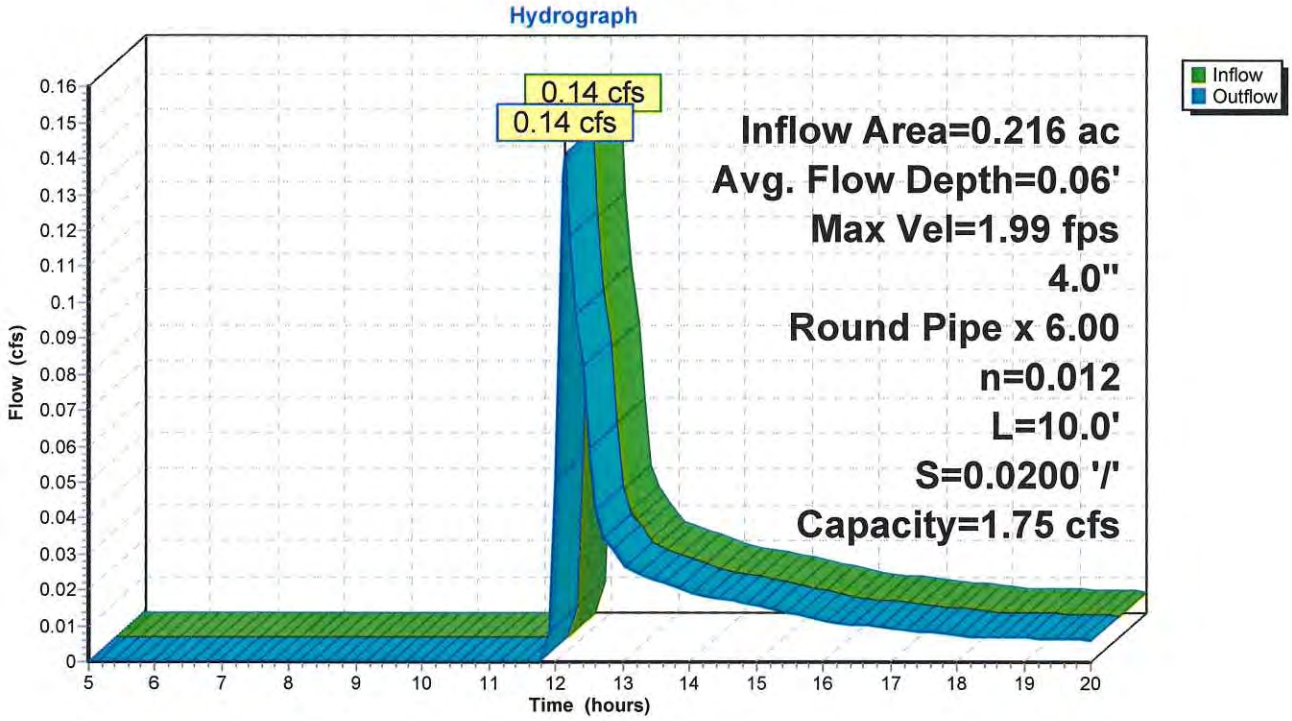
Inflow Area = 0.216 ac, 17.38% Impervious, Inflow Depth > 0.72" for 10 year event
Inflow = 0.14 cfs @ 12.13 hrs, Volume= 0.013 af
Outflow = 0.14 cfs @ 12.13 hrs, Volume= 0.013 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.99 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.33' Flow Area= 0.5 sf, Capacity= 1.75 cfs

A factor of 6.00 has been applied to the storage and discharge capacity
4.0" Round Pipe
n= 0.012
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 9.49', Outlet Invert= 9.29'

Reach 4R: MANIFOLD 1B



Summary for Pond 3P: RECHARGE SYSTEM 1

Volume above grates of SC1 and SC2 between elevations 9.75 (grate elevs) and 10.2 or (max. elevation around impounded area) is shown for Custom Stage Data and is used for attenuation of 100-year event.

Inflow Area = 0.216 ac, 17.38% Impervious, Inflow Depth > 0.72" for 10 year event
Inflow = 0.14 cfs @ 12.13 hrs, Volume= 0.013 af
Outflow = 0.05 cfs @ 12.10 hrs, Volume= 0.013 af, Atten= 66%, Lag= 0.0 min
Discarded = 0.05 cfs @ 12.10 hrs, Volume= 0.013 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 6.49' @ 12.57 hrs Surf.Area= 252 sf Storage= 94 cf

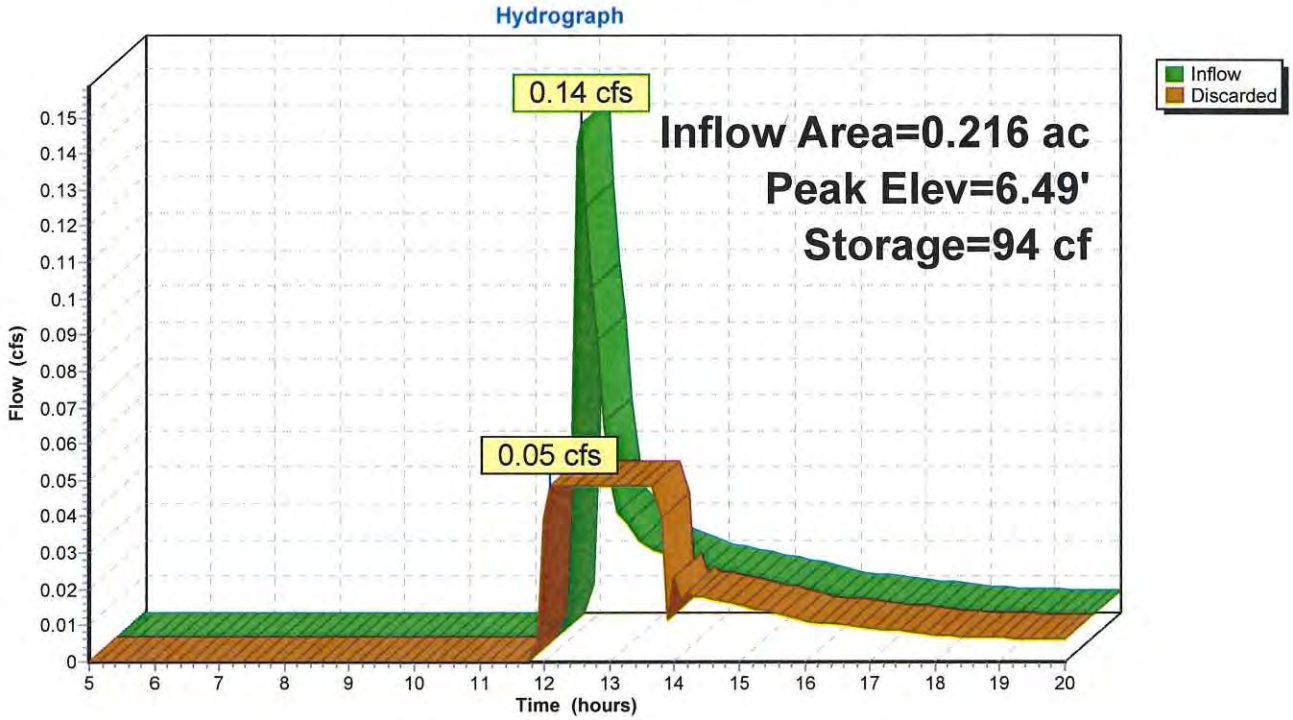
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 11.0 min (859.7 - 848.8)

Volume	Invert	Avail.Storage	Storage Description
#1	5.80'	188 cf	**9.00'W x 28.00'L x 3.21'H Excavation** 809 cf Overall - 340 cf Embedded = 469 cf x 40.0% Voids
#2	6.30'	340 cf	**Cultec R-280** x 8 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
		528 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	5.80'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.10 hrs HW=6.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Pond 3P: RECHARGE SYSTEM 1



Time span=5.00-20.00 hrs, dt=0.10 hrs, 151 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Post-Development Runoff Area=9,409 sf 17.38% Impervious Runoff Depth>1.18"
Flow Length=131' Tc=6.0 min CN=53 Runoff=0.27 cfs 0.021 af

Reach 4R: MANIFOLD 1B Avg. Flow Depth=0.09' Max Vel=2.40 fps Inflow=0.27 cfs 0.021 af
4.0" Round Pipe x 6.00 n=0.012 L=10.0' S=0.0200 '/' Capacity=1.75 cfs Outflow=0.27 cfs 0.021 af

Pond 3P: RECHARGE SYSTEM 1 Peak Elev=7.25' Storage=260 cf Inflow=0.27 cfs 0.021 af
Outflow=0.05 cfs 0.021 af

Total Runoff Area = 0.216 ac Runoff Volume = 0.021 af Average Runoff Depth = 1.18"
82.62% Pervious = 0.178 ac 17.38% Impervious = 0.038 ac

Summary for Subcatchment 2S: Post-Development

[49] Hint: Tc<2dt may require smaller dt

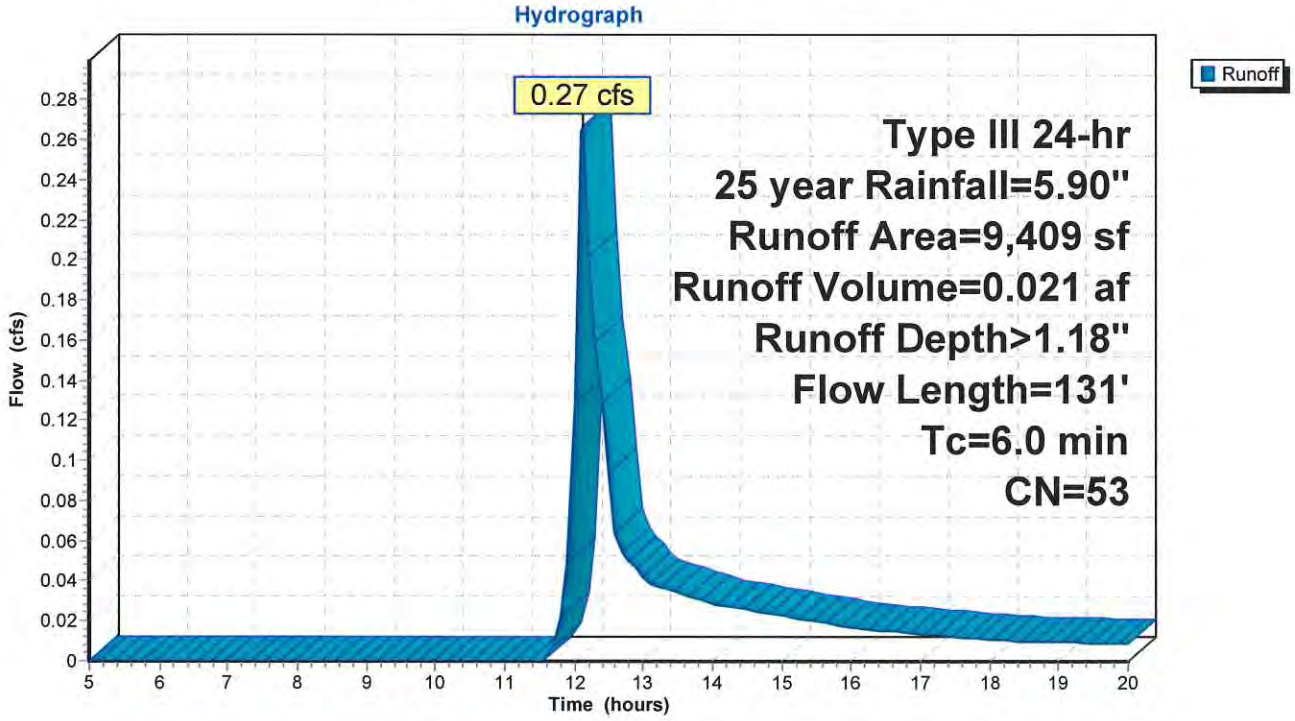
Runoff = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 year Rainfall=5.90"

Area (sf)	CN	Description
7,774	43	Woods/grass comb., Fair, HSG A
1,635	98	Paved parking, HSG A
9,409	53	Weighted Average
7,774		82.62% Pervious Area
1,635		17.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	131		0.36		**Direct Entry, Over pavement**

Subcatchment 2S: Post-Development



Summary for Reach 4R: MANIFOLD 1B

[52] Hint: Inlet/Outlet conditions not evaluated

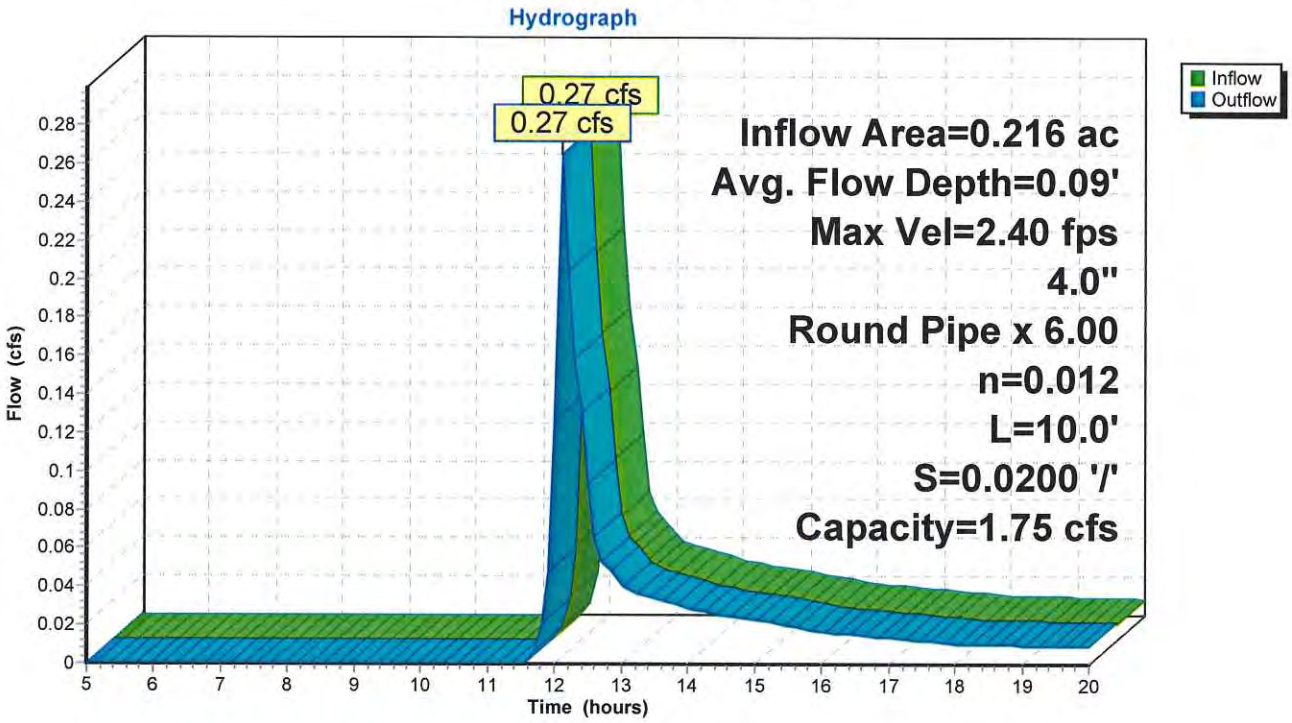
Inflow Area = 0.216 ac, 17.38% Impervious, Inflow Depth > 1.18" for 25 year event
Inflow = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af
Outflow = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.40 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.33' Flow Area= 0.5 sf, Capacity= 1.75 cfs

A factor of 6.00 has been applied to the storage and discharge capacity
4.0" Round Pipe
n= 0.012
Length= 10.0' Slope= 0.0200 '/'
Inlet Invert= 9.49', Outlet Invert= 9.29'

Reach 4R: MANIFOLD 1B



Summary for Pond 3P: RECHARGE SYSTEM 1

Volume above grates of SC1 and SC2 between elevations 9.75 (grate elevs) and 10.2 or (max. elevation around impounded area) is shown for Custom Stage Data and is used for attenuation of 100-year event.

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[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area =	0.216 ac, 17.38% Impervious, Inflow Depth > 1.18" for 25 year event			
Inflow =	0.27 cfs @ 12.12 hrs, Volume=	0.021 af		
Outflow =	0.05 cfs @ 12.00 hrs, Volume=	0.021 af, Atten= 82%, Lag= 0.0 min		
Discarded =	0.05 cfs @ 12.00 hrs, Volume=	0.021 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 7.25' @ 12.85 hrs Surf.Area= 252 sf Storage= 260 cf

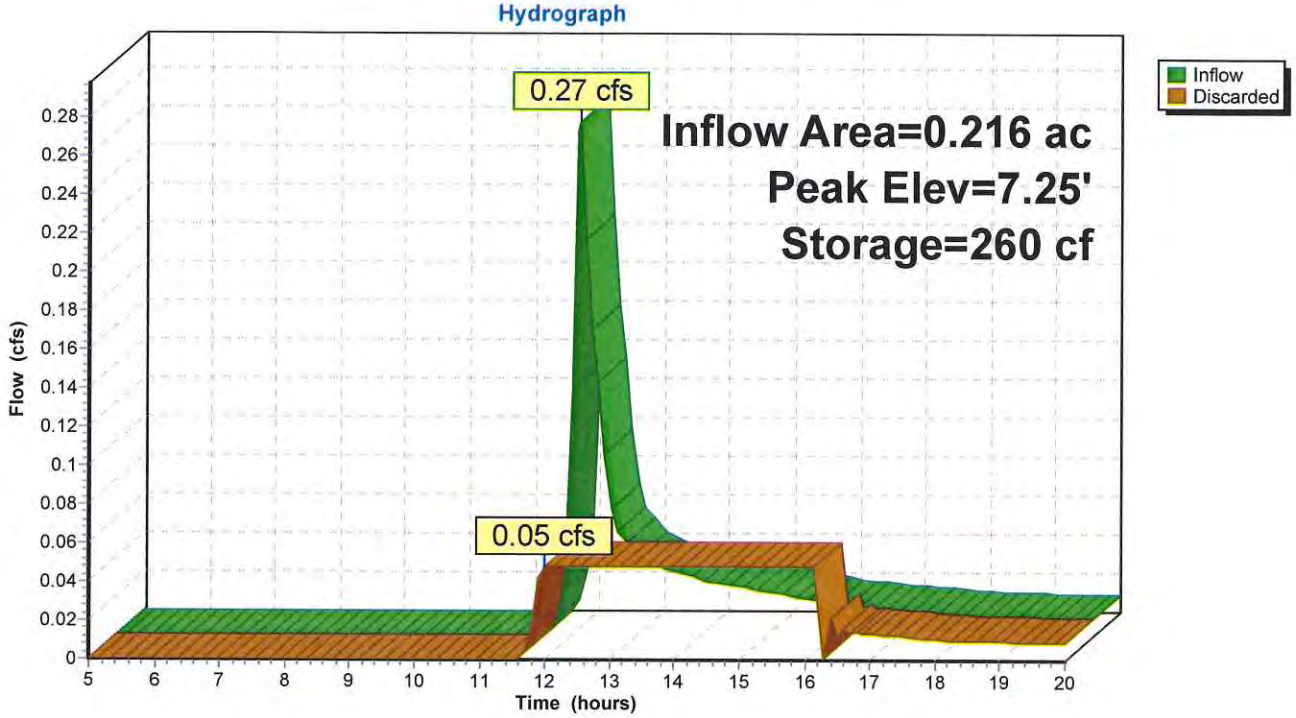
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 45.1 min (880.7 - 835.6)

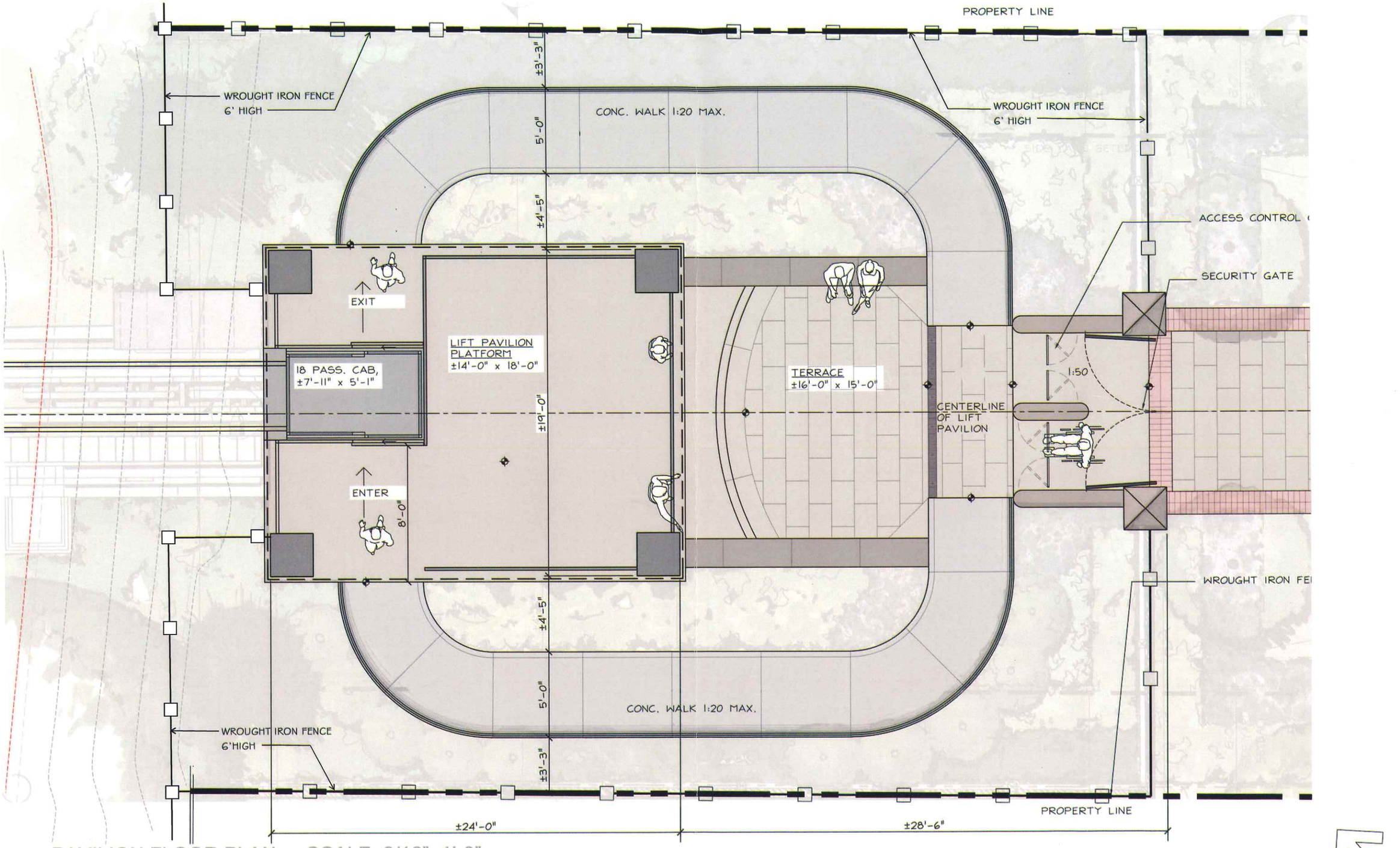
Volume	Invert	Avail.Storage	Storage Description
#1	5.80'	188 cf	**9.00'W x 28.00'L x 3.21'H Excavation** 809 cf Overall - 340 cf Embedded = 469 cf x 40.0% Voids
#2	6.30'	340 cf	**Cultec R-280** x 8 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
		528 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	5.80'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.00 hrs HW=5.98' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Pond 3P: RECHARGE SYSTEM 1





PAVILION FLOOR PLAN - SCALE 3/16"=1'-0"

PROPOSED BRADFORD ACCESS PROJECT FOR PILGRIM MONUMENT & PROVINCETOWN MUSEUM

BRADFORD STREET, PROVINCETOWN, MA

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COASTAL engineering co.

Hawk Design, Inc.
Landscape Architecture Land Planning

OUTDOOR

BROWN LINDQUIST FENUCCIO & RABER ARCHITECTS, INC.

CASHMAN
CONSTRUCTION MANAGEMENT

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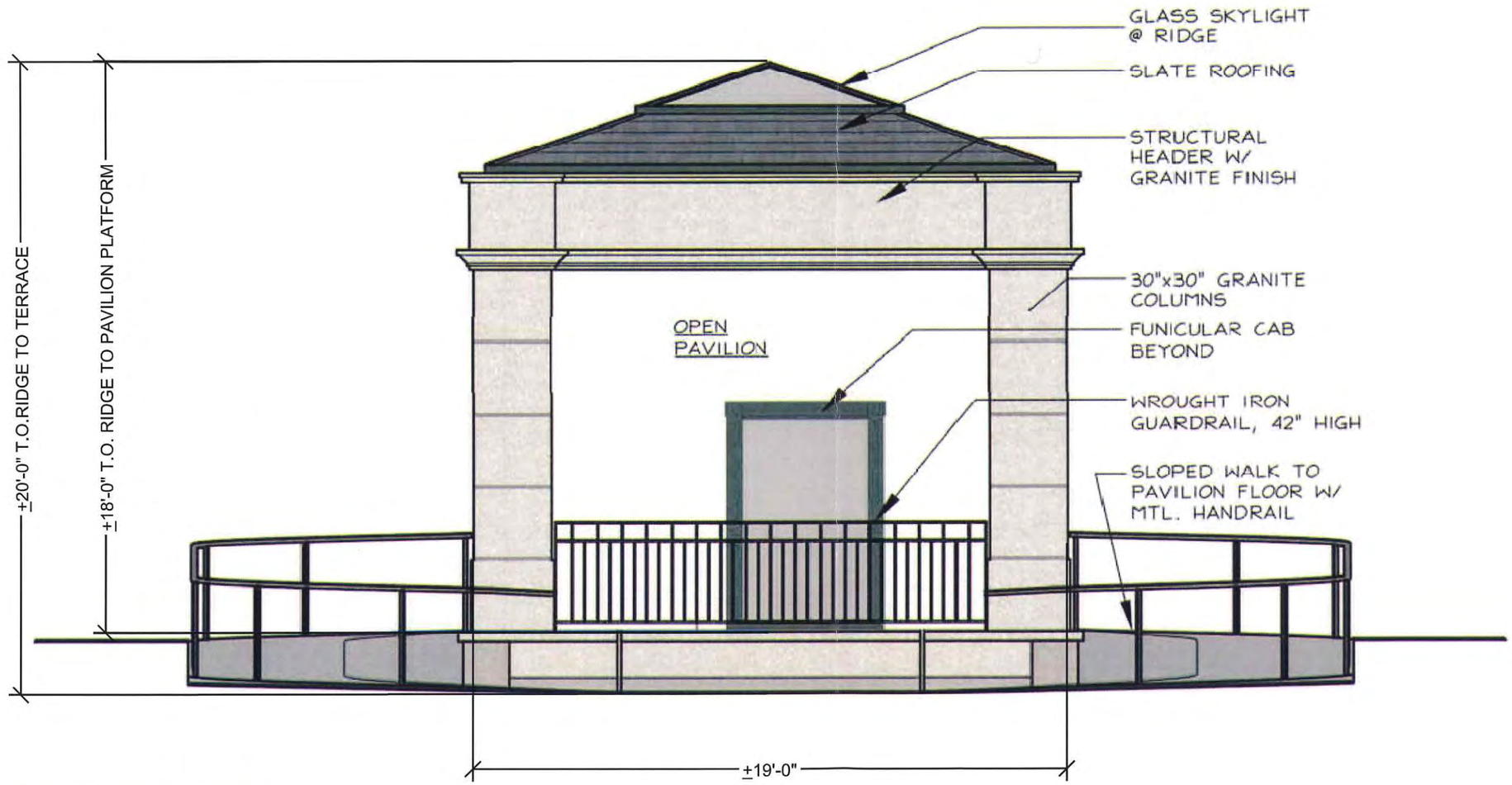

SOUTHEAST ELEVATION
SCALE 1/4"=1'-0"

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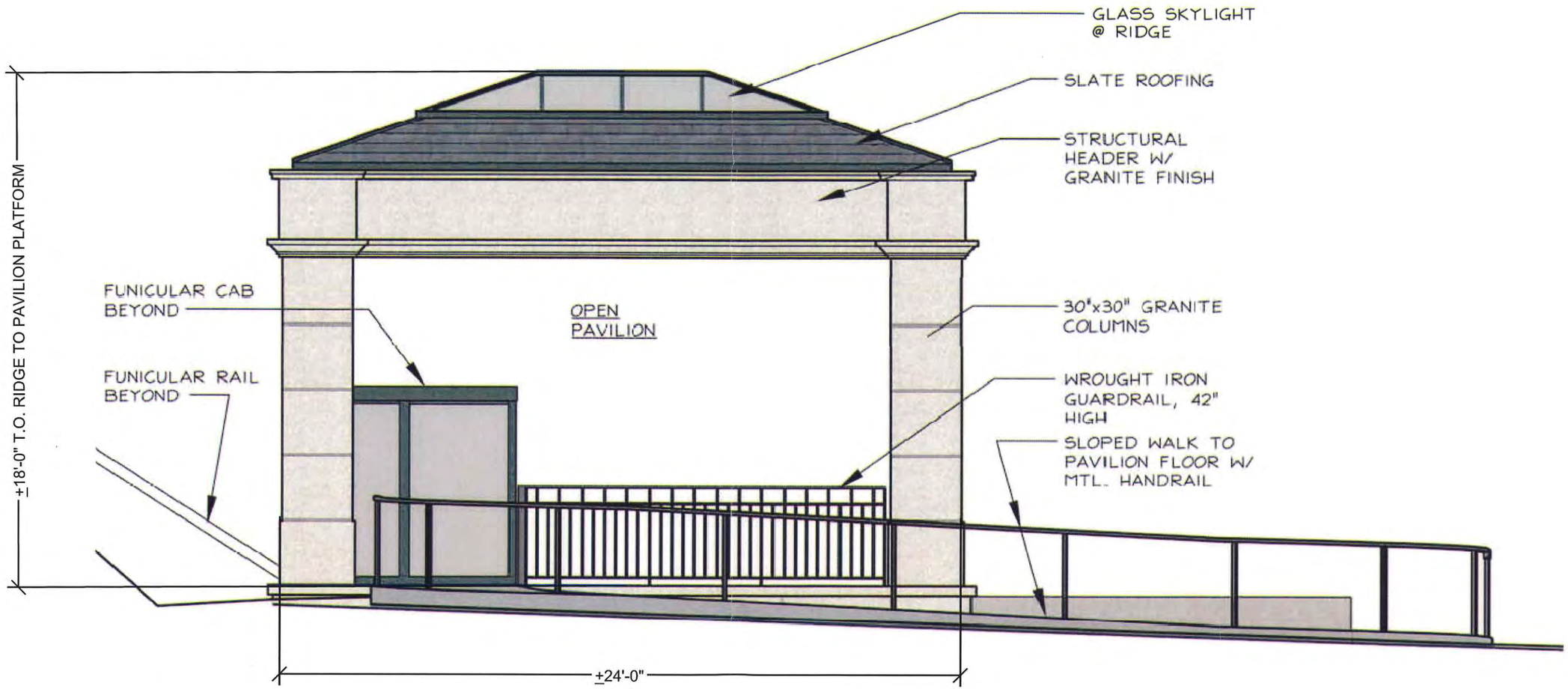

SOUTHWEST ELEVATION
SCALE 1/4"=1'-0"

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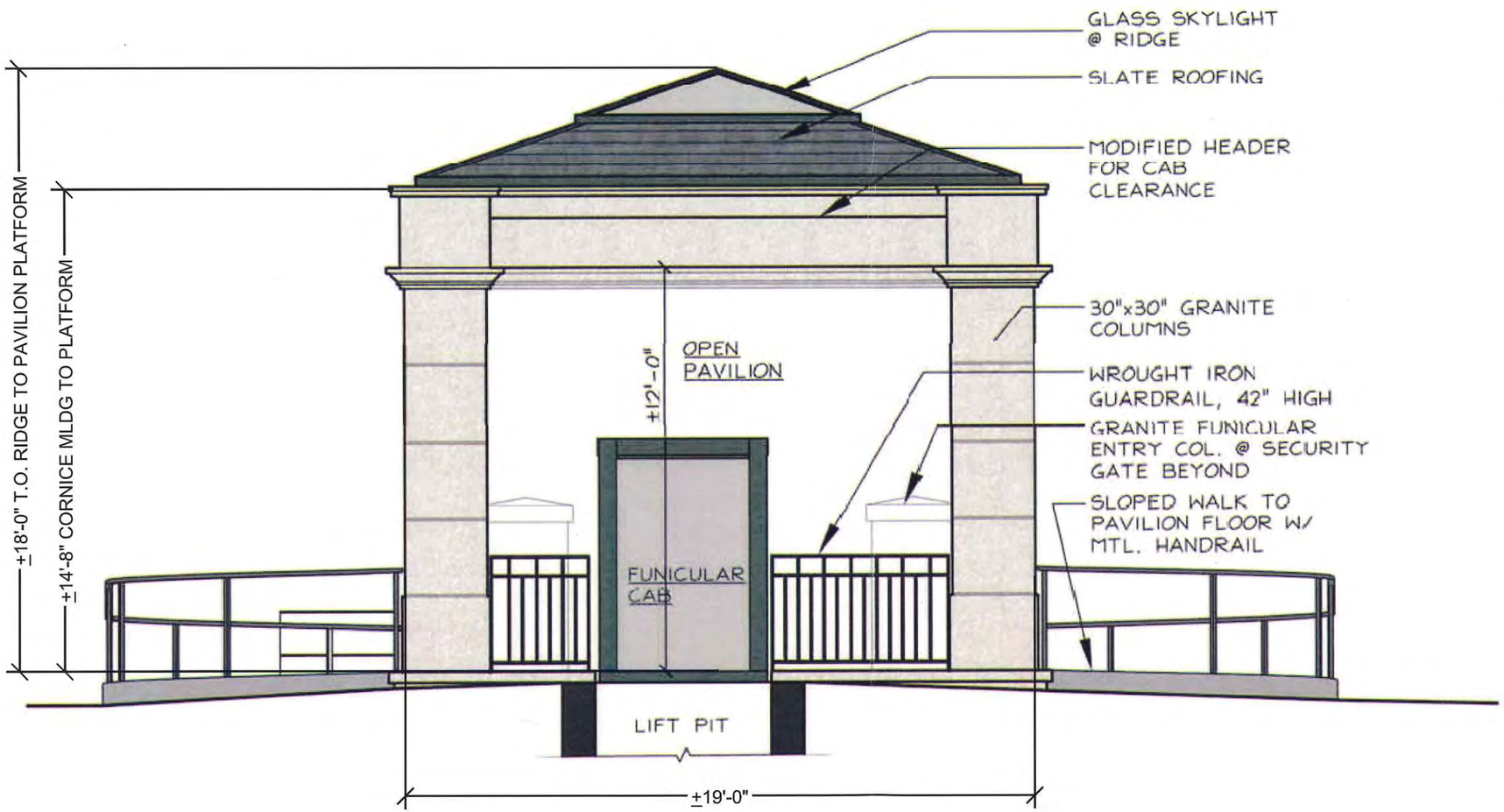

NORTHWEST ELEVATION
SCALE 1/4"=1'-0"

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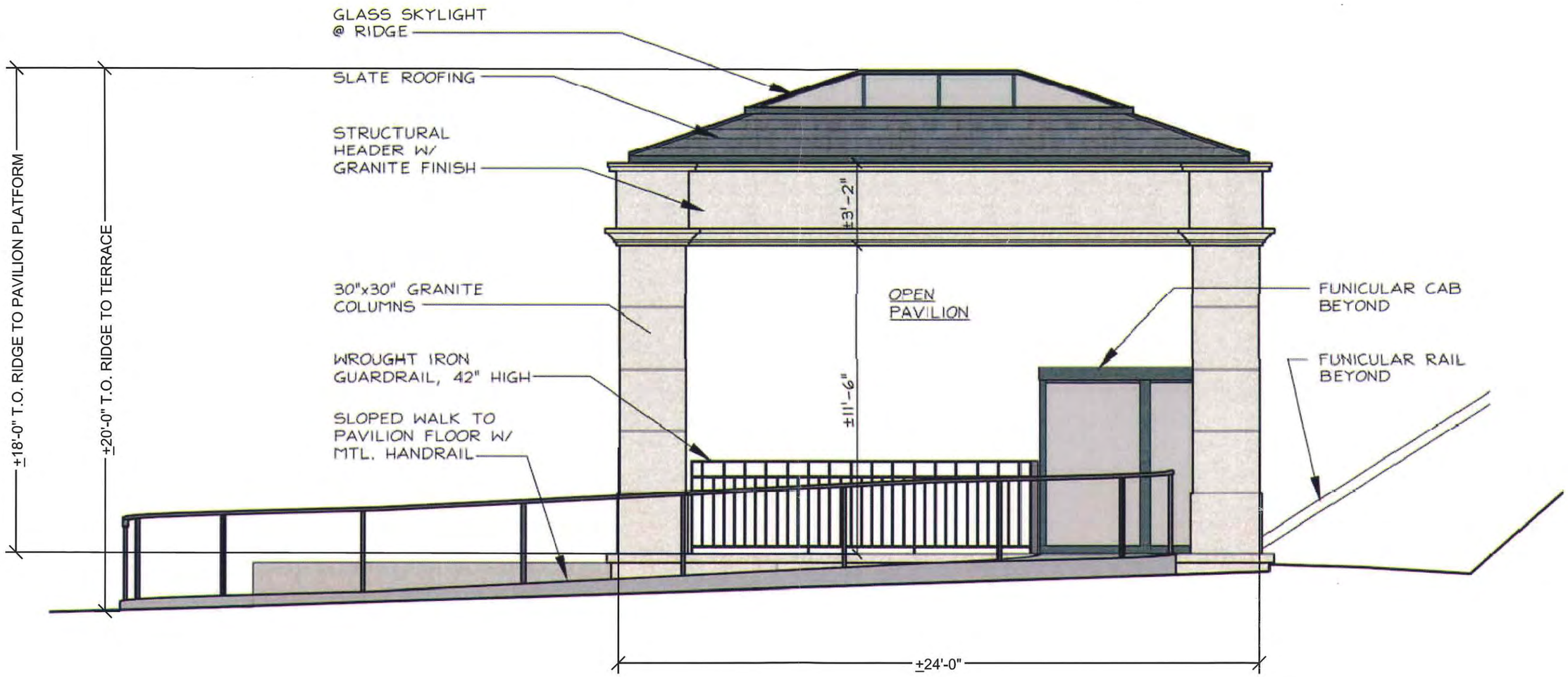

NORTHEAST ELEVATION
SCALE 1/4"=1'-0"

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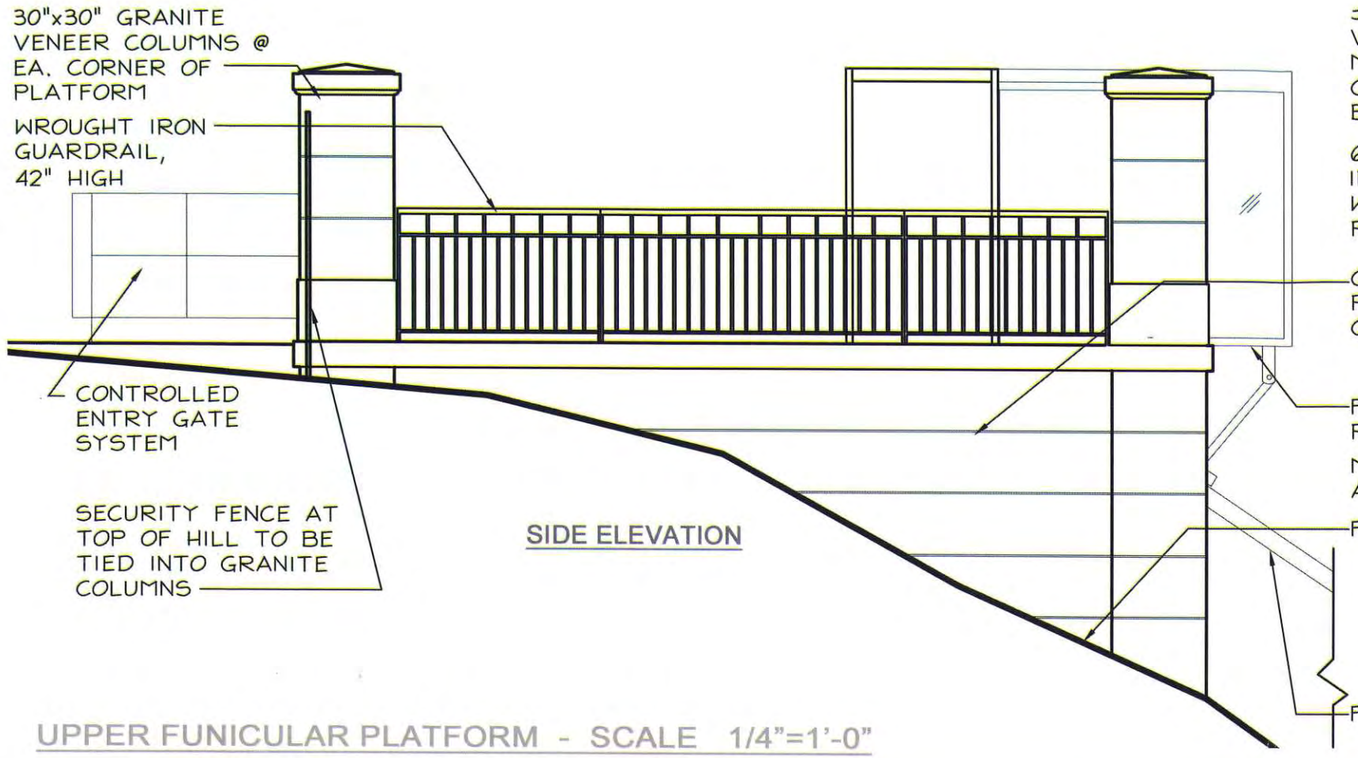
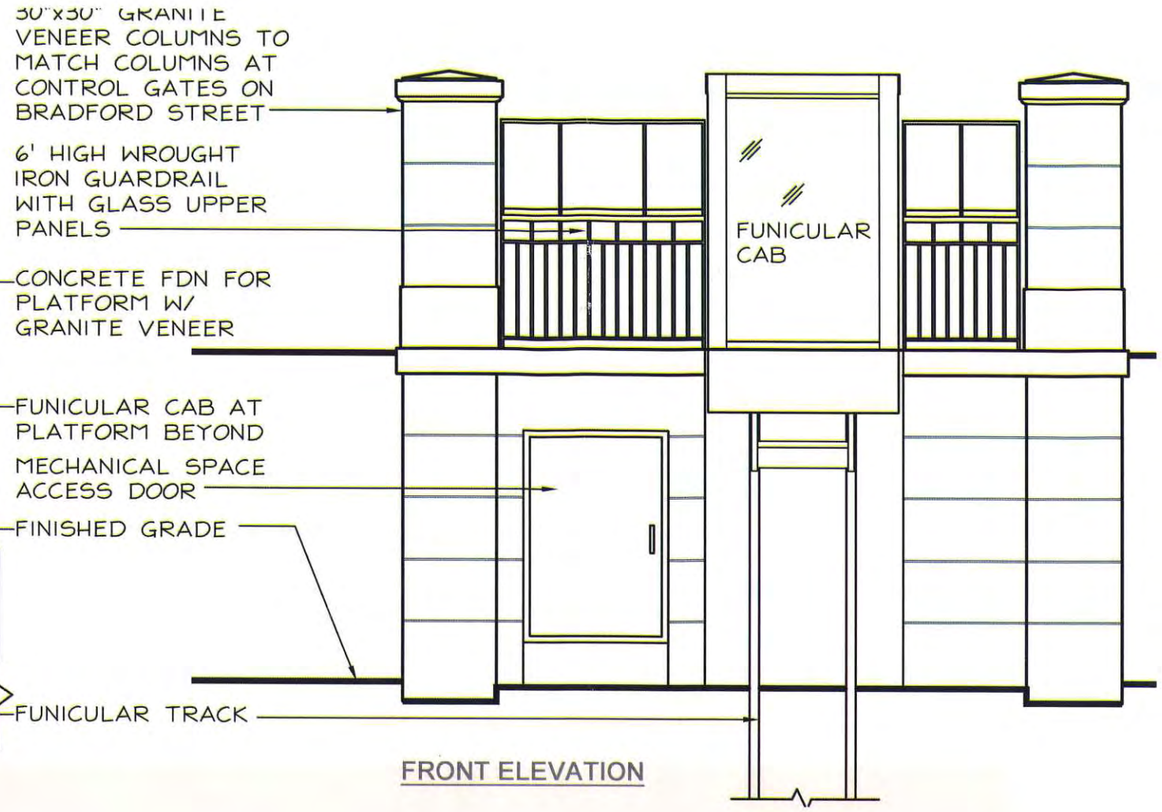
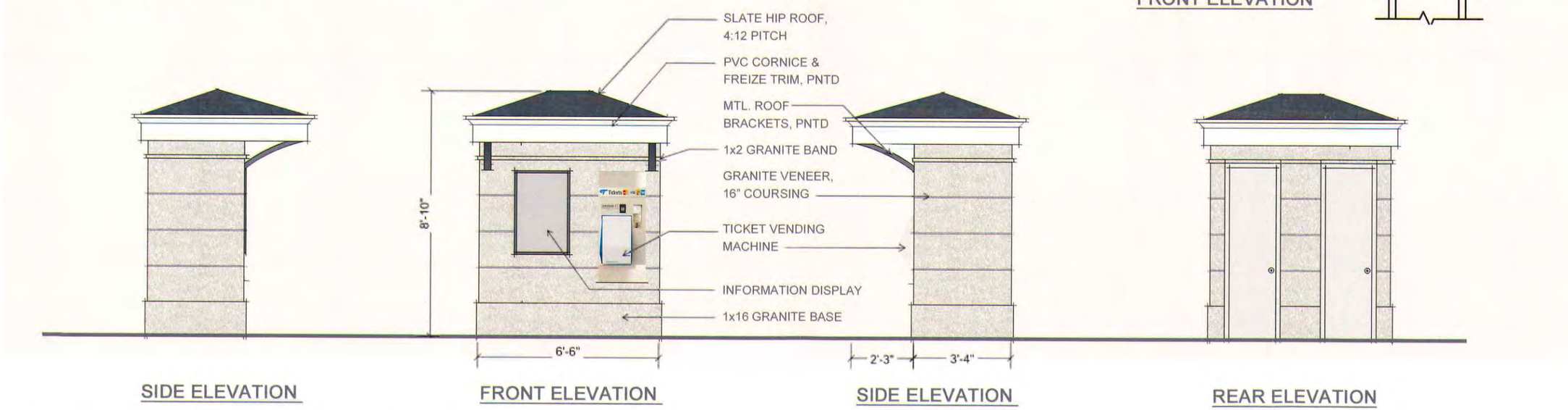


UPPER FUNICULAR PLATFORM - SCALE 1/4"=1'-0"





TICKET KIOSK ELEVATIONS - SCALE 1/4"=1'-0"

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Cashman Construction Management

VIEW FROM BRADFORD STREET

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BRADFORD STREET, PROVINCETOWN, MA

MARCH 16, 2018

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CONSTRUCTION MANAGEMENT

AERIAL VIEW OF SITE CONCEPT

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