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Nantucket Board of Selectmen
16 Broad Street
Nantucket, MA 02554
BY HAND

June 7, 2012
Re: Baxter Road

Dear Selectmen,

In anticipation of the BOS Workshop on June 12, please accept the enclosed materials to assist with your review of what to do about the endangered sections of Baxter Road. As you know, the Sconset Beach Preservation Fund Inc. (SBPF) has had a successful relationship with the Town for twenty years, and has tried various means to address the erosion of the Sankaty Head Bluff. However, the danger to the public way and homes on it is now imminent and urgent action is needed. After reviewing the facts, we believe that you will conclude that using hard protection of the bluff is necessary for many reasons, and that a public private partnership is the best way to move forward on it. SBPF also feels strongly that, despite the urgency, the Conservation Commission should be engaged in this process to ensure environmental balance.

The erosion at Baxter Road poses several real threats to our community in several ways. The erosion threatens Town infrastructure, such as water and sewer lines, and has already eliminated a large section of the public access down to the beach and along the Bluff Walk. The erosion threatens many houses, which are not just private homes, but are historic structures on their own and part of a historic setting together. The erosion threatens sensitive environmental habitats. The erosion undermines the Town's tax base by eliminating tens of millions in previously taxable assessed value. Erosion has already eliminated multiple streets in Codfish Park and several homes on Baxter Lane. However, this is not about a public way or private homes, it is about our Sconset and Nantucket communities, now and for future generations. Failing to act has no benefits.

The threat posed by the erosion is urgent. At its closest point, the top of the bluff is only **29 feet** from the public road. Many of the homes are also this close or even much closer to the top of the bluff. With losses of up to **30 feet** during the 2012/2013 storm season, these distances show that a catastrophic loss that could occur in a single storm season, coming this Fall! The time to permit and install such a system is extremely tight. Failure to act will both increase the Town's financial liability and legal obligations, but will also lower the availability of both private funding and taxable lots to pay for it. The Town suffers from delay as much as the local residents suffer by it.

The best approach for addressing this issue is a two pronged approach. First, we understand that the Town should have a "shovel" ready plan in place for rerouting access and utilities, if needed. The PLUS, DPW, and Water Company have begun the process on this issue and it appears that a plan could be devised and cooperatively endorsed by the abutters, contingent on also trying to keep the road open by preserving the bluff. However, if the Town focuses only on access replacement then it is doubtful that such cooperation will be possible; the Town will

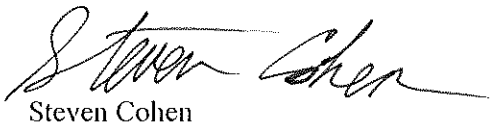
face about $5-10M in immediate costs and will likely face the issue over and over as Baxter Road is breached at various points. In addition to the infrastructure and other costs, the Town's lost tax revenue will increase from nearly $250,000 annual revenue loss today to about $750,000 in lost annual tax revenues, just for the water side of Baxter Road alone. Therefore, the Town should also pursue bluff protection as a way to significantly reduce access and utility costs, to avoid the repetition of the costs, to save the tax base, and to effectuate a public/private partnership to help implement and fund the project. Protecting a bluff to save public infrastructure and historic homes has been done successfully both on Nantucket and in other Massachusetts communities and has potential application for other public infrastructure at risk, such as the airport and the Surfside waste water treatment facility.

Implementing such a plan will require several steps. Access and utility replacement requires significant engineering for design, as well as legal work for securing rights and accesses. Bluff protection requires identifying the urgent and secondary areas of bluff protection, designing and permitting an appropriate bluff protection system, establishing public and private funding sources, and implementing and maintaining it. Several of these issues must be reviewed and approved by the Conservation Commission or will be dependent on ConCom determinations. Most importantly, if Baxter Road is to be protected for the coming storm season, work must begin in August and approvals from the various regulatory bodies including the ConCom must be complete by mid-July. Therefore, the BOS should engage in a process immediately. Enclosed please find the following documents for your information:

1) A technical report on the condition of the bluff and bluff protection options.
2) A public/private partnership outline.
3) Projections on the impact of erosion on tax assessments and revenue.
4) A summary of documentation of the historic homes on Baxter Road.
5) A *proposed* BOS motion to consider for moving forward on this issue.

If the Town engages in a cooperative effort, SBPF believes it can help the Town act quickly, can solidify cooperation from abutters, can provide private funding for the urgent work needed, and can provide monetary resource to fund a significant portion of secondary work and maintenance. The details on this should be worked out through staff immediately. To do this, the Town should vote to take notice of the urgency of action, to authorize the filing of a Notice of Intent, and to urge the ConCom to review the matter on an emergency basis so as to save the public infrastructure and protect the historic homes, to support a public private partnership for urgent and long term bluff stabilization.

Sincerely,



Steven Cohen

SCONSET BLUFF
EROSION CONTOL ALTERNATIVES
and
RECOMMENDATIONS

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EXECUTIVE SUMMARY

Immediate protection of Baxter Road is critical for the 551-foot stretch from 99-105 Baxter Road, where the distance between the road and the top of the coastal bank is less than 45 feet (this distance ranges from 29 to 44 feet). The coastal bank in this area eroded 20 to 30 feet or more from 2012 to 2013; such catastrophic erosion may well occur again during the coming winter storm season. Therefore, some type of protection must be in place before the start of the 2013-2014 winter storm season or else certain sections of Baxter Road may have to be closed or may actually be breached by the erosion.

Similarly, immediate protection of Baxter Road is also necessary for all remaining homes along Baxter Road from 75 Baxter to the Lighthouse, to protect both Baxter Road and threatened homes that are as close as 11-feet to the top of the coastal bank. Significantly, most of the homes from 75 Baxter Road to the Lighthouse would be lost if another severe winter storm season occurs. The opportunity for private funding of erosion control efforts will become more limited if additional homes are lost, moved, or demolished.

Multiple erosion control alternatives have been considered. Sconset is a high-energy environment; therefore, some alternatives are highly unlikely to be effective, such as geotextile tubes and breakwaters. Other alternatives, such as beach dewatering and drift fences, have been tried and proven ineffective over the long term at this location. Still other alternatives, such as seawalls and beach nourishment, could be effective but would be difficult or impossible to get permitted under the Massachusetts Wetlands Protection Act (WPA) and Nantucket Wetlands Bylaw regulations, and have other negative aspects. The groin alternative would not be effective or environmentally feasible at Sconset without an accompanying beach nourishment project or significant sand mitigation program. The coastal bank terraces alternative has been implemented at Sconset for multiple years as a short-term measure, but it has been repeatedly documented that this alternative simply cannot withstand major storms and requires nearly constant post-storm maintenance, which is not always feasible in successive storm situations. A marine mattress/gabion alternative or a revetment alternative would both provide effective protection for Baxter Road and adjoining homes in a high-energy environment like Sconset. Revetments offer an advantage over the marine mattress system in that they do not require anchoring into the bank face, are composed of natural rock material, would not require removal in the event of system failure, and have a comparable or lower cost than the marine mattress/gabion alternative. Revetments are also easy to install and offer a very long service life. Revetments are therefore the recommended alternative for erosion control at Sconset.

Given the high erosion rates of the coastal bank, it is critical that the revetment is installed by late fall of 2013. Meeting this schedule would likely require authorizing the revetment as an "Emergency Project" under the WPA or obtaining Conservation Commission approval for the project in a single public hearing or compressed public hearing process during the month of July. Subsequent to this approval, 4-6 weeks would be required to select a contractor; followed by 8-10 weeks for construction of a 551-linear foot revetment, or 4 months for a 1,500-linear foot

revetment. Provided regulatory approval is secured by July, the contractor could be selected in August, and construction could occur from mid-August or September through early December, depending on the length of revetment installed.

In addition to the areas requiring immediate protection, near term (2014) protection of Baxter Road is also recommended for the remaining stretch of Baxter Road from 53 Baxter to the Lighthouse. The significant erosion occurring along Baxter Road from 2012-2013 underscores the point that this entire section is vulnerable to erosion and should be protected as soon as possible. Private support for those areas from 75 Baxter Road to the Lighthouse requiring immediate protection cannot be achieved without a Board of Selectmen commitment to support near term (2014) extension of the revetment across the entire area from 53 Baxter to the Lighthouse.

EROSION CONTROL ALTERNATIVES AND RECOMMENDATIONS FOR SCONSET

1.0 Current Status of Baxter Road and Adjacent Homes

Baxter Road is a public way owned by the Town of Nantucket that provides the only access to the recently relocated Sankaty Head Lighthouse, as well as access for the public, residents, and emergency vehicles to more than 100 homes (Figure 1). Various utilities (water, sewer, communication and electric services) are also included within Baxter Road. At present, sections of Baxter Road are now within 29 to 44 feet of the edge of Sankaty Bluff (referred to herein as the "coastal bank") (Figure 2). Similarly, several homes along Baxter Road are within 10 to 20 feet of the top of the coastal bank (Figures 3 and 4). Many of these homes have significant historical value[1] and they also represent a significant financial contribution to the Town of Nantucket via taxes paid.

Erosion of the coastal bank along the northern portion of Baxter Road has been apparent since 1994, and has been accelerating over the past decade. As detailed in Table 1 below (which provides information on loss of costal bank for each lot from 55 Baxter Road to 119 Baxter Road), last winter (2012-2013) was particularly severe and resulted in coastal bank retreat of 20 to 30 feet or more along most Baxter Road properties. While the 2012-2013 winter season yielded higher-than-average erosion rates, it underscores the point that chronic erosion along this portion of the coastal bank can be catastrophic and that annual coastal bank losses of 20 to 30 feet or more must be anticipated.

Table 1 also presents the following information:

1. Current (May 2013) minimum setback distance between Baxter Road and the top of the bank,

2. March 2012 setback distance between Baxter Road and the top of the bank,

3. Amount of erosion of the bank last year (March 2012 to May 2013), and

4. Current (May 2013) setback distance between buildings on each lot and the top of the bank.

This table makes it clear that sections of Baxter Road are within one major storm (or series of successive storms) of being undermined or lost. Likewise, several homes are within one major storm or series of successive storms of having to be moved or demolished, while many others will be threatened in the near future (See Figures 3 and 4).

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1 Nantucket Preservation Trust. 2007. 'Sconset Historic Site Survey.

Table 1 Baxter Road and Building Setback Distances to Top of Coastal Bank & 2012-2013 Coastal Bank Erosion Rates for 55 to 119 Baxter Road

Lot #	Property Length (ft)	2013 Minimum Baxter Road Setback to Top of Bank (ft)[1]	2012 Baxter Road Setback to Top of Bank (ft)[2]	2012-2013 Loss of Coastal Bank (ft)	2013 Minimum Building Setback to Top of Bank (ft)
119	67	84	94	10	n/a
117	113	95	100	5	n/a
115	104	91	103	12	18
113	93	84	98	14	13
Way	20	96	102	6	
109	163	80	101	21	11
107	162	65	92	27	n/a
Way	18	65	90	25	
105	166	29	60	31	n/a
101	188	37	60	23	n/a
	24				
99	173	44	74	30	17
97	171	61	93	32	24
Way	18		88		
93	89	58	81	23	8
91	94	52	87	35	n/a
87	164	57	100	43	n/a
Way	26				
85	281	73	100	27	n/a
83	134	91	115	24	32
81	106	115	138	23	18
79	99	122	144	22	13
77	88	120	144	24	75
75	80	127	148	21	11
73	149	122	148	26	56
Way	30				
71	102	144	167	23	67
69	109	160	n/a	n/a	46
67	79	181	n/a	n/a	50
Way	30				
65	69	179	n/a	n/a	29
63	182	164	n/a	n/a	30
Way	23				
61	128	162	n/a	n/a	69
59	147	153	n/a	n/a	60
55	119	93	n/a	n/a	32

Notes:
1. 2013 distances based on field measurements taken on 5/30/13.
2. 2012 distances based on March 2012 aerial photo; distances were measured in the same location on each lot as the 2013 measurements for consistency.
n/a - Top of bank retreat not yet apparent on 2012 aerial photo; erosion of lower portion of bank apparent on many properties.

In light of these conditions, the following recommendations are made:

- Immediate protection of Baxter Road is critical for the 551-linear foot stretch from 99-105 Baxter Road, where the distance between Baxter Road and the top of the coastal bank is less than 45 feet (this distance ranges from 29 to 44 feet; see shaded area in Table 1 below and Figure 2). Bank protection must be in place before the 2013 winter storm season in order to eliminate the risk of road closure.

- Immediate protection is also necessary for all remaining homes along Baxter Road from 75 Baxter to the Lighthouse, to protect both Baxter Road and threatened homes that are as close as 11-feet to the top of the coastal bank (see Figures 2-4). Most of the homes from 75 Baxter Road to the Lighthouse would be lost if another severe winter occurred. Protection of these homes likewise protects Baxter Road and its associated utilities. Further, the opportunity for private funding of erosion control efforts will become more limited if additional homes are lost, moved, or demolished.

In addition to the areas requiring immediate protection, near term (2014) protection of Baxter Road is also recommended for the remaining stretch of Baxter Road from 53 Baxter to the Lighthouse. The significant erosion occurring along Baxter Road from 2012-2013 underscores the point that this entire section is vulnerable to erosion and should be protected as soon as possible. Private support for those areas from 75 Baxter Road to the Lighthouse requiring immediate protection cannot be achieved without a Board of Selectmen commitment to support near term (2014) extension of the revetment across the entire area from 53 Baxter to the Lighthouse.

2.0 Alternatives for Road and Bluff Protection

This section provides a summary description of ten alternatives for preventing erosion of the coastal bank at Sconset.

2.1 Geotextile Tubes

Geotextile tubes (geotubes) are fabricated from high strength, woven polyester or polypropylene sewn together into a tube shape and filled with sand. A conceptual geotube design for a 50-year storm would consist of at least four 30-foot-circumference geotextile tubes installed in a terraced alignment and covered with clean sand fill. Construction would require excavating the existing profile to +4.5 feet MLW and installing a 3-foot-circumference anchor tube and scour apron. Geotubes would then be installed and filled on the excavated terraces to approximately 5 feet tall and 11 feet wide. After the geotubes were filled, a clean sand fill would be placed to a top elevation of approximately +23.5 feet MLW. The sand fill would be placed on a 1 vertical: 2.5 horizontal slope to meet existing grade while maintaining a continuous one foot thick sand cover over the filled tubes.

Geotextile tubes are not well-suited to a high energy environment like Sconset. Too much scour at the toe could potentially lead to structural failure (even when a scour apron is included in the design). Geotubes are susceptible to damage from vandalism, debris, and storm waves; storm-driven debris may puncture and tear the tube. For this reason, maintenance costs for geotubes tend to be higher than for other alternatives. When ripped open by storm waves, geotextile tubes may fail in place, emptying sand onto the beach and possibly releasing geotextile material to the coastal environment. The release of sacrificial sand would not have any adverse environmental effects since clean, beach-compatible sand would be used to fill the tubes. However, replacement of the geotube would be expected to be required on a frequent basis (one or more times annually). Such replacement often cannot be accomplished between successive storms, potentially leaving the bank vulnerable to wave-induced scarping at the toe (and subsequent slumping of the upper bank, which undermines vegetative stabilization that otherwise works) at the time when protection is most needed. For these reasons, geotubes are not considered a viable long-term erosion control solution.

2.2 Beach Nourishment

Beach nourishment would involve the placement of approximately 2.6 million cubic yards of sand on Sconset Beach. The nourished beach would be approximately 200 feet wide with a berm height of 12-16 feet above MLW. Sand would be obtained from an offshore borrow site; a likely candidate would be the offshore shoal system known as Bass Rip, though other potential sites could also be evaluated. The wider beach would absorb and dissipate wave energy, thereby increasing protection to infrastructure and property threatened by erosion and storm damage. Additionally, the wider beach would potentially

offer increased public recreation opportunities. Renourishment would be required approximately every 5 years.

While the beach nourishment alternative offers significant benefits, there are potential adverse impacts that must be carefully minimized and/or mitigated. The nourishment envelope would cover more than 125 acres of beach, inter-tidal, and sub-tidal habitats. Direct mortality to the marine organisms living in or on the seafloor would be unavoidable in those areas covered by the beach nourishment sand, although these resources would be expected to recover in 1-3 years. Areas of nearshore cobble habitat important to the local fishing community would be temporarily or permanently impacted by the placement of the beach fill and would require replication of such habitat nearby. While beach nourishment could be planned and executed in a manner that protects threatened public infrastructure and homes while resulting in a minimal level of environmental impact, beach nourishment is not desirable at Sconset due to potential impacts to locally important fishery resources. Therefore, beach nourishment is not a recommended erosion control alternative.

2.3 Dewatering

Beach dewatering systems are based on the supposition that draining water from the beach face can increase the percolation of swash zone water into the beach and promote the deposition of new sediment that is actively moving through the swash zone. The Sconset Beach Preservation Fund (SBPF) installed four different systems that met with mixed levels of performance success. Three of the systems, Lighthouse North (LHN), Lighthouse South (LHS), and Lighthouse South-South (LHS-S) were severely damaged and ultimately removed. The fourth system at Codfish Park is covered by the existing beach, due to beach accretion after its installation and subsequent system upgrade. Once the beach accreted to a point where the system could no longer pump effectively, operations were terminated and the beach responded by eroding.

Although the patterns of shoreline erosion and accretion at Codfish Park have not been linked conclusively with operations of the dewatering system, they are evidence of the system's potential effectiveness. However, based on the extensive storm damage documented to the LHN, LHS and LHS-S systems, and the difficulties involved in performing associated repair and maintenance, beach dewatering as a stand-alone alternative is not preferred or considered viable for long-term, effective protection of threatened public infrastructure and homes.

2.4 Breakwater

Manufactured breakwaters typically consist of structures placed in water depths of 7 to 9 feet that are intended to break wave action and artificially perch the landward beach. Breakwaters could consist of reef balls, narrow-crested artificial reefs, sunken barges, or rubble mounds. Artificial reef balls and narrow-crested artificial reefs would have limited effectiveness in a high-energy environment like Sconset. Sunken barges would offer a

broader profile to potentially dissipate wave energy but would be subject to corrosion, settlement, and movement along the seafloor due to hydrodynamic forces. Environmental permits for sunken barges may be difficult to obtain given their likely impacts and uncertain effectiveness.

An effective offshore breakwater design at Sconset would likely require a large emergent rubble-mound breakwater system, which would occupy a large area of the bottom, permanently impacting nearshore habitat. In addition, until the beach behind such a structure accreted to the point where it formed a tombolo (i.e., it accreted seaward to the structure itself), a large emergent breakwater would act as a barrier to longshore sediment transport, starving downdrift beaches. The long-term efficacy of such a structure is also questionable. Future consideration of a breakwater on an experimental basis, particularly if combined with other erosion control measures, may be warranted. At present, breakwaters are not a preferred alternative for erosion control at Sconset due to limited or questionable long-term effectiveness, potential impacts to nearshore habitat, and potential impacts to downdrift beaches.

2.5 Groin

Groins are concrete, rock, and/or timber structures constructed perpendicular to the shoreline that are designed to catch and trap sand being transported downdrift. Groins compartmentalize the shoreline, minimizing sediment losses from a given section of beach which can have adverse impacts to adjacent downdrift beaches by reducing the sediment supply available to these areas. When used in conjunction with a beach nourishment project, low-profile or semi-permeable groins can reduce the rate of sediment loss from erosion hotspots within a nourished design beach profile and enhance the effectiveness of nourishment. When used on their own without sand mitigation; however, traditional coastal groins are not preferred due to downdrift impacts and consequently environmental regulatory constraints. Groins would not be effective or environmentally feasible at Sconset without an accompanying beach nourishment project or significant sand mitigation program.

2.6 Seawall

A properly-designed seawall for the Project shoreline would be a massive vertical structure composed of hard, impervious material such as concrete or steel that would be placed on the coastal beach at the toe of the coastal bank. Composite seawalls could also be constructed, which might include a seawall fronted by a rubble-mound structure designed to protect the toe of the structure by dissipating wave energy during storms. A preliminary analysis of seawall designs for the Project area suggests that in order to withstand long-term erosion pressures, the structure would need to extend from 10 feet below the existing beach face to a height equal to at least 20 feet up the face of the coastal bank.

Seawalls are not a preferred erosion control method for Sconset primarily due to environmental regulatory constraints stemming from likely environmental effects. Since they are vertical, smooth structures, seawalls in high energy beach areas like Sconset can cause additional wave reflection and turbulence and thus maintaining a beach in front of them can be a challenge. Depending on local conditions, seawalls can decrease the supply of sediment in the littoral system. Additionally, removing a seawall of the size and depth below the beach required at Sconset in the event of negative impacts would be extremely expensive and difficult.

2.7 Drift Fence

Drift fence is designed to trap wind-blown sand and is typically placed a few feet seaward of an eroding dune or coastal bank. While drift fence can cause some minor accumulation of sand, it has been shown ineffective over the long term in a high energy environment at Sconset. The SBPF installed "Duneguard" drift fence along with the beach dewatering systems over a decade ago. Sand nourishment was placed landward of the drift fence to add a layer of protection to the toe of the coastal bank. Even with this provision, however, the drift fence did not make a measureable impact on the erosion of the coastal bank over the long term. Drift fence can also be a significant source of marine debris when it fails after coastal storms. Drift fence is therefore not a suitable alternative for preventing erosion at Sconset.

2.8 Coastal Bank Terraces

Coastal bank terraces of differing designs (utilizing mats or bags fashioned from coir or jute) have been utilized seaward of portions of Baxter Road since the early 2000's. The current design has been in use since 2006, most consistently at 79 Baxter Road, and consists of jute fabric terraces 3-feet high by 5-feet deep by 50-feet long, constructed to an elevation of 12 to 13 above the back of the beach (approximately +20 to +23 MLW). The terraces are secured using duckbill ground anchors buried into the coastal bank. The current design eliminates the anchor stake and coir debris that occurred when earlier terrace installations were damaged during storms. These terraces are designed to be sacrificial. During storm events, they rip open and release sand to the beach; therefore, the terraces have to be completely replaced once or twice a year. Sand for the terraces is obtained from on-island pits and is trucked to Baxter Road, where it is dumped over the top of the bank at designated access points and then placed in the terraces using bobcat or skid steer equipment. Approximately 9-10 cubic yards of sand per linear foot of terraces have been added to the littoral system each year through the maintenance of the terraces. Nearby properties have benefited from the diffusion of sand onto their adjacent beaches.

The terraces have helped to prevent erosion of the toe of the coastal bank at 79 Baxter Road; however, these terraces do not provide sufficient protection during major or successive storm events and cannot be considered a viable long-term option. The strongest storms the terraces have been subjected to have been 10-year storms, and the terraces have

not withstood those events. Rather, the sacrificial terraces have ripped open and released their sand as designed, subsequently requiring complete replacement multiple times a year. During major or successive storm events, wave-induced scarping can still occur at the toe of the coastal bank, followed by slumping of the upper bank, which undermines vegetative stabilization of the upper bank that otherwise works. Such slumping tears out vegetation on the upper bank and emphasizes that vegetation on the upper bank face cannot have a meaningful impact on slowing upper bank erosion without effective toe protection in place. Terraces are not a viable long-term option because they cannot protect the toe of the coastal bank during major or successive storms and require nearly constant post-storm maintenance.

2.9 Marine Mattress and Gabion System

This alternative would consist of placing flexible marine mattresses and gabion baskets on the lower portion of the coastal bank face and along the toe of the coastal bank. Three rows of gabion baskets would be buried in the beach; each basket would be 4-foot high x 5-foot wide x 10-foot-long and filled with 12- to 22-inch diameter stones. Up to three rows of marine mattresses would be placed on top of the gabions along the bank face; each mattress would be 6 feet wide x 18 inches high x 16-30 feet long and filled with 3- to 6-inch diameter stones. The mattresses would extend up the bank face to an elevation of approximately +26 feet Mean Low Water (MLW), in order to provide protection from a 100-year storm. Both the mattresses and the gabions would be formed from HDPE geogrid material. Returns would be placed at the ends of the system to prevent end scour. The marine mattresses and returns would be anchored to the existing bank slope using Platipus ground anchors or helical anchors driven about 12 feet deep into the coastal bank under the mattresses. Finally, a sand cover would be placed over the entire installation and the upper portion of the bank would be planted with native vegetation to provide habitat and decrease erosion of the upper bank.

Marine mattresses and gabions have been used effectively in multiple locations throughout Massachusetts (Boston, Plymouth, Martha's Vineyard, and at Hinckley Lane on Nantucket) and also at Cape May, New Jersey. Experience at these locations has shown that properly-designed marine mattress and gabion systems can be effective in high-energy environments like Sconset. Including a sediment cover in the design may prevent potential impacts to adjacent beaches. The sloped and porous nature of the system would minimize wave reflection and encourage energy dissipation. Disadvantages associated with the system are that the geogrid material must be removed if the system fails, the relatively high cost of this alternative, and the (inaccurate) perception that the required anchors may serve to destabilize the coastal bank. This perception is part of why a marine mattress and gabion project at Sconset was not permitted by the Conservation Commission in 2012. For these reasons, marine mattresses and gabions are not a preferred alternative.

2.10 Revetment

A revetment is a coastal engineering structure consisting of rock facing to protect a sloping embankment against erosion. Revetments generally consist of an outer protective layer of large rocks (approximately 3-6 feet in diameter), an inner core layer of smaller rocks, and toe protection. The outer protective layer provides the basic protection against wave action, while the inner core layer acts as a filter layer to assure drainage and retention of the underlying soil. The toe protection is needed to provide stability against undermining at the bottom of the structure. The primary advantage of a revetment is its flexibility, which allows it to settle into the underlying soil or experience minor damage and still retain its ability to protect the bank from erosion. Revetments also have rough surfaces, which reduce wave runup and overtopping.

Like other coastal engineering structures placed in front of or on the face of a coastal bank to provide storm damage prevention, revetments can potentially interrupt the supply of sediment to the littoral system; therefore, monitoring of adjacent beaches and/or some type of initial or annual sand mitigation would be required. Additionally, like other coastal engineering structures, scour may potentially occur at the either end of the structure from wave reflection. The most suitable end treatment when there are adjacent eroding banks is to taper the ends of the structure using smaller stone to help blend the structure into the adjacent, unprotected bank.

Revetments are a common coastal structure used for erosion control and have been proven effective in environments similar to Sconset (see Section 3.1.6 below and Attachment B). Revetments are relatively easy to install and maintain, with very long service lives. Additionally, the cost of revetment installation is comparable to or less than other alternatives considered and maintenance costs tend to be lower. Revetments also consist of natural rock material and do not require removal in the event of system failure. For these reasons, a revetment is considered the preferred alternative for preventing further erosion of the coastal bank, thereby protecting Baxter Road and the homes along it.

3.0 Recommended Action and Conclusions

3.1 Recommended Action - Revetment

The recommended action to protect Baxter Road, its associated infrastructure, and private homes along Baxter Road is a revetment. Revetments are proven effective in high-energy environments such as Sconset, are easy to install and maintain, are composed of natural rock material, are not anticipated to result in adverse environmental impacts, and offer a cost of installation and maintenance that is comparable to or less than other alternatives. Given the high-energy wave environment at Sconset, "softer" solutions simply cannot be effective long-term against major storms.

Details of the revetment installation are provided below.

3.1.1 Description of Revetment Design

In Sconset, a rock revetment could be placed on the lower slope of the coastal bank from Elevation +0.0 MLW to Elevation +26 MLW to provide protection against wave action from a 100-year design storm. The revetment would consist of a geotextile fabric lining the coastal bank, a filter layer of 4-inch to 8-inch diameter crushed stone, and two layers of larger "armor" stone (see accompanying sheet for size gradation). The armor layer would provide the basic protection against wave action, while the filter layer assures drainage and retention of the underlying soil. The revetment would likely be graded to a maximum slope of 1 foot vertical to 1.5 feet horizontal (see accompanying sheet in Attachment A).

During installation of such a revetment, a layer of geotextile filter fabric would first be placed on the bank face. Next, a minimum 18-inch thick filter layer consisting of 4-inch to 8-inch diameter crushed stone would placed. Two layers of armor stone would be placed on top of the filter layer to form a thickness of 6-feet (when measured perpendicular to the face of the coastal bank). The revetment toe (consisting of armor stone, filter layer, and geotextile filter fabric) would be buried a minimum of 5-feet deep into the existing beach. The toe protection is needed to provide stability against undermining at the bottom of the structure. Lastly, a sand cover or other form of sand mitigation could be added on the face of the revetment or seaward of the revetment; the volume and frequency of this sand placement would likely be determined during the Conservation Commission review process. Sand covers are not typically placed on the face of revetments (see photographs of typical revetments in Attachment B) but may be included for aesthetic reasons or to supply sand to the littoral system. Native vegetation could be planted above the revetment in the appropriate places to stabilize the upper bank.

3.1.2 Environmental Considerations

The revetment will be sloped, and the stones placed to form a rough surface to maximize wave energy dissipation and minimize wave reflection to adjacent, unprotected areas. No construction or placement of sand fill would occur seaward of the Mean High Water line.

Thus, the revetment would not have any adverse effects on marine fisheries, shellfish beds, or other biological communities such as mole crabs which reside the swash zone. A sand cover could be included for aesthetic reasons and to provide sand to the littoral system to avoid impacts to adjacent beaches; however, a sand cover is not necessary for the revetment to effectively protect the toe of the coastal bank.

3.1.3 Regulatory Considerations

The Massachusetts Wetlands Protection Act (WPA) and Nantucket Wetlands Bylaw and regulations (Bylaw) have specific provisions governing the installation of a coastal engineering structure such as a revetment. The revetment will be placed on the face of the lower coastal bank, and the toe portion of the revetment will be buried at the interface between the coastal bank and coastal beach.

- Under the WPA, coastal engineering structures are allowed to prevent storm damage to pre-1978 buildings. The protected structures can be on the water or land side of the road. Additionally, protection across "gap lots" between pre-1978 homes may also be permitted.

- Under the Nantucket Wetlands Bylaw regulations, coastal engineering structures are allowed on a coastal bank to protect public infrastructure, or pre-1978 structures that have not been substantially improved, from imminent danger.[2] A revetment on a coastal bank is thus permissible. Coastal engineering structures are also allowed on a coastal beach to protect pre-1978 structures that have not been substantially improved from imminent danger.[3] A revetment on a coastal bank and coastal beach is thus permissible, but may require determinations or waivers by the Town and Conservation Commission.

Additionally, §67-1 of the Code of the Town of Nantucket provides for a temporary moratorium (ending December 31, 2013) on coastal engineering structures on Town-owned land from Great Point south to and including the Sconset sewer beds. Subsection D provides for an exception from the moratorium for emergency actions to protect public

---

[2] NAN2.05(B)1. "No new bulkheads, coastal revetments, groins, or other coastal engineering structures shall be permitted to protect structures constructed, or substantially improved, after 8/78 except for public infrastructures. Bulkheads and groins may be rebuilt only if the Commission determines there is no environmentally better way to control an erosion problem, including in appropriate cases the moving of the threatened buildings and/or public infrastructure. Other coastal engineering structures may be permitted only upon a clear showing that no other alternative exists to protect a structure that has not been substantially improved or public infrastructure built prior to 9/78, from imminent danger."

[3] NAN 2.02(B)2. "No new bulkheads or coastal engineering structures shall be permitted to protect structures constructed, or substantially improved, after 8/78. Bulkheads may be rebuilt only if the Commission determines there is no environmentally better way to control an erosion problem, including in appropriate cases the moving of the threatened building. Other coastal engineering structures may be permitted only upon a clear showing that no other alternative exists to protect a structure built prior to 9/78, and not substantially improved, from imminent danger."

infrastructure: "This moratorium shall not prohibit emergency armoring measures necessary to protect public roads, public buildings, or other public assets from imminent destruction." In the case of Sconset, Baxter Road is clearly threatened as well as public property assets.

3.1.4 Cost

The cost of installation and maintenance is comparable or lower than a marine mattress/gabion system, and is substantially lower than terraces.

3.1.5 Construction Information

Approximately 8-10 weeks would be required to install the 551-foot section of revetment. Approximately 1500-feet of revetment could be installed to protect the most severely threatened homes from 75 Baxter to the Lighthouse in approximately 4 months. Construction could occur from August or September into early December.

It is highly likely that the construction would be staged from the beach, with barges bringing in rocks and other supplies and offloading them to a barge anchored at the beach with a gangway to the beach. This approach would avoid truck traffic on local roads during the late summer.

3.1.6 Assessment of Effectiveness

Revetments are a common coastal structure used for erosion control along shorelines in the northeast due to their proven effectiveness and the availability of suitable rock from local quarries. Numerous examples exist of successful revetment projects that have been constructed along Cape Cod and Southeastern Massachusetts. Examples of several such revetment projects are provided in Attachment B, which includes photographs of revetments in Plymouth, Scituate, Hull, Marshfield, and Nantucket. Like Sconset, the revetments included in Attachment B were installed on a coastal bank in a location facing open water. This information shows that revetments can be used for long-term, effective protection of public infrastructure and homes.

3.2 Public Benefits

Erosion protection at Sconset would provide the following public benefits:

- Protection of Baxter Road and associated utilities.
- Preservation of historic homes and historic settings, as well as the relocated but still ultimately endangered Sankaty Head Lighthouse.
- Preservation and possible restoration/expansion of the 'Sconset Bluff Walk.
- Preservation of tax revenue for Town of Nantucket and restoration of significant future tax revenues from deeply depreciated currently threatened properties.

- Preservation of private funding sources for erosion control efforts that protect Baxter Road through retention of private homes on Baxter Road, both now and in the future.

- Possible inclusion of additional points of beach access to the general public.

3.3 Obtaining Environmental Approval for Recommended Action

As indicated above, it is critical that the most vulnerable section of Baxter Road (from 99-105 Baxter Road) is protected prior to the 2013-2014 winter storm season, or it is highly likely that part of Baxter Road will have to be closed or will actually be lost by slumping associated with ongoing bank erosion. Likewise, it is necessary to provide imminent protection for most of the homes from 75 Baxter Road north to the Lighthouse, since most of these homes could be lost during one severe storm season. A revetment would require both the support of the Board of Selectmen and approval from the Nantucket Conservation Commission. Such approval would be required by July in order to meet the following scheduling requirements:

- Installation of the system must be completed by late fall to provide protection from winter storms.

- Approximately 6 weeks will be required to prepare a request for proposals, solicit bids, and select a contractor.

- Installation of the system will require 8-10 weeks for a 551-foot long stretch; or 4 months for an up to 1500-foot long stretch.

Under these timeframes, approval from the Conservation Commission by July would be necessary, to allow selection of the Contractor by August, with construction to commence in mid-August or September and finish no later than early December.

There are two potential means through which a revetment project could receive authorization from the Conservation Commission: as an "Emergency Project" or through the typical Notice of Intent (NOI) review process under the WPA and Bylaw. Each of these options is discussed below.

3.3.1 Emergency Project Approval

The procedure for obtaining approval for an emergency project is outlined in the WPA regulations at 310 CMR 10.06 and described below:

- The Conservation Commission or DEP Commissioner has to certify the project as an "emergency."

- An emergency certification can be issued only for "the protection of public health or safety."
- The Conservation Commission has 24 hours to act after receiving the application form.
- The timeframe for work to be performed is only 30 days, unless the DEP Commissioner approves the extension.
- The only work allowed is that which would "abate" the emergency.
- There is an appeal period associated with the emergency action approval, but work can occur during the appeal period.

The protection of Baxter Road for the 551-foot section from 99-105 Baxter Road may potentially qualify as an emergency, although this is not certain. If the project were certified as an emergency, a timeframe longer than 30 days would have to be approved in order to allow the 8-10 weeks needed for revetment installation from 99-105 Baxter Road or the 4 month installation timeframe required for a 1500-linear foot revetment. Typically emergency certification is given after an emergency such as a major storm has occurred and immediate action is needed to abate the emergency conditions created by the storm damage. In the case of Sconset, an emergency certification would have to be granted under a more pro-active approach where the foreseeable loss of Baxter Road and/or homes is imminent but has not yet occurred.

3.3.2 Normal (Non-Emergency) Project Approval

The normal procedure for obtaining approval for a project under the WPA and Bylaw involves the submission of a NOI followed by one or more public hearings, after which an Order of Conditions (OOC) is issued. Following the issuance of the OOC, there is a 10 business day appeal period under the WPA regulations and a 20 day appeal period under the Nantucket Wetlands Bylaw.

In order for the revetment to be installed prior to the 2013-2014 winter storm season, the revetment must receive Conservation Commission approval during the month of July. A NOI would have to be filed in late June or early July in order to be heard by the Commission in July. The Conservation Commission would have to be prepared to address any questions or concerns about the project within one hearing and to issue an Order of Conditions soon after the close of the single public hearing.

3.4 Conclusions

Immediate protection of Baxter Road is critical for the 551-foot stretch from 99-105 Baxter Road, where the distance between the road and the top of the coastal bank is less than 45 feet (this distance ranges from 29 to 44 feet). Immediate protection of Baxter Road is also necessary for all remaining homes along Baxter Road from 75 Baxter to the Lighthouse, to protect both Baxter Road and threatened homes that are as close as 11-feet to the top of the coastal bank. Most of the homes from 75 Baxter Road north to the Lighthouse would be lost if another severe winter occurred.

A rock revetment would provide effective protection in a high-energy environment like Sconset with no significant adverse environmental impacts; the cost of this alternative is comparable to, or lower than, the other alternatives. Given the high erosion rates of the coastal bank (up to 25 feet or more of the bank can be lost in one strong winter storm season), it is critical that the revetment is installed by late fall 2013. Meeting this schedule would require authorizing the revetment as an "Emergency Project" under the WPA or obtaining Conservation Commission approval for the project in a single public hearing during the month of July. Following this approval, contractor selection could occur in August, and revetment installation could occur from mid-August or early September through early December, depending on the length of revetment installed.

In addition to the areas requiring immediate protection, near term (2014) protection of Baxter Road is also recommended for the remaining stretch of Baxter Road from 53 Baxter to the Lighthouse. The significant erosion occurring along Baxter Road from 2012-2013 underscores the point that this entire section is vulnerable to erosion and should be protected as soon as possible. Private support for those areas from 75 Baxter Road to the Lighthouse requiring immediate protection cannot be achieved without a Board of Selectmen commitment to support near term (2014) extension of the revetment across the entire area from 53 Baxter to the Lighthouse

Attachment A

Figures

Figure 1 Aerial Locus Map
Figure 2 Current Setback of Road and Houses to Top of Bank, 93 to 105 Baxter Road
Figure 3 Current Setback of Houses to Top of Bank, 69 to 83 Baxter Road
Figure 4 Current Setback of Houses to Top of Bank, 109 to 115 Baxter Road
Typical Revetment Section

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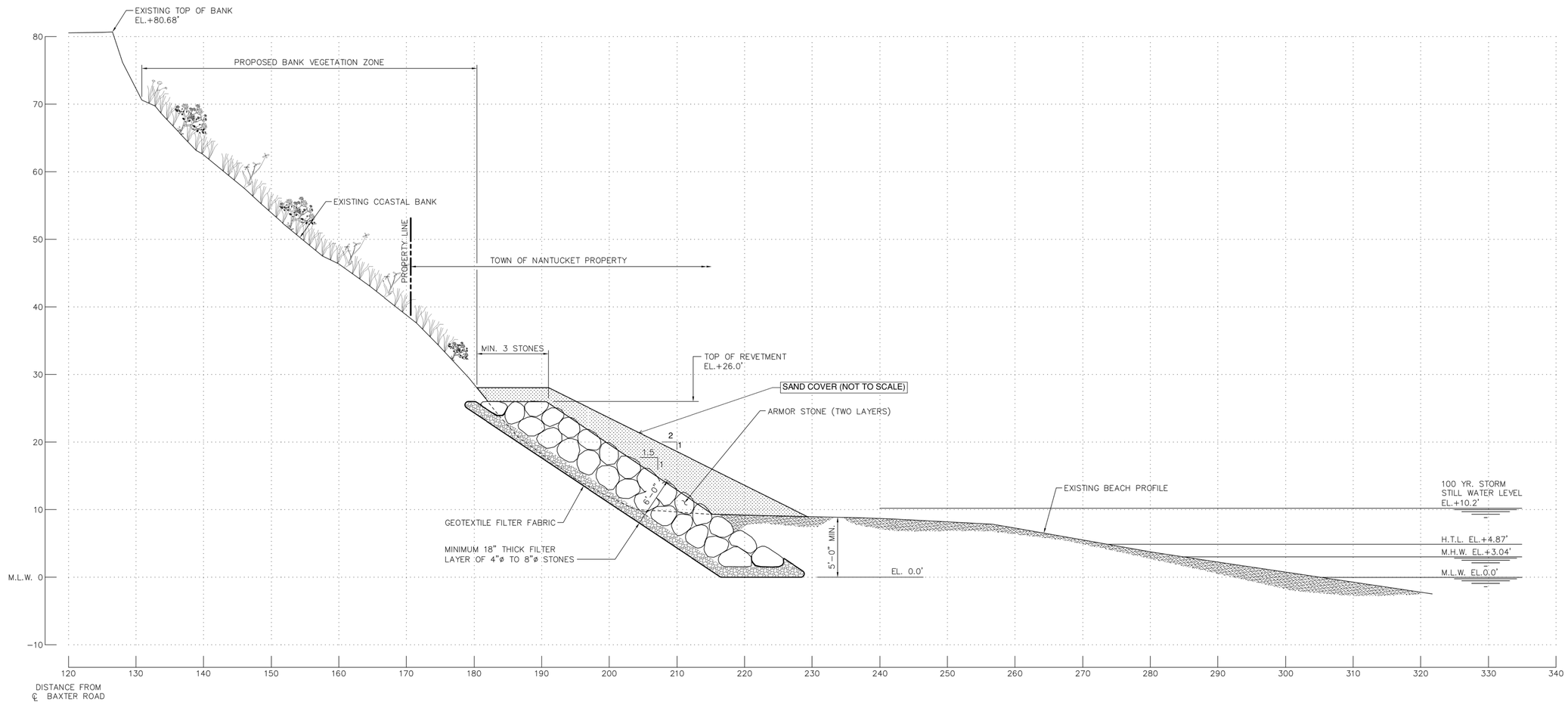
Nantucket, Massachusetts

Figure 1
Aerial Locus Map

Figure 2. Current Setback of Road and Houses to Top of Bank
93 to 105 Baxter Road

Figure 3. Current Setback of Houses to Top of Bank
69 – 83 Baxter Road

Figure 4. Current Setback of Houses to Top of Bank
Lots 109 - 115



GEOTEXTILE FABRIC

1. GEOTEXTILE FABRIC SHALL BE MIRAFI FILTERWEAVE FW-700 GEOTEXTILE FABRIC OR AN EQUIVALENT ACCEPTED BY THE ENGINEER OF RECORD.
2. INSTALL GEOTEXTILE FABRIC IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. MAINTAIN MINIMUM 12 INCH LAP AT ADJACENT SECTIONS.
3. PROVIDE ADEQUATE SLACK IN FABRIC DURING INSTALLATION BY PROVIDING CONTINUOUS 12 INCH FOLDS AT 15 FOOT CENTERS PARALLEL TO THE SHORELINE.
4. PROPERLY ANCHOR FABRIC TO PREVENT SLIDING OR TEARING DURING INSTALLATION OF OVERBURDEN MATERIAL.

RIPRAP SHORE PROTECTION

1. STONE SHALL BE OF A QUALITY TO INSURE PERMANENCE OF THE STRUCTURE IN THE CLIMATE IN WHICH IT IS TO BE USED. THE STONE SHALL BE FREE FROM ORGANIC DEBRIS, DURABLE, SOUND, FREE FROM DETRIMENTAL CRACKS, SEAMS, AND OTHER DEFECTS WHICH TEND TO INCREASE DETERIORATION FROM NATURAL CAUSES OR CAUSE BREAKAGE IN HANDLING OR PLACEMENT. ORGANICS, SAND, CLAY, CHERT AND ROCK FINES ARE PROHIBITED. THE STONE SHALL BE SELECTED GRANITE, QUARTZITE, RHYOLITE, OR LIMESTONE.
2. FILTER LAYER BEDDING STONE SHALL BE 4 TO 8 INCH DIAMETER NOMINAL CRUSHED STONE.
3. RIPRAP ARMOR STONE SHALL CONFORM TO THE FOLLOWING GRADATION:

PERCENT PASSING	ARMOR STONE (LBS)	NOMINAL DIMENSION (FT)
W_0	500	1.5
W_{15}	1,500	2.0
W_{50}	3,850	3.0
W_{85}	7,500	3.5
W_{100}	15,400	4.5

4. ARMOR STONE SHALL HAVE A MINIMUM SIZE OF 18 INCHES MEASURING THE LEAST DIMENSION ACROSS ITS MIDSECTION.
5. NO MORE THAN 15% OF THE ARMOR SHALL BE SCATTERED SPALLS AD STONES LESS THAN 24 INCHES.
6. STONES SHALL BE PLACED IN A MANNER TO PRODUCE A WELL GRADED MASS WITHOUT CAUSING DISPLACEMENT OF THE UNDERLYING MATERIAL. THE FINISHED SURFACE SHALL BE FREE FROM POCKETS OF SMALL STONES AND CLUSTERS OF LARGE STONES.

GENERAL NOTE

ALL ELEVATIONS ARE BASED ON MEAN LOW WATER DATUM (M.L.W.=C.0').

GRAPHIC SCALES
CHECK GRAPHIC SCALES BEFORE USING

1/8"=1'-0" 0 5 10 15 FT.

NOT FOR CONSTRUCTION

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REVISIONS	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY

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SCONSET BEACH
PRESERVATION FUND
18 Sesaoana Road, Nantucket, MA 02554

DESIGNED BY: ADKA
DRAWN BY: CAMA
CHECKED BY: BRJO
QC REVIEW: XXXX

REVETMENT DESIGN ALTERNATIVE
FOR SCONSET COASTAL BANK STABILIZATION

SCALE AS NOTED
DATE 5/30/13
REVISION

PROPOSED TYPICAL SECTION

DRAWING NO.
210019.1-1-01

P:\2010\OCC_210019.1\3_Project_Files\CAD\Task 1\01.dwg Dwg 01 Carrie L. Walter Wed, 05 Jun 2013 - 3:04pm

Attachment B

Revetment Examples

Figure B-1	Hull, Point Atherton Revetment
Figure B-2	Hull, Green Hill Revetment
Figure B-3	Scituate, Fourth Cliff Revetment
Figure B-4	Plymouth, Gurnet Revetment
Figure B-5	Plymouth, Cedarville Landing Revetments
Figure B-6	Nantucket, Capaum Pond Road Revetment
Figure B-7	Nantucket, Westcliff Lane Revetment

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Nantucket, Massachusetts

Figure 1

Existing Revetments

Figure B-1 – Hull, Point Atherton Revetment

Figure B-2 – Hull, Green Hill Revetment

Figure B-3 – Scituate, Fourth Cliff Revetment

Figure B-4 – Plymouth, Gurnet Revetment

Figure B-5 – Plymouth, Cedarville Landing Revetments

Figure B-6 – Nantucket, Capaum Pond Road Revetment

Figure B-7 – Nantucket, Westcliff Lane Revetment

BAXTER ROAD
PUBLIC-PRIVATE PARTNERSHIP
June 7, 2013

As has been advised by Town Counsel, the Town of Nantucket has legal and political obligations to act to protect or replace public roads and infrastructure in cases of erosion, and may also have other liabilities for damages in such cases. Dealing with these issues can be very burdensome on Town staff, public funds, and otherwise. However, interested private parties can play an important role in easing this burden and making the process less expensive, more efficient and more successful. There are several private entities that could play a role, including the Sconset Beach Preservation Fund, the Sconset Trust, the Sankaty Head Golf Club, the Nantucket Preservation Trust, local property owners, and others. The Town should engage with these parties on this issue.

The Town is currently considering proposals that would reroute the access and utilities at the northern end of Baxter Road and is also investigating options to stabilize and protect the Sconset bluff (as well as the historic homes and places, public infrastructure, public access, environmental habitats, tax valuations and other valuable resources at risk). Undertaking these actions can be very complicated and expensive. By engaging in a cooperative process, private parties could offer a windfall of benefits to the Town, including:

1) Engage in preliminary research and data production at private expense.
2) Engage with residents to encourage cooperation with the Town regarding legal actions that can be cooperative or adversarial. Instead of residents opposing the Town over property rights and funding sources, a cooperative approach could be faster and less expensive, while also avoiding potential claims against the Town for damages.
3) Develop donors and supporters to defray a significant portion of public cost for needed infrastructure and infrastructure protection.
4) Help avoid some initial and ongoing or repetitive costs to Town.
5) Potentially fund, gift or directly pay for some or all initial costs, contingent on an agreement for the comprehensive project.
6) Avoid some burdensome or lengthy processes, like 30B bidding, as appropriate.
7) Obtain permits and act as project manager or operator, as appropriate.
8) Encourage expansions of public access to be built into the project.
9) Create tax deduction benefits for private participants.

The terms and conditions that private parties would seek from the Town would not be onerous. For example, participants would likely seek to delay installation of (not preparation for) new roads or utilities to see if those public and private burdens can be avoided. Further, parties absorbing a significant portion of the cost of bluff protection where there are no private homes (anymore) would want to be confident that they will also be able to protect the bluff at habitable locations too, as soon as possible, as appropriate. However, the Town could retain its authorities and controls. The Town would also likely pay some fair share of the costs, although less than its legal liability.

If the BOS agrees that the bluff stabilization effort should move forward, it could be done in two parts: Part 1, the emergency stabilization of the most vulnerable portions of the bluff where Baxter Road and certain homes are imminently threatened to be completed before late fall 2013. Part 1 could be funded and constructed by SBPF with private contributions. Part 2 would consist of protecting the entire bluff from Sankaty Lighthouse to the point at which erosion has begun (approximately 53 Baxter Road).

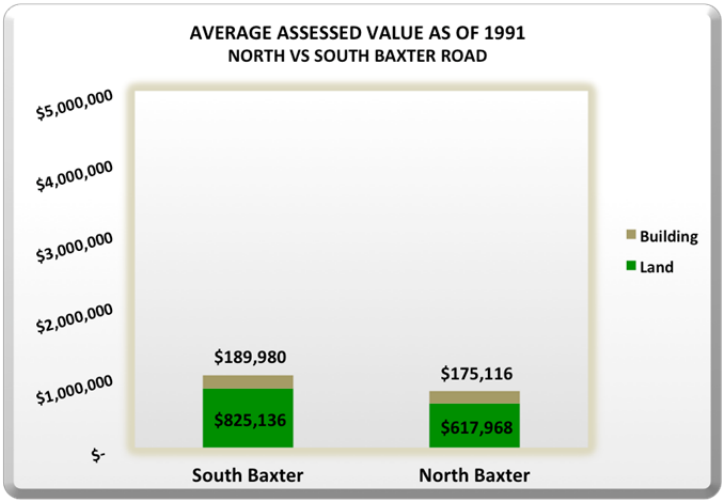
Siasconset Beach Preservation Fund

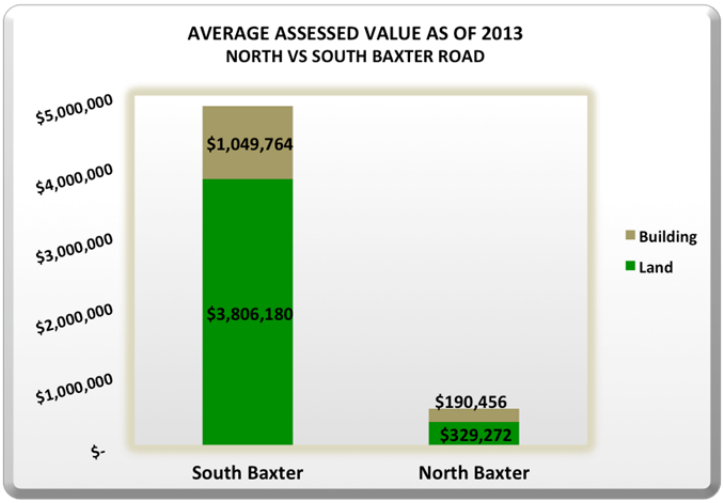
Impact of Bluff Erosion on Baxter Road Real Property Taxable Base

Introduction: In order to approximate the impact that bluff erosion is having on town revenue, Windwalker Real Estate looked at two snapshots of assessed value for the properties on the ocean side of Baxter Road -- one in 1991 and the other in 2013. The properties were separated into two groups: the "South" (#5-63), where erosion has had limited impact, and the "North" (#65-119) which are the properties most impacted by erosion. Land and Building assessments were reviewed separately.

Key Findings:

- In 1991, the average assessed value of land and buildings between the North and South were nearly identical. After 22 years of erosion exposure, this value differential widened substantially (see below chart) such that in 2013 there was a stark difference between the average assessed value of properties on the North and South side of Baxter Road.
- If the properties in the North had appreciated at the same rate as the properties in the South, the Town of Nantucket would realize $230,000* in additional tax revenue from the $63 million in land and building value that has been "lost" to erosion. Over the next ten years, this would equate to approximately $2.3 million in Town revenue.
- If all of the properties along the eastern side of Baxter Road were lost to erosion, the town would lose $134 million* in assessed value, or $473,000* in tax revenue. Combined with the $63 million already lost, nearly $200 million* (or $734,000* in revenue) would be lost to the Town's tax base from the east side of Baxter Road alone. Substantial additional losses would be seen from the west side of Baxter Road and elsewhere in 'Sconset. (**Based on 2013 assessment values and residential mil rate*).





Analysis:

LAND

THEN: In 1991, the average assessed value of land for lots located on the **south*** end of Baxter Road was **$825,000** while those located on the **north*** end of Baxter Road averaged **$618,000**.

- Land located on south Baxter was, on average, assessed at 1.3X the value of land located on north Baxter.

NOW: In 2013, the average assessed value of land for lots located on the **south** end of Baxter Road was **$3,806,000** while those located on the **north** end of Baxter Road averaged **$329,000**.

- Land located on south Baxter was, on average, assessed at 11.6X the value of land located on north Baxter.

BUILDINGS

THEN: In 1991, the average assessed value of buildings located on the **south** end of Baxter Road was **$190,000** while buildings on the **north** end of Baxter Road averaged **$175,000.**

- Buildings located on south Baxter were, on average, assessed at 1.1X the value of buildings on north Baxter.

NOW: In 2013, the average assessed value of buildings located on the **south** end of Baxter Road was **$1,050,000** while buildings on the **north** end of Baxter Road averaged **$190,000.**

- Buildings located on south Baxter were, on average, assessed at 5.5X the value of buildings on north Baxter.

Tax Impact:

Between 1991 and 2013, the average assessed value of land and buildings on the southern portion of Baxter Road increased by 361% and 453% respectively, while the assessed value of land and buildings on the northern portion declined by 47% and increased by only 9% respectively.

Hypothetically, had erosion been controlled, ceteris parabis, and the assessed values of the northerly properties enjoyed the same appreciation as the southerly properties, in 2013, the Town of Nantucket would have had additional revenue of:

Land: $175,000
Buildings: $55,000
TOTAL: $230,000

Holding all economic conditions constant, this yearly revenue loss would only increase over time as erosion worsens on the properties presently affected, and more properties, south and west of Baxter Road, are exposed to erosion.

Historic Structures (more than 50 years old) on Baxter Road
In high erosion area (from the Lighthouse to Ann's Lane).

Property Address	Map/ Parcel	Date of Construction	Records of Main Dwelling Moves • Building Department file, unless noted • year noted is building permit issue year
119 Baxter Road	48-7		1987 - Moved to 82 Baxter Road *
117 Baxter Road	48-9	By 1923 Note: per B Dept, built in 1978	1988 - Moved on same lot 2005 - Moved to 116 Baxter
116 Baxter Road	48-34		2005 - 117 Baxter moved to this lot
115 Baxter Road	48-10	By 1923 1925	1988 - Moved on same lot
113 Baxter Road	48-11	Since 1940**	1988 - Moved on same lot
112 Baxter Road	48-36		2005 - 99 Baxter moved to this lot
109 Baxter Road	48-12	Since 1940**	1988 - Moved from "Lot A to Lot B"/ 111 Baxter (109 & 111 are combined)
106 Baxter Road	48-39		1998 - 105 Baxter moved to this lot
105 Baxter Road	48-15	By 1940	1975 - Moved per HDC file 1988 - Moved on same lot 1998 - Moved to 106 Baxter
104 Baxter Road	48-40		2001 - 101 Baxter moved to this lot
101 Baxter Road	48-17	By 1940	1988 - Moved per HDC file 2001 - Moved to 104 Baxter
99 Baxter Road	48-18	By 1940	1975 - Moved per HDC file 1988 - Moved on same lot 2005 - Moved to 112 Baxter
97 Baxter Road	48-19	Since 1940**	1975 - Moved per HDC file 1988 - Moved on same lot 2010 - Moved part to 7 Plainfield
96 Baxter Road	48-44	Since 1940**	n/a
93 Baxter Road	48-21	1950 1951	1992 - Moved on same lot 2010 - Moved on same lot
92 Baxter Road	48-23	Since 1940**	2005 - Moved to 18 Irving (note: this lot is on the West side of Baxter & a new dwelling was built on this lot in 2005)
91 Baxter Road	48-22		(combined with 93 Baxter)
86 Baxter Road	49-36	By 1940	n/a
85 Baxter Road	49-35	1925 By 1940	2010 - Moved to 47 Monomoy
84 Baxter Road	49-37	Since 1940**	n/a
83 Baxter Road	49-34	Since 1940**	2001 - Moved on same lot
82 Baxter Road	49-39	By 1923	1987 - 119 Baxter moved here *
81 Baxter Road	49-33	By 1923	1993 - Demolished (note: new dwelling built in 1993)
79 Baxter Road	49-32	1916 By 1923	n/a
77 Baxter Road	49-31	Since 1940**	2006 - Moved on same lot
76 Baxter Road	49-42		(combined w/ 3 Bayberry)
75 Baxter Road	49-30	1922 By 1923	n/a
3 Bayberry Lane	49-43		n/a
73 Baxter Road	49-27	1920 (both show same year)	2012 - Demo portion & moved on lot

72 Baxter Road	49-44	Since 1940**	n/a
71 Baxter Road	49-26.1	1932 1939	2009 - Moved on same lot
70 Baxter Road	49-45	1940	2000 - Moved to 4 Lincoln (note: new dwelling built in 2000)
69 Baxter Road	49-25	Since 1940**	1997 - Moved to 320R Milestone (note: new dwelling built in 1996 - co in 1998)
68 Baxter Road	49-47	By 1938	n/a
67 Baxter Road	49-24	1930 (both show same year)	2001 - Moved on same lot
65 Baxter Road	49-23	1895 (both show same year)	n/a
63 Baxter Road	49-22	1890 1892	n/a
61 Baxter Road	49-21	1893-4 1893	n/a
59 Baxter Road	49-20	1905 By 1923	n/a
58 Baxter Road	49-54	Since 1938**	1999 - Moved on same lot
55 Baxter Road	49-18	1890 (both show same year)	1998 - Moved on same lot
53 Baxter Road	49-17	1925 1930	n/a
52 Baxter Road	49-57	Since 1938**	n/a
51B Baxter Road	49-16	1886 1887	2009 - Moved on same lot
51A Baxter Road	49-16.1		
49 Baxter Road	49-15	1886/1978 By 1904	destroyed by fire, replaced in 1978
47 Baxter Road	49-14	1886 By 1904	n/a

* historic structures files indicate that the home at 82 Baxter was moved in 1987 and ". . . originally stood just southeast of the Lighthouse. During the 1970s and 80s it was owned by M/M Ward West". 119 Baxter Road traces back to Austin Ward West (Cert. 7568) & Austin Ward West & Barbara C. West, Trustees (Cert. 11,420).

** actual date of construction is estimated to be between the date referenced and 1972 (year building code implemented)

Source is Historic Structures files
Source is NPT

Note: detailed histories and substantiating documentation is available upon request.

‘Sconset

Historic

Site Survey

Prepared for

The ‘Sconset Beach Preservation Fund

By

The Nantucket Preservation Trust

2007

Siasconset Historic Site Study

In the Spring of 2007 the Nantucket Preservation Trust (NPT) undertook an investigation of historic resources within the Siasconset Beach Preservation Fund (SBPF) study area.

The study grew out of a concern for historic resources threatened by erosion along the bluff and storm events that affect low lying areas such as Codfish Park. NPT was asked to evaluate properties to determine if there were significant structures and resources in the area.

To evaluate historic resources, NPT designed a reconnaissance survey to provide a better understanding of the architectural development of the area, as well as information on the architectural integrity and historic significance of individual properties.

The historic site survey provides information on architectural and historical significance and helps to bring attention to these resources. NPT believes documenting resources in this manner is also critical for understanding 'Sconset's evolution and more recent history, as well as for ensuring that the architectural heritage of these resources is recorded for future generations.

The Project Scope

Determining what buildings to include in the project was based on the SBPF study area and the age of structures. NPT determined that structures that date from 1950 or earlier should be surveyed due to this being the standard benchmark for inclusion as historic and eligible for listing on the National Register of Historic Places. On Nantucket, buildings constructed prior to 1900 are currently classified as contributing to the National Historic Landmark district—the highest level of historic designation. The designation report, first completed in 1966, is in the process of being updating to include buildings 50 years old and older.

Documents such as Town of Nantucket assessment records, town maps, Sanborn maps, past survey sheets, Preservation Institute reports and other historic reports and papers available at the Nantucket Historical Association's research library were reviewed to provide a list of potential historic resources and to assist in identifying general dates of construction.

NPT estimated that 50 properties within 50 feet of the bluff or below the bluff appear to date prior to 1950. Due to the large number of buildings, the historic site survey was limited to properties along the east side of Baxter Road and in Codfish Park. The area, although limited and easily expandable, was determined to be adequate for preliminary determination. The reconnaissance survey is meant to provide an overview of these resources rather than a comprehensive architectural and historical analysis.

Survey Format

Upon review of existing information, it was determined that each identified property should be surveyed using the standard state historic preservation form. Form B, prepared by the Massachusetts Historical Commission, is the most comprehensive form available on the state level for reconnaissance survey work. The form allows for documenting the structure's date of construction, general exterior materials, and historical information. Photographs and a property map are also crucial components. The forms are intended to provide basic information to identify the property and the resources on site.

It was determined that the following fields should be completed. A brief explanation of how the information was gathered or completed follows.

Property/Location

The form provides several options for property identification. The following were included:

Assessor's number: The Assessor's Number refers to the property parcel identification number assigned by the Town of Nantucket.

Town/Place: Each resource is located in the Town of Nantucket and within the village of Siasconset.

Address: The street address was noted for each property.

Historic name: Nantucket has a tradition of naming cottages, and where known the historic name is noted. In several cases, early names perhaps no longer used were found through historic research and are provided on the form. Common names are not necessarily listed.

Resource Description

Uses: Present and original. All main structures appear to be for residential use. It is assumed the structures were built for this purpose, unless otherwise noted. More detailed historic research on several could change the original use category.

Date of construction: An estimated date of construction was provided for each structure. The source for the date was usually based on deed research, historic map research, or architectural style. In some instances other information such as Town assessment records were used to pinpoint a more specific date.

Style/Form: The style of the structure or its general form was noted. Most resources are vernacular versions of high style structures and determining one style or form is subjective. Prevalent architectural styles include elements common to the following architectural styles: Shingle style cottages dating from the 1880s to 1920s; Gothic Revival cottages dating from the 1870s to 1880s; Stick/Queen Anne style cottages dating

from the 1880s to 1890s, Colonial Revival cottages dating from the 1890s to the1920s, and Bungalows dating from the 1900s to 1930s. Some dwelling styles are difficult to identify and a classification was established. For example, most cottages in Codfish Park developed from fishing shacks that were rectangular in plan. The term Fish Shack or Cottage are used under this heading.

Architect/Builder: In only a few cases were the architect and/or builder identified. Additional research may provide new information.

Exterior material: Several elements were noted when visible. Sections for the foundation, wall/trim and roof material and form of the structure were noted.

Outbuilding/Secondary Structures: The name/use and an estimated construction date were noted for most resources.

Major alterations: Information was provided where it was obvious that changes had occurred. Alteration dates were provided by the owners or noted from Town records. Many properties may have alterations that were not noted.

Condition: Only two categories were determined necessary for the purpose of this study. Most resources have been maintained in Good condition and were noted as such. Several properties that are in need of maintenance were identified as Fair.

Moved: It is often difficult to determine if a structure has been moved since house-moving has a long tradition on Nantucket. For the purposes of this study, it has been assumed that the structures were not moved unless documentation was found to prove otherwise. Unlike most communities, moving a structure on Nantucket does not necessarily impact the structure's architectural integrity.

Acreage: Information from Town records was used to determine lot size. Most lots were found to be less than an acre. Properties greater than an acre were noted.

Setting: All structures surveyed were determined to be in a residential setting.

Architectural description: The architectural description was determined in the field and completed in March and April of 2007. In general, it describes the exterior of a structure by size, scale, form, style and materials. In most cases, the east elevation (North Bluff) was noted as the main façade and more detailed descriptions for the elevation was completed. The following common terms are the most common elements noted:
Stories: Number of floors to determine height.
Bays: Number of openings (doors/windows) to determine width.
Plan: Footprint of the building, rectangular, T- or L- shaped etc., main block, wings and ells.
Materials: Shingle (patterns noted), clapboard.
Roof form- gable, hip, mansard, jerkin-head.
Roof elements: Chimneys, dormers, cupolas, roof walks, rafters.

Windows: Window type, including the sash (panes), and how they are aligned on an elevation.
Door: Location and form.
Porch: Location and form, elements such as balusters, post, railings, brackets
Other: Decorative elements.

Historical narrative: Historical narratives were compiled over the course of the project as historic maps were viewed and historic research was completed. During the investigation, it was discovered that only limited historical documentation was available on most properties.

Documentation of late 19th and 20th century resources had often not been completed due to past focus on Nantucket's rich 17th, 18th and early 19th century history. Today historians, architectural scholars and others interested in learning more about this period discover that they need to complete deed research and other primary source documentation for resources, especially those constructed after 1900.

In order to be as thorough as possible, NPT gathered known documents and undertook some primary research to uncover the individual histories of resources. The information provided, however, in some cases may be preliminary, and more in depth research could be completed. Access to the interiors of only a few properties was gained; interviews with property owners and additional deed research and historic research on past owners will reveal much more.

Please note that the recommendation for listing in the National Register of Historic Places was not checked for any property since the entire island is already a National Historic Landmark. Approximately 2,400 structures are listed as contributing to the district under current regulations. The NHL update being completed in 2007-2008 will ensure that the remaining resources are also listed as contributing structures.

Other Documentation: Other materials have been included along with the individual survey forms to supplement the historic information. Historic photographs of both extant structures and those no longer standing have been included, as have copies of past property owners where available, and recent interior photographs documenting a handful of historic resources. In addition, information on past owners has been included where appropriate.

Findings

The survey, begun in March 2007 and completed in June 2007, was designed to identify historic resources in the study area. The project was seen as a first step in learning more about resources and if they retain their architectural and historical integrity. In short, the survey identified a total of 54 resources 50 years old or older in the area east of Baxter Road on the North Bluff, and in Codfish Park below the bank near 'Sconset's historic core. Thirty of the structures surveyed were on the North Bluff, and 24 were in Codfish Park.

Field study revealed that many of the historic resources remain and, like most structures on Nantucket, have evolved over time. Research also unveiled rich histories that reflect Nantucket's importance as a resort development from its birth in the 1870s and heyday in 'Sconset as a retreat in the early 20th century. Overall the properties provide a glimpse of summer life from both the eyes of the nation's rich and famous as well as those who lived and worked here.

The study found that, like many of Nantucket's 18th and early 19th century resources, the late 19th and early 20th century buildings along the North Bluff and in Codfish Park remain remarkably intact; and continue to be an important part of 'Sconset's evolution. It is often difficult to determine if a building evokes its past from the exterior alone, so a sampling of interior inspections was completed. Interior inspection revealed that many homes retain original and old fabric as well as their original plan. Remarkably, only a few intrusions--or structures built after the period of significance from 1880 to 1950, were found in the study area. Like other neighborhoods in Nantucket, evolution of the structures along the North Bluff and in Codfish Park has taken place for the most part in a sensitive manner. New structures, such as secondary cottages, as well as landscaping have altered the historic appearance of some properties, but overall the integrity of resources has not been negatively impacted.

The study also revealed that most historic resources date to the 1880-1920 period, the boom years in development of Nantucket's resort community. For the most part, structures are vernacular examples of their style and period. A handful of early structures no longer remain, having been replaced in the 1920s or later, or lost to fire. Surprisingly, we found that the earlier resources are located along the North Bluff, whereas most known resources in Codfish Park date to the early 20th century.

The resources also include a variety of building types, including the predominate Shingle style--often with Colonial Revival elements--Bungalow and low Cape style structures, and even examples of the Second Empire and International style.

Overall, the areas along the North Bluff and in Codfish Park have been shown to be essential components of 'Sconset that should be preserved for future generations.

Historical Context

To understand the development of the study area and to place it into a broader context, it is necessary to provide historical background.

It is important to remember that the trend of constructing seasonal housing at Siasconset has existed for centuries and both the North Bluff and Codfish Park are linked to this pattern of development.

The small village that grew at the east end of the island in the 18th and early 19th centuries, known as 'Sconset, began as a seasonal destination for local fishermen as early as 1675. The first structures, believed to date from the late 1600s, were crude one-room, post-and-beam dwellings with gable roofs that later were expanded with "warts," or small, ell-like additions. There also were secondary buildings such as barns, boat houses and outhouses, as well as large numbers of fish racks known as "flakes" that were used to dry fish. Throughout the 18th and early 19th century the village evolved slowly, growing in a medieval or organic pattern with no real plan. Most additions and changes to structures as well as the layout of lanes conformed to human scale and usage rather than a set pattern.

The significant change in the plan of the village came about during the economic boom years of the Nantucket whaling industry, in the 1830s and early 1840s, when Nantucket residents began to build summer homes along the main lane leading into the village of 'Sconset. The road, now called Main Street, was soon lined with orderly cottages containing traces of Greek Revival architectural elements such as columned porches and symmetrical facades. Unlike the small seasonal fishing shacks crowded together along the bluff, these new cottages were situated on large lots with side and rear yards. The trend of constructing seasonal housing in this fashion continued until the middle of the 19th century, when the island's economy collapsed and construction came to a sudden halt.

Early records reveal that the village experienced its share of natural changes that affected the built environment. Historical accounts suggest that the bank in the heart of the village extended further east prior to 1835. That year and again in 1841, storms eroded a large portion of the bank causing the lost of an entire row of houses east of present-day Front Street. The fate of these cottages is not known, but they were most likely moved or portions used for new housing elsewhere in the village.

It was not until the advent of the resort/tourist era in the 1870s that the village and the island itself began to recover economically and the pattern of seasonal housing began to flourish once again.

The resort industry in Siasconset began in earnest in 1873, when Nantucket builder Charles H. Robinson and his partner, Dr. Franklin A. Ellis, purchased a tract of land south of Main Street in 'Sconset.

Robinson and Ellis plotted 19 lots along Ocean Avenue and 68 lots along adjoining side streets. Robinson and his crews built two-story cottages in Sunset Heights; "Wolf's Head" on Cottage Avenue is typical of the homes built as part of this summer resort community, with its Gothic Revival elements and a T-shaped plan.

Speculators began buying land throughout the island and developed building plans—often elaborate schemes that were never realized. In 1879, the land known as the Pochick Lot sold to Edward F. Underhill of New York City. His plan was a success; by the 1890s, Underhill's thriving cottage community became the center of the village's "Actors' Colony," populated by Broadway actors and actresses, artists and writers who came to 'Sconset to escape the heat of the cities.

Publications, advertisements and news accounts spurred the interest of off-islanders in 'Sconset's quaint architecture. In 1881, for example, New York attorney and author Ansel Judd Northrup published what became a popular book--"'Sconset Cottage Life: A Summer on Nantucket Island"--that helped to spread word of the charms of the isolated village.

In 1884, the Nantucket Railroad extended its tracks along the south shore from Surfside to the 'Sconset station below the Ocean Avenue bank, making 'Sconset the destination of choice for hundreds of summer visitors.

North Bluff

The North Bluff, which lies north of the historic core of Siasconset along the Atlantic Ocean from the top of Broadway to the Sankaty Head Lighthouse, has a much different character than the earliest Sconset development. The lots on the east side of present day Baxter Road, with their endless ocean views, were generally developed first. Similar to the 1830s and 1840s cottages found along Main Street, early houses built along the North Bluff were used as family vacation homes for the summer months. The houses were built on large rectangular shaped lots, usually 75 to 85 feet wide and roughly twice as deep. Baxter Road formed their western boundary and the North Bluff their eastern ends. Houses typically were centered on their lots but often located nearer their western ends, thereby providing expansive lawns to the east facing the Atlantic Ocean. A big draw remained the "Bluff Walk" from the historic core to Sankaty Head Light; the public right of way was laid out as early as 1846 and runs along the bluff's upper edge.

The North Bluff developed in several phases over a relatively short period of 40 years. The success of Sunset Heights at the south end of the village and the establishment of the railroad most certainly spurred land speculation and development along the North Bluff. Charles Robinson, who developed Sunset Heights in the 1870s, soon thereafter constructed Ocean Park, which consisted of 13 Gothic Revival cottages at the site of the present Wade Cottages, just north of the historic core.

Construction further North along the bluff spread at a rapid pace in the mid to late 1880s. William J. Flagg (1818-1898)--an Ohio and New York-based businessman and writer--

began purchasing property along the North Bluff in the 1870s and eventually owned the majority of the bluff area. Flagg was responsible for the Flagg Subdivision of 1883: a two-block area just north of Ocean Park bounded by Butterfly Lane, the Road to Sankaty Head (now Sankaty Avenue), Rosaly's Lane and both sides of "Baxter's Road". A plot plan found in the Nantucket County Plan Book 2, page 22, reveals the development's simple grid plan.

Flagg's first subdivision must have been at least modestly successful, since by 1888 six cottages are identified on the Harry Platt map of that year, including four large cottages along the bluff. Three of these structures are extant: 5, 11 and 13 Baxter Road. The cottages were built for some of the nation's wealthiest and influential families. Five and 7 Baxter (since removed), appears to have been built by the Furniss family of New York City, who were described in newspaper accounts as millionaires. Grace Furniss, who appears to have held 7 Baxter, was one of the earliest woman playwrights. Seven Baxter stood on the site for approximately 15 years. Grace Furniss' brother William, an attorney and part owner of the property, also may have held 5 Baxter which eventually was sold to Frank Gilmore, a founder of Actors' Equity.

Among the most impressive and intact cottages that was part of this early development is "Idlemoor," which was constructed in 1884 by E. A. and M. B. Leighton, builders from Martha's Vineyard, for Abraham W. Rice, a financial manager of the Detroit Safe Co. Another early cottage that remains is 13 Baxter, which was constructed for William Ballantyne, a major book publisher whose main residence and company were in Washington, D.C.

The areas north of Flagg's subdivision were developed in a similar pattern. A large tract immediately north of Flagg's was owned by Emily P. Rice and Robert B. Coffin. Their Aurora Heights subdivision, surveyed in 1887 and registered the following year, extended north from Rosaly's Lane and east of Sankaty Avenue, incorporating both sides of current day Baxter Road (then known as Atlantic Avenue) to the rear/north lot lines along Emily Street. The plan shows the property then extended along the east side of present-day Baxter Road to Ann's Lane. Development in Aurora Heights appears to have begun prior to the registration of the plan. U.S. Senator John C. Spooner of Wisconsin purchased lots at the north end of the subdivision in 1886. Spooner's property soon was split in two, with the northernmost cottage being purchased by Bertha Galland, a popular actress of the time and part of the wave of actors who summered in 'Sconset beginning in the 1890s. Other property in the subdivision was home to Broadway actors, including "Captain's Cabin" at 27 Baxter, built by Isabel Irving and her husband William H. Thompson who purchased the land in 1902. In 1935, Elsie Lombard Brush, actress built a cottage at 29 Baxter. Other famous residents included author Thomas Beer, whose family was influential in Ohio politics and purchased "The Braes" in 1890.

The area north of Aurora Heights remained largely undeveloped until the 1920s, most likely due to its location farthest from the village. The area was owned by William and Eliza L. Flagg and was registered in 1885. It contained 87 lots and was known as Sankoty Heights (the spelling has since changed to Sankaty). This was the largest of the

subdivisions, extending along both sides of present-day Baxter Road from Ann's Lane to the lighthouse. In 1892, a 10-lot addition was made, extending the area farther south. The plan was further refined in 1899 and again in 1910 and then registered by heirs of William J. Flagg the following year.

Among the earliest cottages in this area was "Sunnycliffe," which was constructed in 1887 by local contractor George Gibbs for Dr. Charles A. Oliver of Philadelphia. Family tradition indicates that Dr. Oliver received the land in lieu of cash payment from a patient who received medical care from Dr. Oliver. At least three additional cottages were built in the 1890s near the Oliver cottage, including Flagg's own Second Empire cottage, known as "Flaggship," and a large Shingle style house called "Mayflower," which was built by the Wilson family of Washington, D.C., and Boston.

Maps from the early to mid 1900s show that most lots in each subdivision had been developed with cottages. The addition of garages and outbuildings came after the introduction of the automobile on-island in 1916; many garages are evident in photographs and maps of the period. The trend of wealthy and influential owners continued in the early 20th century with the construction of 79 Baxter by 1916 by Colonel Watres, industrialist and former lieutenant governor of Pennsylvania.

By the end of 1920s, a few smaller cottages had built along the North Bluff; only two homes were built during the Depression years (29 and 71 Baxter Road).

Codfish Park

While orderly cottages for some of the country's wealthy families were built along the North Bluff, the area below the bank near the village core--the area known as Codfish Park--also began to expand in the 1880s.

The development of Codfish Park did not follow the grid and orderly plot plans of the North Bluff. It did, however, echo the development pattern of the historic core, having a varied organic plan. Bound by the Atlantic Ocean to the east and the bluff or bank adjoining the village to the west, the area's land mass has changed over the years with erosion--and occasional expansion--of the shoreline.

For most of Nantucket's history the beach below Front Street appears to have been very narrow. In fact, 19th century histories indicate that storms in the 1830s and 1840s destroyed the land on which another row of fishing shacks east of Front Street were situated. By the end of the 19th century, however, the beach had widened significantly, permitting the development of a new residential area.

With that beach expansion, fishermen built seasonal shacks--just as they had done above the bank 200 years earlier. The 1888 Harry Platt Map of the village shows over 25 structures in the Codfish Park area. Here fisherman dried their catch on racks known as flakes. Photographs and maps from the last decades of the 19th century indicate a large clustering of simple shacks, grouped in the vicinity of Beach and Bank streets.

With the boom in the resort industry, Codfish Park too began to evolve towards residential use. Abandoned fishing shacks were moved and remodeled for use as dwellings to house Sconset's working-class population. Historic account suggests that as early as 1912 the fish house was almost only a memory.

Historic research of the area is problematic due to the nature of how the structures evolved and the lack of information on specific families. The Sanborn Maps provide the best clues to the evolution of the area. The 1898 and 1904 maps, for example, indicate 21 structures labeled "fish and bath houses" suggesting their use for occasional activities rather than for even temporary housing. Only one structure is noted with a "D" for dwelling. In 1909, seven dwellings are indicated as dwelling units, with many small shack removed. And by 1923, the majority of structures in Codfish Park were used as housing, with only a handful of outbuildings noted. Most of these early houses were probably constructed from abandoned materials in the area, given the island's--and particularly Sconset's--history of moving and reusing wood.

It is possible that sections of the new dwellings reused the early fishing shacks. Research suggests that only a few structures actually pre-date 1900. The majority date to the 1900-1910 period, and to the 1930s and 1940s, when many simple bungalows were constructed. Aerial photographs from the 1930s and 1940s show that the area held many more structures, many of which have since been lost to storm events.

Architecture

Architecture along the North Bluff and Codfish Park reflects the popular styles of the late 19th and early 20th century as well as local building traditions. The styles include the Gothic Revival, Stick, Queen Anne, Shingle, Colonial Revival, and Bungalow modes, as well as examples of the French Second Empire, plus later styles including the International style and later common forms such as the "cape" and "ranch." Most structures--even those built by wealthy residents--were designed in the vernacular, with only a hint of the style or a handful of elements associated with the high-style examples of the forms found on the mainland. The dominate architecture mode found along the North Bluff is not surprisingly the Shingle style, with 22 buildings employing material, form and/or decorative elements associated with the style. Many cottages, however, are a combination of several styles especially Shingle with Colonial Revival or Bungalow style elements. Along the North Bluff, 14 structures were built between 1884 and 1899, three in the first decade of the 1900s, nine in the 1920s, and five in the late 1930s-to-1950 period. Codfish Park has a total of 24 resources that date from the late 1890s to the 1940s. These cottages reflect the vernacular Bungalow styles or have no apparent style, but are based on use and tradition building practices common to 'Sconset for many years.

The earliest architectural form along the North Bluff appears to be the simple Gothic Revival cottage with a cross-shaped plan such as the house at 13 Baxter (although lacking pointed-arched windows). The house may have had more elaborate detailing common to Stick and Queen Anne cottages. Today some early features include its Queen Anne door with multi-paned upper lights, as well as its ship-lap shingle pattern still visible on its

north elevation. Similar cottages are found in the village and south bluff development planned in the 1870s.

"Idlemoor" at 11 Baxter Road, built in 1884, is one of the finest examples of the Stick style on Nantucket Island. It retains many of its original features, including decorative shingles, cut-out vergeboard, and steep gables, and is far more ornate in its detailing than most houses in of its period. The various shingled patterns seen here were typically found on the cottages built along the Bluff in the 1880s. Historic photographs suggest other cottages employed similar decorative features that have disappeared over the years. Only minor changes have occurred to "Idlemoor," including the loss of its upper tower floor—reportedly in a hurricane in the early 20th century. The interior, however, retains its original plan with only minor changes, and its elements, including its plaster walls—an unusual feature in 'Sconset, where most cottages have exposed rafters and studs. The main rooms at "Idlemoor" have oak decorative trim, including reeded-door and reeded-window surrounds with bull's-eye corner blocks, built-in cupboards and elaborate oak and incised mantels.

Several large two-story cottages with open porches and a variety of windows and rooflines were built in the 1880s and 1890s evoking the Queen Anne style. "Sunnycliffe" at 51 Baxter Road, built in 1886, employs more typical Queen Anne style features and the typical irregular form. Evident in early photographs are its ornate porch details and decorative window hoods.

"Flaggship" at 55 Baxter Road, built about 1890, has 'Sconset's only mansard roof--a prominent Second Empire style feature.

Several good examples of the Shingle style stand along the Bluff, including "Mayflower" at 61 Baxter Road. It was built in 1894, and contains a half gambrel roof sweeping into a gable roof on the east side. It holds lunettes, an overhanging second floor, and shingled rakeboards and porch elements. Sixty-five Baxter Road circa 1895, is also a fine example of the style, with a gambrel front and recessed porch. Forty-seven Baxter also has elements associated with the Shingle style such as its massing and use of materials. The interior exhibits high Victorian features such as its elaborate turned staircase, arched openings and heavy moldings.

The house at 63 Baxter Road, circa 1890, has Colonial Revival features such as its columned porch revised soon after its construction. Historic photographs suggest it was originally a Queen Anne style house. The interior holds an extraordinary brick fireplace in the main room with inset pebbled-stone panel and rounded opening evoking decoration of the Arts and Crafts period. The open staircase has turned elements and bead board walls laid horizontally. "The Braes" at 25 Baxter Road, circa 1890, exhibits the influence of both the Shingle and Colonial Revival styles.

Early 20th century cottages on the North Bluff exhibit elements of the Four Square and/or variations of the Bungalow modes. Fifty-nine Baxter Road, circa 1905, has a hipped roof typical of Four-Square cottages, as well as a low porch roof that wraps around the

structure. "Captain's Cabin" at 27 Baxter Road, built in 1903, has a similar square plan, but it is crowned by a jerkinhead roof and a hip-roofed cupola. The second-story roof extends over the first floor mass to create a wrap-around porch a feature seen in early Shingle style houses. A slightly later hip-roofed bungalow stands at 15 Baxter Road, built around 1916. Here the massive roof dominates the structure and even extends over the first-floor porch. The house is also unusual as one of the few island examples with a stucco exterior. In recent years the house has been moved to become a secondary dwelling.

By the early 20th century new forms emerged along the North Bluff. Fifty-three Baxter Road is typical of later Colonial Revival houses employing classically-inspired doorways and saltbox rooflines. Wade Cottage has similar elements. Several other examples from the period have Colonial Revival and/ or Arts and Craft details. Both 75 and 79 Baxter Road have deep eaves often with exposed rafters and purlins. The interior of 79 Baxter Road retains its simple recessed paneled staircase, simple square balustrade typical of Arts and Craft homes, and an exposed rafter ceiling on the second floor. Built-in cupboards and other furniture such as a dressing table have been retained.

A common form from the 1920s appears is the 1 ½ story shingled house with Bungalow elements. Sixty-seven and 115 Baxter Road are typical examples. One Baxter Road evolved from a 1 1/2 story cottage but also employs features typical of early 'Sconset, including warts, roof forms and window types. Twenty-nine Baxter, circa 1935, was the first U-plan house in the area and contains a large central chimney that is a focal point. The chimney at Wade Cottage is also an architectural feature with a window constructed within the chimney at the second floor level. The U-plan with prominent chimney appears to be a local form that is echoed in later cottages, including 71 Baxter Road, with its International style features, and 93 Baxter, circa 1950, with Ranch elements.

The houses along the North Bluff generally have outbuildings, some of which may have been originally constructed as carriage houses. Several early garages remain too. These buildings often reflect the stylistic features of the main structure on the property. The garages at 11, 49, and 53 Baxter Road are typical examples.

Only a handful of builders and architects responsible for the design and construction of the buildings have been identified and all of these are along the North Bluff. It is likely that many cottages were built by craftsmen who had access to pattern books and supplies rather than designed by architects. However, it is possible that several cottages not yet identified were designed by off-island architects, given the wealth of many owners and their contacts across country. Several contractor/builders worked throughout the island, including Charles Robinson, who is credited with the construction of most Gothic Revival and Italianate structures on the island. George Gibbs, believed to have built "Sunnycliffe" for the Oliver family, is known to have worked on several residences on-island. Other identified contractors include E. A. and M. B. Leighton from Martha's Vineyard, who built "Idlemoor." Additional historic research will likely produce

additional names. For example, it is likely that Asa Jones, who constructed the Underhill cottages, worked on several of North Bluff structures.

Two architects appear to have been associated with the design of 20th century buildings along Baxter Road: Frederick P. Hill and Alfred Francis Shurrocks.

Frederick P. Hill designed at least one cottage (1 Baxter Road, also known as "The Barry House,") and appears to have been associated with another (29 Baxter Road). The Barry House Papers 1919-1922, housed at the Nantucket Historical Association, suggest the core of the Barry House was constructed in 1919. Hill hired James A. Holmes Jr. that year to perform most construction. He also employed John C. Ring to build the foundation, cellar, and chimneys. Hill, known as "the architect of Nantucket," is credited with the design or remodeling of over 20 'Sconset cottages in the late 19th and early 20th centuries. Among his most important local work are the renovations to the 'Sconset Casino in 1925, including the lattice ceiling, and the original design for the Sankaty Head Golf Club in 1921.

Hill (1862-1957) graduated from Rutgers University in 1883 with a Bachelor of Arts and in 1896 with a Master of Arts, and worked for 17 years under the supervision of Charles F. McKim, head of the firm McKim Mead and White, before starting his own practice. Among his work contribution to McKim's firm was work on New York's original Pennsylvania Station, the Columbia University Library, New York City's Main Post Office, the Boston Public Library and the Rhode Island State Capitol—perhaps the firm's most prominent structures.

Architect Alfred Francis Shurrocks, an early 20th century preservation architect who worked on various historic structures on Nantucket including the restoration of the Oldest House, likely designed or completed changes to 29 Baxter Road, which had long been associated with Frederick P. Hill. Shurrocks, an 1894 graduated of the Massachusetts Institute of Technology, entered the office of Charles F. Wilcox about 1899. His own practice began in 1902 with two partners, Franklin J. Sawtelle and Wayland T. Robertson; the firm, located in Providence, was known as Sawtelle Robertson and Shurrocks.

Only a handful of cottages on the North Bluff have been removed by demolition, fire or alteration the majority early in the development of the area. Historic photographs indicate that the Ocean Park cottages (at the Wade Cottage site) were typical of dwellings built in the 1870s, with gable fronts. The cottages lined a narrow street off Shell Street, and employed elaborate vergeboard decorative trim along the rooflines topped with pendants and front porches with decorated sawn and cut-out details. Today, several of the cottages are found in the village, lacking their decorative trim. The main structure on site is believed have incorporated at least two of these early buildings reused during the 1928 construction of Wade Cottage.

The Furniss Cottage at 7 Baxter Road was typical of the summer houses built along the bluff. It had a twin gabled façade with large wrap-around porch, simple railing and decoration limited to ship-lap shingles.

Remodeling of houses has had little impact on the architectural integrity of most structures, but it remains a threat. Most changes are minor, such as at 5 Baxter which lacks its original covered porch with Roman arched openings. The interior, however, retains its exposed stubs and rafters as well as a decorative brick fireplace and built-in cupboards.

Planned alterations--especially to several cottages of early 20th century vintage--may be as serious a threat as that of erosion.

Meanwhile, in Codfish Park, late 19th century structures evolved through the moving and reuse of old outbuildings and the creation of additions. This fact makes it difficult, if not impossible, to determine the dates of construction for the majority of resources. The scale of most cottages, such as 13 Bank Street, has remained small, however, thereby helping the area retain its unique charm.

For the most part, the cottages in Codfish Park reflect their evolution in their additive nature, repeating that of the historic resources in the core of the village. Like their predecessors, upon close inspection the Codfish Park houses seem to have a pattern of development. The simple long, one-room wide fishing shack with gable roof forms the core of many dwellings. Additions to these structures were usually to the rear or side, forming L-plans (13 and 19 Bank Street). Shed additions and rear and side wings were added in the early-late 20th century in a haphazard way. In recent years second floors have also been added to some structures. This evolution echoes that of 'Sconset's historic "whale" cottages, which also expanded up when their footprints became as large as their small lots would allow. The Codfish Park cottages, however, appear to be a bit more individual in their development. Many early sections and additions in Codfish Park show evidence of changes to the gable roofs. Early steep roofs have been raised to accommodate new wings, mostly on one elevation so the original form is still visible, such as at 19 and 21 Bank Street.

In Codfish Park, several gable front Bungalows remain, such as 11 Bank. These forms were much simpler than those along the North Bluff. In the 1930s simple square Bungalows with gable or hip roofs were constructed at 26 and 32 Codfish Park. Ten Beach Street is a later version of the early fish shack with a very low gable front and long rectangular plan. The cottage retains its early appearance, including its 2/2 windows as visible in early photographs.

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On this date _____, the Town of Nantucket, by and through its Board of Selectmen, finds the following:

1) Baxter Road is a Public Way that provides the sole source of legal access and frontage for most of the abutting lots, and also contains within it public and private utilities, including water and sewer lines.

2) The northern portion of Baxter Road is in danger of forced closure or physical breach due to seasonal erosion of the bluff.

3) The danger to the public infrastructure and risk to public safety is imminent because the distance from the top of the bluff to the road is less than 30 feet, and is declining significantly in regularly occurring storm events.

4) Baxter Road is a historic place with historically important structures on both sides that are at risk of loss, and some have been lost already.

5) The loss of any portion of Baxter Road, or of any homes, poses an imminent and significant threat to public infrastructure and public health and safety, to Nantucket's historic structures and settings, and to the its finances (for both liability and taxes).

6) This erosion is also reducing public accesses to the beach, public access along the Bluff Walk, and other recreational and environmental resources.

Therefore, the Town and its staff shall engage cooperatively with the public and stakeholders to develop and implement an emergency and long term plan to protect public roads, public buildings, or other public assets from imminent destruction, to allow for the protection of the historic structures and settings of Siasconset, to protect and enhance the tax base, to limit public liability, and to provide for alternatives and replacement of the most endangered portion(s) of the at risk public infrastructure in the event of a failure of such protection, as appropriate. Such a plan shall include permitting, construction and public and private funding mechanisms and schedules to be approved by the Board of Selectmen and shall encourage public benefits, as appropriate. It should also work out the details of alternative access routes and utility replacement plans. The BOS support a public/private partnership for immediate and long term bluff stabilization, authorizes the filing of a Notice of Intent for such, and urges the Conservation Commission to review the matter on an emergency basis so as to save the public infrastructure and historic homes, as appropriate.