City of Norfolk

Chesapeake Bay Coastal Management Area (CBCMA)

Guidance Document

A comprehensive guide to appropriate practices and activities within the City of Norfolk's Chesapeake Bay Coastal Management Area.

Adopted: September 27, 2011

Amended: February 28, 2012

/28/11 sb
rm and Correctness Approval: RAP

Office of the City Attorney

Form CCO-005

Contents Approved:

By

DEPT. PLANNING

NORFOLK, VIRGINIA

Resolution 1,507

R-16

A RESOLUTION APPROVING THE GUIDANCE DOCUMENT FOR THE CHESAPEAKE BAY COASTAL MANAGEMENT AREA SO AS TO ESTABLISH PARAMETERS FOR THE USE AND ENJOYMENT OF THE COASTAL AREA.

- - -

BE IT RESOLVED by the Council of the City of Norfolk:

Section 1:- That the Guidance Document for the Chesapeake Bay Coastal Management Area which establishes parameters for the use and enjoyment of the coastal area, a copy of which is attached as Exhibit A, is hereby approved.

Section 2:- That this resolution shall be in effect from and after its adoption.

Adopted by Council February 28, 2012
Effective February 28, 2012

TRUE COPY
TESTE:

R. BRECKENRIDGE DAUGHTREY, CITY CLERK

BY:

DEPUTY CITY CLERK

Table of Contents

1. Purpose and Need 1
2. Coastal Processes: Dunes, Beach Shape, and Vegetation 2
3. Norfolk's Chesapeake Bay Shoreline 4
4. Relevant Practices of Other Coastal Communities 7
5. Regulations Governing the Beach and Dune System 8
6. Chesapeake Bay Coastal Management Area (CBCMA) 10
7. Typical Structures, Uses and Activities within the CBCMA 12
8. Major Structures – *Walkways* 15
9. Major Structures – *Stairs* 21
10. Major Structures – *Decks, Patios and Observation Platforms* 27
11. Major Structures – *Bulkheads, Revetments & Retaining Walls* 33
12. Minor Structures 37
    - *Bird Houses* 38
    - *Bird Feeders and Baths* 38
    - *Flag Poles* 39
    - *Swing Sets* 39
    - *Lights* 40
    - *Fences* 40
    - *Art and Sculpture* 41
    - *Volleyball Poles and Nets* 41
13. Non-Structural Items, Recreational Uses & Other Activities 42
    - *Benches, Tables and Chairs* 43
    - *Signs* 44
    - *Sand Dune Conversion to Yard* 44
    - *Planting of Non-Dune Species* 45
    - *Boat and Watercraft Storage* 45

1. Purpose and Need

Following Hurricane Isabel in 2003, a number of Norfolk residents in the vicinity of 13th Bay Street in East Ocean View rebuilt or constructed new stairways in order to gain access to the beach (as the dune had been severely eroded by the storm) and decks/gazebos to provide enhanced recreational opportunities within the sand dunes. Many of these structures were built without required approvals from the City and did not meet applicable building codes. Further, some of the structures were built in Bayside Avenue (an unimproved right-of-way) and were in direct conflict with City Council Resolution #1,274, which forbids the granting of any encroachment in this right-of-way.

The issue of these illegal encroachments was brought to the City's attention by local residents. After staff analysis, the recommendation was made to develop a guidance document for City Council consideration that specified appropriate uses and structures on City land and in the various public rights-of-way that border the Chesapeake Bay.

Preparation of the guidance document was initiated but did not advance due to other competing shoreline erosion priorities. The issue at the time was not widespread, being confined to a handful of properties. That assessment, however, changed markedly over the next few years as a rash of citizen complaints about encroachments, structures and uses began to filter in through various channels including the Call Center, through the City's lifeguard staff, and the Environmental Services Bureau.

In response, a field survey was conducted of the entire Chesapeake Bay shoreline from the tip of Willoughby Spit to Little Creek Entrance Channel. The results of this survey were cataloged into eight separate issues that were having a negative impact on the sand dune and beach system, i.e., encroachments, safety issues, privatization, abandoned boats, fire hazards, dune conversion activities, recreational use impacts and debris disposal. A preliminary review of the appropriate City codes that govern these issues revealed both fragmented authority and the inadequacy of some codes. Subsequent contacts and meetings with various City staff indicated a need for improved coordination and strengthening of enforcement protocols.

An update on the issue was presented to the Mayor's Ocean View Task Force on May 22, 2008, with a recommendation to establish a Codes Review Committee with representatives from the Task Force and affected City departments. Councilman Wright asked for members to indicate their interest in serving on the Committee.

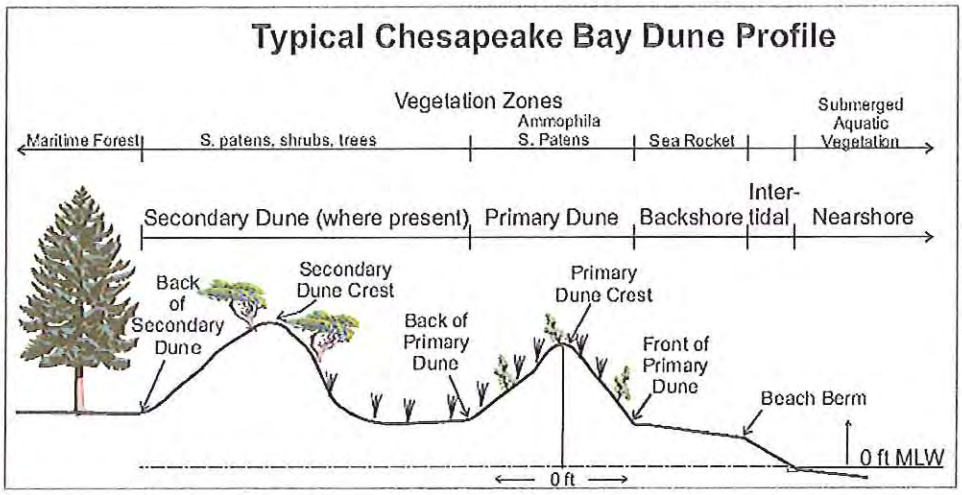
The Beach and Dune Codes Review Committee was formed in September of 2008, and made up of members of the various affected Civic Leagues as well as City staff. This Committee was tasked with providing City Council with a comprehensive review of the issue and recommendations for strengthening of various City codes related to structures and uses along the City's Chesapeake Bay shoreline. The result of the Committee process was to recommend the establishment of a Chesapeake Bay Coastal Management Area (CBCMA) and the development of this Guidance Document to assist City staff in determining the suitability of proposed structures and uses within the CBCMA. Other Committee recommendations include enhanced public education regarding the importance of the coastal primary sand dune for property protection during storms, as well as coordinated code enforcement for violations.

2. Coastal Processes: Dunes, Beach Shape, and Vegetation

Sand dunes and dune vegetation are important beach assets for three reasons:

1. They provide protection for bayfront property during storm events.
2. They contribute to an aesthetically pleasing, "natural" beach.
3. They provide habitat for many species of coastal creatures, including birds, crabs, etc.

Dunes are defined as any area landward of the active beach where dune grasses are the dominant plants. In the beach profile below, the dune is the vegetated area farthest from the shoreline. The toe refers to the base of the dune where it meets the beach. The berm is the dry, sandy area where we typically put our beach blankets. The beachface is the steeper sloped area leading down to the water, where the surf breaks. The beach shape is in a constant state of flux due to the tides as well as the variable forces of wind and waves. For example, most beaches naturally lose sand in the winter and gain sand in the summer because of wave climate changes.



Typical Dune Profile[1]

Waves absorb energy from the wind. This energy is carried by the waves to the shore where the waves break, unleashing that energy onto the beach. Wave energy shifts and moves sand throughout the beach. Higher waves shift sand from the berm into deeper water, flattening the beachface. Smaller waves move sand back to the berm and steepen the beachface. Stronger winds and larger storms create larger waves and more serious impacts to both the berm and beachface. For example, hurricane strength winds can cause storm surge—a dramatic rise in sea level along the coast which washes over the beach and any adjacent property, causing significant damage.

Dunes act to reduce the impact of storm damage. During more severe storm events the dune provides a reservoir of sand used to protect the landward areas. The dunes can prevent waves and storm surge from washing over the land.

Dune vegetation is an important component of the dune system because it prevents the dune from eroding away. The stems and roots of dune plants trap sand. While these plants continue to grow, they continue to trap more and more sand, which in turn stabilizes and strengthens the dune. Sand fences and other wind barriers trap sand in a similar way, but these barriers lack the ability to grow as the dune grows.

[1] Shoreline Evolution, Chesapeake Bay Shoreline, City of Norfolk, Virginia, VIMS, 2005

Sand fencing can be useful when managing pedestrian traffic. A few people randomly walking over dunes will not cause significant damage to the dune or surrounding vegetation. However, dune vegetation will not tolerate repeated trampling. Once the vegetation along a path is destroyed, wind and continued use will cause the path to erode faster than the surrounding dune, compromising the dune's ability to provide adequate protection against storm damage.

3. Norfolk's Chesapeake Bay Shoreline

Norfolk's shoreline extends 7.3 miles along the Chesapeake Bay from Little Creek Inlet to Willoughby Spit. Historically, Norfolk's beach has been an eroding beach, meaning that, over time, it loses more sand than it gains. This is due to the fact that the City's shoreline lies at the mouth of the Chesapeake Bay and is constantly subjected to the movement of water between the Bay and the Atlantic Ocean.

The City's shoreline is unique in that it is oriented east/west as opposed to north/south like so many other beachfront communities on the East Coast. This means that the winds and waves impacting the Norfolk coast gain strength over large stretches of open water to the northwest, north, and northeast. Storms with strong northeast winds (nor'easters) can be quite significant in terms of beach and dune erosion due to their storm surge and waves.[2] Another unique characteristic of Norfolk's shoreline is that it is more urban than many other beachfront communities. The lots are narrow—fifty (50) feet wide in some locations—and historic dune sculpting/bulldozing has allowed some development to encroach upon the natural dune line.

Shoreline Characterization

The City's Chesapeake Bay shoreline is made up of five distinct areas with gradual transition areas in between. Each area is defined by the prevailing characteristics of the beach and dune system prevalent therein. These areas are outlined below, moving east to west from Little Creek Inlet to the terminal groin at Willoughby Spit.

East Beach and Vicinity (Little Creek Inlet to 17th Bay Street): East Beach and the surrounding vicinity is an erosional beach, which means that it loses more sand than it gains. Construction of the jetties at Little Creek in 1927 resulted in a chronic loss of sand along the shoreline west of the jetties due to interruption of the westerly longshore transport of sand.[3] Over the years, projects have been undertaken to stabilize this area, including periodic large-scale beach renourishment, construction of 15 offshore breakwaters and the planting of dune grasses to provide shoreline stabilization. The dunes in the East Beach area are in a state of transition and should, over time, become similar in character to those found further west in East Ocean View.

East Ocean View Area (17th Bay Street to Cape View Avenue): Notwithstanding recent beach nourishment projects, the East Ocean View area also an erosional beach which loses more sand than it gains. Generally, the dunes in East Ocean View are wide, steep and high. The beach nourishment projects undertaken to the east at East Beach allow for a portion of the sand to migrate westward to help build the dunes in East Ocean View.

[2] Shoreline Evolution, Chesapeake Bay Shoreline, City of Norfolk, Virginia, VIMS, 2005

[3] USACE, 1983

Cottage Line Area (Cape View Avenue to Warwick Avenue). The beach in Cottage Line is relatively stable and the dunes are wide, broad and generally lower than those found in East Ocean View. The toe of the dunes in Cottage Line is accreting as they are the beneficiary of nourishment sand migrating west from East Beach and East Ocean View Beach. Historically, this area had the greatest prevalence of dune grading activities. Many of the older, historic beach cottages were located here and many were constructed with wrap-around porches on the first floor. Prior to State enactment of the Coastal Primary Sand Dune Protection Act in 1980, many residents in Cottage Line annually graded down the sand dunes to maintain a clear and unobstructed view of the water. Consequently, the character of the dunes in Cottage Line has changed significantly over the last 30 years as the dunes have been protected.

Central Ocean View Area (Warwick Avenue to 4th View Street). The eastern section of Central Ocean View beach is now relatively stable and the dunes are wide, broad and low as a result of a 1999 project involving the construction of four offshore breakwaters and subsequent beach nourishment and dune grass planting in 2004. Some property development in Central Ocean View has historically occurred too close to the shoreline, and despite the relative stability of the beach, properties can be in danger during major storms. The eastern end of Central Ocean View is also a beneficiary of sand migrating west from nourishment projects in East Beach and East Ocean View Beach. The western end of Central Ocean View is more erosional and some properties were significantly damaged by Hurricane Isabel in 2003. While the sand dunes adjacent to the Pinewell neighborhood are broad and low, other sections of the shoreline to the west cannot maintain a protective dune line due to chronic shoreline erosion.

Willoughby Spit (4th View Street to the tip of Willoughby Spit): Willoughby Spit is a mildly erosional beach and the dunes are narrow and low. There are a few erosional hotspots in Willoughby due to inadequate terminal controls to trap sand at the western end, encroaching development and deteriorating groins. The groins were installed beginning in 1937 in an effort to maintain the beach front. The large terminal groin at the end of the Spit was raised in 1990. However, sand losses have continued to occur at the terminal groin. The dune material in Willoughby is predominantly shell hash (i.e. small fragments of broken shell) and therefore does not behave like loose sand. In addition, Beach Vitex (*Vitex rotundifolia*)—an invasive plant from Asia that has ravaged sand dunes in North Carolina and South Carolina for two decades—has recently been found in Virginia for the first time at Willoughby Spit.[4] Since its discovery in 2008, the City has undertaken a plan for eradication.

[4] Carolinas Beach Vitex Task Force; www.beachvitex.org

Beach and Dune Restoration Efforts

In recent years, Norfolk's shoreline has suffered severe damage from both long-term erosion and short-term storm-related erosion. In 2003, the combined impacts of a severe nor'easter and Hurricane Isabel resulted in extreme erosion and threatened many properties along the City's shoreline. Isabel alone removed thirty (30) feet of the dune in East Ocean View as well as most of Willoughby's dune line. As a result of these storms, the City embarked upon a large-scale restoration project in order to not only repair the damage from these storms, but also to stabilize the beach and restore its ability to provide adequate property protection. There are three hotspots (areas that exhibit high erosion rates relative to the surrounding beach) along Norfolk's beach. Parts of East Ocean View, Central Ocean View and Willoughby Spit lose more sand than the rest of the beach. It is in these areas that the City of Norfolk has focused most of their recent efforts to restore the beach and dunes.

Bay Breeze Point Beach
June 2003

Bay Breeze Point Beach Following Beach Nourishment & Dune Planting
September 2004

Between 1981 and 2006, the City spent $21 million (including $5 million of State grant funds) for beach improvement projects. These funds have gone towards projects such as the East Ocean View Beach Nourishment Project completed in 2004 and the Central Ocean View Dune Restoration Project completed in 2005. These projects placed over 800,000 cubic yards (the equivalent of 80,000 truck loads) of sand along Ocean View. Offshore stone breakwaters have also been constructed at Central Ocean View and Willoughby. The City spends approximately $2 million per year on beach and dune improvements.

4. Relevant Practices of Other Coastal Communities

To assist the Norfolk Beach and Dune Codes Review Committee in assessing the impact of structures, uses and activities prevalent along Norfolk's Chesapeake Bay shoreline, a comprehensive review of relevant practices of other coastal communities was undertaken by the City's coastal engineering consultant, Moffatt & Nichol.

Relevant ordinances, codes and policies from the following locations and agencies were reviewed:

- Virginia Beach, Virginia
- North Carolina Division of Coastal Management
- Myrtle Beach, South Carolina
- Emerald Isle, North Carolina
- Salisbury Beach, Massachusetts
- Florida Department of Environmental Protection
- Hull, Massachusetts
- Ocean City, Maryland
- St. Augustine Beach, Florida
- Rehoboth Beach, Delaware
- Mantoloking, New Jersey
- Kill Devil Hills, North Carolina
- Duck, North Carolina
- Pawleys Island, South Carolina
- Queensland Beach Protection Authority (Australia)
- Brevard County, Florida
- Palm Beach County, Florida
- City of Miami Beach, Florida
- Saint Simon's Island, Georgia

The results of this analysis concluded that, while all of these locations and agencies had some type of ordinances and guidelines in place to govern certain structures, uses and activities in the beach and dune system, none had the type of comprehensive program Norfolk is in the process of developing.

5. Regulations Governing the Beach and Dune System

The following regulations and codes apply to the beaches and coastal primary sand dunes along Norfolk's Chesapeake Bay shoreline. Full text of these codes can be found in Appendix A of this document.

Commonwealth of Virginia

Coastal Primary Sand Dune and beach Regulation (Dune Law). All coastal sand dunes and beaches in the Commonwealth of Virginia are currently regulated by the Code of Virginia, § 28.2 1400 et seq., Coastal Primary Sand Dunes and Beaches. This regulation provides a model ordinance that certain localities may adopt. Changes to the regulation and model ordinance require action by the Virginia General Assembly. § 28.2-1408 of the Code of Virginia specifically states that:

> *"No permanent alteration of or construction upon any coastal primary sand dune shall take place which would (i) impair the natural functions of the dune, (ii) physically alter the contour of the dune, or (iii) destroy vegetation growing thereon unless the wetlands board or the Commission, whichever is applicable, determines that there will be no significant adverse ecological impact, or that the granting of a permit is clearly necessary and consistent with the public interest, considering all material factors."*

Some uses and activities are permitted under the Dune Law, such as the construction of private walkways and observation platforms, provided that they do not alter the contour of the coastal primary sand dune. It is important to make clear that the entire dune is covered by this law, even if all or part of the dune is on private property.

City of Norfolk

Chesapeake Bay Coastal Management Area regulations in the Zoning Ordinance (NEW)

Coastal Primary Sand Dune Ordinance. As authorized by the Code of Virginia, § 28.2-1403, the City of Norfolk adopted the Coastal Primary Sand Dune Ordinance in 1981. The City's Dune Ordinance also covers beaches. Development in these areas requires a permit from the Norfolk Wetlands Board. If a project involves the use, development or any other activity that will impact a coastal primary sand dune or beach, a dune/beach permit is required. The City's Environmental Services Bureau provides staff services to the Wetlands Board and processed permit applications.

Encroachment Permits. Most sections of the coastal primary sand dune and beach are City property, a public right-of-way, or City park land. Any permanent item that rests in any of these areas, excepting those items that belong to the City of Norfolk, must be approved by City Council. An application for the encroachment must be submitted to the Department of Public Works, Division of Surveys. One of the requirements for granting an encroachment is naming the City of Norfolk as an additional insured on liability coverage for the property to which the encroachment is attached. Approval for encroachment into a City right-of-way is obtained through an ordinance passed by City Council. All encroachments are revocable. If permitted structures are destroyed, the property owner must reapply for a new City encroachment permit.

Recreation, Parks and Open Space. Beach uses such as operation of vehicles, riding horses, storage of boats, sleeping, and fishing are governed by regulations contained in Article VIII and Article IX in Chapter 25.2 of the Norfolk City Code.

Building Permit. The City of Norfolk, by State mandate, enforces the *Virginia Uniform Statewide Building Code* (VUSBC), which uses as its referenced documents the *International Residential Code* (IRC) *for One- and Two-Family Dwellings.* Any structures built within the dune system on both private and City land require building permits and must adhere to applicable building codes. In all cases, zoning approval is required before a permit can be issued. In every case, the permit authorizes the work to be done, but does not guarantee that the work complies with the code. An inspection is required to assure code compliance.

Abandoned or Hazardous Boats. The City of Norfolk has code authority under Section 32-73 of the Norfolk City Code to require the removal of any abandoned or hazardous boat or vessel within the dune system, beach or waterways. If the owner of the abandoned or hazardous boat cannot be located, after proper notice the City many remove the subject boat or vessel.

6. Chesapeake Bay Coastal Management Area (CBCMA)

Recognizing that there was a degree of overlap and ambiguity in the various City of Norfolk codes and regulations governing structures, uses and activities within the City's beach and dune system, the City established the Chesapeake Bay Coastal Management Area (CBCMA) in 2011 The CBCMA extends from the western boundary of the Little Creek Navigation Channel to the City's terminal groin at the western end of Willoughby Spit and consists of the area between the mean low water mark and the landward limits of the coastal primary sand dune or beach, or the southern boundary of a right-of-way or city parcel adjacent to the beach However, the CBCMA does not include the area from Warwick Street to 1st Bay Street.

Any structures, uses, and activities within the CBCMA should be evaluated for consistency with the CBCMA Guidance Document. The following items, activities or uses in the CBCMA are generally not consistent with the guidelines· playground equipment, pools, fish ponds, fountains, tiki torches, fire pits, grills, chimineas, debris disposal (other than beach cleaning by City personnel), or boat storage in the dune.

Temporary uses and activities on the beach—such as fishing, sunbathing, etc.—are consistent with the guidelines provided that all other applicable regulations are met.

THIS PAGE INTENTIONALLY LEFT BLANK

7. Typical Structures, Uses and Activities within the CBCMA

The following structures, uses and activities are typical of what can be found within the CBCMA along the City's Chesapeake Bay shoreline:

Major Structures

- Walkways
- Stairs
- Decks, Patios, Gazebos and Observation Platforms
- Bulkheads, Revetments and Walls

Minor Structures

- Bird Houses
- Bird Feeders and Baths
- Flagpoles
- Swing Sets
- Lights
- Fences
- Art and Sculpture
- Volleyball Poles and Nets

Non-Structural Items, Recreational Uses & Other Activities

- Benches, Tables and Chairs
- Signs
- Sand Dune Conversion to Yard
- Planting of Non-Dune Species
- Boat and Watercraft Storage

Evaluation Criteria

While many of the structures, uses and activities listed above may enhance the experience of beachfront living for some, it is important to evaluate these items carefully to ensure that a) negative impacts to the sand dunes and beach are minimized, and b) they do not impact the enjoyment of the beach and dune by others. Each of the above structures, uses and activities should be evaluated according to the impact criteria listed below:

Necessity. All structures, uses and activities in the CBCMA will be evaluated on the basis of whether or not they are truly necessary. For example, while walkways and trails over the dunes are necessary in one respect to reach the beach and water, it is not necessary that they be massive, permanent structures. A simple sandy path or narrow, low-elevation walkway meets the access requirement while also minimizing negative impacts to the dune system.

Paths & Walkways are Necessary for Beach Access

View Obstruction/Aesthetics. An unobstructed view of the beach or water is another reasonable desire of all beachfront residents. Any structures built within the CBCMA should impede the view of the beach from adjacent properties as little as possible. While aesthetics is admittedly a very subjective criterion, a pleasing and natural dune environment is windswept, wild and dominated by relatively low-growing plants. Structures in the CBCMA should strive to stay below the vegetation line to ensure unobstructed and unbroken views of the dunes and water.

Walkways can Obstruct Views

Maintenance/Safety. Keeping in mind that all structures—especially those built seaward of the dune crest—are subject to varying degrees of yearly storm damage, any structures built within the CBCMA will be evaluated as to their maintenance requirements. In these cases, easy-to-maintain, non-structural alternatives are preferred. If the structure is on City property, an encroachment permit will be required. One of the requirements for granting an encroachment is naming the City of Norfolk as an additional insured on liability coverage for the property to which the encroachment is attached. For this reason, any encroachments granted by City Council will be subject to safety requirements. This includes meeting building codes for safety.

Spliced Support Posts are Safety Hazards

In addition, any structures, uses or activities within the CBCMA must be consistent with the City of Norfolk Fire Prevention Code. This includes the use of grills and fire pits, as well as limitations on the outside storage of combustible or flammable materials, and the accumulation of waste material such as wood, straw, weeds, litter, pallets, etc. on any premises, open space or right-of-way.

Privatization/Public Access. Any structures built on City land or within a City right-of-way cannot be marked as "Private Property" even though they have been built at the homeowner's expense. The property itself is not private; it is owned by the City and therefore public. "Private Property" signs must be physically on the homeowner's property and never in the dune system itself. A more appropriate designation would be "No Public Access to Street" or similar equivalent. It is important that the public is not discouraged by signage from using and enjoying the City's public beaches and the waters of the Chesapeake Bay.

Privatization Signs Discourage Beach Enjoyment

Other Impacts. Any structures, uses or activities within the CBCMA must not present a health hazard to residents or beachgoers. These considerations include such things as rusty nails on walkways which can create opportunities for exposure to tetanus.

Japanese Sedge is Invasive

Ecology is also an important concern in the natural development and maintenance of the dune system. Activities within the CBCMA should not negatively impact the ecology of the dune system. This includes activities that destroy the natural dune vegetation, encourage the growth of non-native plants or negatively affect the habitats of any natural dune animal species.

8. Major Structures – Walkways

Impact Statement

Property owners and residents along Norfolk's Chesapeake Bay beaches naturally want to maximize their location through improved visual and physical access to the beach. Typically, some sort of walkway is constructed to meet the access need, be it a simple sandy path or some type of elevated structure. Because of the dynamic nature of the dune system and the potential for major coastal storms, it is important to evaluate and regulate what form these walkways take. When choosing a location, orientation, and type of beach access walkway, it is important to consider the following:

- Walkways oriented perpendicular to the beach can serve as natural channels for strong northerly winds to move sand out of the dune system and into the area landward of the dune crest, resulting in a blowout. These blowouts are typically the first point of entry for storm surge overwash during storm events.
- Walkways oriented parallel to the beach can trap these winds in such a way that sand at the face of the dune is eroded away, causing a scarp. Over time the scarp will continue to grow, destabilizing the dune as well as the walkway above it.
- The shade created by walkways can kill native dune grasses, the roots of which help stabilize the dune by keeping the sand in place. Without the dune grass plantings, the sand beneath walkways can more easily be eroded away by wind and waves.
- When constructed haphazardly and in proliferation along an urban beach, elevated walkways can provide significant view obstruction.
- Structural walkways in a beach and dune environment are always considered impermanent and expendable. The contour of the dune system is always changing—whether through beach nourishment projects or natural coastal processes—in a way that precludes "permanent" walkway structures.

Primary Regulatory Review

In addition to complying with the CBCMA Guidance Document, any structures built within the dune system must adhere to all of the following applicable ordinances and codes.

Coastal Primary Sand Dune Ordinance. The construction and maintenance of noncommercial walkways does not require a permit under the City's Dune Ordinance, provided none of these structures alter the contour of the coastal primary sand dune. The Dune Ordinance assumes that walkways that are properly constructed will preserve natural dune vegetation and allow the dune to function in trapping sand. Consequently, any walkway that is of such a design that it would destabilize the sand dune would not meet the exemption and would require an individual permit from the Norfolk Wetlands Board.

Encroachment Permit. If a proposed walkway extends into the public right-of-way or onto City property, an encroachment application must be submitted to the Department of Public Works and City Council must pass an ordinance authorizing the encroachment. In addition, the applicant will need to provide liability coverage with the City as a co-insured for the encroachments.

Building Code. Sand trails and on-grade walkways do not require building permits. Above-grade structures built within the CBCMA require building permits and must adhere to applicable building codes. These codes require that walkways greater than 30" above grade have handrails and guardrails consisting of railings and pickets.

Impact Analysis

Since beach walkways can impact the dune system which protects our coastal neighborhoods from major storms, it is important to regulate what form these walkways take. The following types of walkways are considered in this impact analysis.

Public Walkway – Any beach access walkway constructed and maintained by the City, typically elevated and located in a City right-of-way. The use of public walkways is encouraged in order to minimize the number of private walkways impacting the dune system in Norfolk's urban beach environment as well as to provide access for those who do not live on the beach.

Sand Trail – A narrow pathway (typically 12" to 36" wide) through the dune which is free of vegetation. Sand fencing is generally not required to demarcate the path, except in those cases where there are high volumes of foot traffic which would gradually, over time, widen the pathway.

On-grade Walkway – Any walkway that is placed directly on the sand, typically 48" wide or less and following the contour of the dune. On grade walkways are typically anchored to prevent them from blowing or floating away. One example of an on-grade walkway is the pre-manufactured "roll-up" variety. On-grade walkways do not require building permits.

Low-Elevation Walkway – An elevated walkway less than 30" high, 48" wide or less, and not requiring handrails or guardrails. Low-elevation walkways require building permits and must meet all applicable building codes.

Elevated Walkway – An elevated walkway greater than 30" high, 48" wide or less, and requiring handrails and guardrails with pickets spaced no greater than 4" apart. Elevated walkways require building permits and must meet all applicable building codes.

Necessity. Walkways or trails across the dune are necessary to reach the beach and water; however, not every dwelling requires individual access. For example, combined access for multi-family or adjacent residences or use of a public access point reduces impacts but meets the access need. If individual walkways are desired, the preferred option will always be low impact solutions such as sand trails, on-grade or low-elevation walkways. It is also important to mitigate the access need with the type of walkway desired. The topography of the dune system ultimately dictates the feasibility and impact of various walkway options. For example, in areas where the slope of the dune is gentle and gradual, a sand trail or low-elevation walkway will be adequate to provide beach access. In other areas where the dune is steep and difficult to cross, other types of walkways may be considered. The necessity of proposed walkways must be evaluated on a case-by-case basis with regard to the type of walkway proposed, the homeowner's specific circumstances and the limiting characteristics of the dune system in that area.

View Obstruction/Aesthetics. The preservation of water views is extremely important to most beachfront property owners. Beach walkways obstruct natural views when they are elevated to a point that handrails and guardrails are required. The City's Chesapeake Bay beaches are dense, urban beaches—unlike those found along North Carolina's Outer Banks. Beachfront lots within the City are typically about fifty (50) feet wide with regard to beach frontage. If everyone were to construct an elevated walkway with handrails and guardrails, the view obstruction would be substantial, so it is important to carefully evaluate these types of structures. On-grade walkways, sand trails and low-elevation walkways not requiring handrails or guardrails do not obstruct views.

Norfolk's beaches are important aesthetic/visual resources, and maintaining the look of the natural beach environment is important in preserving aesthetic and visual resource quality. The City's natural dune environment is mostly windswept, wild and dominated by plants adapted to coastal conditions. Any proposed walkway should complement the aesthetic value of the sand dunes and beach. Walkways that stay below the vegetation line provide unobstructed and unbroken views of the natural dune landscape. Similarly, natural materials such as wood harmonize with the dune environment whereas lava stone, plastic pickets, metal gates and brightly painted structures contrast sharply with the dune environment.

Maintenance/Safety. Maintenance costs are an important consideration when building any structure, and even more important when building in a coastal dune ecosystem subject to salt corrosion and major storms. Any structure built seaward of the dune crest is likely to be severely damaged or destroyed in a major coastal storm, resulting in high repair or replacement costs. Aside from storm damage, elevated walkways have much higher levels of general maintenance requirements (and costs) than non-structural walkways and trails. Elevated walkways should be maintained regularly to prevent any safety or health concerns. Sand trails and on-grade walkways have the lowest level of maintenance and replacement costs. If sand fencing is used to demarcate a path, it must be rigorously maintained and replaced when damaged.

The safest option for accessing the beach is to use a City-constructed public walkway which has been constructed according to building code standards, and maintained and inspected regularly. If private walkways are desired, sand trails are inherently safer than structural walkways provided that they are crossing relatively level terrain. In areas where the dune is steep and difficult to cross, a wooden walkway up and over the dune may be desirable; however, wooden walkways deteriorate rapidly in the harsh coastal environment resulting in "popped" nail heads, cupped boards, and other safety hazards. Elevated walkways also carry the added risk of injury from falls. While stepping stones might stabilize a walking trail and will not deteriorate as wooden structures will, they may present a stumbling hazard. In addition, any structure can potentially break apart during a storm and create a safety hazard.

Beach walkways and trails can encourage the use of fire hazards such as Tiki torches, grills, fire pits, hibachi pots and chimineas, which are prohibited in the CBCMA. Smokers lingering on walkways might also carelessly dispose of their cigarettes by tossing them onto the dune where they might ignite dry grasses or other debris. While not considered primary fire hazards, wooden walkways may also serve as a secondary source of fuel in the case of a dune fire.

Privatization/Public Access. Walkways built within a City right-of-way and/or on City land require an encroachment granted by City Council. As such, they cannot be marked as "Private Property" even though they have been built at the homeowner's expense. Any "Private Property" signs and/or gates must be physically on the homeowner's property and never in the public part of the dune. However, a "No Public Access to Street" sign at the beach end of the walkway would be helpful in letting beachgoers know that they cannot get to the street from that location.

Elevated wooden walkways are expensive to build and maintain, thereby encouraging privatization markers, such as "Keep Off" and "Private Property" signs. They also may mirror the look of City access points, thereby causing confusion and private trespass. Sand trails and on-grade walkways blend in with the surroundings and do not draw attention as elevated structures do.

The City's public beaches are an important recreational amenity for residents and visitors alike. It is important to remember that all dune walkways, whether public or private, provide access to the City's public beach and the waters of the Chesapeake Bay. Privately constructed walkways on public land that are signed as "Private Property" discourage public use and enjoyment of the dune and coastal environment. Any proposed walkway should meet the homeowner's need for access while not discouraging public enjoyment of the beach.

Other Impacts. Poorly constructed wooden walkways (both elevated and on-grade) with rusty nails and fasteners can create opportunities for tetanus exposure. Walkways that are not regularly maintained also pose similar health risks.

Sand trail walkways can expose people to sandspurs and sand sedge spikes creating potential for infection. Coast Sandspur (or Field Sandbur) is a grass plant that produces a spiny bur that attaches itself to socks, shoes, cuffs, towels and other items. Sandspurs are summer annuals with a preference for dry sandy areas with lots of sun. In the fall, the plant produces several seedheads each with many sandspurs. Japanese sedge is an invasive perennial adapted to coastal beaches and dunes. Many flower spikes on this plant appear as one large spike. The mature sedge is coarse and stout and forms extensive colonies through cord-like rhizomes that extend many feet under the sand and produce new shoots.

Coastal sand dunes support many species of plants and animals. The native grasses are particularly important for retaining sand and stabilizing the dune. Any man-made objects or structures placed in the dune area will have some impact on the ecosystem. For example, trails and on-grade walkways can displace dune plants and, in certain situations, contribute to dune destabilization. Sand trail walkways also provide an open sandy area where invasive plants can gain a foothold and compete with native dune plants.

Appropriate Practices

Appropriate practices for the construction of private beach walkways in the CBCMA will be evaluated based on the criteria above. Successful plans and designs will meet the access need while also addressing each of the impact criteria. A narrow sand path is the preferred non-structural alternative where the dune terrain is gentle and easy to cross. While it is impossible to identify one type of structural walkway which will work at all locations and under all circumstances, the following is just one example that meets the criteria where the dune terrain is relatively level and uniform.

Low-Elevation Walkway

Low-Elevation Walkway Example

A low-elevation walkway would typically be any narrow, walkway less than 30" high without handrails or guardrails that follows the natural contour of the dune. The optimum height of the walkway should be below the elevation of the surrounding dune grasses, but high enough to prevent significant overhang. The width of the walkway should be based on the expected volume of pedestrian traffic. If a walkway is infrequently used, a 36" width is usually sufficient. Heavily traveled or multi-family walkways should be wider—up to 48" in width. Forty-eight (48) inches is the maximum width considered necessary for anything other than public walkways built by the City. All structural walkways must be built according to applicable building codes.

Low-Elevation Walkway Side View

Low-elevation walkways should be constructed of unpainted, treated wood or composite decking materials. Composite materials must be installed in accordance with manufacturer's recommendations. All structural hardware should be double hot-dipped galvanized or stainless steel. Standard carbon-steel or aluminum metal products may corrode in the salt water environment. Nails or uncoated fasteners are not recommended. Deck fasteners should be rated for outdoor use in a marine environment. Planting and maintaining dune grasses adjacent to the walkway is required to stabilize the surrounding dune and help prevent sand from covering the structure.

Impact Analysis

Necessity. If individual beach access is necessary, a low-elevation walkway would be most appropriate in areas where the slope of the dune is gentle and gradual.

View Obstruction/Aesthetics. Low-elevation walkways do not obstruct the view corridor as they stay below the level of the natural dune grasses and therefore become effectively invisible when viewed from an angle. Provided they are constructed from natural materials, low-elevation walkways are aesthetically pleasing because they mimic the natural contour of the dune and are often obscured from view by bordering dune grasses.

Maintenance/Safety. Any structure built in the coastal environment is likely to be damaged or destroyed in a storm, resulting in high repair or replacement costs. As with any walkway structure, routine maintenance is required for a low-elevation walkway. These walkways are subject to being covered by sand, resulting in the need to regrade the sand and stabilize the area with native dune grasses. Assuming the walkway meets building code and is regularly maintained, low-elevation walkways are relatively safe as they are low to the ground and there is less chance of injury from falls.

Privatization/Public Access. Low-elevation walkways do not mimic the look of elevated public walkways; therefore it is more obvious that they lead to private property. Level lines of sight may also contribute to the realization that the walkway leads to a house or yard and not to the street. Low-elevation walkways do not discourage public enjoyment of the beach because they naturally blend in with the dune environment and it is typically clear that they lead to a private dwelling. Their low-profile design gives no clues that would cause a non-resident beachgoer to mistake it for a public access point.

Other Impacts. Assuming the walkway is regularly maintained, low-elevation walkways offer little exposure to health risks. In addition, they keep the user off the ground and away from sandspurs which could pierce the skin and cause infection.

While a low-elevation walkway would shade out the dune grasses within its footprint, it would also prohibit the establishment of invasive species, such as Coastal Sandspur or Japanese sedge, in the resulting sandy area beneath the walkway.

9. Major Structures – Stairs

Impact Statement

As mentioned earlier in the Walkways section of this document, it is a natural desire for property owners and residents along Norfolk's Chesapeake Bay beaches to maximize their location through improved access to the beach. In many cases a simple walkway meets this need; however, in areas where the slope of the dune is steeper, stairs may be desired. When choosing a location, orientation and type of beach access stairway, it is important to consider the following:

- Stairs, regardless of their alignment, can funnel strong northerly winds resulting in erosive wind scour which destabilizes the dune. Over time, these areas of destabilization continue to grow, further eroding the dune face and creating a blowout. These blowouts are typically the first point of entry for storm surge overwash during storm events.
- The shade created by stairs can kill native dune grasses, the roots of which help stabilize the dune by keeping the sand in place. Without the dune grasses, the sand adjacent to stairways can more easily be eroded away by wind and waves, further contributing to the destabilization of the dune.
- When constructed haphazardly and in proliferation along an urban beach, stairs with handrails and guardrails can provide significant view obstruction.
- Stairs can break apart during storm events and become projectiles which may cause additional property damage during storms and/or become waterway hazards for boaters.
- There is no correct or permanent position or alignment for stairs on the leading edge of a dynamic dune system. The contour of the dune system is always changing—whether through beach nourishment projects or natural coastal processes—in a way that precludes "permanent" structures such as stairs.

Primary Regulatory Review

In addition to complying with the CBCMA Guidance Document, any structures built within the dune system must adhere to all of the following applicable ordinances and codes.

Coastal Primary Sand Dune Ordinance. The construction and maintenance of noncommercial stairways does not require a permit under the City's Dune Ordinance, provided these structures do not alter the contour of the coastal primary sand dune. Consequently, any stairway that is of such a design that it would destabilize the sand dune would not meet the exemption and would require an individual permit from the Norfolk Wetlands Board.

Encroachment Permit. If a proposed stairway extends into the public right-of-way or onto City property, an encroachment application must be submitted to the Department of Public Works and City Council must pass an ordinance authorizing the encroachment. In addition, the applicant will need to provide liability insurance coverage with the City named as a co-insured for such encroachments.

Building Code. Stair structures built within the CBCMA require building permits and must adhere to applicable building codes. All stairways require handrails. Stairs greater than 30" above grade require both handrails and guardrails consisting of railings and pickets. Stairs less than 30" above grade do not require guardrails; however, both handrails and guardrails are recommended for safety and stability in a dynamic dune environment.

Impact Analysis

Since stairways on the beach can impact the dune system which protects our coastal neighborhoods from major storms, it is important to regulate what form these stairways take. The following types of stairways are considered in this impact analysis:

Public Stairway – Any beach access stairway constructed and maintained by the City, typically elevated and located in a City right-of-way. The use of public stairways is encouraged in order to minimize the number of private stairways impacting the dune system in Norfolk's urban beach environment as well as to provide access for those who do not live on the beach.

Sand Trail – A narrow pathway over the dune typically free of vegetation. Where the slope of the dune is gentle, sand trails can provide adequate transition from dune to beach. Sand fencing is generally not required to demarcate the path, except in those cases where there are high volumes of foot traffic which would gradually, over time, widen the pathway.

Rope-and-Tread Ladder – An on-grade option for areas where a sand trail is desired, but the slope of the dune is steeper and more difficult to cross. The rope-and-tread ladder consists of two parallel ropes (½" or greater) placed between 24" to 36" apart with 2"x4" wooden treads spaced at approximately 15" intervals along their length. Holes are drilled at both ends of each tread through which the ropes are threaded then either knotted above and below or secured in place with screws. The ladder is then laid on the sand and anchored at the top to prevent slipping. The wooden treads provide adequate footing for climbing while also minimizing the displacement of sand due to foot traffic. When the ladder becomes covered by sand, it can easily be lifted from the bottom and placed back on the surface.

Low-Elevation Stairway – An elevated stairway less than 30" high and 36" to 48" wide with handrails. While building codes do not require that stairways less than 30" above grade have guardrails, they are recommended for stairways built in the dune environment due to the changing nature of the dune.

Elevated Stairway – An elevated stairway greater than 30" high and 36" to 48" wide. Building codes require that stairways higher than 30" above grade have both handrails and guardrails comprised of railings and vertical pickets.

Necessity. Simple sand trails can provide adequate transition from dune to beach in most areas of Norfolk's dune system. In areas where the slope of the dune is steep, structural stairs or a rope-and-tread ladder may be desired; however, not every dwelling requires individual stairs. For example, combined stairways for multi-family or adjacent residences can be placed near the adjacent property line to reduce impacts while also meeting the access need. Use of public stairways is also encouraged. If individual stairways are desired, the topography of the dune system will ultimately dictate the feasibility and impact of various stairway options. The necessity of proposed stairways will be evaluated on a case-by-case basis with regard to the homeowner's individual needs, circumstances, location within the dune system and the type of stairway proposed.

View Obstruction/Aesthetics. The preservation of beach and water views is an important component of beachfront living. Elaborate elevated stairways are sometimes built high and far out on the beach in an often unsuccessful attempt to avoid conflicts with the dune's natural erosion/accretion cycle. These structures provide significant view obstruction because they require handrails and guardrails which are higher than the natural crest of the dune. Norfolk's Chesapeake Bay beaches are dense, urban beaches—unlike those found along North Carolina's Outer Banks or some of the high-end waterfront communities in Florida. Beachfront lots within the City are typically about fifty (50) feet wide with regard to beach frontage. If everyone were to construct an elaborate, elevated stairway, the view obstruction would be immense.

Ideally, stairways should be positioned on the dune face leading down to the beach and should stay below the vegetation line as much as possible in order to provide unobstructed and unbroken views of the natural dune landscape. Sand trails do not obstruct views. Low-elevation and rope-and-tread ladders placed on the dune face leading down to the beach meet the access need while providing the least view obstruction.

Maintaining the aesthetic, visually pleasing look of the natural beach environment is also important when considering stairs for beach access. The City's natural dune environment is mostly windswept, wild and dominated by native coastal vegetation. Any proposed stairway should complement the aesthetic value of the sand dunes and beach. Natural materials such as wood harmonize with the dune environment whereas white vinyl pickets, metal gates and brightly painted structures provide sharp contrast.

Maintenance/Safety. Maintenance costs are an important consideration when building any structure, and even more important when building in a coastal dune ecosystem subject to salt corrosion and major storms. Any structure built seaward of the dune crest is likely to be damaged or destroyed in a major coastal storm, resulting in high repair or replacement costs. Lower maintenance stairway materials—such as vinyl and composite lumber—are more expensive and do not provide any greater storm damage protection. It is important to remember that there is no correct or permanent position or alignment for a stairway on the leading edge of a dynamic dune system. Stairs will always require significant maintenance, repairs or rebuilding after storms.

Aside from impacts from major storm events, stairways also have much higher levels of general maintenance requirements (and costs) than sand trails. All stairways must be maintained regularly to prevent any safety or health concerns. Sand trails and rope-and-tread ladders have the lowest level of maintenance and replacement costs.

From a safety standpoint, the best option for accessing the beach is to use a City-constructed public stairway which has been built according to building codes and repaired and inspected regularly. Sand trails are inherently safer than stairs provided that they are not too steep. In areas where the dune is too steep for a sand trail, a rope-and-tread ladder might be an appropriate solution. If a structural stairway is desired, it is important to remember that wooden stairs deteriorate rapidly in the harsh coastal environment resulting in "popped" nail heads, cupped boards, and other safety hazards such as loose, sloped or uneven treads and slipping due to sand covering the stairway surface. Elevated stairways also carry the added risk of injury from falls. In addition, any structure can potentially break apart during a storm and create a safety hazard. After significant storm events, it is not unusual for the dune and beach to be eroded away from the base of the stairs, creating an unsafe drop-off situation.

While stepping stones, treaded ramps and partial stairways might stabilize a sloped walking trail and will not deteriorate as wooden structures will, they may present a stumbling hazard.

Stairways within the dune system can also encourage the use of obvious fire hazards such as Tiki torches, grills, fire pits, hibachi pots and chimineas (all of which are prohibited in the CBCMA). Smokers using the stairways might also carelessly dispose of their cigarettes by tossing them onto the dune where they might ignite dry grasses or other debris. While not considered primary fire hazards, stairs may serve as a secondary source of fuel in the case of a dune fire.

Privatization/Public Access. The City's public beaches are an important recreational amenity for both residents of and visitors to the City of Norfolk. All stairways built in the dune environment, whether public or private, provide access to the City's public beach and the waters of the Chesapeake Bay.

Stairways built within a City right-of-way and on City land require an encroachment granted by City Council. As such, they cannot be marked as "Private Property" even though they have been built at the homeowner's expense. Such signage discourages public use and enjoyment of the dune and coastal environment. Any "Private Property" signs and/or gates must be physically on the homeowner's property and not in the public part of the dune system. It may be helpful to place a "No Public Access to Street" sign at the beach end of the stairway to help beachgoers recognize that it is not one of the City's designated public walkways.

Sand trails and rope-and-tread ladders are unobtrusive and it is typically clear that they lead to a private home. Low-elevation stairways that are not part of an associated structure also blend in with the surroundings. It would be unlikely that a beachgoer would mistake any of these for a public access point.

Other Impacts. Poorly constructed wooden stairways with rusty nails and fasteners can create opportunities for tetanus exposure. Stairways that are not regularly maintained also pose similar health risks.

While sand trails are an encouraged means of beach access, they can expose people to sandspurs and sand sedge spikes creating potential for infection.

Native dune grasses are particularly important to the retention of sand and stabilization of the dune. Stairways built in the dune environment shade out dune vegetation, thereby displacing dune grasses and contributing dune destabilization. Dune grass plantings should be maintained on both sides of the stairs to minimize blow outs.

While sand trails are encouraged forms of beach access, they can provide an open sandy area where invasive plants can gain a foothold and compete with native dune plants. When using sand trails for beach access it is important to monitor and eradicate invasive species.

Appropriate Practices

A narrow sand path is the preferred non-structural alternative where the dune terrain is gentle and easy to cross. In areas where the dune is too steep for a sand trail, some type of stairway may be desired. Appropriate practices for the construction of beach stairways in the CBCMA will be evaluated on a case-by-case basis using the criteria above. Successful plans and designs will meet the access need while also addressing each of the impact criteria. While it is impossible to identify one type of stairway which will work at all locations and under all circumstances, the following is one example of a structural stairway that meets the criteria where the slope of the dune would warrant stairs.

Low-Elevation Stairway

A low-elevation stairway would typically be any stairway positioned less than 30" above the face of the dune leading down to the beach, but not attached to any associated structure such as an elevated wooden walkway, deck, platform or gazebo. Appropriate access to such a stairway would be via a sand trail or a low-elevation walkway as outlined in the section on Walkways.

Low-Elevation Stairway Example

The width of the stairway should be based on the expected volume of pedestrian traffic. If a stairway is infrequently used, a 36" width is usually sufficient. However, more heavily traveled or multi-family stairways should use a wider, up to 48" width. Forty-eight (48) inches is the maximum width considered necessary for anything other than public stairways built by the City of Norfolk.

Stairways must have handrails and be built according to all applicable building codes. Handrails must be located on both sides of the stairway. While building codes do not require that stairways less than 30" above grade have guardrails composed of vertical pickets, they are recommended for stairways built in the dune environment, especially for those built on the seaward slope of the dune. This part of the dune is the most dynamic and also the most vulnerable to storm damage. It is also important to remember that while a stairway may have initially been built lower than 30" above grade, there is no guarantee that it will remain so when natural coastal processes come into play.

Low-elevation stairways should be constructed of unpainted, treated wood or composite decking materials. Composite materials must be installed in accordance with manufacturer's recommendations. All structural hardware should be double hot-dipped galvanized or stainless steel. Standard carbon-steel or aluminum metal products may corrode in the salt water environment. Nails or uncoated fasteners are not recommended. Deck fasteners should be rated for outdoor use in a marine environment. Planting and maintaining dune grasses adjacent to a stairway is required to stabilize the surrounding dune and help prevent sand from covering the structure.

Impact Analysis

Necessity. If individual beach access is desired, a low-elevation stairway would be most appropriate in areas where the slope of the dune is steep enough to preclude the safe use of a sand trail.

View Obstruction/Aesthetics. Low-elevation stairways not connected to any ancillary structure do not obstruct the view corridor like elevated stairways do. Low-elevation stairways made of natural materials and built close to the dune face are often at or below the height of the dune crest and therefore blend in better with the dune topography. Provided they are constructed from natural materials, low-elevation stairways placed on the face of the dune leading down to the beach are aesthetically pleasing because they mimic the natural contour of the dune and are somewhat obscured from view by bordering dune grasses. Low-elevation stairways on the front of the dune are also generally invisible from adjacent properties on the back of the dune.

Maintenance/Safety. Any structure built in the coastal environment is likely to be damaged or destroyed during storms, resulting in high repair or replacement costs. Stairs placed on the face of the dune leading down to the beach are especially vulnerable. Routine maintenance is required for all stairways.

Assuming the stairway meets building code and is regularly maintained, low-elevation stairways are relatively safe as they are low to the ground and there is less chance of injury from falls. While building codes do not require that low-elevation stairways have guardrails or handrails, both are recommended for stairways built in the dune environment due to the changing nature of the dune.

Assuming the stairway is in good repair and is not used to support such things as Tiki torches, grills, fire pits, hibachi pots or chimineas (which are prohibited in the CBCMA), a low-elevation stairway would not typically present a fire hazard.

Privatization/Public Access. Low-elevation stairways positioned on the face of the dune leading down to the beach do not mimic the look of elevated public walkways; therefore it is more obvious that they lead to private property. Use of a sand trail to access the stairway may also contribute to the understanding that the stairs lead to a private home or yard and not to the street. Low-elevation stairways accessed via a sand trail or low-elevation walkway do not discourage public enjoyment of the beach because they naturally blend in with the dune environment and it is typically clear that they lead to a private dwelling. Their narrow width and low-profile design gives no clues that would cause a beachgoer to mistake it for a public access point.

Other Impacts. Assuming they are regularly maintained, low-elevation stairways offer little exposure to health risks. In addition, they keep the user off the ground and away from sandspurs which could pierce the skin and cause infection.

While a low-elevation stairway would shade out the dune grasses within its footprint, it would also prohibit the establishment of invasive species, such as Coastal Sandspur or Japanese sedge, in the resulting sandy area beneath the stairs. It is important to maintain dune grass plantings on both sides of the stairs to promote sand retention and minimize blowouts.

10. Major Structures – Decks, Patios and Observation Platforms

Impact Statement

In areas of the CBCMA where decks, patios, and observation platforms are permitted, they are typically placed on or near the dune crest in order to provide the best views of the beach and water. When choosing a location, orientation and type of deck, patio or observation platform, it is important to consider the following:

- Observation platforms placed seaward of the dune crest can create natural channels for scour to move sand out of the dune system and down the beach, creating a scarp. The shading provided by these structures also kills dune vegetation, further contributing to the loss of sand within the footprint of the structure. Over time, the scarp will grow, compromising the integrity of the dune, as well as the stability of the structure itself.

- Observation structures placed directly on the dune crest essentially "cap" the dune and impair the dune's natural ability to build over time. While no dune growth occurs in the footprint of the structure, sand may accumulate on either side, creating a natural channel for strong northerly winds to move sand out of the dune system and into the area landward of the dune crest, resulting in a blowout. These blowouts are typically the first point of entry for storm surge overwash during storm events.

- The best location for observation structures in the dune system is landward of the dune crest. Structures in this location will have some of the same impacts as those placed directly on the dune crest, but over a longer period of time. In some cases where the dune is naturally retreating landward, these structures may eventually be covered by sand. Landward structures also shade the vegetation over the back side of the dune, which contributes to destabilization.

- When constructed haphazardly and in proliferation along an urban beach, decks or gazebos with handrails, guardrails and/or roofs can provide significant view obstruction.

- Wooden decks and gazebos can break apart during storm events and become projectiles which may cause additional property damage during storms and/or become waterway hazards for boaters.

- Any structures built in a beach and dune environment must be considered impermanent and expendable. The contour of the dune system is always changing—whether through beach nourishment projects or natural coastal processes—in a way that precludes "permanent" observation structures.

Primary Regulatory Review

In addition to complying with the CBCMA Guidance Document, any structures built within the dune system must adhere to all of the following applicable ordinances and codes.

Coastal Primary Sand Dune Ordinance. The construction and maintenance of observation platforms which are not an integral part of any dwelling does not require a permit under the City's Dune Ordinance, provided none of these structures alter the contour of the coastal primary sand dune. The Dune Ordinance assumes that properly constructed observation platforms will preserve natural dune vegetation and allow the dune to function in trapping sand. Consequently, any observation structure that is of such a design that it would destabilize the sand dune would not meet the exemption and would require an individual permit from the Norfolk Wetlands Board.

Encroachment Permit. If a proposed observation structure extends into the public right of way or onto City property, an encroachment application must be submitted to the Department of Public Works and City Council

must pass an ordinance authorizing the encroachment. In addition, the applicant will need to provide liability coverage with the City as a co-insured for such encroachments.

Building Code. While at-grade patios do not require building permits, any above-grade structures built within the CBCMA require building permits and must adhere to applicable building codes. These codes require that decks greater than 30" above grade have handrails and guardrails consisting of railings and pickets.

Impact Analysis

Since observation structures can impact the dune system which protects our coastal neighborhoods from major storms, it is important to regulate what form these structures take. The following types of observation structures are considered in this impact analysis.

Attached Structure – Any observation structure that is attached to a residential dwelling and fully on the homeowner's property. Attached structures require building permits and must meet all applicable building codes. The construction of attached structures is encouraged in order to minimize the number of private observation structures impacting the dune system in Norfolk's urban beach environment.

Gazebo/Roofed Deck – Gazebos vary in size and typically feature an octagonal deck, a railing and a shingled roof supported by posts. A roofed deck is any deck to which a roof has been attached.

Patio – Any observation structure that is placed directly on the sand, typically 10' x 10' (100 sq. ft.) or less and level with the dune elevation. Patios are typically constructed of concrete or stone pavers or flagstones that are placed directly on the sand surface. Patios in direct contact with the ground do not require a building permit. If a patio is supported by a girder and joist system, it is technically considered a deck and a building permit is required.

Deck – An exterior floor system typically 10' x 10' or 100 sq. ft. or smaller and supported on at least two opposing sides by an adjoining structure and/or posts, piers or other independent supports.

Low-Elevation Deck – An elevated deck platform without a roof which is 10' x 10' or 100 sq. ft. or smaller, less than 30" high, and not requiring handrails or guardrails. Low-elevation decks require building permits and must meet all applicable building codes.

Elevated Deck – An elevated deck platform without a roof which is 10' x 10' or 100 sq. ft. or smaller, greater than 30" high, and requiring handrails and guardrails with pickets spaced no greater than 4" apart. Elevated decks require building permits and must meet all applicable building codes.

Necessity. Observation structures are typically unrelated to beach access and exist solely as a means of moving recreational space into the dune system to provide better views and enjoyment of the beach and water. As with other structures built within the dune system, the topography of the dune system ultimately dictates the necessity, feasibility and impact of various observation structures. Observation structures are not considered a necessity in areas where the dune system is fragile and water views from a dwelling are adequate. However, these structures are necessary in stable areas of the dune where the placement of benches, tables and chairs is desired. Because these items cause significant damage to the dune when placed directly on the sand, they should only be placed upon approved observation structures.

If an observation structure is desired, the preferred option will always be low impact solutions such as attached structures, patios or low-elevation decks built on or landward of the dune crest. Given the variable nature of the dune topography along Norfolk's Chesapeake Bay shoreline, the necessity of proposed observation structures must be evaluated on a case-by-case basis with regard to the homeowner's specific circumstances, the type and location of the structure proposed, and the stability of the dune system in that area.

View Obstruction/Aesthetics. The preservation of water views is extremely important to most beachfront property owners. Observation structures in the dune environment can obstruct views when they are elevated above the crest of the dune. This is especially true of structures requiring handrails and guardrails, as well as gazebos or roofed decks, which are typically larger and more elaborate than simple on-grade structures. Gazebos not only obstruct views from adjacent properties, but they can also obstruct views from the principal dwelling itself. The City's Chesapeake Bay beaches are more dense and urban than many other beachfront communities. In fact, beachfront lots within the City are typically about fifty (50) feet wide with regard to beach frontage. If everyone were to construct an elevated deck structure or gazebo, the view obstruction would be considerable. While patios and low-elevation decks without handrails or guard rails do provide some view obstruction, it is not as significant as that resulting from elevated structures.

Norfolk's beaches are important aesthetic/visual resources, and maintaining the look of the natural beach environment is important in preserving aesthetic and visual resource quality. The City's natural dune environment is mostly windswept, wild and dominated by a variety of coastal plants. Any proposed observation structure should complement the aesthetic value of the sand dunes and beach. Gazebos and elevated decks visually interrupt the expansiveness and simplicity of the dune system. Low-elevation decks and patios that stay below the vegetation line provide unobstructed and unbroken views of the natural dune landscape. Similarly, natural materials such as wood are visually appropriate in the dune environment whereas white vinyl pickets, metal gates and brightly painted structures provide sharp contrast.

Maintenance/Safety. Elevated deck structures and gazebos are very expensive to build and maintain. Maintenance costs are an important consideration when building any structure, and even more important when building in a coastal dune ecosystem subject to salt corrosion and major storms. Any structure built seaward of the dune's crest zone is likely to be damaged or destroyed in a major coastal storm, resulting in high repair or replacement costs. Decks washed away during storm events create waterway hazards for boaters, and gazebo roofs can become airborne projectiles during extreme storm events. Observation structures located landward of the dynamic dune crest zone may benefit from greater safety and longevity, but they still require regular maintenance if the dune is not properly stabilized with vegetation. Aside from impacts from major storm events, elevated observation structures have much higher levels of general maintenance requirements (and costs) than on-grade patios. Elevated decks must be on a rigorous maintenance schedule to prevent any safety issues or health concerns.

All wooden structures deteriorate rapidly in the harsh coastal environment resulting in "popped" nail heads, cupped boards, and other safety hazards. Elevated decks present safety concerns related to the difficulty of maintaining structural supports in a changing dune environment. They also carry the added risk of injury from falls. While on-grade patios and low-elevation decks may be safer, there is still the risk of injury from falling down the dune slope in areas where the dune is high and steep. In addition, any structure can potentially break apart during a storm and create a safety hazard.

Any observation structure situated in the dune environment can encourage the use of fire hazards, such as Tiki torches, grills, fire pits, hibachi pots and chimineas (all of which are prohibited in the CBCMA). Smokers using observation structures might also carelessly dispose of their cigarettes by tossing them onto the dune where they might ignite dry grasses or other debris. While not considered a primary fire hazards, wooden structures may also serve as a secondary source of fuel in the case of a dune fire.

Privatization/Public Access. Most observation structures are expensive to build and maintain thereby encouraging privatization markers, such as "Keep Off" and "Private Property" signs even when these structures are built on public land. If an observation structure is built out on the seaward side of the dune crest, it can easily be mistaken for a City access point, especially if there are stairs leading down from the structure to the beach. On-grade patios and low-elevation decks built on or landward of the dune crest are not as easily mistaken for public access points. Decks or balconies attached to residential structures are clearly perceived as private property.

Observation structures built within a City right-of-way or on City land require an encroachment granted by City Council. As such, they cannot be marked as "Private Property" even though they have been built at the homeowner's expense. Any "Private Property" signs and/or gates must be physically on the homeowner's property and never in the public part of the dune system. However, a sign worded to indicate that there is no public street access may be helpful in letting the general public know that they cannot get to the street from that location.

The City's public beaches are an important recreational amenity for residents of and visitors to the City of Norfolk. Private structures built on public land that are signed as "Private Property" discourage public use and enjoyment of the dune and coastal environment. Any proposed observation structure should meet the homeowner's view requirements while not discouraging public enjoyment of the beach. If there is any type of access (i.e. walkway or stairs) from the public beach to a private observation structure, a sign stating "No Public Access to Street" can let non-resident beachgoers know that they cannot get to the street from that location without giving the idea that the beach or dune itself is private.

Other Impacts. Poorly constructed wooden decks (both elevated and on-grade) with rusty nails and fasteners can create opportunities for tetanus exposure. Observation structures that are not regularly maintained also pose similar health risks.

Any man-made objects or structures placed in the dune area will have obvious impacts on the ecosystem. Coastal sand dunes support many species of plants and animals. The native grasses are also particularly important to the retention of sand and stabilization of the dune. Cleared sandy areas for chairs and other recreational items can expose people to sandspurs and sand sedge spikes creating vectors for infection. They can also provide an open area where invasive plants can gain a foothold and compete with native dune plants. On-grade patios and low-elevation deck structures can benefit the dune by containing recreational activities to a defined and restricted area, but it is important to maintain dune grass plantings around the structure in order to prevent destabilization of the dune. The shade of elevated deck structures may kill or stress dune vegetation which, in turn, contributes to wind erosion of sand below the structure.

Appropriate Practices

Gazebos are discouraged in the CBCMA except for in areas where they are behind the development line and do not obstruct views. In areas where the construction of private observation structures in the CBCMA is permitted, these structures will be evaluated based on the criteria above. Successful plans and designs will meet the need for beach and water views while also addressing each of the impact criteria. While it is impossible to identify one type of observation structure which will work at all locations and under all circumstances, the following is one example of a deck that meets the criteria.

Low-Elevation Deck

A low-elevation deck would typically be any elevated deck platform without a roof which is 10' x 10' (100 sq. ft.) or smaller, less than 30" high, and not requiring handrails or guardrails. Location is as important as physical dimension when it comes to the construction of a low-elevation deck. These structures are most appropriate when constructed on or landward of the dune crest. All observation structures must be built according to applicable building codes.

Low-Elevation Deck Example

Low-elevation decks should be constructed of treated, natural (unpainted) wood or composite decking materials. Composite materials must be installed in accordance with manufacturer's recommendations. All structural hardware should be double hot-dipped galvanized or stainless steel. Standard carbon-steel or aluminum metal products may corrode in the salt water environment. Nails or uncoated fasteners are not recommended. Deck fasteners should be rated for outdoor use in a marine environment. Planting and maintaining dune grasses adjacent to the deck structure is required to stabilize the surrounding dune and help prevent sand from covering the structure.

Impact Analysis

Necessity. Observation structures are permitted in certain areas of the CBCMA. Homeowners wishing to use benches, tables or chairs to view the beach and water must place them on approved observation structures in order to minimize impacts to the dune. In these cases, a low-elevation deck or on-grade patio built on or landward of the dune crest meets the necessity criteria while minimizing other impacts.

View Obstruction/Aesthetics. Low-elevation decks do not obstruct the view corridor because they stay below the level of the natural dune grasses and therefore become effectively invisible when viewed from an angle. Provided they are constructed from natural materials, low-elevation decks are aesthetically pleasing because they blend in with the natural dune environment and are sometimes obscured from view by bordering dune grasses.

Maintenance/Safety. Any structure built in the coastal environment is likely to be damaged or destroyed in a storm, resulting in high repair or replacement costs. As with any wooden structure, routine maintenance is required for a low-elevation deck. Low-elevation decks can sometimes be covered by blowing sand. Stabilizing the surrounding dune with dune grass plantings can help to keep the sand in place and off the deck structure. Assuming that they meet building code and are regularly maintained, low-elevation decks are relatively safe as they are low to the ground and there is less chance of injury from falls.

Privatization/Public Access. Low-elevation decks do not discourage public enjoyment of the beach because they naturally blend in with the dune environment. The structure however is on public land, therefore no signage may be posted and no verbal instructions given to prevent public use or occupation of structures on City land or in the public right-of-way. However, low-elevation decks without sand trails, walkways or stairs leading to the beach encourage beachgoers to use public access points. If beach access is desired from a low-elevation deck in areas where the slope of the dune is not to steep, a sand trail more clearly suggests that there is no public access to the street from that location. Reducing the visibility of the structure effectively minimize potential use conflicts.

Other Impacts. Assuming the structure is regularly maintained, low-elevation decks offer little exposure to health risks. In addition, they keep the user off the ground and away from sandspurs which could pierce the skin and cause infection.

While a low-elevation deck would shade out the dune grasses within its footprint, it would also prohibit the establishment of invasive species, such as Coastal Sandspur or Japanese sedge, in the resulting sandy area beneath the deck as well as cover over any exposed sand, preventing it from being eroded by wind action.

11. Major Structures – Bulkheads, Revetments & Retaining Walls

Impact Statement

Generally speaking, bulkheads, revetments and retaining walls are a structural means of protecting property or stabilizing a shoreline and are often in conflict with the natural processes that shape a coastal primary sand dune system. There are few bulkheads, revetments, or retaining walls along the City's Chesapeake Bay shoreline; however, most of the structures that do exist are located in Willoughby, and there is one revetment in East Ocean View.

The City's ongoing shoreline stabilization efforts have focused on maintaining a healthy beach and dune system. The strategy is to maintain a nourished beach as the primary line of defense from storms and waves, with the coastal primary sand dune serving as the secondary line. Bulkheads and revetments are considered the third line of defense, and only necessary in situations where extreme erosion threatens private property. Because these structures are expensive to build and have the potential to alter the contour of the dune, it is important to consider the following when the construction of a bulkhead, retaining wall or revetment is proposed:

- While retaining walls can function to temporarily prevent the encroachment of the dune onto private property, these structures often fail over time as the dune puts continual pressure on the structure.
- If walls are desired to separate private development from the dune, short walls known as "knee walls" are most appropriate. The East Beach neighborhood has been successful in requiring the construction of knee walls for new development. These knee walls have proven beneficial for demarcating property boundaries by keeping the dune from creeping into homeowner's yards and vice versa.
- Large man-made shoreline protection structures, such as bulkheads and revetments, are prohibitively expensive for a homeowner to build and maintain. They must be designed by a professional engineer for structural and safety reasons. In addition, studies have shown that, in some cases, these structures can actually increase wind scour and accelerate the movement of sand out of the dune system.

Primary Regulatory Review

In addition to complying with the CBCMA Guidance Document, any structures built within the dune system must adhere to all of the following applicable ordinances and codes.

Coastal Primary Sand Dune Ordinance. The City's Dune Ordinance requires a permit for the construction of bulkheads, revetments or retaining walls within the coastal primary sand dune. However, the normal maintenance of any existing groin, jetty, riprap, bulkhead, or other structure designed to control beach erosion which may abut a coastal primary sand dune does not require a permit under the Dune Ordinance.

Encroachment Permit. Retaining structures built on City land or in a City right-of-way will require that an encroachment application be submitted to the Department of Public Works. City Council must then pass an ordinance authorizing the encroachment. In addition, the applicant will need to provide liability coverage with the City named as a co-insured for such encroachments.

Building Code. Retaining walls must meet applicable building codes. Bulkheads and revetments are not addressed in the IRC and must be designed in accordance with accepted engineering practice. Therefore, plan drawings developed by a registered professional engineer are required.

Impact Analysis

The impact criteria for bulkheads, revetments and retaining walls are mainly centered on necessity with some access, maintenance, and aesthetics issues. The following definitions are provided to characterize each type of structure discussed in the impact analysis below.

Bulkhead – Shoreline protection structures that are vertically faced and constructed parallel to the shoreline. Bulkheads are typically constructed out of concrete, wooden timbers or steel sheet pile. Bulkheads retain or prevent sliding of the land while also protecting upland areas against damage due to wave action. Shoreline protection bulkheads in an ocean/bay environment are normally placed landward of the beach and are often buried in the sand for aesthetic purposes. Bulkheads are not necessary in areas where a healthy dune system exists. Bulkheads are also not typically constructed by individual homeowners due to the high costs of construction and maintenance.

Revetment – An apron-like sloped structure typically constructed out of granite stone placed directly on a dune face or shoreline slope. A tough, flexible sheeting material is often placed beneath the rock to prevent undercutting and wash out. The rough, irregular surface of these structures decrease wave reflection and associated scour. Revetments should be placed on a stable slope and be high enough to withstand waves that may break over the top of the structure in extreme conditions. Revetments are not necessary in areas where a healthy dune system exists. Revetments are also not typically constructed by individual homeowners due to the high costs of construction and maintenance.

Retaining Wall – A vertical structure designed to hold back sand from a designated area. Generally made of masonry, stone, brick, concrete, vinyl, steel or timber, retaining walls provide support for vertical or near-vertical grades. Retaining walls must be built according to applicable building codes. These structures must be designed to ensure stability against lateral sliding and overturning. A tie-back system is sometimes used to improve stability.

Knee Wall – A vertical structure typically 18" high or less which bears no load, but serves to demarcate a property boundary or the transition from 'yard' to 'dune'. Knee walls can be constructed of masonry, stone, brick, concrete, vinyl or timber. The area on the outboard side of the wall is typically stabilized with dune vegetation. Knee walls do not require building permits, but may require a dune permit depending on their location.

Necessity. Bulkheads and revetments are not typically necessary anywhere along the City's Chesapeake Bay shoreline, except perhaps in extreme cases where severe erosion threatens private property. The beach and dune system provides ample storm protection. Retaining walls are not shoreline related structures and are considered unnecessary except in extreme cases where the natural movement of the dune encroaches on private property. Knee walls can be beneficial in keeping the dune from creeping into a homeowner's yard. Ideally, structures protecting or demarcating private property should be on private property.

View Obstruction/Aesthetics. Norfolk's beaches are important aesthetic/visual resources, and maintaining the look of the natural beach environment is important in preserving aesthetic and visual resource quality. The City's natural dune environment is mostly windswept, wild and dominated by plants adapted to the harsh coastal conditions. By their nature, bulkheads and revetments present very little view obstruction since they are constructed low to the ground, on-grade or below-grade. Retaining walls, if they are built high enough, can obstruct views. Knee walls do not obstruct views as they are very short (typically below the height of the average person's knee). Structures constructed of natural materials such as wood or stone complement the dune environment whereas vinyl and/or brightly painted walls provide sharp contrast with the natural dune environment.

Maintenance/Safety. Maintenance costs are an important consideration when building any structure, and even more important when building in a coastal dune ecosystem subject to salt corrosion and major storms. Bulkheads and revetments must be able to stand up to waves from the Chesapeake Bay—which can measure up to thirteen (13) feet—and therefore can be prohibitively expensive for the average homeowner to build and maintain. Retaining walls also require significant maintenance and can be problematic when overtopped by sand. In addition, retaining wall tie-backs can deteriorate over time causing the wall to fail, potentially resulting in injury and/or property damage. Since a knee wall is short and bears no load, they are relatively inexpensive to construct and maintain. While none of these structures would be considered a primary fire hazard, any wooden structures may serve as a secondary source of fuel in the case of a dune fire. In addition to the maintenance of the structure, it is also important to consider the need for maintaining dune grass plantings in the surrounding area.

Privatization/Public Access. The City's public beaches are an important recreational amenity for residents of and visitors to the City of Norfolk. High retaining walls can present a physical and visual barrier which discourages public use and enjoyment of the dune and coastal environment.

Other Impacts. Retaining walls built within the footprint of the dune can also lead to the extension of recreational activities into the dune system which kills native dune vegetation and provides an open sandy area where invasive plants can gain a foothold and compete with native dune plants.

Appropriate Practices

The construction of bulkheads, revetments or retaining walls is only appropriate in areas where severe erosion threatens private property. Knee walls are encouraged for demarcation in areas where the development line abuts any part of the dune. Any of these structures adjacent to the dune system will be evaluated based on the criteria above. Successful plans and designs will address the necessity of such a structure while also addressing each of the impact criteria. While it is impossible to identify one type of structure which will work at all locations and under all circumstances, the following example is representative of an appropriate practice.

Knee Wall

A knee wall is a vertical structure typically 18" high which serves to demarcate a property line but bears no loads. Knee walls can be constructed of masonry, stone, brick, concrete, vinyl or timber. The area on the outboard side of the wall should be stabilized with dune vegetation. The photo to the right shows the knee wall with a brick patio behind, and dune grass plantings to the right. Knee walls are always built on private property and do not require building permits.

Knee Wall Example

Impact Analysis

Necessity. While knee walls are not necessary, they do benefit the dune by serving as a boundary between what is considered "yard" and what is considered "dune" in areas where the development line abuts the dune. Providing this clear line of demarcation keeps the dune sand and vegetation separate from a homeowner's grass and yard and prevents each from spilling over into the other. Knee walls should not be used to mark private property.

View Obstruction/Aesthetics. Knee walls do not obstruct views as they are very short and stay below the level of the natural dune grasses. Knee walls constructed of natural materials are most aesthetically pleasing; however, knee walls that follow the décor of the adjacent structure are visually part of that structure and do not interfere with the aesthetics of the sand dunes and beach.

Maintenance/Safety. Since a knee wall is short and bears no load, they are relatively inexpensive to construct and maintain. The maintenance of dune grass plantings in the surrounding area is also important to preserving the stability of the dune. While knee walls would not be considered a primary fire hazard, any wooden structures may serve as a secondary source of fuel in the case of a dune fire. Knee walls do need to be clearly visible so as not to present a tripping hazard.

Privatization/Public Access. In most cases, knee walls are clearly part of an associated dwelling, and it is clear that they are private property. Because they are low to the ground, knee walls do not present a physical or visual barrier which might discourage public enjoyment of the beach. In fact, if dune grass plantings are properly maintained, they are almost totally obscured from view by waving grasses.

Other Impacts. Assuming that they are regularly maintained, knee walls offer little exposure to health or safety risks. In addition, they serve to discourage the movement of recreational and other activities into the dune area by providing a clear demarcation between what is yard and what is dune. This helps to preserve the natural vegetation and stability of the dune.

12. Minor Structures

Impact Statement

A minor structure is broadly defined as any non-load-bearing structure. Minor structures may be embedded in the sand or placed upon the surface of the dune. This section will cover the following minor structures:

- Bird Houses
- Bird Feeders and Baths
- Flag Poles
- Swing Sets
- Lights
- Fences
- Art and Sculpture
- Volleyball Poles and Nets

While the use of some of these minor structures contributes to the experience of beachfront living, it is important to understand their impacts before allowing them to be placed in the CBCMA. Minor structures sometime have unintended dune impacts with regard to view obstruction, maintenance, ecological and/or privatization. Appropriate practices and designs for minor structures in the CBCMA will first address the necessity of the item while also addressing any other impacts.

Primary Regulatory Review

In addition to complying with the CBCMA Guidance Document, any minor structures or items placed within the dune system must adhere to all of the following applicable ordinances and codes.

Coastal Primary Sand Dune Ordinance. The placement of sand fences or other material within the dune system does not require a permit under the City's Dune Ordinance, provided that the sand fence is intended to stabilize the dune and that any other materials do not present a public health or safety hazard. All other items and structures within the dune system require an individual permit from the Norfolk Wetlands Board.

Encroachment Permit. Any minor structures or other item placed on City land or in the City right-of-way require that an encroachment application be submitted to the Department of Public Works. City Council must then pass an ordinance authorizing the encroachment. In addition, the applicant will need to provide liability coverage with the City as a co-insured for such encroachments.

Building Code. Most of the structures considered in this section are non-load-bearing and do not require a building permit.

Bird Houses

Impact Analysis

While bird houses may add to the coastal living experience for some, they are generally not in keeping with the natural dune environment. Bird houses can obstruct views from adjacent residences, depending upon their height. In addition, the birds who visit leave droppings containing the seeds of non-native vegetation which can take hold in certain areas and displace the native grasses which stabilize the dune.

Appropriate Practices

Bird houses should be placed on private property that is not part of the CBCMA due to view obstruction and ecological concerns.

Bird Feeders and Baths

Impact Analysis

While bird feeders and baths may seem harmless at first glance, they are generally not compatible with the dune environment upon closer inspection. The birds using them leave droppings containing the seeds of non-native vegetation which can take hold in certain areas and compete with native dune grasses. In addition, the standing water in bird baths can also serve as a breeding ground for bacteria and mosquitoes.

Appropriate Practices

Bird feeders and baths should be placed on private property that is not part of the CBCMA due to ecological, aesthetic and health concerns.

Flag Poles

Impact Analysis

Flags flying along the shoreline are representative of the beach lifestyle. Some flags are intended to mark the direction of "home" for boaters on the water, and still others are flown to indicate the direction of the wind. While flags and flagpoles have minimal impact on the stability of the dune itself, some homeowners may disagree on other issues with relation to flags and flagpoles. Flag poles can also obstruct views depending upon their location and the size of the flag. A large flag flying in a high wind can provide significant view obstruction. Some flags may represent political or cultural ideas that others might find offensive, especially when flown on City property or in a City right-of-way. Any flag flying in a high wind flaps very loudly, resulting in noise concerns. Flag poles that are not properly supported can fall over and cause injury or property damage.

Appropriate Practices

Flag poles and flags should be placed on private property that is not part of the CBCMA due to view obstruction, aesthetic and noise issues.

Swing Sets

Impact Analysis

A swing set is defined as a free-standing structure usually supported by an A-frame from which a wide bench-style seat with a back is suspended. These types of swings are typically pre-manufactured. The use of swing sets can enhance a homeowner's enjoyment of the beach and dune; however, if they are in the public areas of the dune, they cannot be privatized and anyone may use them. Swing sets with canopies can obstruct views. When placed in the dune, swing sets promote increased foot traffic which kills dune grasses and destabilizes the dune.

Appropriate Practices

Swing sets should be placed on private property that is not part of the CBCMA due to privatization, view obstruction and ecological concerns.

Lights

Impact Analysis

Solar or electric lights are typically used as a decoration, to define a trail or to light up/demarcate private recreational space. If used to light up or demarcate an open recreational area, lights can promote foot traffic and kill dune vegetation. Tall light poles and bright lights can be unsightly in a natural dune environment. Electrical wiring and extension cords can cause tripping. Electrical systems in the dune present an electrical and fire hazard.

Appropriate Practices

Solar lights are permitted on sand paths. Solar or low-voltage lights are permitted on approved walkway or stair structures provided that no wiring is buried in the sand in order to get electricity to the structure.

Fences

Impact Analysis

Fences are typically pre-manufactured sand fencing, but can also take the form of stockade fencing and split rail fence. Sand fencing is sometimes useful to trap sand in areas where the dune is eroding; to protect newly planted dune vegetation; to define a yard, or to control access. Sand fencing must be rigorously maintained, especially if it placed seaward of the dune crest where it can easily be destroyed by storms. The remnants of T-iron posts and wooden stakes left behind after fencing is destroyed can present a safety hazard. Sand fencing on the crest of the dune can provide as much view obstruction as elevated walkways and stairways. Sand fencing unrelated to dune stabilization can lead to conversion of the sand dune into yard. Stockade or sand fencing intended to define a yard also provides view obstruction to adjacent properties.

Appropriate Practices

The City's shoreline protection strategy focuses on a healthy, well vegetated dune system as the most sustainable means of protection. Sand fences are usually not needed for dune building[5]. Where applicable, dune grass planting is the preferred method of stabilizing the dune. Dune plants are just as effective and need little or no maintenance. Dune grass plants are also less expensive than fencing.

[5] Dunes: Frontline for Storm Protection, Coastwatch, Winter 2004, North Carolina Sea Grant.

Art and Sculpture

Impact Analysis

Art and sculpture is sometimes placed in the dune system to personalize a homeowner's space and add to their enjoyment of the beach and dune. While these items do not have major impacts on the dune itself, they can kill dune grasses and exacerbate existing destabilization problems in areas where the dune is in flux. They also provide view obstruction when placed on the crest of the dune. Some of the art and sculpture items placed in the CBCMA are very beach appropriate, while others are unsightly and not in keeping with the aesthetics of the natural dune environment.

Appropriate Practices

Art and sculpture should be placed on private property that is not part of the CBCMA due to ecological, view obstruction and aesthetic concerns.

Volleyball Poles and Nets

Impact Analysis

Volleyball is a typical summertime activity which many residents and visitors enjoy. Volleyball is an appropriate activity for the beach, but not for the dune. The game of volleyball, when played in the dune, results in large swaths of trampled vegetation which can destabilize the dune and cause blowouts. When played on the beach, portable volleyball poles and nets have very few impacts.

Timber volleyball poles embedded either directly in the sand or in a makeshift concrete footing (i.e. a bucket or tire) pose a danger to beach cleaning crews or police patrols which may be out at night. These types of poles can also become hazardous debris during and after storms, and if they are left up season after season without proper maintenance.

Appropriate Practices

Volleyball should not be played in any part of the dune because of its damaging effects. Individual homeowners and tenants should use portable volleyball poles and nets on the beach where applicable. These portable systems should be taken down and stored when not in use and should not be left on the beach overnight.

Any seasonal volleyball nets set up by condo associations, community groups or beach volleyball tournament associations should have a permit from the City and meet the conditions set out and enforced by the Department of Recreation, Parks and Open Space.

13. Non-Structural Items, Recreational Uses & Other Activities

Impact Statement

A non-structural item can be generally defined as any object placed on the surface of the beach or dune which is generally recreational in nature. Recreational uses and other activities generally refer to human behaviors which impact the beach and dune system. This section will cover the following non-structural items, recreational uses and other activities:

- Benches, Tables and Chairs
- Signs
- Sand Dune Conversion to Yard
- Planting of Non-Dune Species
- Boat and Watercraft Storage

While many of these items and uses contribute to the experience of beachfront living, it is important to understand their impacts before placing any of them in the dune system. The items and uses listed above can have unintended impacts on the dune, as well as view obstruction, maintenance, ecological and privatization issues. Appropriate practices and designs for non-structural items, recreational uses and other activities in the CBCMA will first address the necessity of the item while also addressing any other impacts.

Primary Regulatory Review

Any non-structural items and activities within the dune system must adhere to all of the following applicable ordinances and codes. Some of these codes apply specifically to boat use and storage.

Coastal Primary Sand Dune Ordinance. Outdoor recreational activities are permitted under the City's Dune Ordinance provided that they do not alter the natural contour of the coastal primary sand dune or destroy dune vegetation.

Encroachment Permit. Any items placed on City land or in a City right-of-way require that an encroachment application be submitted to the Department of Public Works. City Council must pass an ordinance authorizing the encroachment, and the applicant will need to provide liability coverage with the City as a co-insured.

Virginia Department of Game and Inland Fisheries Boat Registration and Titling Requirements. All boats in Virginia propelled by machinery—whether gasoline, diesel, or electric—must be registered and titled. All sail powered vessels longer than 18 feet must also be titled. Watercraft currently registered by the owner in another state and not kept in Virginia for more than 90 consecutive days are not required to be registered in Virginia. The Department of Game and Inland Fisheries uses the information gained during the application process to maintain an online boat registration database.

City of Norfolk Zoning Ordinance. It is unlawful to park or to store, or allow to be parked or be stored, any recreational vehicle, boat, personal watercraft, or trailer for said items in the front yard of a lot or on a public street or right-of-way in a residence district, unless it is parked or stored in a garage, carport or accessory structure. A recreational vehicle can be stored in a side yard as long as it does not exceed six feet in height. Said items can be parked in the rear yard five feet off the property line.

City of Norfolk Code of Ordinances Section 32-73. If the Manager of Environmental Services has reason to believe that any vessel has been abandoned on the beach or in the dunes, or that that vessel might constitute a public health or safety hazard, he can serve the owner of the vessel with a written notice directing the owner to remove or repair the vessel within a certain time frame. If the owner fails to do so, he will be guilty of a Class 1 misdemeanor. Each day's default will constitute a separate offense.

Also, if the owner fails to remove or repair the vessel within the prescribed time frame, the City may remove and dispose of it at the expense of the owner. Any expenses incurred by the City will be chargeable to and paid by the owner of abandoned vessel. If the owner does not pay, a lien will be placed upon his real property and fees collected in the same manner as city taxes levied upon real estate. This lien will be recorded in the judgment lien docket book in the circuit court of the City and may be reduced to a personal judgment against the owner.

If the identity or whereabouts of the owner is unknown or cannot be ascertained, the City can remove and dispose of an abandoned vessel after a 2-week public notice has been made in a local newspaper.

Benches, Tables and Chairs

Impact Analysis

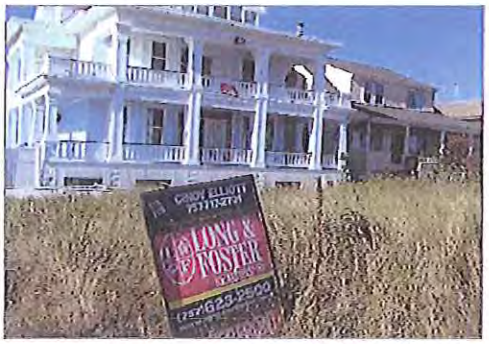
Benches, tables and chairs add to the enjoyment of the beach and dune system. These items are typically recreational in nature and can be made of plastic, metal, fabric or wood. When placed directly on the dune, these items can kill dune grasses and destabilize the dune.

Appropriate Practices

Benches, tables and chairs used within the CBCMA should be placed on an approved deck, patio or observation structure or transported over the dune to the beach via an approved sand trail, walkway or stairway and removed at the end of each day.

Signs

Impact Analysis



Homeowners with approved recreational structures and items within the CBCMA may wish to privatize those items through the use of signs which read "Private Property", "For Sale", "No Trespassing", "Private Beach" etc. When these structures or items are within a City right-of-way and/or on City land, they require an encroachment granted by City Council and cannot be marked as "Private Property" even though they have been built at the homeowner's expense. Privatization signs in the public areas of the CBCMA discourage public use and enjoyment of the dune and coastal environment. Other issues with signs are related to view obstruction and aesthetics. Large or tall signs can obstruct views. "For Sale" signs are out of place in a coastal dune environment.

Appropriate Practices

Privatization signage should be worded in such a way as to let the general public know that a walkway or stairway does not provide public access to the street. "For Sale" signs should only be placed on private property. "Private Property" signs should be placed on private property and not on City land or in the City right-of-way. "Private Beach" signs are not permitted as Norfolk's beaches are public beaches for the enjoyment of all. All signage must adhere to City of Norfolk regulations regarding signs.

Sand Dune Conversion to Yard

Impact Analysis

Fencing off any part of the coastal primary sand dune and converting it into a private recreational space is very damaging to the dune. It kills dune vegetation and destabilizes the dune, compromising its ability to provide property protection in the event of a major coastal storm.

Appropriate Practices

Homeowners should confine their recreational activities to their own property outside of the CBCMA. Even if part of the dune is on private property, converting it to yard space would not be consistent with best practices within the CBCMA.

Planting of Non-Dune Species

Impact Analysis

Beachfront homeowners who plant non-dune species (i.e., roses, oleander, pampas grass, palm trees, etc.) in the dune often do so with a desire to beautify their surroundings or to indulge a love of gardening. Planting non-dune plant species has unintended impacts on the dune. Non-dune vegetation can choke out native plants and beach grasses that trap sand and keep the dune stable. Plants and trees which have a tall growth habit can obstruct views. Some ornamental plants, such as oleander, are extremely toxic.

Appropriate Practices

Homeowners should plant only dune species, especially dune-stabilizing grasses, within the CBCMA. The City can provide guidance as to what plants are appropriate and where they can be obtained.

Boat and Watercraft Storage

Impact Analysis

Boating in general is a large part of the enjoyment of waterfront living, but boat and watercraft storage has always been a concern for beachfront communities. Boats stored or abandoned in the front of the dune pose a safety hazard during storms. The frontal dune area is very dynamic and boats can be easily damaged by winds and waves, which leads to further safety concerns with loose wires, broken masts, etc. Groups of boats are also sometimes stored together in the dunes, which leads to a number of masts sticking up which are unsightly and can obstruct views. When stored on the crest of the dune or in the back dune areas, these masts can be as tall as street lights and create significant view obstructions. Abandoned boats quickly deteriorate in the weather and can become targets for graffiti.

The storage of multiple boats in an area can deter the public from using the beach in that area. Storage of boats in the dune can lead to the construction of private structures (i.e. boat racks, boat winches, etc.) on City land. Other concerns with regard to boat storage in the beach and dune system include the noise from the rigging and masts, mosquitoes breeding in the standing water of upturned boats, and the shading of dune vegetation which encourages invasive grasses and can lead to dune destabilization.

Appropriate Practices

Where applicable, boats and watercraft should be legally stored on the homeowner's property outside of the CBCMA, transported over the dune to the beach and water using beach wheels or catamaran dollies less than 48" wide, then transported back at the end of each day's sailing.

Due to their large size, catamarans may be stored on the beach provided that they have a permit from the City and the meet the conditions set out and enforced by the Department of Recreation, Parks and Open Space.